west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Tuesday, April 11, 2023
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BOULEVARD, PLAZA II
SUITE 200
CANONSBURG, PA 15317

Re: Permit Modification Approval for VAN WINKLE N-6HM
47-051-02364-00-00

Lateral Extension

TUG HILL OPERATING, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

| | |
|---|---|
| Operator's Well Number: | VAN WINKLE N-6HM |
| Farm Name: | XCL MIDSTREAM OPERATING, LLC |
| U.S. WELL NUMBER: | 47-051-02364-00-00 |
| Horizontal 6A | New Drill |
| Date Modification Issued: | 4/11/2023 |

Promoting a healthy environment.

04/14/2023

WW-6B
(04/15)

MODIFICATION

API NO. 47- 051 - 02364
OPERATOR WELL NO. Van Winkle N-6HM
Well Pad Name: Hunter Pethtel

# STATE OF WEST VIRGINIA
# DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
# WELL WORK PERMIT APPLICATION

1) Well Operator: Tug Hill Operating, LLC | 494510851 (Operator ID) | Marshall (County) | Meade (District) | Glen Easton 7.5' (Quadrangle)

2) Operator's Well Number: Van Winkle N-6HM Well Pad Name: Hunter Pethtel

3) Farm Name/Surface Owner: XcL Midstream Operating, LLC Public Road Access: County Route 74

4) Elevation, current ground: 753' Elevation, proposed post-construction: 753'

5) Well Type (a) Gas X Oil ____ Underground Storage ____
Other ____
(b)If Gas Shallow X Deep ____
Horizontal X

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6,139' - 6,143', thickness of 50' and anticipated pressure of approx. 3800 psi.

8) Proposed Total Vertical Depth: 6,293'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 22,349'

11) Proposed Horizontal Leg Length: 15,789.68'

12) Approximate Fresh Water Strata Depths: 70; 414'

13) Method to Determine Fresh Water Depths: Based on the depth of Pittsburgh Coal seam, per WVGES mapping contours

14) Approximate Saltwater Depths: 869'

15) Approximate Coal Seam Depths: Sewickley Coal - 313' and Pittsburgh Coal - 408'

16) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated

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Office Of Oil and Gas
MAR 30 2023
WV Department of
Environmental Protection

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes ____ No X

(a) If Yes, provide Mine Info: Name: ____
Depth: ____
Seam: ____
Owner: ____

3/22/2023



04/14/2023

WW-6B
(04/15)

API NO. 47- 051 - 02364
OPERATOR WELL NO. Van Winkle N-6HM
Well Pad Name: Hunter Pethtel

18)

## CASING AND TUBING PROGRAM

| TYPE | Size (in) | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling (ft) | INTERVALS: Left in Well (ft) | CEMENT: Fill-up (Cu. Ft.)/CTS |
|---|---|---|---|---|---|---|---|
| Conductor | 30" | NEW | BW | BW | 120' | 120' | 259ft^3(CTS) |
| Fresh Water/Coal | 13 3/8" | NEW | J55 | 54.5# | 515' | 515' | 708ft^3(CTS) |
| Intermediate | 9 5/8" | NEW | J55 | 36# | 2,227' | 2,227' | 723ft^3(CTS) |
| | | | | | | | |
| Production | 5 1/2" | NEW | CYHP110 | 20# | 22,349' | 22,349' | 5,684ft^3(CTS) |
| Tubing | 2 3/8" | NEW | P110 | 4.7# | | 5,844' | |
| Liners | | | | | | | |

| TYPE | Size (in) | Wellbore Diameter (in) | Wall Thickness (in) | Burst Pressure (psi) | Anticipated Max. Internal Pressure (psi) | Cement Type | Cement Yield (cu. ft./k) |
|---|---|---|---|---|---|---|---|
| Conductor | 30" | 36" | 1.0 | 2,333 | 1,866 | CLASS A | 1.2 |
| Fresh Water/ Coal | 13 3/8" | 17 1/2" | .38 | 2,740 | 2,192 | SEE #24 | 1.2 |
| Intermediate | 9 5/8" | 12 1/4" | .352 | 3,520 | 2,816 | SEE #24 | 1.19 |
| | | | | | | | |
| Production | 5 1/2" | 8 7/8"_8 3/4" | .361 | 12,640 | 10,112 | SEE #24 | 1.17/1.19 |
| Tubing | 2 3/8" | | .19 | 11,200 | 8,960 | | |
| Liners | | | | | | | |

## PACKERS

| | | | | |
|---|---|---|---|---|
| Kind: | N/A | | | |
| Sizes: | N/A | | | |
| Depths Set: | N/A | | | |

3/22/2023



04/14/2023

WW-6B
(10/14)

API NO. 47- 051 - 02364
OPERATOR WELL NO. Van Winkle N-6HM
Well Pad Name: Hunter Pethtel

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill through the Marcellus and TD Pilot Hole 100' into the Onondaga. Log vertical section and run a solid cement plug back to proposed KOP (5,344'). Drill curve and lateral per proposed well plan, run and cement production casing. Perform CBL from 60 deg to surface, make cleanout run, and stimulate.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Well to be completed with approximately 39,500,000 lb proppant and 720,000 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 16.63 acres

22) Area to be disturbed for well pad only, less access road (acres): 4.87 acres

23) Describe centralizer placement for each casing string:

Will run 3 centralizers on surface casing at equal distance. Intermediate will have 1 centralizer every other joint. Production casing will have one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

24) Describe all cement additives associated with each cement type:

Sfc - Premium NE-1 + 2% CaCl; Int1 - Premium NE-1 + 1.5% CaCL + Flake; Int2 - Lead: Premium NE-1 + 5% BA-90 + .85% R-3 + 3% KCl + .75 gals/100sk FP-13L + 1% MPA-170 Tail: Premium NE-1 +.1% R-3 + 5% KCl + 1% CD-32 + .4% FL-52 +.2% ASA-301 + .6% Sodium Metasilicate; Kick Plug - Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L; Prod - Lead: 50:50 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .75 gal/100sk FP-13L Tail: 25:75 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .375 gal/100sk FP-13L

25) Proposed borehole conditioning procedures:

Will circulate a minimum of 3 hours at TD, short trip to curve, circulate bottoms up, check for flow, POOH

*Note: Attach additional sheets as needed.

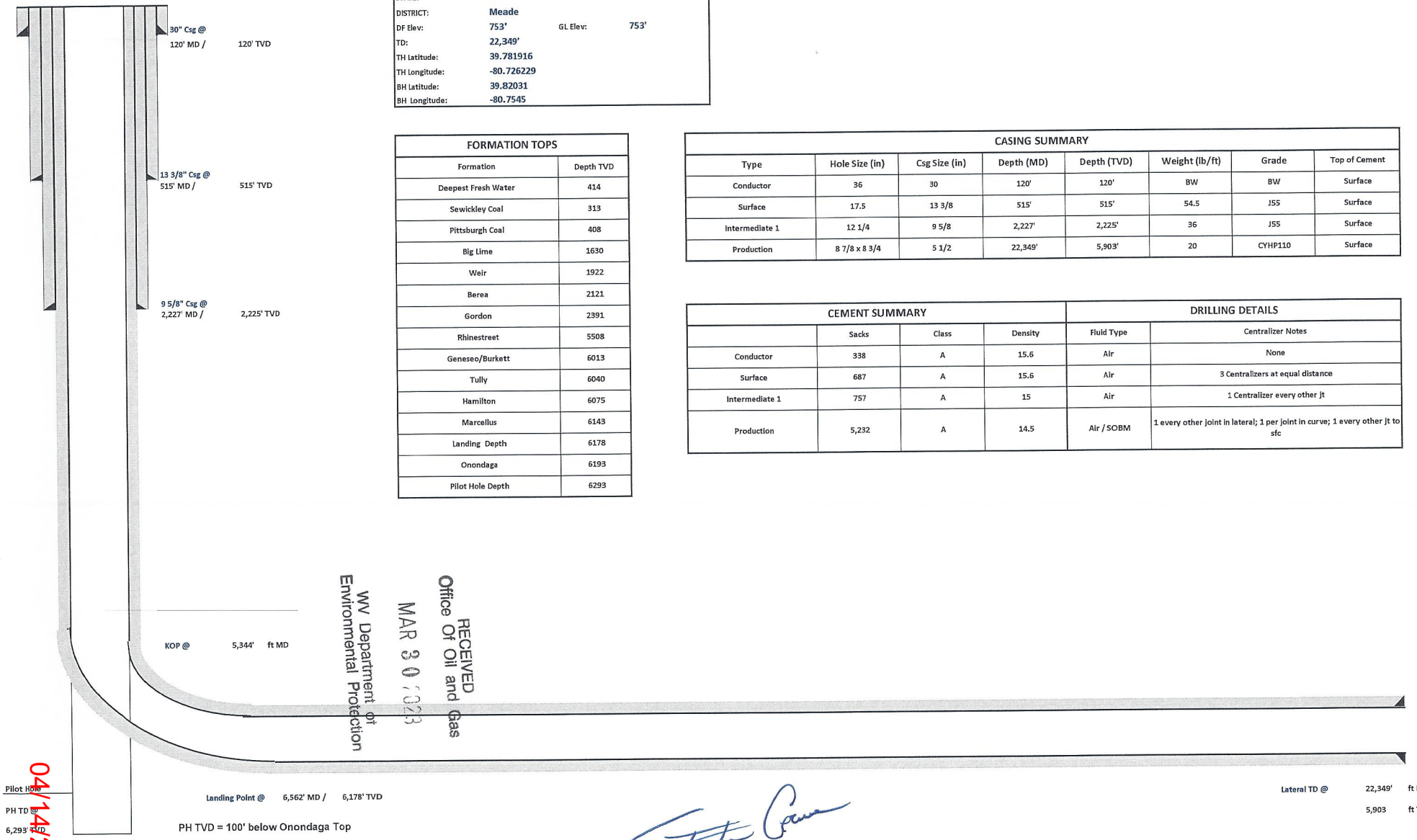
3-22-2023.



04/14/2023

TUG HILL OPERATING

| | | | |
|---|---|---|---|
| WELL NAME: | Van Winkle N-6HM | | |
| STATE: | WV | COUNTY: | Marshall |
| DISTRICT: | Meade | | |
| DF Elev: | 753' | GL Elev: | 753' |
| TD: | 22,349' | | |
| TH Latitude: | 39.781916 | | |
| TH Longitude: | -80.726229 | | |
| BH Latitude: | 39.82031 | | |
| BH Longitude: | -80.7545 | | |




PH TVD = 100' below Onondaga Top

| FORMATION TOPS | |
|---|---|
| Formation | Depth TVD |
| Deepest Fresh Water | 414 |
| Sewickley Coal | 313 |
| Pittsburgh Coal | 408 |
| Big Lime | 1630 |
| Weir | 1922 |
| Berea | 2121 |
| Gordon | 2391 |
| Rhinestreet | 5508 |
| Geneseo/Burkett | 6013 |
| Tully | 6040 |
| Hamilton | 6075 |
| Marcellus | 6143 |
| Landing Depth | 6178 |
| Onondaga | 6193 |
| Pilot Hole Depth | 6293 |

| CASING SUMMARY | | | | | | | |
|---|---|---|---|---|---|---|---|
| Type | Hole Size (in) | Csg Size (in) | Depth (MD) | Depth (TVD) | Weight (lb/ft) | Grade | Top of Cement |
| Conductor | 36 | 30 | 120' | 120' | BW | BW | Surface |
| Surface | 17.5 | 13 3/8 | 515' | 515' | 54.5 | J55 | Surface |
| Intermediate 1 | 12 1/4 | 9 5/8 | 2,227' | 2,225' | 36 | J55 | Surface |
| Production | 8 7/8 x 8 3/4 | 5 1/2 | 22,349' | 5,903' | 20 | CYHP110 | Surface |

| CEMENT SUMMARY | | | | DRILLING DETAILS | |
|---|---|---|---|---|---|
| | Sacks | Class | Density | Fluid Type | Centralizer Notes |
| Conductor | 338 | A | 15.6 | Air | None |
| Surface | 687 | A | 15.6 | Air | 3 Centralizers at equal distance |
| Intermediate 1 | 757 | A | 15 | Air | 1 Centralizer every other jt |
| Production | 5,232 | A | 14.5 | Air / SOBM | 1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc |

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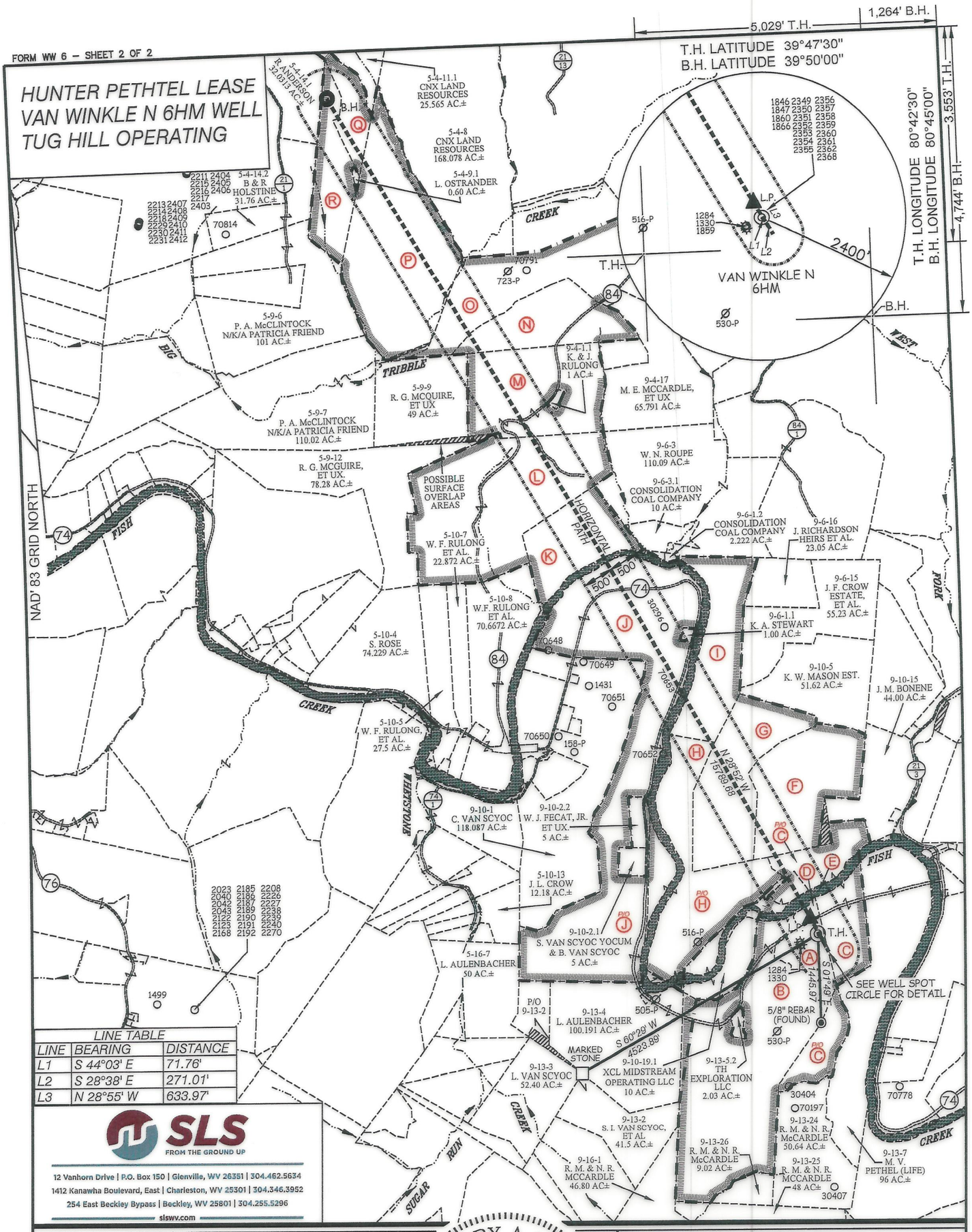
Office Of Oil and Gas
MAR 30 2023
WV Department of
Environmental Protection

3-22-2023.

04/14/2023

FORM WW 6 – SHEET 2 OF 2

# HUNTER PETHTEL LEASE
# VAN WINKLE N 6HM WELL
# TUG HILL OPERATING




| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | S 44°03' E | 71.76' |
| L2 | S 28°38' E | 271.01' |
| L3 | N 28°55' W | 633.97' |

SLS FROM THE GROUND UP
12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slswv.com

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

| | | |
|---|---|---|
| NAD'83 S.P.C.(FT) | N. 469,265.47 | E. 1,623,895.44 |
| NAD'83 GEO. | LAT-(N) 39.781916 | LONG-(W) 80.726229 |
| NAD'83 UTM (M) | N. 4,403,588.32 | E. 523,443.20 |
| | LANDING POINT | |
| NAD'83 S.P.C.(FT) | N. 469,531.0 | E. 1,623,768.6 |
| NAD'83 GEO. | LAT-(N) 39.782640 | LONG-(W) 80.726693 |
| NAD'83 UTM (M) | N. 4,403,668.6 | E. 523,403.2 |
| | BOTTOM HOLE | |
| NAD'83 S.P.C.(FT) | N. 483,359.0 | E. 1,616,146.3 |
| NAD'83 GEO. | LAT-(N) 39.820310 | LONG-(W) 80.754500 |
| NAD'83 UTM (M) | N. 4,407,842.5 | E. 521,010.6 |

GREGORY A. SMITH LICENSED No. 677 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

P.S. 677 Gregory A. Smith

SCALE 1" = 2000' FILE NO. 8952P6HMR2.dwg
VAN WINKLE N 6HM-REV3

DATE JANUARY 22, 20 21

REVISED 6-1-2022 & 3-21-2023

OPERATORS WELL NO. VAN WINKLE N 6HM

API WELL NO. 47 — 051 — 02364
STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
DIVISION OF
ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

LEGEND

LEASE LINE
SURFACE LINE
WELL LATERAL
OFFSET LINE
TIE LINE
CREEK
ROAD
COUNTY ROUTE
PROPOSED WELL
EXISTING WELL
PERMITTED WELL
TAX MAP–PARCEL 00–00
SURFACE OWNER (SEE TABLE) (A)
LEASE # (SEE WW–6A1)

04/14/2023

COUNTY NAME

PERMIT

WELL OPERATOR TUG HILL OPERATING, LLC
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500
FORT WORTH, TX 76107

DESIGNATED AGENT DARREN BROWN
CT CORPORATION
ADDRESS 5098 WASHINGTON ST. W, STE 407
CHARLESTON, WV 25313-1561

FORM WW 6 – SHEET 1 OF 2

# HUNTER PETHTEL LEASE
# VAN WINKLE N 6HM WELL
# TUG HILL OPERATING

5,029' T.H. | 1,264' B.H.

T.H. LATITUDE 39°47'30"
B.H. LATITUDE 39°50'00"

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

| | | |
|---|---|---|
| NAD'83 S.P.C.(FT) | N. 469,265.47 | E. 1,623,895.44 |
| NAD'83 GEO. | LAT-(N) 39.781916 | LONG-(W) 80.726229 |
| NAD'83 UTM (M) | N. 4,403,588.32 | E. 523,443.20 |
| | LANDING POINT | |
| NAD'83 S.P.C.(FT) | N. 469,531.0 | E. 1,623,768.6 |
| NAD'83 GEO. | LAT-(N) 39.782640 | LONG-(W) 80.726693 |
| NAD'83 UTM (M) | N. 4,403,668.6 | E. 523,403.2 |
| | BOTTOM HOLE | |
| NAD'83 S.P.C.(FT) | N. 483,359.0 | E. 1,616,146.3 |
| NAD'83 GEO. | LAT-(N) 39.820310 | LONG-(W) 80.754500 |
| NAD'83 UTM (M) | N. 4,407,842.5 | E. 521,010.6 |

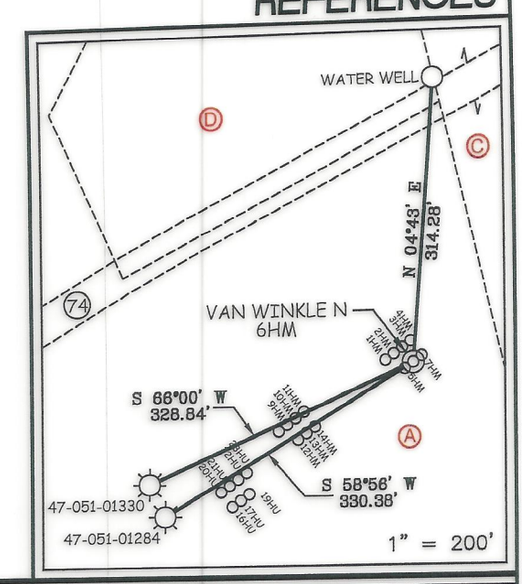
T.H. LONGITUDE 80°42'30"
B.H. LONGITUDE 80°45'00"

3,553' T.H.
4,744' B.H.

T.H.
B.H.

| TAG | SURFACE OWNER | PARCEL | ACRES |
|---|---|---|---|
| A | TH EXPLORATION | 9-13-5.3 | 16.10 |
| B | XCL MIDSTREAM OPERATING, LLC | 9-13-5 | 168.73 |
| C | MARY VIRGINIA PETHTEL (LIFE) | 9-13-6 | 66.36 |
| D | KIRSTIN POSEY | 9-13-5.1 | 3.26 |
| E | STATE OF WEST VIRGINIA (FISH CREEK) | N/A | N/A |
| F | COBLENTZ BROS. INC. | 9-10-18 | 67.88 |
| G | KENNETH W. MASON EST. | 9-10-4 | 67.00 |
| H | ALAN KELLEY ET AL | 9-10-19 | 113.08 |
| I | WILLIAM N. ROUPE | 9-10-3 | 52.00 |
| J | CAROL VAN SCYOC EST | 9-10-2 | 206.988 |
| K | WILLIAM F. RULONG, ET AL | 5-9-11 | 56.00 |
| L | ROBERT GREGORY McGUIRE, ET UX | 5-9-10 | 139.60 |
| M | ROBERT GREGORY MCGUIRE, ET UX | 9-4-1 | 76.75 |
| N | ROBERT GREGORY MCGUIRE, ET UX | 9-4-2 | 45.233 |
| O | SCOTTIE LYONS ET UX | 9-4-3 | 81.33 |
| P | LINDA S. OSTRANDER | 5-4-8.1 | 122.301 |
| Q | CNX LAND RESOURCES | 5-4-10 | 20.20 |
| R | FRED H. MORRIS ET UX | 5-4-9 | 36.292 |

## REFERENCES




## NOTES ON SURVEY

1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
2. WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'.
3. BASED ON WV DOT COUNTY ROUTE 74 IS A 40' STRIP OF LAND ACQUIRED IN NUMEROUS DEEDS.


SLS FROM THE GROUND UP
12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slswv.com


I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 677 Gregory A. Smith

GREGORY A. SMITH LICENSED No. 677 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

DATE JANUARY 22, 20 21

REVISED 6-1-2022 & 3-21-2023

OPERATORS WELL NO. VAN WINKLE N 6HM

API WELL NO. 47 — 051 — 02364
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8952P6HMR2.dwg
VAN WINKLE N 6HM-REV3

HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

STATE OF WEST VIRGINIA
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

WELL TYPE: OIL ____ GAS X LIQUID INJECTION ____ WASTE DISPOSAL ____ IF "GAS" PRODUCTION X STORAGE ____ DEEP ____ SHALLOW X

LOCATION :
ELEVATION 753.50' WATERSHED FISH CREEK (HUC 10)
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'
SURFACE OWNER TH EXPLORATION, LLC ACREAGE 16.10 ±
ROYALTY OWNER DENNIS HUNTER, ET AL - SEE WW-6A1 ACREAGE 190.12 ±
PROPOSED WORK : LEASE NO. SEE WW-6A1

04/14/2023

DRILL X CONVERT ____ DRILL DEEPER ____ REDRILL ____ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ____ PERFORATE NEW FORMATION ____ PLUG AND ABANDON ____ CLEAN OUT AND REPLUG ____ OTHER ____
PHYSICAL CHANGE IN WELL (SPECIFY) ____ TARGET FORMATION MARCELLUS
ESTIMATED DEPTH TVD: 6,293' / TMD: 22,349'

COUNTY NAME
PERMIT

WELL OPERATOR TUG HILL OPERATING, LLC
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500
FORT WORTH, TX 76107

DESIGNATED AGENT DARREN BROWN
CT CORPORATION
ADDRESS 5098 WASHINGTON ST. W, STE 407
CHARLESTON, WV 25313-1561

124588

WW-6A1
(5/13)

Operator's Well No. Van Winkle N-6HM

## INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
## Chapter 22, Article 6A, Section 5(a)(5)
## IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

(1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;

(2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

| Lease Name or Number | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Book/Page |
|---|---|---|---|---|

*See attached pages

### Acknowledgement of Possible Permitting/Approval In Addition to the Office of Oil and Gas

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Tug Hill Operating, LLC
By: Amy L. Morris Amy L. Morris
Its: Permitting Specialist - Appalachia Region



04/14/2023

# WW-6A1 Supplement

| Lease ID | Parcel | Tag | Grantor, Lessor, Etc. | Grantee, Lessee, Etc. | Royalty | Deed Book | | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10*31312 | 9-13-5.3 | A | DENNIS W HUNTER AND KATHY A HUNTER | CENTRAL MICHIGAN EXPLORATION LLC | 1/8+ | 668 | 155 | N/A | N/A | N/A | N/A | Central Michigan Exploration LLC to Stone Energy Corp.: DB 668/155 & AB 21/356 | Stone Energy Corp. to EQT Production Company: AB 38/75 | EQT Production Company to TH Exploration LLC: 48/21 |
| 10*31312 | 9-13-5 | B | DENNIS W HUNTER AND KATHY A HUNTER | CENTRAL MICHIGAN EXPLORATION LLC | 1/8+ | 668 | 155 | N/A | N/A | N/A | N/A | Central Michigan Exploraiton LLC to Stone Energy Corporation: 21/288 & 21/356 | Stone Energy Corporation to EQT Production Company: 38/75 | EQT Production Company to TH Exploration LLC: 48/21 |
| 10*31303 | 9-13-6 | C | MARY V PETHTEL AND FRANK E PETHTEL | CENTRAL MICHIGAN EXPLORATION LLC | 1/8+ | 668 | 525 | N/A | N/A | N/A | N/A | Central Michigan Exploration LLC to Stone Energy Corp.: AB 21/288 & 21/356 | Stone Energy Corp. to EQT Production Company: AB 38/75 | EQT Production Company to TH Exploration LLC: 48/21 |
| 10*31304 | 9-13-6 | C | MARY V PETHTEL AND FRANK E PETHTEL | CENTRAL MICHIGAN EXPLORATION LLC | 1/8+ | 675 | 171 | N/A | N/A | N/A | N/A | Central Michigan Exploration LLC to Stone Energy Corp.: AB 21/288 & 21/356 | Stone Energy Corp. to EQT Production Company: AB 38/75 | EQT Production Company to TH Exploration LLC: 48/21 |
| 10*31306 | 9-13-6 | C | RICHARD CUNNINGHAM | STONE ENERGY CORPORATION | 1/8+ | 859 | 595 | N/A | N/A | N/A | N/A | N/A | Stone Energy Corp. to EQT Production Company: AB 38/75 | EQT Production Company to TH Exploration LLC: 48/21 |
| 10*31307 | 9-13-6 | C | LINDA DANLEY | STONE ENERGY CORPORATION | 1/8+ | 859 | 593 | N/A | N/A | N/A | N/A | N/A | Stone Energy Corp. to EQT Production Company: AB 38/75 | EQT Production Company to TH Exploration LLC: 48/21 |
| 10*31308 | 9-13-6 | C | SUZY WALKER | STONE ENERGY CORPORATION | 1/8+ | 859 | 591 | N/A | N/A | N/A | N/A | N/A | Stone Energy Corp. to EQT Production Company: AB 38/75 | EQT Production Company to TH Exploration LLC: 48/21 |
| 10*31312 | 9-13-5.1 | D | DENNIS W HUNTER AND KATHY A HUNTER | CENTRAL MICHIGAN EXPLORATION LLC | 1/8+ | 668 | 155 | N/A | N/A | N/A | N/A | Central Michigan Exploraiton LLC to Stone Energy Corporation: 21/288 & 21/356 | Stone Energy Corporation to EQT Production Company: 38/75 | EQT Production Company to TH Exploration LLC: 48/21 |
| 10*23458 | FISH CREEK | E | WEST VIRGINIA DIVISION OF NATURAL RESOURCE | TH EXPLORATION LLC | 1/8+ | 1019 | 373 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*17383 | 9-10-18 | F | JACQUES ROY | TH EXPLORATION LLC | 1/8+ | 919 | 631 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*17385 | 9-10-18 | F | GABRIEL ARTHUR KRAUSE ROY | TH EXPLORATION LLC | 1/8+ | 919 | 633 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*17386 | 9-10-18 | F | LYNNE MERYL KRAUSE | TH EXPLORATION LLC | 1/8+ | 919 | 629 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*17387 | 9-10-18 | F | JACINTHE KRAUSE-ROY | TH EXPLORATION LLC | 1/8+ | 919 | 636 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*19749 | 9-10-4 | G | JOHN CALVERT | TH EXPLORATION LLC | 1/8+ | 944 | 428 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*19750 | 9-10-4 | G | DELORES J MYERS | TH EXPLORATION LLC | 1/8+ | 944 | 430 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*19824 | 9-10-4 | G | ROBERT BRADLEY HIGGINS | TH EXPLORATION LLC | 1/8+ | 946 | 57 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*19972 | 9-10-4 | G | ALBERT J WARSINKY AIF ELLEN K NYLES | TH EXPLORATION LLC | 1/8+ | 948 | 209 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*27947 | 9-10-4 | G | STONE HILL MINERALS HOLDINGS LLC | TH EXPLORATION LLC | 1/8+ | 1063 | 568 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*29814 | 9-10-4 | G | DAVID P WARSINSKY | TH EXPLORATION LLC | 1/8+ | 1101 | 29 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*29816 | 9-10-4 | G | ELLEN K NYLES | TH EXPLORATION LLC | 1/8+ | 1101 | 31 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

04/14/2023

## WW-6A1 Supplement

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PENDING | 9-10-4 | G | JAMES W MASON AND VICKIE J MASON, ET AL | AB RESOURCES LLC | 1/8+ | 692 | 461 | N/A | N/A | N/A | AB Resources LLC to Chevron USA Inc: 756/397 | Chevron USA Inc to Stone Energy Corporation: 33/325 | Stone Energy Corp. to EQT Production Company: AB 38/75 | EQT Production Company to TH Exploration LLC: 48/21 |
| 10*31384 | 9-10-19 | H | JOHN E KELLEY AND JANET E KELLEY | STONE ENERGY CORPORATION | 1/8+ | 693 | 6 | N/A | N/A | N/A | N/A | N/A | Stone Energy Corp. to EQT Production Company: AB 38/75 | EQT Production Company to TH Exploration LLC: 48/21 |
| 10*23561 | 9-10-3 | I | VINCENT PATRELLO AND AMANDA PATRELLO | TH EXPLORATION LLC | 1/8+ | 988 | 97 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*23562 | 9-10-3 | I | WILLIAM B ROUPE AND KATHERINE A ROUPE | TH EXPLORATION LLC | 1/8+ | 988 | 94 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*23563 | 9-10-3 | I | WILLIAM N ROUPE AND VIRGINIA A ROUPE | TH EXPLORATION LLC | 1/8+ | 1009 | 317 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*23564 | 9-10-3 | I | CHRISTOPHER A ROUPE AND KARI S ROUPE | TH EXPLORATION LLC | 1/8+ | 988 | 100 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*19894 | 9-10-2 | J | CAROL L VANSCYOC | TH EXPLORATION LLC | 1/8+ | 941 | 392 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*18726 | 5-9-11 | K | EMILY K RULONG AND WILLIAM F RULONG SR | TH EXPLORATION LLC | 1/8+ | 941 | 441 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.305.0 | 5-9-10 | L | ROBERT G & TERRI L MCGUIRE | TH EXPLORATION LLC | 1/8+ | 895 | 45 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.305.0 | 9-4-1 | M | ROBERT G & TERRI L MCGUIRE | TH EXPLORATION LLC | 1/8+ | 895 | 45 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*29855 | 9-4-2 | N | ROBERT G & TERRI L MCGUIRE | TH EXPLORATION LLC | 1/8+ | 1101 | 307 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*41361 | 9-4-3 | O | SCOTT LYONS | SEP EXPLORATION LLC | 1/8+ | 1156 | 562 | N/A | N/A | N/A | N/A | N/A | N/A | SEP Exploration, LLC to TH Exploration, LLC: 51/218 |
| 10*41159 | 5-4-8.1 | P | VENABLE ROYALTY LTD & V14 LP | TH EXPLORATION LLC | 1/8+ | 1151 | 442 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| CVX868216 | 5-4-10 | Q | JAMES D DIMITRO | TRIENERGY HOLDINGS LLC | 1/8+ | 706 | 603 | TriEnergy Holdings LLC to NPAR LLC: 24/180 | AB Resources LLC & NPAR LLC to Chief Exploration & Development LLC & Radler 2000 Ltd Partnership: 24/466 | Chief Exploration & Development LLC & Radler 2000 Ltd Partnership to Chevron USA Inc: 25/1 & 25/105 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC to Chevron USA Inc: 28/356 | Chevron USA Inc to HG Energy II Appalachia LLC: 42/219 | Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286 |
| 10*25513 | 5-4-9 | R | KAREN L WALKER TRUST DTD 1996 | AMERICAN PETROLEUM PARTNERS LLC | 1/8+ | 987 | 322 | N/A | N/A | N/A | N/A | N/A | American Petroleum Operating LLC changed name to High Road Operating LLC: 44/254 | High Road Operating LLC, High Road Minerals LLC & High Road Midstream LLC to TH Exploration LLC: 49/249 |
| 10*40464 | 5-4-9 | R | ROCK OIL COMPANY LLC | TH EXPLORATION LLC | 1/8+ | 1137 | 383 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*40719 | 5-4-9 | R | ROSS AVENUE MINERALS 2012 LLC | TH EXPLORATION LLC | 1/8+ | 1138 | 231 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

04/14/2023

# ASSIGNMENT AND BILL OF SALE

This ASSIGNMENT AND BILL OF SALE (this "*Assignment*") dated as of December 1, 2020 (the "*Execution Date*"), is made by and between EQT PRODUCTION COMPANY, a Pennsylvania corporation, with an address at 625 Liberty Avenue, Suite 1700, Pittsburgh, Pennsylvania 15222 ("*EQT*"), and TH EXPLORATION, LLC, a Texas limited liability company, with an address at 1320 S. University Drive, Suite 500, Fort Worth, Texas 76107 ("*TH*") pursuant to the terms of that certain Acreage Trade Agreement by and among EQT, TH and TH Exploration II, LLC ("*TH II*"), dated July 8, 2020 (the "*Agreement*"). EQT and TH may be referred to herein together as the "*Parties*", and each individually as a "*Party*".

## RECITALS

WHEREAS, EQT desires to transfer, convey and assign to TH certain of EQT's oil and gas leasehold interests located in Marshall County, West Virginia set forth on Exhibit A attached hereto and incorporated herein ("*EQT Leases*") in accordance with this Assignment and the Agreement; and

WHEREAS, TH desires to receive from EQT, all of EQT's right, title and interest in and to the EQT Leases in accordance with this Assignment and the Agreement.

NOW, THEREFORE, for and in consideration of the mutual promises contained herein and in the Agreement, the benefits to be derived by each Party hereunder and under the Agreement, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

## ARTICLE I
## DEFINED TERMS

*1.1 Definitions.* Capitalized terms used herein and not otherwise defined throughout this Assignment shall have the meanings given such terms in the Agreement.

## ARTICLE II
## ASSIGNMENT OF ASSETS

*2.1 Assignment.* Subject to the terms and conditions of this Assignment and the Agreement, EQT does hereby assign, convey and transfer to TH all of the right, title and interest of EQT in and to the following (collectively for purposes of this Assignment, the "*EQT Assets*"):

(a) Subject to the conveyance of the Wells Assets from EQT to TH II as described in the Agreement, the EQT Leases and appurtenances thereto (including rights of access and to install facilities), all Hydrocarbons within, produced from, derived from, or sold from the EQT Leases (and all proceeds related thereto), on and after the Valuation Date, and all Surface Contracts including but not limited to those set forth on Exhibit B attached hereto and incorporated herein (the "*EQT Surface Contracts*") related to the EQT Leases and such Hydrocarbons; and

(b) Copies of deeds, files and all other ownership information directly related to the acquisition, operations and maintenance of the EQT Leases, lease files for the EQT Leases

RECEIVED
Office Of Oil and Gas

MAR 30 ..3

WV Department of
Environmental Protection

04/14/2023

DPS LAND SERVICES CORP
6000 TOWN CENTER BOULEVARD, SUITE 145
CANONSBURG PA 15317-5841

# ASSIGNMENT OF OIL AND GAS LEASE

This **ASSIGNMENT OF OIL AND GAS LEASE** (the "**Assignment**") is made and entered into this 15th day of March, 2023 (the "**Effective Date**"), between SEP Exploration, LLC, a Colorado limited liability company, having an address at 745 17th Street, Suite 790, Denver, CO 80202 (hereinafter "**Assignor**"), and **TH Exploration, LLC**, a Texas limited liability company, having an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "**Assignee**").

WITNESSETH:

**WHEREAS**, Assignor is the owner of the right, title, and interest in that certain Oil and Gas Lease situated in Marshall County, West Virginia, which is described in Exhibit A, and more fully depicted in Exhibit B, attached hereto and made a part hereof (hereinafter the "**Lease**"); and

**WHEREAS**, subject to the exceptions and reservations herein contained, Assignor desires to assign, set over, and transfer to Assignee a part of Assignor's right, title, and interest in and to the Lease.

**NOW, THEREFORE**, for and in consideration of the sum of Ten Dollars ($10.00), cash in hand paid, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and subject to the limited warranties, restrictions and conditions hereinafter mentioned, the parties hereto, intending to be legally bound, do covenant and agree as follows:

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, subject to the terms, reservations, waivers and provisions as hereinafter set forth, an undivided interest of all of Assignor's right, title and interest in and to the Lease and all oil, natural gas, natural gas liquids, condensate, casinghead gas and other liquefied or gaseous hydrocarbons or products ("**Hydrocarbons**") thereby held, in the Marcellus Shale Formation ("**Assigned Formation**"), together with any and all other rights that are reasonably necessary or convenient to explore for and produce Hydrocarbons from the Assigned Formation, including, but not limited to, the right of surface access, use and occupancy, the right of ingress and egress, the right to conduct geophysical and other exploratory activities, the right to lay pipeline, the right to drill through, but not perforate or stimulate, all other depths and formations necessary for the purpose of reaching the Assigned Formation and to conduct operations therein. For the avoidance of doubt, all rights assigned herein are exclusive to those rights granted in the Lease by and between Assignor in its capacity as Lessee and the Lessor listed in Exhibit A attached hereto and made a part hereof.

**TO HAVE AND TO HOLD** such right, title and interest in and to the Lease unto Assignees or their designee, and their respective successors and assigns, forever, in accordance with the provisions of this Assignment.

2. Representations and Warranties. Assignor represents and warrants that such Assignor has not conveyed or otherwise encumbered its interest in the Lease since the time that Assignor obtained its interests in the Lease.

Assignor represents and warrants that, as to its interests in the Lease, Assignor has paid all royalties, and other payments required by the Lease which were due for the period in which Assignor held its interests in the Lease, including, but not limited to, the interests assigned hereunder, and that Assignor has fully performed all conditions necessary to maintain the Lease in full force and effect during such period.

3. Successors and Assigns. The terms of this Assignment shall be binding upon and inure to the benefit of the parties hereto and each of their respective successors and assigns, and such terms shall be covenants running with the land, and with each subsequent transfer or assignment thereof.

Marshall County
Connie Howard, Clerk
Instrument 1503948
03/20/2023 @ 11:29:51 AM
ASSIGNMENTS
Book 51 @ Page 218
Pages Recorded 6
Recording Cost $ 13.00

04/14/2023

DPS LAND SERVICES CORP
6000 TOWN CENTER BOULEVARD, SUITE 145
CANONSBURG PA 15317-5841

# MEMORANDUM OF OPERATING AGREEMENT AND FINANCING STATEMENT

This Memorandum of Operating Agreement and Financing Statement (hereinafter referred to as "Memorandum") is executed to be effective concurrently with that certain Operating Agreement (the "Operating Agreement") by and between TH Exploration, LLC, as Operator, and HG Energy II Appalachia, LLC and TH Exploration II, LLC, as Non-Operators, covering, among other things, the development and production of crude oil, natural gas and associated substances from the leases (hereinafter called the "Contract Area") described on Exhibit "A-1" and Exhibit "A-2" attached hereto and owned by Operator and Non-Operator in the respective percentages of shares indicated on Exhibit "A" to the Operating Agreement.

The Operating Agreement contains an Accounting Procedure, along with provisions giving the parties hereto mutual liens and security interests where one or more parties hereto are or may become Debtors to one or more other parties hereto. This Memorandum incorporates by reference all of the terms and conditions of the Operating Agreement, including but not limited to the lien and security interest provisions.

The purpose of this Memorandum is to place third parties on notice of the Operating Agreement, and to secure and perfect the mutual liens and security interests of the parties hereto.

The Operating Agreement specifically provides and the parties do hereby confirm and agree that:

1. The Operator shall conduct and direct and have full control of all operations on the Contract Area as permitted and required by, and within the limits of, the Operating Agreement.

2. The liability of the parties under the Operating Agreement shall be several, not joint or collective. Each party shall be responsible only for its obligations and shall be liable only for its proportionate share of costs.

3. Each Non-Operator grants to Operator a lien upon its oil and gas rights, oil and gas leases and mineral interests in the Contract Area, and a security interest in its share of oil and/or gas when extracted and its interest in all fixtures, inventory, personal property and equipment located on or used on the Contract Area and in all its contract rights and receivables related thereto and arising therefrom to secure payment of its present and future share of costs and expenses, together with interest thereon at the rate provided in the Accounting Procedure referred to above. To the extent that Operator has a security interest under the Uniform Commercial Code ("Code") of the state or states in which the Contract Area is located, Operator without prejudice and in addition to all other legal, equitable and contractual remedies which are expressly reserved, shall be entitled to exercise the rights and remedies of a secured party under the Code. The bringing of a suit and the obtaining of judgment by Operator for the secured indebtedness shall not be deemed an election of remedies or otherwise affect the rights or security interests for the payment thereof.

4. The Operator grants to Non-Operator a lien and security interest equivalent to that granted to Operator as described in Paragraph 3 above, to secure payment by Operator of its own share of costs and expenses when due.

04/14/2023

DPC LAND SERVICES CORP
5000 TOWN CENTER BOULEVARD, SUITE 145
CANONSBURG PA 15317-5841



# ASSIGNMENT AND BILL OF SALE

STATE OF WEST VIRGINIA §
§ KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF MARSHALL §

This Assignment and Bill of Sale ("Assignment') is made and entered this the 26th day of August, 2021 (the "Effective Date"), by and among **High Road Operating, LLC**, a Delaware limited liability company, **High Road Minerals, LLC**, a Delaware limited liability company and **High Road Midstream, LLC**, a Delaware limited liability company (collectively, "Assignor") and **TH Exploration, LLC**, a Texas limited liability company, with an address of 1320 South University Drive, Suite 500, Fort Worth, TX 76107 ("Assignee"). Assignor and Assignee may be referred to herein together as "Parties", and each individually as a "Party".

WHEREAS, Assignor desires to assign to Assignee, and Assignee desires to receive from Assignor, all of Assignor's right, title and interest in and to certain assets and associated agreements located in Marshall County, West Virginia; and

WHEREAS, TH Exploration IV, LLC acquired the equity interests of Assignor in that certain Membership Interest Assignment Agreement dated July 9, 2021 made pursuant to that certain Purchase and Sale Agreement dated June 21, 2021, and, as a result, is the Sole Member of Assignor.

NOW THEREFORE, for and in consideration of the mutual promises contained herein, and other good and valuable consideration not recited herein, the receipt and sufficiency of which are hereby acknowledged, Assignor, subject to the terms and conditions of this Assignment, does hereby ASSIGN, TRANSFER and DELIVER to Assignee, and Assignee hereby acquires, all of Assignor's right, title and interest in and to the following assets, leases, wells, properties, contracts, agreements, permits (such rights, title and interest collectively, the "Assets"):

(a) All oil, gas and mineral leases and royalties located in Marshall County, WV, including those described in Exhibit A, together with any and all other right, title and interest in and to the leasehold estates created thereby, subject to the terms, conditions, covenants and obligations set forth in such leases or other instruments creating such right or interests (such leases, royalties and mineral interests, collectively, the "***Leases***"), together with any related interest in the lands covered by the Lease or lands unitized, pooled or consolidated therewith (the "***Lands***");

(b) All of the oil and/or gas wells identified on Exhibit B hereto (***"Wells"***), and any other oil, gas, or other wells located on any of the Leases or the Lands in each case, whether producing, non-producing, shut-in, temporarily or permanently abandoned or otherwise, including all Hydrocarbons produced therefrom;

(c) All equipment, machinery, fixtures and other personal, movable and mixed property, operational or nonoperational, primarily attributable to or used in connection with the Wells, including the constructed pads and equipment more fully identified, but not limited to, Exhibit C;

(d) All contracts and agreements to which Assignor is a party or is bound insofar as such contracts and agreements relate to the Leases, Lands and Wells identified herein, including, but limited to, those contracts identified on Exhibit D;

(e) All governmental permits, licenses, and authorizations, as well as any applications for the same, as more fully described, but not limited to those, identified in Exhibit E;

(f) All of Assignor's files, records and data to the extent related to the Assets, including: (i) land and title records (including abstracts of title, title opinions and title curative documents); (ii) all geophysical and other seismic and related technical data and information relating to the Assets; (iii) related contract files; (iv) correspondence; (V) operations, environmental, production and accounting records; and (vi) facility and well records; and

(g) Any and all assets not previously assigned by Assignor, whether or not specifically enumerated herein, which the Assignor may hold any right, title and interest, in Marshall County, WV. For the avoidance of doubt, this Agreement is intended to convey all of the

04/14/2023

TUG HILL

March 28, 2023

CHARLES T. BREWER
WV DEP OFFICE OF OIL & GAS
601 57TH STREET SE
CHARLESTON, WV 25304-2345

**VIA USPS**
**RE: Van Winkle N-6HM API # 47-051-02364 (H6A Permit Modification)**
**Meade District, Marshall County, WV**

Dear Taylor:

Tug Hill Operating, LLC is submitting a permit modification for its permitted well, Van Winkle N-HM to add 6,667.16' to the lateral length. Therefore, enclosed please find the following:

- Modified WW-6B with changes highlighted in yellow
- Updated well plat
- Updated WW-6A1 information
- Updated Site Safety Plan

RECEIVED
Office Of Oil and Gas
MAR 30 2023
WV Department of
Environmental Protection

If you have any questions or need any additional information, please do not hesitate to call me on (304) 376-0111. Thank you for attention to this matter, it is greatly appreciated.

Sincerely,

Amy Morris

AMY MORRIS
PERMIT SPECIALIST-APPALACHIA REGION
TUG HILL OPERATING, LLC

Enclosures

Ck# 063138
Amt $2500
Date 3/23/23



04/14/2023

TUG HILL
OPERATING

# Well Site Safety Plan
# Part A – Site Specific Data and Figures

## Well Name: Van Winkle N-6HM
## Pad Name: Hunter Pethtel Pad
## County: Marshall

**UTM (meters), NAD83, Zone 17**
**Northing: 4,403,588.27**
**Easting: 523,443.20**

**KEY CONTACT FOR WELL SITE SAFETY PLAN DEVELOPMENT AND MAINTENANCE**

**Jerry V. DeRosa, Director EH&S Affairs**
**(724) 338-2029 (office)**
**(412) 736-5767 (cellular)**

**24-HOUR EMERGENCY PHONE NUMBER**

**(800) 921-9745**

3/22/2023

04/14/2023

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| 2.1 | Emergency Contact Information | 6 |
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**WSSP PART A -- SITE-SPECIFIC DATA Section**

- Emergency Contacts
- Emergency Contacts List by Operational Phase

**Siting Exhibits**

Exhibit 1 – Directions to Well Site, Evacuation & Bonded Routes
Exhibit 2 – Topographic Maps – 1-mile Map, Resident Information and Area Schools, if any
1500' Map, Resident Information and Area Schools, if any
Exhibit 3 – Helicopter Landing Zone
Exhibit 4 – Plan View Map
Exhibit 5 – Zone of Critical Concern

**Well Development and Equipment Layout Figures**

Figure 1 – Collision Avoidance Well Bore Spider Plot
Figure 2 – Casing and Cementing
Figure 3 – Well Bore Layout Program
Figure 4 – Anticipated Drilling Rig Layout
Figure 5 – Anticipated Frac layout
Figure 6 – Planned Production Facilities

**Chemical Inventory Safety Data Sheets**

- See Chemical Inventory Table.
- SDS provided electronically. Hard Copies onsite
  - SDS- Drilling
  - SDS- completions
  - SDS- Production


**(See WSSP PART B – EMERGENCY PROCEDURES AND ATTACHMENTS)**



04/14/2023

## 1.0 PURPOSE

Pursuant to West Virginia legislative rule 35 CSR 8-5.7 – Rules Governing Horizontal Well Development, Tug Hill Operating LLC ("Tug Hill") has prepared this Well Site Safety Plan (WSSP) to address proper measures to be employed for the protection of persons on the well site, as well as the general public in the area surrounding the well site. This rule establishes the minimum requirements for WSSPs, which are to be prepared and submitted with each well work permit application and maintained in connection with each phase including Drilling, Completions, and Work-Over activities (referred to herein as "Operations").

Various additional federal and state environmental, safety and health regulations govern protection of life, property, and the environment in connection with oil and natural gas development. Other specific environmental and safety related contingency plans are, therefore, either incorporated herein or are referenced to meet these related requirements. These various components and other plans include:

- WV Well Site Safety Plan (WSSP)
- Emergency Response Plan (ERP)
- Incident Response and Notification Procedure
- Incident Command Structure (ICS) – pursuant to the federal National Incident Management System (NIMS)
- Hydrogen Sulfide (H2S) Contingency Plan
- Example Tug Hill Drilling and Completions Plans
- Example Production Facilities Design Plans

Once the site wells are flowing gas to sales gathering lines, it is referred to as being in the "Production" phase. During Production, gas flows to the sales lines and brine water and petroleum liquids (which will be referred to hereafter as "Condensate") are typically stored on location in aboveground storage tanks (ASTs). As such, once in Production, we also implement a Spill Prevention, Control, and Countermeasure Plan (SPCC) Plan and, in some instances depending upon location of the site and size of the tank(s), the added elements of a WV Department of Environmental Protection (WVDEP) Spill Prevention and Response Plan (SPRP).

These additional documents shall be referred to herein as "Companion Documents" to the WSSP and together, collectively, comprise the **Tug Hill Integrated Contingency Plan (ICP)**.

Also, incorporated by reference is the Tug Hill Contractor Expectations Manual (CEM) and the Tug Hill Master Containment Plan (MCP).

Tug Hill has developed this WSSP/ERP/ICP binder of Companion Documents, to provide and confirm the procedures to be followed during emergencies, to facilitate the rapid deployment of resources, and to minimize impact and risk to the environment and personnel at the Tug Hill Well Pads.

## 1.1 Well Site Safety Plan Organization

Tug Hill has sought to follow the outline and sequence of the WVDEP guidance document on "Scope of Work for Site Safety Plans". Additional sections and attachments included in this WSSP and the ICP binder are provided to address other environmental, safety, and emergency response needs relevant to the various components of federal and state regulations and industry standard practices. The Tug Hill ERP draws upon the protocol established through Federal Emergency Management Agency (FEMA) National Incident Management System (NIMS). The NIMS is a systematic, proactive approach to guide departments and agencies of government, nongovernmental organizations, and the private sector, to work together seamlessly and manage incidents involving all threats and hazards, regardless of cause, size, location, or complexity, to reduce loss of life, property, and harm to the environment.

For ease of reference, therefore, the WSSP is separated into two parts:

### 1.1.2 WSSP PART A -- SITE-SPECIFIC DATA

- SITE-SPECIFIC DATA and information
- Siting Location Plans and Exhibits
- Well Development Figures
- Chemical Inventory Information

Because there is duplication of some topics under these different regulatorily required plans, we have sought to compile and condense those exhibits, figures and other items which would be most needed and accessed quickly by incident command in case of an emergency into a singular section that comprises **PART A -- SITE-SPECIFIC DATA** section.

Where applicable, the reviewer of the WSSP is directed to find site plans, drawings, exhibits and tables, in the **PART A -- SITE-SPECIFIC DATA** tab.

### 1.1.3 WSSP PART B – EMERGENCY PROCEDURES AND ATTACHMENTS

Standard policies and procedures required under W.Va. Rule 35 CSR 8-5.7 which apply to all Tug Hill well pads in West Virginia.

Topics covered in Part B Include:

1. **Emergency Contacts and Emergency Event Levels**
2. **Site Access and Management**
3. **Site Safety**
4. **Emergency Response and Evacuation Plans**
5. **Well Work Plan**
6. **Chemical Inventory**
7. **Spills and Releases**
8. **Blow-Out Preventer and Well Control**
9. **Hydrogen Sulfide**

10. **Well Flaring**
11. **Collision Avoidance**
12. **Additional Requirements**

Attachment to Part B include:

1. **Standard Wellhead Assemblies Figures**
2. **Emergency Response Plan (ERP) and Procedures**
3. **Hydrogen Sulfide ($H_2S$) planning**

The Emergency Response Plan (ERP) is in **PART B**. Components of the ERP includes Emergency Response scenarios and the Incident Command System (ICS) – which is an organizational hierarchy and description of the division of responsibilities for large-scale, severe incidents such as a well control incident. As shown above, the ERP is provided in the **PART B – EMERGENCY PROCEDURES AND ATTACHMENTS**.

## 1.2 Revisions

Revisions and updates to the WSSP relating to changes of Operational phases and/or personnel will occur in the **PART A -- SITE-SPECIFIC DATA** section.

**WSSP/ICP Record of Review & Revision Index**

| Date | Description of Changes | Reviewer/Revised by: |
|---|---|---|
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### 1.3 Distribution

WSSPs will be prepared and submitted to the WVDEP Office of Oil and Gas with the Well Work Permit application for review and approval. The WSSP, once approved, may only be modified upon approval by the WVDEP Office of Oil and Gas.

Copies of the WSSP will also be provided by Tug Hill to the County Office of the Emergency Management Agency (EMA) at least seven (7) days prior to the commencement of well work or site preparation work that involves any disturbance of land.

The WSSP and ICP binder of Companion Documents are to be maintained in the Company Man trailer on Drilling and Completions ("D&C Operations") pads. The **PART A -- SITE-SPECIFIC DATA** section of the WSSP (e.g., Emergency Contacts List, Site Layout, Emergency Evacuation, Helicopter Landing Zone, and Incident Response and Notification Procedure) are also to be kept in the Operations Pad Security Guard Shack for readily available access during a well control event. A hard copy of the WSSP will also be placed in the in the well pad site access road mailbox.

Once the well pad is converted to the Production phase, the ICP and engineer stamped SPCC/SPRP will be available to Operations personnel in the local Tug Hill Production field office and will also be available in the field electronically through the Tug Hill subscription database known as "EHS Insight".

All personnel working on location and managers making decisions about activities on-site, even if such manager does not visit the site, are to be cognizant of the contents of the WSSP and ICP Companion Documents.

**DISTRIBUTION LIST**

| Recipients | Date |
|---|---|
| WVDEP Oil & Gas County Inspector Approval | |
| WVDEP Oil & Gas Division – Permit Application | |
| Marshall County Emergency Management Agency | |
| Drilling and Completions Person-in-Charge (PIC) Field Offices | |
| Tug Hill Pre-Spud Meeting - Drilling Person-in-Charge (PIC) | |
| Tug Hill Pre-Spud Meeting - Completions Person-in-Charge (PIC) | |
| Tug Hill Production Field Office | |

# 2.0 CONTACTS, SCHEDULES, AND MEETINGS

## 2.1 Emergency Contact Information

The Tug Hill Emergency Contacts List presented within **PART A -- SITE-SPECIFIC DATA** section of this WSSP. The list includes contact information for local emergency response, Tug Hill management personnel, and contractors currently operating at the well site. Contractors working on location will vary for Drilling versus Completions vs Production.

For reference, the Emergency Contacts List within **PART A -- SITE-SPECIFIC DATA** section of this WSSP is comprised of those contractors being utilized by Tug Hill at the time of permit submittal. An updated Emergency Contact List will be issued and in the WSSP / ICP binder on location prior to the commencement of the Operational phase.

Schools, residences, and public facilities within a one (1) mile radius are shown in Siting Exhibits also in the **PART A -- SITE-SPECIFIC DATA** section.

## 2.2 Incident and Emergency Notifications

Incident notifications commence by following the Tug Hill **Initial Incident Response and Notification Procedure**, which is provided herein and in the ERP in **PART B – EMERGENCY PROCEDURES AND ATTACHMENTS** of this WSSP. Contractors and Employees alike are required to report all and every incident as soon as practicable.

Pursuant to the Tug Hill executive management EH&S policy directive, **all incidents** (e.g., safety or environmental related accidents and near miss events, equipment failure, vehicle accidents, injuries, illnesses, and/or spills, releases, or leaks involving loss of fuels, petroleum, chemical fluids, and other hazardous materials used, stored, produced, or transported on-site) must be reported immediately to the either Tug Hill Company Man/Completions Consultant or other Tug Hill Person-in-Charge (PIC), **AND** to the on-duty EHS Coordinator.

The observer of the condition or incident of concern continue attempting contacts until a person is reached. Voicemail, texts, emails are **NOT** sufficient contact.

The Tug Hill Company Man/Completions Consultant/PIC or EHS Coordinator will enter the FIRST ALERT REPORT into the Tug Hill EHS Insight database. The FIRST ALERT will automatically disseminate via email to the Tug Hill Operations Management team. The EHS Coordinator on-duty is to report to the scene and complete Incident SUBMISSION details in EHS Insight and will coordinate response actions in concert with the Company Man/PIC, EHS Director, and Tug Hill Operations management.

## 3.0 EXHIBITS REQUIRED IN THE WSSP

Maps and figures of the location and access road, nearby dwellings, etc. as required in the WSSP by W.Va. 35 CSR 8-5.7 are presented in the **PART A -- SITE-SPECIFIC DATA section** of this WSSP, and in the ICP.

### 3.1 Driving Directions to Site

Driving directions, the County EMA-assigned 911 street address, and the coordinates for the well pad and access road entrance are provided as a packet of **Siting Exhibits** in **PART A -- SITE-SPECIFIC DATA section** of this WSSP.

Additionally, Tug Hill issues a **Vehicle Operations Contractor Expectation** policy to all Contractors working on the location during the Pre-Spud and/or Pre-Stim meetings. The Vehicle Expectations also specify the hours of the bus curfews, provides maps of the approved bonded routes trucks may travel to access the location, and other rules regarding vehicle operations, especially those if trucks. The bonded route and evacuation route is shown on Exhibit 1.

Contractors are fully responsible for enforcing a **Zero Tolerance** policy regarding Vehicle Expectations with their personnel and the sub-contractors under their direction.

### 3.2 Site Location Maps

The following maps and figures are provided as a packet of **Siting Exhibits** in **PART A -- SITE-SPECIFIC DATA section** of this WSSP.

#### 3.2.1 Topographic Map – Resident Information

1-Mile and 1500 Safety Buffer Map, depicts the site location, site entrance, and location of the access road with UTM NAD 83 coordinates. See Exhibit 2.

A table of resident locations and businesses within a one-mile radius of the well pad is shown. Contact information for residences and businesses identified in this area are provided on List of Commercial and Residential Receptors. Helicopter landing zone is shown in Exhibit 3.

#### 3.2.2 Plan View Map

General Site Plan and Vicinity Plan illustrating of site features, flare lines, and access roads are provided in the **PART A -- SITE-SPECIFIC DATA section** of this WSSP. See Exhibit 4.

3.2.3 Well Development and Equipment Layouts

The layout of the drilling rig, completions spread, and production equipment figures are also provided in **PART A -- SITE-SPECIFIC DATA** section. Adjustments to the exact layout of the drilling rig and completions spread will be made as needed at the time of moving on and rigging up.

Drawings of the final layout our included in Pre-Spud and Pre-Stim packages provided to Contractors at the pre-work safety meetings, to which the WVDEP Oil & Gas Inspector is invited.

Copies of the Pre-Spud and Pre-Stim (or "Pre-Frac") documents are sent out electronically and will also be provided in **WSSP PART A -- SITE-SPECIFIC DATA** of the ICP binder maintained in the Company Man/Completions Consultant office on location.

## 4.0 CHEMICAL INVENTORY AND SAFETY DATA SHEETS (SDS)

### 4.1 Safety Data Sheets (SDS):

Policies and procedures regarding Safety Data Sheets (SDS) being collected and maintained for each chemical on location are covered in **PART B – EMERGENCY PROCEDURES AND ATTACHMENTS** of this WSSP. Maintaining these records on location and submittal of notices to the county and state agencies is required by laws and regulations.

SDSs for all materials and chemicals on-site will provided in this **PART A -- SITE-SPECIFIC DATA section** of this WSSP, and in the ICP. of the submitted copy of this plan and in the SDS section of the ICP.

# Incident Response and Notification Procedure

# INITIAL INCIDENT RESPONSE AND NOTIFICATION PROCEDURE
## Tug Hill - Appalachia Based Operations

This procedure is designed for **INITIAL** internal reporting as a quick start guide to the Tug Hill WSSP/ERP/$H_2S$/SPCC/Stormwater Plans (which is part of the Tug Hill Integrated Contingency Plan or "ICP"). Please refer to the ICP for detailed instructions.

**ALL incidents (e.g., near-miss, injuries, truck accidents, vandalism, acts of violence, pollution control malfunction), and spills/releases (e.g., gas leaks, fluid spills of chemicals, fuels, brine, & other hazardous materials used, stored, produced or transported) must be reported following the flow-chart below. Enter the event in EHS Insight First Report and follow-up with EHS Coordinator.** Reporting to agencies will be performed by the Tug Hill Director of EH&S Affairs or a designee.

**REPORT ALL INCIDENTS ASAP EVERY TIME**

1. **UNCONTROLLED FIRE, EMERGENCY or SERIOUS INJURY ➡ CALL 911**
2. **Emergency Number: 1-800-921-9745 (for External Use)**
3. **ALL INCIDENTS: Follow Reporting Below (for Internal Use)**

**Actions ⬇** **⬇ Reporting**

Observer of incident is to ***immediately*** contact **Tug Hill Company Man** or Tug Hill Person-in-Charge (PIC) and Contractor's Supervisor

For Spills, Stop and/or contain material and consult with EH&S

**Take these containment and clean up actions only if they can be performed safely**

**Small, Minor to Moderate Spill Events**

Clean-up with onsite personnel and equipment

EHS Coordinator is responsible for confirming clean-up is complete

Observer of incident is to ***immediately*** enter **First Report** into **EHS Insight** and call Tug Hill EHS Coordinator

Tug Hill EHS Coordinator to contact Tug Hill Operations Superintendent, Director or PIC to ensure collaboration

**Larger, Major, More Serious/Significant and Crisis Spill Events**

EH&S group to coordinate and manage clean-up and response actions using qualified response contractor pursuant to the Tug Hill ICP

Tug Hill EHS Coordinator to complete **EHS Insight Incident Submission** step and contact Tug Hill EHS Superintendent or Director

**Tug Hill Director** of EH&S to notify WVDEP via telephone **within 2 hours** of incident involving leak, spill or release of material

Tug Hill Director of EH&S to provide WVDEP with email followup **within 24 hours**

**Tug Hill Operating EHS Contacts**

Jeremy Barber: 412-877-5869 (c)
jbarber@tug-hillop.com

Noel Missig: 412-498-7322 (c)
nmissig@tug-hillop.com

Josh Southern: 304-476-3079 (c)
jsouthern@tug-hillop.com

Joey Guzzo: 910-712-3480 (c)
joseph.guzzo@gryphonesp.com

Tony Laquatra: 412-716-7396 (c)
alaquatra@gryphonesp.com

Randy Luna: 681-758-5428
randy.luna@gryphonESP.com

Cass Mattison: 832-262-1613 (c)
cassidy.mattison@gryphonesp.com

Brian O'Neil: 412-463-6430 (c)
oneil.contractor@gryphonesp.com

Doug Sykes: 304-815-3098 (c)
doug.sykes@gryphonesp.com

**Tug Hill Director, EH&S Affairs**

Jerry DeRosa: 412-736-5767
jderosa@tug-hillop.com

**WVDEP Hotline (Reportable)**

1-800-642-3074

**WVDEP Inspectors**

**Strader Gower – Marshall**
304-993-6188

**Steve McCoy – Wetzel**
681-344-3265

**Marshall Co. EMA 24 hr.**
304-845-1920

**Wetzel Co. EMA 24 hr.**
304-455-6730

**Continue attempting contacts until a person is reached.**

**Voicemail, texts, emails are NOT sufficient contact.**

➡ Enter the **FIRST REPORT** into EHS Insight. EHS Coordinator will report to site & collect details for Report **SUBMISSION** and will support Operations management with response actions.

➡ For all events requiring Muster, activate and follow the **Tug Hill Well Site Safety Plan (WSSP).**

➡ **For Immediately Dangerous to Life or Health (IDLH)** conditions, off-site Muster, or when involving state or federal Emergency Response Agencies, activate and follow the **Tug Hill Emergency Response Plan (ERP) attached to the WSSP.**

## All incidents are to be recorded in the EHS Insight database.

Incident Reporting is a several step process. The first two (2) steps combined comprise the initial reporting:

- Step 1: **First Alert/First Report** – All personnel have a responsibility to make the First Report ASAP and contact the on-duty EHS Coordinator.
- Step 2: **Submission step** – the EHS Coordinator will report to the site and gather incident details. Complete:
  - **ASAP:** (e.g., within time less than 2 hours)
  - **Routinely:** Before the end of the shift
  - **ALWAYS:** No later than within **24 hours** (unless approved by the EHS Superintendent or EHS Director).

## Incident Severity Determination

- Incident severity will be determined pursuant to the **Incident Risk Matrix** in EHS Insight Step 2, Incident Details Submission. EHS Coordinators will enter the severity on the matrix when completing Step 2.
- High Severity Incidents, Hi-Potential Near Miss, and Reportable Injuries will typically require investigation.

## Spill Response Guide for Contractor Selection

Pursuant CEM and the Tug Hill Incident Response and Notification Procedures, clean-up of reportable spills, especially larger, higher severity spill events, will be managed and coordinated by the EHS Department. When deemed necessary, the EHS Department will engage a professional environmental spill response Contractor to perform the response action. Approved spill response contractors shown on the Operations Emergency Contact List and found in the ICP and the SPCC Plan.

Reportable spills, and those considered larger and higher severity events are those that trigger a reporting requirement, and one of the following:

a) Spills off containment sufficient to have the potential in impact surface and/or groundwater (e.g. >1 bbl.).
b) The release of outside the confines of berms on the Operations pad and/or the permitted Limit of Disturbance.
c) The release will likely result in contaminated soils requiring excavation based upon state requirements.
d) The release that may result in a Notice of Violation (NOV) issued from the state or federal government.
e) The release is into a water body and/or in defined protect environ (e.g. Zone of Critical Concern or wetland).

Smaller spills may be cleaned-up by personnel on location if the spill is within certain specific parameters.

Under no circumstances, however, are spills of materials that constitute a "**hazardous waste"** to be cleaned-up by workers not trained in hazardous waste operations pursuant to OSHA regulation.

Contractors are to comply with all relevant and applicable regulations regarding spills and releases of pollutants and hazardous chemicals as defined by federal, state, and local laws and regulations. Contractors shall additionally adhere to any Tug Hill-issued policies and procedures pertaining to the work performed including, but not limited to the following:

- **Tug Hill Integrated Contingency Plan (ICP) binder contains the**
  - **Well Site Safety Plan (WSSP)** (Drilling and Completions Sites only)
  - **Emergency Response Plan (ERP)**
  - **Incident Command System (ICS)**
  - **Hydrogen Sulfide Contingency Plan**
  - **Spill Prevention and Countermeasure Plan (SPCC) / Spill Prevention and Response Plan (SPRP)**
- **Storm Water Management Plans and Groundwater Protection Plans (GPP)** (where applicable)
- **The Tug Hill Operating Contractor Expectation Manual (CEM)** (see the Incidents section).


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# Emergency Contacts List by Operational Phase

# TUG HILL OPERATING – HUNTER PETHTEL/VAN WINKLE WELL
## EMERGENCY NUMBER 800-921-9745
## Key Personnel & Agency Emergency Contact List

### TUG HILL OPERATING REPRESENTATIVES

| Contact | Name | Phone | Cell Phone | Email |
|---|---|---|---|---|
| **SVP Operations/Advisor** | David Patterson | 817-632-5240 | 620-304-1031 | dpatterson@tug-hillop.com |
| **VP Operations** | Sean Gasser | 817-632-5250 | 972-510-8438 | sgasser@tug-hillop.com |
| **VP Geology** | Jim Pancake | (724) 749-8388 | (412) 463-9091 | jpancake@tug-hillop.com |
| **Drilling & Completions Engineering** | Rory Johnston | 817-632-5200 | 432-664-4497 | rjohnston@tug-hillop.com |
| **Drilling Superintendent 1** | Bill Smith | | 724-255-2308 | bsmith@tug-hillop.com |
| **Drilling Superintendent 2** | Jon Capuccio | | 580-678-2724 | Drillingsup2@tug-hillop.com |
| **Completions Superintendent** | Jordan Buterbaugh | 724-762-8271 | 724-762-8271 | jbuterbaugh@tug-hillop.com |
| **Company Man** | Company Man | **Satellite Phone ?** | 570-337-5635 (o) | falcon24@tug-hillop.com |
| **Director EH&S** | Jerry DeRosa | | 412-736-5767 | Jderosa@tug-hillop.com |
| **Sr. EHS Coordinator** | Josh Southern | | 304-476-3079 | Jsouthern@tug-hillop.com |
| **Sr. EHS Coordinator** | Noel Missig | | 412-498-7322 | Nmissig@tug-hillop.com |
| **Sr. EHS Coordinator** | Jeremy Barber | | 412-877-5869 | jbarber@tug-hillop.com |
| **VP Production** | Chad Grinnell | | 817-201-1566 | cgrinnell@tug-hillop.com |
| **Sr. Production Engineer** | Blake Armstrong | | 817-517-1149 | barmstrong@tug-hillop.com |
| **Production Superintendent** | Jeffery Walker | | 724-503-0668 C<br>304-810-2093 H | jwalker@tug-hillop.com |
| **Facilities** | Rob Springer | 724-749-8388 | 724 833-4328 | rspringer@tug-hillop.com |
| **Facilities** | Terry Campbell | | 817-586-9374 | tcampbell@tug-hillop.com |
| **Construction** | Geoff Radler | | 817-247-7233 | gradler@tug-hillop.com |
| **Construction** | Chad Dunham | | 304-215-5405 | cdunham@tug-hillop.com |
| **Construction** | Randy Sleeth | | 682-404-6266 | rsleeth@tug-hillop.com |

| | | |
|---|---|---|
| **ALL INCIDENTS:** SPILLS, NEAR MISS, ACCIDENTS, INJURIES, VIOLENCE | **TUG HILL INCIDENT RESPONSE AND NOTIFICATION PROCEDURE** | |
| **TUG HILL 24 HOUR EMERGENCY** | **800-921-9745** | **911** |


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# TUG HILL OPERATING – HUNTER PETHTEL/VAN WINKLE WELL
## EMERGENCY NUMBER 800-921-9745
## Key Personnel & Agency Emergency Contact List

### DRILLING RELATED CONTRACTOR INFORMATION

| Contact | Company | Name | Cell Phone | Email |
|---|---|---|---|---|
| **Nabors B-28 Rig Phone** | | | 817-897-8168 (c)<br>412-906-8643 | naborsb28@tug-hillop.com |
| **Rig Falcon 24 Phone** | Falcon Drilling | Rig Manager(s) & Tour Pusher(s) | 724-288-3909 (c)<br>724-263-6504 | |
| **Nabors NE District Ops. Manager** | Nabors | Gus Miller | 570-766-2971 | gus.miller@nabors.com |
| **Nabors Drilling Superintendent** | Nabors | Jonathan Gardner | 714-7422274 | jonathan.gardner@nabors.com |
| **Nabors HSE Supv.** | Nabors | Bill Schwaderer | 814-335-9482 | william.schwaderer@nabors.com |
| **Nabors HSE** | Nabors | Mardie Harrison | 803-331-6122 | mardie.harrison@nabors.com |
| **Nabors HSE** | Nabors | Trent Metzger | 406-529-8419 | trent.metzger@nabors.com |
| **Nabors HSE** | Nabors | Sam Tucker | 304-923-7321 | samuel.tucker@nabors.com |
| **Director, HSE** | Falcon Drilling | Sam Hockenberry | 724-840-5859 | shockenberry@falcondrilling.com |
| **Director, Operations** | Falcon Drilling | Luke Salazar | 940-210-1170 | lsalazar@falcondrilling.com |
| **OPS Manage / Superintendent** | Falcon Drilling | David Palamides | 412-759-7282 | dpalamides@falcondrilling.com |
| **Coordinator, HSE [Starting 10/18/2021]** | Falcon Drilling | Brandon Lawson | 724-388-8562 | blawson@falcondrilling.com |
| **Surface Casing 1** | Producers Supply | Brad Poleski | 412-491-9937 | brad@p-s-c.com |
| **Surface Casing 2** | Miller Supply | Hal Payne | 740-350-3688 | hpayne@kenmillersupply.com |
| **Intermediate Casing** | Tenaris | Mallory Corlee | 304-639-5028 | mcorlee@tenaris.com |
| **Trucking Casing** | PANHANDLE TRUCKING | John Antonelli | 304-989-4948 | |
| **Clean, Drift and Tally Crew** | IOS | Michael Stewart | 724-553-4212 | mstewart@ibfoster.com |
| **Casing Crew** | KIMZEY CASING CREW | Jordan Beckner | 724-747-0402 | jbeckner@kimzeycasing.com |
| **Casing Crew** | WYOMING CASING CREW | Sam Lopez | 330-415-8609 | samlopez@wyomingcasing.com |
| **Trucking** | C & S Trucking | Jen McIntyre | 724-809-0708 | |
| **DIRECTIONAL MWD** | NZONE | Cole Patterson<br>Luke Moodie | 682-715-3624<br>512-672-9227 | cpatterson@nzoneguidance.com<br>lmoodie@nzoneguidance.com |
| **Fresh Water Trucks** | J&R | Dispatch | 304-845-4974 | |
| **Fresh Water Trucks** | Enlink | Dispatch | 877-593-0821 | |


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# TUG HILL OPERATING – HUNTER PETHTEL/VAN WINKLE WELL

**EMERGENCY NUMBER 800-921-9745**

## Key Personnel & Agency Emergency Contact List

| Contact | Company | Name | Cell Phone | Email |
|---|---|---|---|---|
| **Dirty Water Trucks** | LITTMAN | Chris Lattea | 304-455-2736, office 304-447-1567 | |
| **Solids Control** | WHITE'S WELDING | Kyle Grubaugh | 724-554-8981 | kyle@whitesequipment.com |
| **Cuttings** | NOBLE ENVIRONMENTAL | Alex Sulkowski | 412-979-5493 | asulkowski@nobleenviro.com |
| **Cement** | Schlumberger | Patrick Crowder | 318-560-8667 | pcrowder@slb.com |
| **Air Hammer** | NUMA/Bill's Bits | Rich Walkos | 412-582-5217 | rwalkos@billsbitservice.com |
| **Hotshot** | WA STONE KING | Angie Stoneking | 724-986-1735 | angiestoneking@yahoo.com |
| **Wellhead** | Cactus | Troy Romero | 504-908-9269 | Troy.romero@cactuswellhead.com |
| **Hot Work** | WHITE'S WELDING | Kyle Grubaugh | 724-554-8981 | kyle@whitesequipment.com |
| **Pipe Inspection & Machine Shop** | Fairmont Tool | Connie Brown | 304-694-3644 304-363-8339 | conniebrown@fairmonttool.com |
| **Pipe Inspection, Hard Banding, ECT** | IOS | Michael Stewart | 724-553-4212 | mstewart@ibfoster.com |
| **Mud** | Dynamic | John Gault | 214-535-5838 | John.gault@ddfluids.com |
| **Rental Equipment** | Black Diamond | Joe Mixter | 412-925-1207 | jfm@bd-er.com |
| **Rental Equipment** | Rapid Fire Rentals | | 724-350-6153 | ray@rapidfirerentals.com |
| **Facilities (mechanical)** | Hickory Energy | Randall Legg | 304-276-4293 | randall@hickoryenergyservices.com |
| **Facilities (mechanical)** | Hickory Energy **HSE** | Andrew Grubler | 304-888-7711 | andrew@hickoryenergyservices.com |
| **Facilities (I&E)** | CPS | Jason Leamon | 724-944-3069 | jleamon@completepipelineservices.com |
| **Containment** | New Pig | Drew Huff | (814) 505-3361 | drewh@newpigenergy.com |
| **Rig Mats** | Strad | Steve Antoinette | (724) 802-5773 | santoinette@stradinc.com |
| **General Construction** | Robey Construction | Mike Swiger | (304) 677-8062 | rmikeswiger@gmail.com |
| **Security / Traffic Control** | EM1 | Daniel Roberts | 570-560-2561 | droberts@em1services.com |
| **XcL Midstream Operations Mgr.** | XcL Midstream | Paul Mickoloff | 682-404-8816 | pmickoloff@xclmidstream.com |
| **XcL Midstream EH&S Director** | Greg Dotson | 724-416-3314 | 724-288-7185 | gdotson@xclmidstream.com |



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# TUG HILL OPERATING – HUNTER PETHTEL/VAN WINKLE WELL
## EMERGENCY NUMBER 800-921-9745
## Key Personnel & Agency Emergency Contact List

### CONTRACT EH&S REPRESENTATIVES

| Contact | Name | Phone | Cell Phone | Email |
|---|---|---|---|---|
| **EH&S Coordinator Gryphon Energy** | Joey Guzzo | | 910-712-3480 | Joseph.guzzo@gryphonesp.com |
| **EH&S Coordinator Gryphon Energy** | Anthony LaQuatra | | 412-716-7396 | anthony.laquatra@gryphonesp.com |
| **EH&S Coordinator Gryphon Energy** | Randy Luna | | 681-758-5428 | randy.luna@gryphonESP.com |
| **EH&S Coordinator Gryphon Energy** | Cass Mattison | | 832-262-1613 | cassidy.mattison@gryphonESP.com |
| **EH&S Coordinator Gryphon Energy** | Brian O'Neil | | 412-463-6430 | oneil.contractor@gryphonesp.com |
| **EH&S Coordinator Gryphon Energy** | Doug Sykes | | 304-815-3098 | doug.sykes@gryphonesp.com |

### EMERGENCY SPILL RESPONSE CONTRACTORS

In case of spill getting into stream or if spill emergency requires greater expertise, these contractors can respond to spill emergencies 24 hours a day.

| Contact | Name | Phone | Cell Phone | Email |
|---|---|---|---|---|
| **BBU Service of WV** | Chip Hoover<br>Tony Long | 740-738-0314 | 304-549-9165<br>304-415-0881 | choover@bbuservicesofwv.com<br>tlong@bbuservicesofwv.com |
| **IPC Services, LLC** | Stephanie McKinney | 724-831-7167 | 412-584-6961 | stephanie.mckinney@insightpipe.com |
| **Ryan Environmental** | Jeremy Monday | 800-649-5578 (24 Hr.)<br>304-842-5578 (ofc.) | 304-629-6767 | jeremy.monday@ryanenv.com |
| **Robey excavating (Gen. Contractor)** | Brian Robey<br>Mike Swiger | 304-783-4491 (ofc) | 304-677-9141<br>304-677-8062 | brian@robeyexcavating.com<br>rmikeswiger@gmail.com |
| **Gryphon/ESP Oilfield Services** | Jason Anderson<br>Chris Mitchell | 855-479-7466 (24 Hr.) | 903-316-7410<br>903-288-0648 | jason.anderson@gryphonesp.com<br>chris.mitchell@gryphonesp.com |
| **EMS Onsite** | Josh Baker<br>Ryan Anderson | 877-816-9111 24 hr. | 614-800-5779 JB | jbaker@hepaco.com |
| | | | | |


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# TUG HILL OPERATING – HUNTER PETHTEL/VAN WINKLE WELL
## EMERGENCY NUMBER 800-921-9745
## Key Personnel & Agency Emergency Contact List

### UNCONTROLLED WELL CONDITIONS

| Wild Well Response Contractor | Address | Phone |
|---|---|---|
| **Wild Well** | 380 Southpointe Blvd. Canonsburg, PA 15317 | 281-784-4700 (24 Hr.)<br>724-873-5081 Office |

### H2S EMERGENCY RESPONSE CONTRACTOR

| Name & Title | Address | Contact |
|---|---|---|
| **Jason Anderson**<br>**Chris Mitchell**<br>**Gryphon/ESP Oilfield Services** | USA CORPORATE HEADQUARTERS<br>11300 Windfern Road<br>Houston, TX 77064 | 855-479-7466 (24 Hr.)<br>903-316-7410<br>903-288-0648 |

### INCIDENT COMMAND SYSTEM – STATE AND NATIONAL AGENCY CONTACTS

In the event of a large-scale incident with the potential to harm life or property in the surrounding community, in addition to the agencies listed above, notify the agency listed below:

| Agency | Contact Person | Phone |
|---|---|---|
| **West Virginia Division of Homeland Security and Emergency Management** | | 304-558-5380 (24 Hr.) |
| **WV State Police** | | 304-746-2100 |
| **EPA National Response Center** | Report Oil & Chemical Spills to Navigable Waters | 800-424-8802 (24 Hr.) |
| **Environmental Protection Agency (Region III)** | Cosmo Servidio, Region 3 Administrator<br>Linda Marzulli (24 hr.)<br>Arlin Galarza-Hernandez<br>(SPCC Coordinator) | 304-234-0231<br>Wheeling WV Regional Offices<br>800-438-2474 Reg. 3 Ofc<br>Philly 215-814-9016 |
| **OSHA Region 3 Charleston WV Office** | Richard Mendelson Regional Administrator | 304-347-5937<br>Report Fatalities within 24 hours<br>**800-321-6742 (24 hr)** |
| **US Coast Guard, Marine Safety Unit Barboursville, WV** | | 304-733-0198<br>Ohio Valley Section 8 Office, Louisville, KY<br>502-779-5300 |


04/14/2023

# TUG HILL OPERATING – HUNTER PETHTEL/VAN WINKLE WELL
## EMERGENCY NUMBER 800-921-9745
## Key Personnel & Agency Emergency Contact List

### LOCAL AGENCY CONTACTS – WVDEP, COUNTY

| Contact | Name | Phone | Cell Phone | Email |
|---|---|---|---|---|
| **West Virginia One Call** | | 811<br>800-245-4848 | | |
| **WVDEP Spill Hotline** | | 800-642-3074<br>(24 Hr) | | |
| **WVDEP Tank Div. Project Manager** | Justin Tincher | 304-368-2000 | 681-319-1856 | Justin.m.tincher@wv.gov |
| **WVDEP Inspector, Marshall County** | Strader Gower | 304-926-0499 | 304-993-6188 | Strader.c.gower@wv.gov |
| **WVDEP Inspector, Wetzel County** | Ken Greynolds | 304-926-0499 | 304-206-6613 | Kenneth.i.greynolds@wv.gov |
| **WVDEP Inspector Supervisor** | Douglas Newlon | 304-926-0499 | (304) 932-8049 | douglas.C.Newlon@wv.gov |
| **Marshall County Office of Emergency Mgmt.** | Tom Hart, Director<br>Tracey White<br>Anthony Novel | **911**<br>304-843-1130<br>Ext. 1130 (TH)<br>Ext. 1131 (TW) | 304-650-3922<br>(TH Cell)<br>304-281-0359 (TW)<br>304-551-5438 (TN) | oem@marshallcountywv.org<br>thart@marshallcountywv.org<br>twhite@marshallcountywv.org<br>tnovel@marshallcountywv.org |
| **Marshall County Sheriff's Office** | Kevin Cecil, Sheriff<br><br>Bill Helms Chief Deputy<br>Rick Mercer, Lt. | 304-843-1500<br>(24 Hr.)<br><br>Ext 220 (KC)<br>Ext. 226 (WH)<br>Ext. 285 (RM) | **911** | sheriff@mcsowv.org<br>whelms@mcsowv.org<br>rmercer@mcsowv.org |
| **Wetzel County Office of Emergency Mgmt.** | Steven Yoho, Director | (304) 455-2430 | (304) 455-6960 | wce911@frontier.com |
| **WVDOH** | Corey Gast, Oil & Gas Administrator | 304-843-4022 | | corey.m.gast@wv.gov |
| **Marshall County Animal Control Office** | Rosy Cozart | 304-455-5348 | | wcasrosy@frontier.com |


04/14/2023

# TUG HILL OPERATING – HUNTER PETHTEL/VAN WINKLE WELL
## EMERGENCY NUMBER 800-921-9745
## Key Personnel & Agency Emergency Contact List

### MEDICAL SERVICES

| Agency | Address | Phone |
|---|---|---|
| **Reynolds Memorial Hospital** | 800 Wheeling Avenue<br>Glen Dale (Moundsville), WV 26038 | 304-845-3211 |
| **Reynolds Rapid Care** | 215 North Lafayette Avenue<br>Moundsville, WV 26041<br>Open Mon – Saturday<br>• 9:00 AM – 7:00 PM Mon – Fri.<br>• 8:00 AM – 4:00 PM Sat. & Sun. | (304) 843-3435 |
| **Wheeling Hospital** | 1 Medical Park, Wheeling, WV 26003 | (304) 243-3000 |
| **Med Express New Martinsville** | 260 Russell Ave, New Martinsville, WV 26155<br>Open Mon – Saturday<br>• 8:30 AM – 6:30 PM Mon – Fri.<br>• 9:00 AM – 4:30 PM Saturday<br>• Closed Sunday | 304-398-4949 |
| **EZ CARE** | 260 Russell Avenue<br>New Martinsville, WV 26155<br>• M-F 8:30 AM-7:00 PM<br>• S 9:00 AM – 5:00 PM | 304-398-4949 |
| **Wetzel County Hospital** | 2705 3E Benjamin Drive<br>New Martinsville, WV 26155<br>• 2318 Whiteman Hill Road, New Martinsville, WV 26155 (North Entrance)<br>• Head North on Whiteman Hill Rd. (Cty. Rt. 30) (2.3 mi.)<br>• Slight Right onto Pike Street and then 1st Left on Central Street (300 ft.)<br>• Turn Right onto WV-2 Energy Rd. (3.3 mi.) (Pass Pizza Hut on Left in 3.1 mi)<br>• Turn Right on E Benjamin Drive (0.4 mi.) | 304-455-8000 |
| | | |

**TUG HILL OPERATING – PRODUCTION PADS**

**EMERGENCY NUMBER 800-921-9745**

**Key Personnel, Agency and Emergency Contact List**

## TUG HILL OPERATING REPRESENTATIVES

| Contact | Name | Phone | Cell Phone | Email |
|---|---|---|---|---|
| **SVP Operations/Advisor** | David Patterson | 817-632-5240 | 620-304-1031 | dpatterson@tug-hillop.com |
| **VP Operations** | Sean Gasser | 817-632-5250 | 972-510-8438 | sgasser@tug-hillop.com |
| **VP Production** | Chad Grinnell | | 817-201-1566 | cgrinnell@tug-hillop.com |
| **Sr. Production Engineer** | Blake Armstrong | | 817-517-1149 | barmstrong@tug-hillop.com |
| **Production Superintendent** | Jeffery Walker | | 724-503-0668 C<br>304-810-2093 H | jwalker@tug-hillop.com |
| **Asst. Production Foreman** | David Stover | | 412-779-3805 | dstover@tug-hillop.com |
| **Production** | Greg Rohrer | | 814-289-3158 | grprodsvc07@gmail.com |
| **Production** | Aaron Gaughenbaugh | | 304-312-4630 | agaughenbaugh@tug-hillop.com |
| **Production** | Cody Jeffery | | 740-630-4718 | cjeffery@tug-hillop.com |
| **Production** | Lucas Pfouts | | 740-457-9606 | ltpfouts@tug-hillop.com |
| **Production** | Bill Williams | | 682-404-6255 | bwilliams@tug-hillop.com |
| **Production** | Branden Wilson | | 682-404-6260 | bwilson@tug-hillop.com |
| **Production** | Logan Pfouts | | 740-219-1859 | lpfouts@tug-hillop.com |
| **Production** | John Stover | | 412-328-5314 | jstover@tug-hillop.com |
| **Production** | Richard Lokuta | | 682-404-6244 | rlokuta@tug-hillop.com |
| **Production** | Cole Miller | | 304-771-9592 | cmiller@tug-hillop.com |
| **Production** | Andrew Church | | 304-780-4193 | achurch@tug-hillop.com |
| **Production** | Brody Lamp | | 304-588-5132 | blamp@tug-hillop.com |
| **Production** | Justin Johnson | 682-404-6225 | 682-404-6225 | jjohnson@tug-hillop.com |
| **Production** | Aaron Wilson | | 682-771-5183 | awilson@tug-hillop.com |
| **Production** | Tom Allen | | 724-288-8894 | tallen@tug-hillop.com |
| **Production** | Josh Larsen | | 304-312-1345 | jlarsen@tug-hillop.com |
| **Production** | Jeff Thornburg | | 970-712-2797 | jthornburg@tug-hillop.com |
| **Production** | Kaleb Kucera | | 304-312-3398 | kkucera@tug-hillop.com |
| **Production** | David Amos | | 878-212-8705 | damos@tug-hillop.com |

**TUG HILL OPERATING – PRODUCTION PADS**

**EMERGENCY NUMBER 800-921-9745**

**Key Personnel, Agency and Emergency Contact List**

| Contact | Name | Phone | Cell Phone | Email |
|---|---|---|---|---|
| **Facilities Supt.** | Rob Springer | 724-749-8388 | 724 833-4328 | rspringer@tug-hillop.com |
| **Facilities Foreman** | Terry Campbell | | 817-586-9374 | tcampbell@tug-hillop.com |
| **EH&S Director** | Jerry DeRosa | 724-749-8388 | 412-736-5767 | Jderosa@tug-hillop.com |
| **EHS Superintendent** | | | | |
| **Sr. EHS Coordinator** | Josh Southern | | 304-476-3079 | jsouthern@tug-hillop.com |
| **Sr. EHS Coordinator** | Noel Missig | | 412-498-7322 | nmissig@tug-hillop.com |
| **EH&S Coordinator** | Jeremy Barber | | 412-877-5869 | jbarber@tug-hillop.com |
| **Drilling Superintendent 1** | Bill Smith | | 724-255-2308 | bsmith@tug-hillop.com |
| **Drilling Superintendent 2** | Jon Capuccio | | 580-678-2724 | Drillingsup2@tug-hillop.com |
| **Completions Superintendent** | Jordan Buterbaugh | 724-762-8271 | 724-762-8271 | jbuterbaugh@tug-hillop.com |
| **Construction** | Geoff Radler | | 817-247-7233 | gradler@tug-hillop.com |
| **Construction** | Chad Dunham | | 304-215-5405 | cdunham@tug-hillop.com |
| **Construction** | Randy Sleeth | | 682-404-6266 | rsleeth@tug-hillop.com |
| **ALL INCIDENTS:** SPILLS, NEAR MISS, ACCIDENTS, INJURIES, VIOLENCE | | **TUG HILL INCIDENT RESPONSE AND NOTIFICATION PROCEDURE** | | |
| **TUG HILL 24 HOUR EMERGENCY** | | **800-921-9745** | | **911** |

## XcL MIDSTERAM REPRESENTATIVES

| Contact | Company | Name | Cell Phone | Email |
|---|---|---|---|---|
| **Midstream Operations Mgr.** | XcL Midstream | Paul Mickoloff | 682-404-8816 | pmickoloff@xclmidstream.com |
| **Midstream EH&S Director** | XcL Midstream | Greg Dotson | 724-288-7185 | gdotson@xclmidstream.com |
| **XcL MIDSTREAM 24-HR EMERGENCY** | | **800-751-0434** | | **911** |

**TUG HILL OPERATING – PRODUCTION PADS**

**EMERGENCY NUMBER 800-921-9745**

**Key Personnel, Agency and Emergency Contact List**

## PRODUCTION RELATED CONTRACTOR INFORMATION

| Contact | Company | Name | Cell Phone | Email |
|---|---|---|---|---|
| **Produced Water Hauling** | AOS | Terry Dunn | 740-525-9561 | terry.dunn@appalservices.com |
| **Roustabout** | ShalePro | Dottie Jones | 724-833-6926 | Dj_katko@yahoo.com |
| **Facilities (mechanical)** | Hickory Energy | Randall Legg | 304-276-4293 | randall@hickoryenergyservices.com |
| **Rental Equipment** | Black Diamond | Jeff Waggett | 724-963-8344 | jeffw@blackdiamondrental.net |
| **Rental Equipment** | Rapid Fire Rentals | | 724-350-6153 | ray@rapidfirerentals.com |
| **Rental Equipment** | Enerstar | Maynard Green | 570-494-6277 | mgreen@enerstarrentals.com |
| **Contract Operators (BS)** | ROC | Ralph Dixon | 724-531-7353 | rdixon@rocserviceco.com |
| **General Contractor** | Robey excavating | Brian Robey<br>Mike Swiger | 304-677-9141<br>304-677-8062 | brian@robeyexcavating.com<br>r.mike.swiger@gmail.com |
| **Facilities (mechanical)** | Hickory Energy | Randall Legg | 304-276-4293 | randall@hickoryenergyservices.com |
| **Facilities (I&E)** | CPS | Jason Leamon | 724-944-3069 | jleamon@completepipelineservices.com |
| **Produced Water Hauling** | AOS | Terry Dunn | 740-525-9561 | terry.dunn@appalservices.com |
| **General Contractor** | Robey excavating | Brian Robey<br>Mike Swiger | 304-677-9141<br>304-677-8062 | brian@robeyexcavating.com<br>r.mike.swiger@gmail.com |
| **Waste** | NOBLE ENVIRONMENTAL | Alex Sulkowski | 412-979-5493 | asulkowski@nobleenviro.com |
| **Hotshot** | WA STONEKING LLC | Angie Stoneking | 724-986-1735 | angiestoneking@yahoo.com |
| **Containment** | New Pig | Drew Huff | (814) 505-3361 | drewh@newpigenergy.com |
| **Rig Mats** | New Park | Troy Letters | 814-574-3115 | tletters@newpark.com |
| **Rig Mats** | Strad | Steve Antoinette | (724) 802-5773 | SAntoinette@stradenergy.com |

**TUG HILL OPERATING – PRODUCTION PADS**

**EMERGENCY NUMBER 800-921-9745**

**Key Personnel, Agency and Emergency Contact List**

## CONTRACT EH&S REPRESENTATIVES

| Contact | Name | Phone | Cell Phone | Email |
|---|---|---|---|---|
| **EH&S Coordinator Gryphon Energy** | Joey Guzzo | | 910-712-3480 | Joseph.guzzo@gryphonesp.com |
| **EH&S Coordinator Gryphon Energy** | Anthony LaQuatra | | 412-716-7396 | anthony.laquatra@gryphonesp.com |
| **EH&S Coordinator Gryphon Energy** | Randy Luna | | 681-758-5428 | randy.luna@gryphonESP.com |
| **EH&S Coordinator Gryphon Energy** | Cass Mattison | | 832-262-1613 | cassidy.mattison@gryphonESP.com |
| **EH&S Coordinator Gryphon Energy** | Brian O'Neil | | 412-463-6430 | oneil.contractor@gryphonesp.com |
| **EH&S Coordinator Gryphon Energy** | Doug Sykes | | 304-815-3098 | doug.sykes@gryphonesp.com |

## EMERGENCY SPILL RESPONSE CONTRACTORS

In case of spill getting into stream or if spill emergency requires greater expertise, these contractors can respond to spill emergencies 24 hours a day.

| Contact | Name | Phone | Cell Phone | Email |
|---|---|---|---|---|
| **BBU Service of WV** | Chip Hoover<br>Tony Long | 740-738-0314 | 304-549-9165<br>304-415-0881 | choover@bbuservicesofwv.com<br>tlong@bbuservicesofwv.com |
| **IPC Services, LLC** | Stephanie McKinney | 724-831-7167 | 412-584-6961 | stephanie.mckinney@insightpipe.com |
| **Ryan Environmental** | Jeremy Monday | 800-649-5578 (24 Hr.)<br>304-842-5578 (ofc.) | 304-629-6767 | jeremy.monday@ryanenv.com |
| **Robey excavating (Gen. Contractor)** | Brian Robey<br>Mike Swiger | 304-783-4491 (ofc) | 304-677-9141<br>304-677-8062 | brian@robeyexcavating.com<br>rmikeswiger@gmail.com |
| **Gryphon/ESP Oilfield Services** | Jason Anderson<br>Chris Mitchell | 855-479-7466 (24 Hr.) | 903-316-7410<br>903-288-0648 | jason.anderson@gryphonesp.com<br>chris.mitchell@gryphonesp.com |
| **EMS Onsite** | Josh Baker<br>Ryan Anderson | 877-816-9111 24 hr. | 614-800-5779 JB | jbaker@hepaco.com |
| | | | | |

**TUG HILL OPERATING – PRODUCTION PADS**

**EMERGENCY NUMBER 800-921-9745**

**Key Personnel, Agency and Emergency Contact List**

## LOCAL AGENCY CONTACTS – WVDEP, COUNTY

| Contact | Name | Phone | Cell Phone | Email |
|---|---|---|---|---|
| **West Virginia One Call** | | 811<br>800-245-4848 | | |
| **WVDEP Spill Hotline** | | 800-642-3074<br>(24 Hr) | | |
| **WVDEP Tank Div. Project Manager** | Justin Tincher | 304-368-2000 | 681-319-1856 | Justin.m.tincher@wv.gov |
| **WVDEP Inspector, Marshall County** | Strader Gower | 304-926-0499 | 304-993-6188 | Strader.c.gower@wv.gov |
| **WVDEP Inspector, Wetzel County** | Ken Greynolds | 304-926-0499 | 304-206-6613 | Kenneth.i.greynolds@wv.gov |
| **WVDEP Inspector Supervisor** | Douglas Newlon | 304-926-0499 | (304) 932-8049 | douglas.C.Newlon@wv.gov |
| **Marshall County Office of Emergency Mgmt.** | Tom Hart, Director<br>Tracey White<br>Anthony Novel | **911**<br>304-843-1130<br>Ext. 1130 (TH)<br>Ext. 1131 (TW) | 304-650-3922<br>(TH Cell)<br>304-281-0359 (TW)<br>304-551-5438 (TN) | oem@marshallcountywv.org<br>thart@marshallcountywv.org<br>twhite@marshallcountywv.org<br>tnovel@marshallcountywv.org |
| **Marshall County Sheriff's Office** | Kevin Cecil, Sheriff<br><br>Bill Helms Chief Deputy<br>Rick Mercer, Lt. | 304-843-1500<br>(24 Hr.)<br><br>Ext 220 (KC)<br>Ext. 226 (WH)<br>Ext. 285 (RM) | **911** | sheriff@mcsowv.org<br>whelms@mcsowv.org<br>rmercer@mcsowv.org |
| **Wetzel County Office of Emergency Mgmt.** | Steven Yoho, Director | (304) 455-2430 | (304) 455-6960 | wce911@frontier.com |
| **WVDOH** | Corey Gast, Oil & Gas Administrator | 304-843-4022 | | corey.m.gast@wv.gov |
| **Marshall County Animal Control Office** | Rosy Cozart | 304-455-5348 | | wcasrosy@frontier.com |



04/14/2023

**TUG HILL OPERATING – PRODUCTION PADS**

**EMERGENCY NUMBER 800-921-9745**

**Key Personnel, Agency and Emergency Contact List**

## INCIDENT COMMAND SYSTEM – STATE AND NATIONAL AGENCY CONTACTS

In the event of a large-scale incident with the potential to harm life or property in the surrounding community, in addition to the agencies listed above, notify the agency listed below:

| Agency | Contact Person | Phone |
|---|---|---|
| **West Virginia Division of Homeland Security and Emergency Management** | | 304-558-5380 (24 Hr.) |
| **WV State Police** | | 304-746-2100 |
| **EPA National Response Center** | Report Oil & Chemical Spills to Navigable Waters | 800-424-8802 (24 Hr.) |
| **Environmental Protection Agency (Region III)** | Cosmo Servidio, Region 3 Administrator<br>Linda Marzulli (24 hr.)<br>Arlin Galarza-Hernandez<br>(SPCC Coordinator) | 304-234-0231<br>Wheeling WV Regional Offices<br>800-438-2474 Reg. 3 Ofc<br>Philly 215-814-9016 |
| **OSHA Region 3 Charleston WV Office** | Richard Mendelson Regional Administrator | 304-347-5937<br>Report Fatalities within 24 hours<br>**800-321-6742 (24 hr)** |
| **US Coast Guard, Marine Safety Unit Barboursville, WV** | | 304-733-0198<br>Ohio Valley Section 8 Office,<br>Louisville, KY<br>502-779-5300 |

## UNCONTROLLED WELL CONDITIONS

| Wild Well Response Contractor | Address | Phone |
|---|---|---|
| **Wild Well** | 380 Southpointe Blvd. Canonsburg, PA 15317 | 281-784-4700 (24 Hr.)<br>724-873-5081 Office |

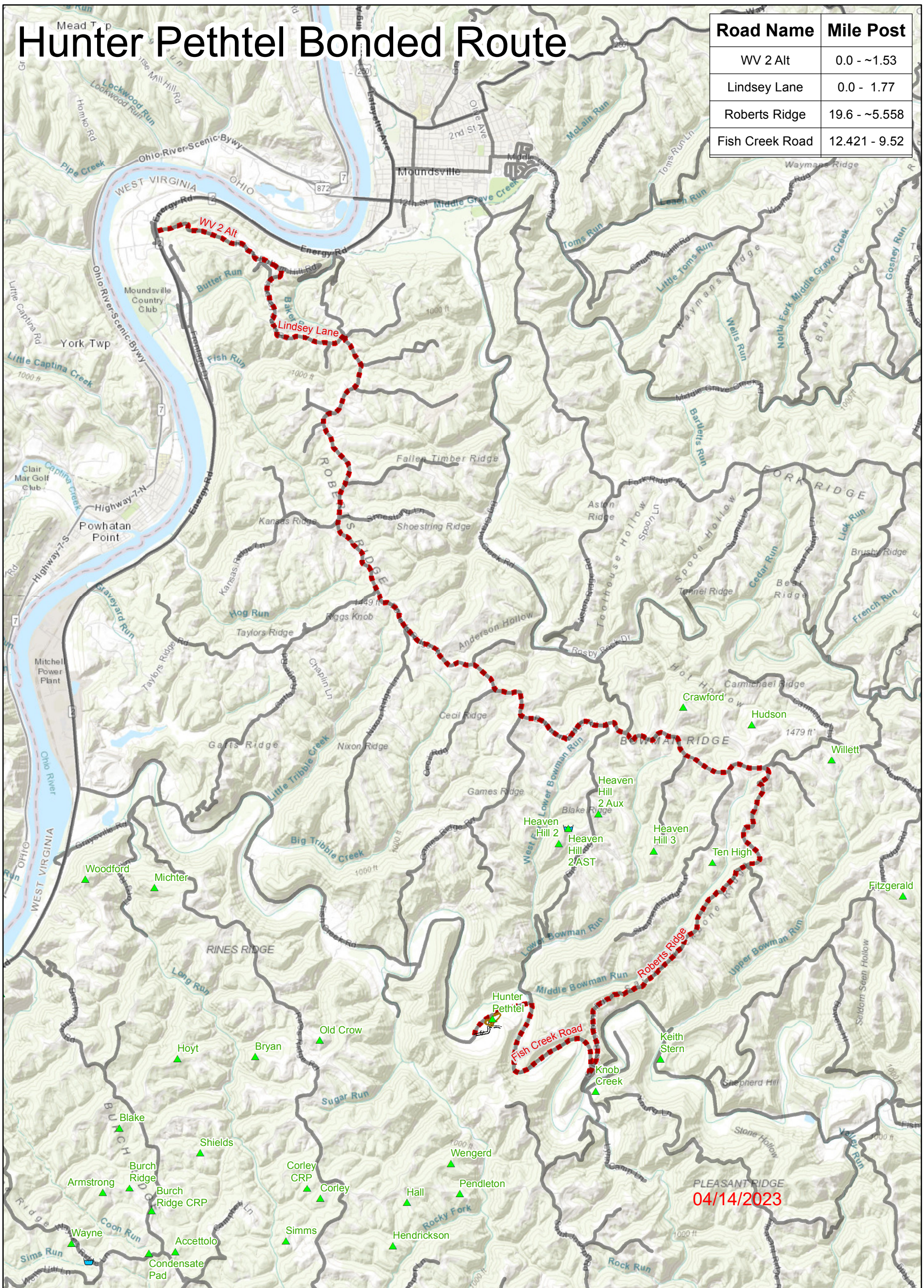
## H2S EMERGENCY RESPONSE CONTRACTOR

| Name & Title | Address | Contact |
|---|---|---|
| **Jason Anderson**<br>**Chris Mitchell**<br>**Gryphon/ESP Oilfield Services** | USA CORPORATE HEADQUARTERS<br>11300 Windfern Road<br>Houston, TX 77064 | 855-479-7466 (24 Hr.)<br>903-316-7410<br>903-288-0648 |

# Exhibit 1 – Directions to Well Site Evacuation & Bonded Rotes

# Hunter Pethtel Bonded Route

| Road Name | Mile Post |
|---|---|
| WV 2 Alt | 0.0 - ~1.53 |
| Lindsey Lane | 0.0 - 1.77 |
| Roberts Ridge | 19.6 - ~5.558 |
| Fish Creek Road | 12.421 - 9.52 |




Coordinate System: NAD 1983 UTM Zone 17N
Projection: Transverse Mercator
Datum: North American 1983
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -81.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter

**CONFIDENTIAL**

0 2,750 5,500 11,000
Feet

TUG HILL OPERATING

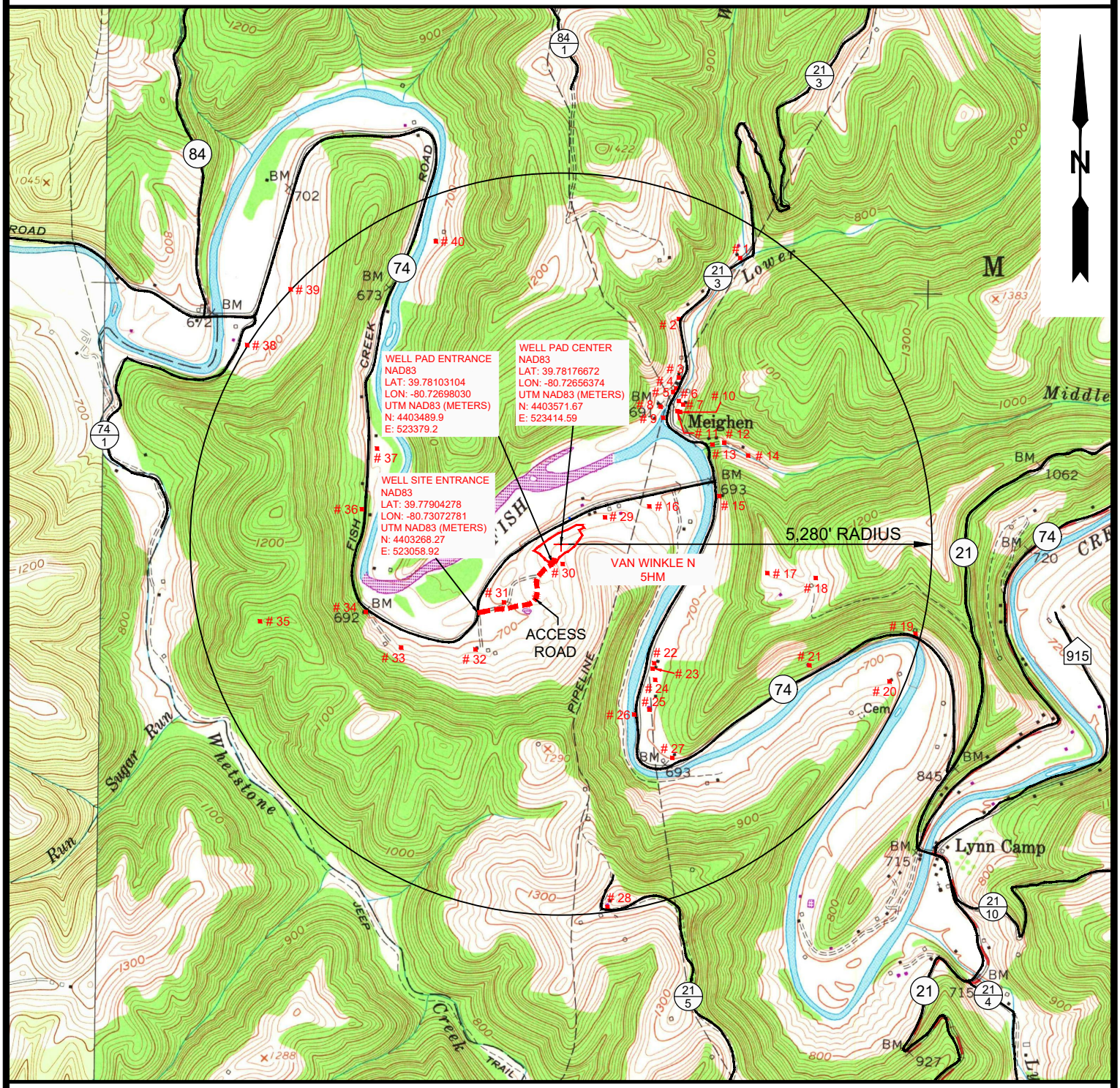
- Pad
- Water Impoundment
- Water Line
- Padsite Road
- THO Bonded Route

A:\GIS\Projects\EHSR\MXD\BONDED_ROUTES\THO\THQA_BONDED_ROUTES_DDP.mxd
Map Created By: dcreighton on 10/7/2020

# Exhibit 2 – Topo Maps
# Resident Information and Schools

# PROPOSED
# VAN WINKLE N - 5HM

EXHIBIT 2




NOTE: THERE APPEARS TO BE THIRTY-SEVEN (37) POSSIBLE RESIDENCES, TWO (2) POSSIBLE BUSINESS OR COMMERCIAL SITES, ONE (1) ABANDONED SCHOOL AND NO CHURCHES OR EMERGENCY FACILITIES WITHIN 5,280'.


SLS
FROM THE GROUND UP
12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slswv.com


| TOPO SECTION: | | OPERATOR: | |
|---|---|---|---|
| GLEN EASTON 7.5' | | PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317 | |
| COUNTY | DISTRICT | | |
| MARSHALL | MEADE | | |
| DRAWN BY | JOB NO. | DATE | SCALE |
| K.G.M. | 8952 | 12/22/2020 | 1" – 2000' |

TUG HILL OPERATING

04/14/2023

CAD FILE: R:\Data\CADD\WORK 8900-8999\8952 Hunter Pethtel Plats and Mapping\8952\Survey\Send Files\122220\5HM\Cadd Files\5HM\8952-5HM Exhibits-R2.dwg LAYOUT: Layout1 USER: kmoyers

**Exhibit 2A**

Tug Hill Operating, LLC
380 Southpointe Blvd, Suite 200
Cannonsburg, PA 15137

## Residences within 1 Mile

Well: Van Winkle N – 5HM
District: Meade
State: WV

There are thirty-seven (37) possible residences, two (2) possible business or commercial sites, no churches, one (1) abandoned school and no emergency facilities within 1 mile (5,280 feet) of the above referenced well location.

| | | |
|---|---|---|
| **Residence (#1)***<br>TM 10 Pcl. 9 or TM 10 Pcl. 11<br>J. F. Crow Estate, et al<br>c/o Lloyd Baker (Tax Address);<br>Tim James Crow (Physical Address)<br>**Phone:** 304-277-3908; 740-277-3908; 304-810-0512; 304-845-0824<br>**Physical Address:**<br>3529 Blake Ridge RD<br>Glen Easton, WV 26039<br>**Tax Address: ****<br>4918 Taylors Ridge RD<br>Moundsville, WV 26041<br>*Appears to be a damaged home and may not be occupied.<br>** Tax Address same for both parcels. | **Residence (#2)**<br>TM 10 Pcl. 7<br>David P. & Pamela M. Schimmel<br>**Phone:** 304-843-5413, 616-583-0446, 304-780-7494 (reverse tax address)<br>**Physical Address:**<br>3759 Blake Ridge RD<br>Glen Easton, WV 26039<br>**Tax Address:**<br>800 Blaris Ridge Rd<br>Moundsville, WV 26041 | **Residence (#3)***<br>TM 10 Pcl. 15<br>Joseph Michael Bonene<br>**Phone:** 304-843-1807, 717-792-0914, 717-870-3509 (reverse tax address)<br>**Physical Address:**<br>3925 Blake Ridge Rd<br>Glen Easton, WV 26039<br>**Tax Address:**<br>560 Cloverleaf RD<br>York, PA 17406-8450<br>*Unable to determine if physical address represents an actual residence. |
| **Residence (#4)***<br>TM 10 Pcl. 15<br>Joseph Michael Bonene<br>**Phone:** 304-843-1807, 717-792-0914, 717-870-3509 (reverse tax address)<br>**Physical Address:**<br>3955 Blake Ridge Rd<br>Glen Easton, WV 26039<br>**Tax Address:**<br>560 Cloverleaf RD<br>York, PA 17406-8450<br>*Unable to determine if physical address represents an actual residence. | **Residence (#5)***<br>TM 10 Pcl. 15<br>Joseph Michael Bonene<br>**Phone:** 304-843-1807, 717-792-0914, 717-870-3509 (reverse tax address)<br>**Physical Address:**<br>3969 Blake Ridge Rd<br>Glen Easton, WV 26039<br>**Tax Address:**<br>560 Cloverleaf RD<br>York, PA 17406-8450<br>*Unable to determine if physical address represents an actual residence. | **Residence (#6)***<br>TM 10 Pcl. 14<br>William McConnell<br>**Phone:** 304-845-4318, 304-845-9381, 304-845-4872, 740-845-4872, 209-253-2205, 304-281-4261, 304-843-1474 (reverse tax address)<br>**Physical Address:**<br>None Found<br>**Tax Address:**<br>1100 Jefferson Ave<br>Moundsville, WV 26041-2443<br>*Unable to determine actual type of building or its use. Unknown occupancy. |
| **Residence (#7)***<br>TM 10 Pcl. 14<br>William McConnell<br>**Phone:** 304-845-4318, 304-845-9381, 304-845-4872, 740-845-4872, 209-253- | **Abandoned School (#8)***<br>TM 10 Pcl. 16<br>William McConnell<br>**Phone:** 304-845-4318, 304-845-9381, 304-845-4872, 740-845-4872, 209-253- | **Residence (#9)**<br>TM 10 Pcl. 14<br>William McConnell<br>**Phone:** 304-845-4318, 304-845-9381, 304-845-4872, 740-845-4872, 209-253- |

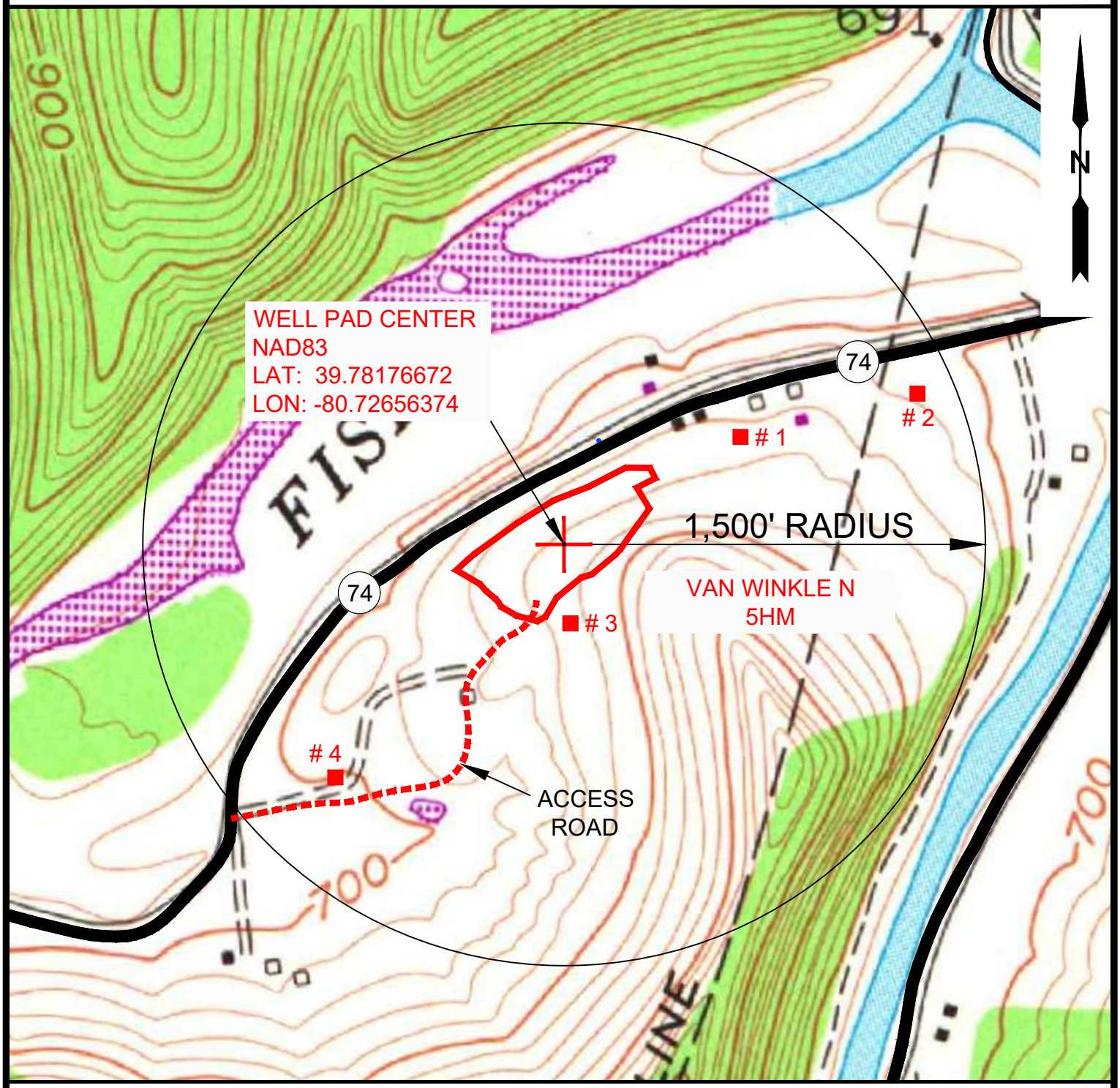
| | | |
|---|---|---|
| 2205, 304-281-4261, 304-843-1474 (reverse tax address)<br>**Physical Address:**<br>4020 Blake Ridge Rd<br>Glen Easton, WV 26039<br>**Tax Address:**<br>1100 Jefferson Ave<br>Moundsville, WV 26041-2443<br>*Appears to be mobile home. Unknown occupancy. | 2205, 304-281-4261, 304-843-1474 (reverse tax address)<br>**Physical Address:**<br>4009 Blake Ridge Rd<br>Glen Easton, WV 26039<br>**Tax Address:**<br>1100 Jefferson Ave<br>Moundsville, WV 26041-2443<br>*Appears to be an abandoned school or church. Tax ticket lists as Meighen School. Historical Topographic maps show school and/or church symbols. | 2205, 304-281-4261, 304-843-1474 (reverse tax address)<br>**Physical Address:**<br>4071 Blake Ridge Rd<br>Glen Easton, WV 26039<br>**Tax Address:**<br>1100 Jefferson Ave<br>Moundsville, WV 26041-2443<br>*Appears to be part of community building/pavilion or playground area. Does not appear to be an occupied residence. |
| **Residence (#10)***<br>TM 10 Pcl. 14<br>William McConnell<br>**Phone:** 304-845-4318, 304-845-9381, 304-845-4872, 740-845-4872, 209-253-2205, 304-281-4261, 304-843-1474 (reverse tax address)<br>**Physical Address:**<br>4028 Blake Ridge Rd<br>Glen Easton, WV 26039<br>**Tax Address:**<br>1100 Jefferson Ave<br>Moundsville, WV 26041-2443<br>*Appears to be adjacent to or a part of a larger residence or home (see #11). | **Residence (#11)***<br>TM 10 Pcl. 14<br>William McConnell (Tax Address)<br>William H. Baker (Physical Address)<br>**Phone:** 304-845-4318, 304-845-9381, 304-845-4872, 740-845-4872, 209-253-2205, 304-281-4261, 304-843-1474 (reverse tax address); 304-845-0967 (reverse physical address)<br>**Physical Address:**<br>4024 Blake Ridge Rd<br>Glen Easton, WV 26039<br>**Tax Address:**<br>1100 Jefferson Ave<br>Moundsville, WV 26041-2443<br>*Appears to be adjacent to a smaller residence or home (see #10). | **Residence (#12)**<br>TM 11 Pcl. 2.2<br>Judith L. Padlow – TOD,<br>c/o Brent Padlow<br>**Phone:** 304-232-0747; 740-232-0747, 304-233-8929, 304-845-0137, 304-233-7914, 740-233-7914, 304-232-2003, 304-845-9544 (c/o reverse name)<br>**Physical Address:**<br>42 Padlow LN<br>Glen Easton, WV 26039<br>**Tax Address:**<br>48 21st ST<br>McMechen, WV 26040<br>**Possible Current c/o Address:**<br>37 21st ST<br>McMechen, WV 26040 |
| **Residence (#13)**<br>TM 11 Pcl. 1<br>Judith L. Padlow - TOD<br>**Phone:** 304-232-0747, 304-845-0137, 304-233-8929, 740-232-0747 (reverse name & address)<br>**Physical Address:**<br>4186 Blake Ridge RD<br>Glen Easton, WV 26039<br>**Tax Address:**<br>29 Sixth ST<br>McMechen, WV 26040-1053 | **Residence (#14)**<br>TM 11 Pcl. 2.1<br>Pamela P. Colvin<br>c/o Pamela Colvin<br>**Phone:** 304-845-0750<br>**Physical Address:**<br>51 Padlow LN<br>Glen Easton, WV 26039<br>**Tax Address:**<br>1405 Center ST<br>Moundsville, WV 26041 | **Residence (#15)**<br>TM 13 Pcl. 9<br>TH Exploration LLC<br>**Phone:** None Found<br>**Physical Address:**<br>10084 Fish Creek RD<br>Glen Easton, WV 26039<br>**Tax Address:**<br>1320 S University Dr Ste 500<br>Fortworth, TX 76107 |
| **Residence (#16)**<br>TM 13 Pcl. 7<br>Mary Virginia Pethtel<br>**Phone:** 304-684-2646, 304-845-3423<br>**Physical Address:**<br>9845 Fish Creek Rd<br>Glen Easton, WV 26039<br>**Tax Address:**<br>Same | **Residence (#17)**<br>TM 13 Pcl. 11<br>Kenneth & Teresa A. Smertneck<br>**Phone:** 304-845-0265, 304-280-3303, 304-845-0213, 304-845-1635<br>**Physical Address:***<br>4287 Sally's Backbone Dr.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>309 7th St.<br>Glen Dale, WV 26038<br>*Address appears to be in right of way /driveway for 2 homes (Sites 17 & 18) | **Residence (#18)**<br>TM 13 Pcl. 11<br>Kenneth & Teresa A. Smertneck<br>**Phone:** 304-845-0265, 304-280-3303, 304-845-0213, 304-845-1635<br>**Physical Address:***<br>4287 Sally's Backbone Dr.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>309 7th St.<br>Glen Dale, WV 26038<br>*Address appears to be in right of way /driveway for 2 homes (Sites 17 & 18) |

| | | |
|---|---|---|
| **Residence (#19)**<br>TM 13 Pcl. 12.1<br>Robert T. & Barbara A. Ankrom<br>Phone: 304-845-4657; 304-845-4762<br>**Physical Address:**<br>11698 Fish Creek Rd.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>55 Sentimental Dr.<br>Moundsville, WV 26041 | **Residence (#20)**<br>TM 13 Pcl. 20<br>Daniel J. Fitzwater<br>Phone: 304-845-0517; 740-845-0517<br>**Physical Address:**<br>None Found – Appears to be an old home location. Unknown Occupancy.<br>**Tax Address:**<br>840 Round Bottom Hill Rd.<br>Moundsville, WV 26041 | **Residence (#21)**<br>TM 13 Pcl. 18<br>Eleanor M. Fox Est.; Thomas John Fox<br>Phone: 304-845-6016; 304-845-6683<br>**Physical Address:**<br>11562 Fish Creek Rd.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>100 Lynn Camp Ln.<br>Glen Easton, WV 26039 |
| **Residence (#22)**<br>TM 13 Pcl. 23<br>Margaret Fox, C/O Paul Fox<br>Phone: 304-455-3817; 304-845-0597<br>**Physical Address:**<br>None Found – Second dwelling. Unknown occupancy.<br>**Tax Address:**<br>5761 Saint Joseph Rd.<br>Proctor, WV 26055 | **Residence (#23)**<br>TM 13 Pcl. 23<br>Margaret Fox, C/O Paul Fox<br>Phone: 304-455-3817; 304-845-0597<br>**Physical Address:**<br>10590 Fish Creek Rd.<br>Glen Easton, WV<br>**Tax Address:**<br>5761 Saint Joseph Rd.<br>Proctor, WV 26055 | **Residence (#24)**<br>TM 13 Pcl. 22.2<br>Eugene A. Sherrer<br>Phone: 304-232-9129; 304-242-9807; 304-232-9729<br>**Physical Address:**<br>None Found – Appears to be trailer/ mobile home. Unknown Occupancy.<br>**Tax Address:**<br>10698 Fish Creek Rd.<br>Glen Easton, WV 26039 |
| **Residence (#25)**<br>TM 13 Pcl. 22.1<br>Henry Jr. & Barbara Dick<br>Phone: 304-845-4636, 937-865-5376, 937-859-0361<br>**Physical Address:**<br>10698 Fish Creek Rd.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>Same | **Residence (#26)**<br>TM 13 Pcl. 22<br>Tricycle LLC<br>Notice of Process: Robert W. Wheeler<br>Phone: 304-599-4995, 304-685-0289<br>**Physical Address:**<br>None Found – Possible Hunting/Fishing Cabin. Unknown occupancy.<br>**Tax Address:**<br>908 Briarwood St.<br>Morgantown, WV 26505 | **Residence (#27)**<br>TM 13 Pcl. 22<br>Tricycle LLC<br>Notice of Process: Robert W. Wheeler<br>Phone: 304-599-4995, 304-685-0289<br>**Physical Address:**<br>10936 Fish Creek Rd.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>908 Briarwood St.<br>Morgantown, WV 26505 |
| **Residence (#28)**<br>TM 16 Pcl. 5<br>Robert M. & Nancy R. McCardle<br>Phone: 304-455-2259, 304-845-6188, 304-843-1687, 904-737-2828<br>**Physical Address:**<br>1081 Shutler Ln.<br>Proctor, WV 26055<br>**Tax Address:**<br>Same | **Residence (#29)**<br>TM 13 Pcl. 6<br>Mary Virginia Pethtel<br>**Phone:** 304-684-2646, 304-845-3423<br>**Physical Address:**<br>None Found – Possible Mobile Home<br>**Tax Address:**<br>9845 Fish Creek Rd<br>Glen Easton, WV 26039 | **Commercial/Business (#30)***<br>TM 13 Pcl. 5<br>XcL Midstream Operating, LLC<br>**Phone:** 1-888-751-0434<br>**Physical Address:**<br>9269 Fish Creek Rd.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>1320 S University DR STE 500<br>Fort Worth, TX 76107<br>*Physical address appears to be related to Oil & Gas Well Pad. |
| **Residence (#31)**<br>TM 13 Pcl. 5<br>XcL Midstream Operating, LLC<br>**Phone:** 1-888-751-0434<br>**Physical Address:**<br>None Found – Appears to be newer home<br>**Tax Address:**<br>1320 S University DR STE 500<br>Fort Worth, TX 76107 | **Residence (#32)**<br>TM 13 Pcl. 5<br>XcL Midstream Operating, LLC<br>**Phone:** 1-888-751-0434<br>**Physical Address:**<br>9201 Fish Creek Rd.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>1320 S University DR STE 500<br>Fort Worth, TX 76107 | **Residence (#33)**<br>TM 13 Pcl. 4<br>Louis Aulenbacher<br>**Phone:** 740-671-0077, 304-845-6184, 304-845-7025, 610-845-7025<br>**Physical Address:**<br>8919 Fish Creek Rd.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>96 Aulenbacher LN<br>Glen Easton, WV 26039 |

| | | |
|---|---|---|
| **Residence (#34)**<br>TM 13 Pcl. 4.1<br>H & L Equip LLC<br>c/o Herbert Aulenbacher<br>**Phone:** 304-845-0349<br>**Physical Address:**<br>8905 Fish Creek Rd.<br>**Tax Address:**<br>844 Aulenbacher Ln.<br>Proctor, WV 26055 | **Commercial (#35)**<br>TM 13 Pcl. 4<br>Louis Aulenbacher<br>**Phone:** 740-671-0077, 304-845-6184, 304-845-7025, 610-845-7025<br>**Physical Address:**<br>Unknown – Appears to be possible hunting cabin or newer home. Unknown occupancy.<br>**Tax Address:**<br>96 Aulenbacher LN<br>Glen Easton, WV 26039 | **Residence (#36)**<br>TM 10 Pcl. 2<br>Carol Vanscyoc<br>**Phone:** 304-845-6139<br>**Physical Address:**<br>8577 Fish Creek Rd.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>7523 Fish Creek Rd.<br>Glen Easton, WV 26039 |
| **Residence (#37)**<br>TM 10 Pcl. 19<br>Alan Arn Kelley<br>**Phone:** 304-843-2747, 973-838-5783, 973-291-4871, 201-838-5783<br>**Physical Address:**<br>8458 Fish Creek Rd.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>Same | **Residence (#38)**<br>TM 10 Pcl. 20<br>Joshua A. & Shannon N. Hoyt<br>**Phone:** 304-845-1446, 304-281-0368, 304-810-0706, 304-905-3126, 304-845-6150, 304-843-2280<br>**Physical Address:**<br>86 Whetstone Run Ln.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>RR 1 Box 46B<br>Glen Easton, WV 26039-9710 | **Residence (#39)**<br>TM 10 Pcl. 22<br>James & Vickie J. Mason<br>**Phone:** 304-845-6138, 412-855-7588, 724-727-7851<br>**Physical Address:**<br>6821 Fish Creek Rd.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>Same |
| **Residence (#40)**<br>TM 10 Pcl. 3<br>William N. Roupe<br>**Phone:** 304-845-9062, 304-845-6062<br>**Physical Address:**<br>7934 Fish Creek Rd.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>85 Kirkman Ln.<br>Proctor, WV 26055 | | |

# PROPOSED
# VAN WINKLE N - 5HM

EXHIBIT 3




NOTE: THERE APPEARS TO BE FOUR (4) POSSIBLE RESIDENCES WITHIN 1,500'.


SLS
FROM THE GROUND UP
12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slswv.com


| TOPO SECTION: | | OPERATOR: | |
|---|---|---|---|
| GLEN EASTON 7.5' | | PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317 | |
| COUNTY | DISTRICT | | |
| MARSHALL | MEADE | | |
| DRAWN BY | JOB NO. | DATE | SCALE |
| K.G.M. | 8952 | 12/22/2020 | 1" – 500' |

TUG HILL OPERATING

04/14/2023

CAD FILE: R:\Data\CADD\WORK 8900-8999\8952 Hunter Pethtel Plats and Mapping\8952\Survey\Send Files\122220\5HM\Cadd Files\5HM\8952-5HM Exhibits-R2.dwg LAYOUT: Layout2 USER: kmoyers

## Exhibit 3A

Tug Hill Operating, LLC
380 Southpointe Blvd, Suite 200
Cannonsburg, PA 15137

## Residences within Fifteen-Hundred Feet 1,500'

Well: Van Winkle N – 5HM
District: Meade
State: WV

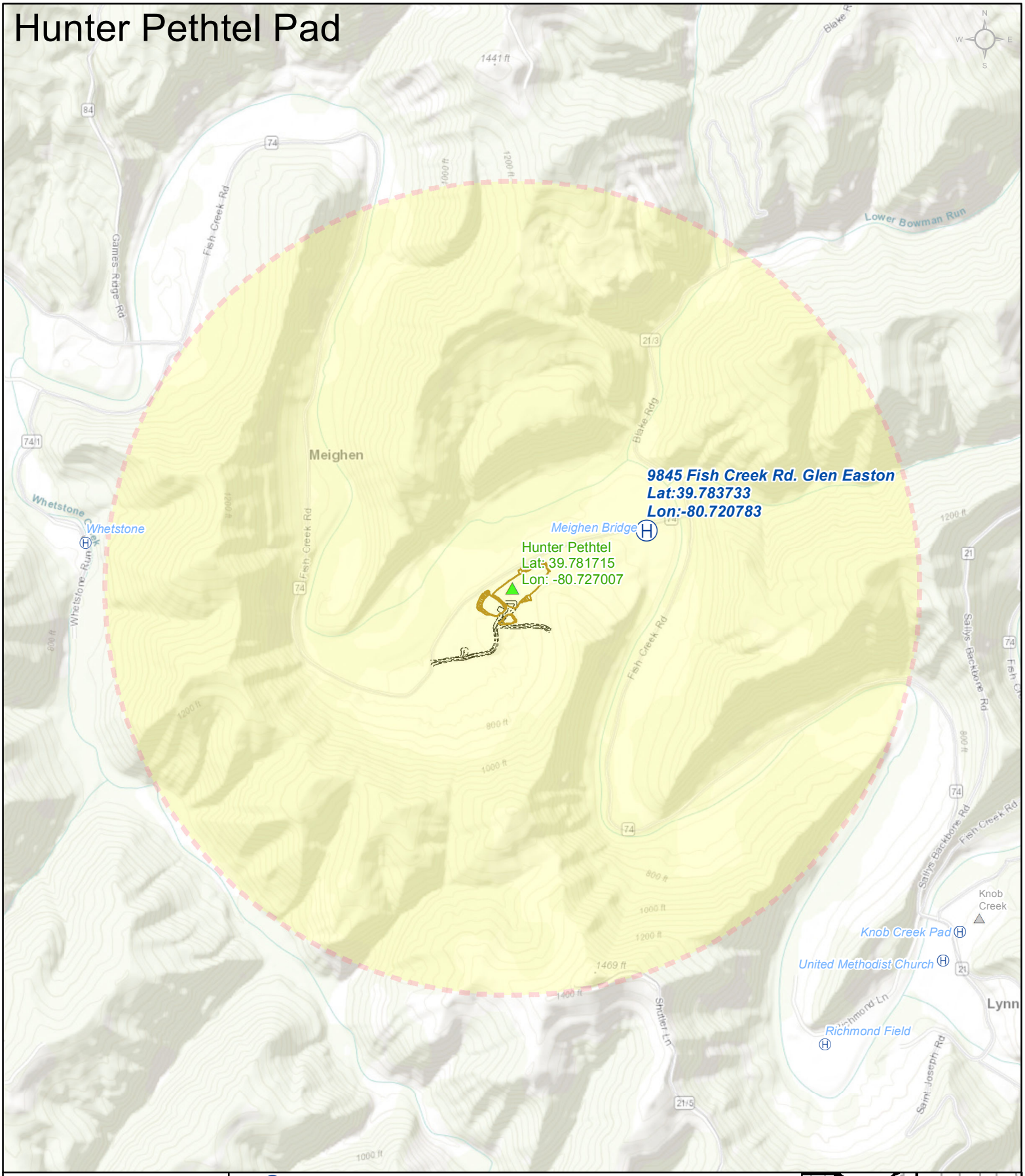
There are three (3) possible residences, one (1) possible commercial or business site, no churches, no schools and no emergency facilities within fifteen-hundred feet (1,500') of the above referenced well location.

| | | |
|---|---|---|
| **Residence (#1)**<br>TM 13 Pcl. 6<br>Mary Virginia Pethtel<br>**Phone:** 304-684-2646, 304-845-3423<br>**Physical Address:**<br>None Found – Possible Mobile Home<br>**Tax Address:**<br>9845 Fish Creek Rd<br>Glen Easton, WV 26039 | **Residence (#2)**<br>TM 13 Pcl. 7<br>Mary Virginia Pethtel<br>**Phone:** 304-684-2646, 304-845-3423<br>**Physical Address:**<br>9845 Fish Creek Rd<br>Glen Easton, WV 26039<br>**Tax Address:**<br>Same | **Commercial/Business (#3)***<br>TM 13 Pcl. 5<br>XcL Midstream Operating, LLC<br>**Phone:** 1-888-751-0434<br>**Physical Address:**<br>9269 Fish Creek Rd.<br>Glen Easton, WV 26039<br>**Tax Address:**<br>1320 S University DR STE 500<br>Fort Worth, TX 76107<br>*Physical address appears to be related to Oil & Gas Well Pad. |
| **Residence (#4)**<br>TM 13 Pcl. 5<br>XcL Midstream Operating, LLC<br>**Phone:** 1-888-751-0434<br>**Physical Address:**<br>None Found – Appears to be newer home<br>**Tax Address:**<br>1320 S University DR STE 500<br>Fort Worth, TX 76107 | | |

04/14/2023

# Exhibit 3 – Helicopter Landing Zone

# Hunter Pethtel Pad



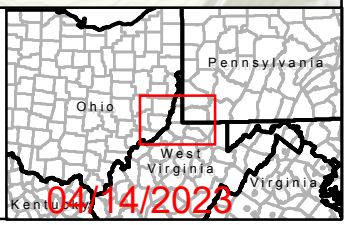

## Nearby EMS LZ's

0 600 1,200 2,400 Feet

Coordinate System: NAD 1983 UTM Zone 17N - Units: Foot US

TUG HILL OPERATING

- EMS Landing Zones within 1 Mile
- Alternative EMS Landing Zones
- THQA Pad of Interest
- Other THQA Operated Pad
- 1 Mile Buffer Zone
- THQA Padsite Road
- Local Roads



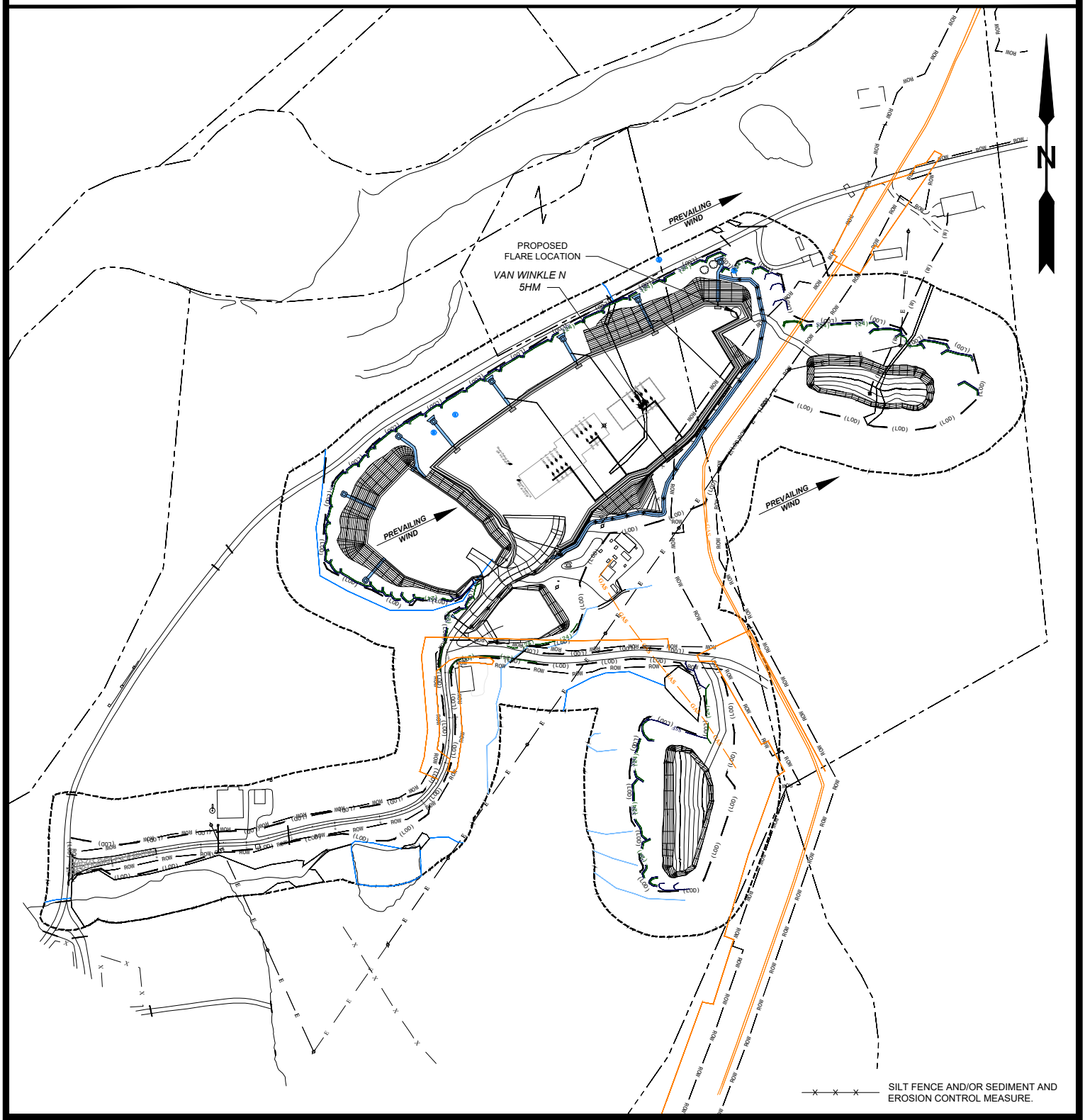

04/14/2023

A:\GIS\Projects\EHSR\MXD\THQA_ACTIVE_PAD_LOCATIONS_HLZS.mxd
Map Created By: dcreighton on 8/25/2020

# Exhibit 4 – Plan View

# PROPOSED
# VAN WINKLE N - 5HM

EXHIBIT 1




SLS
FROM THE GROUND UP

12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slswv.com

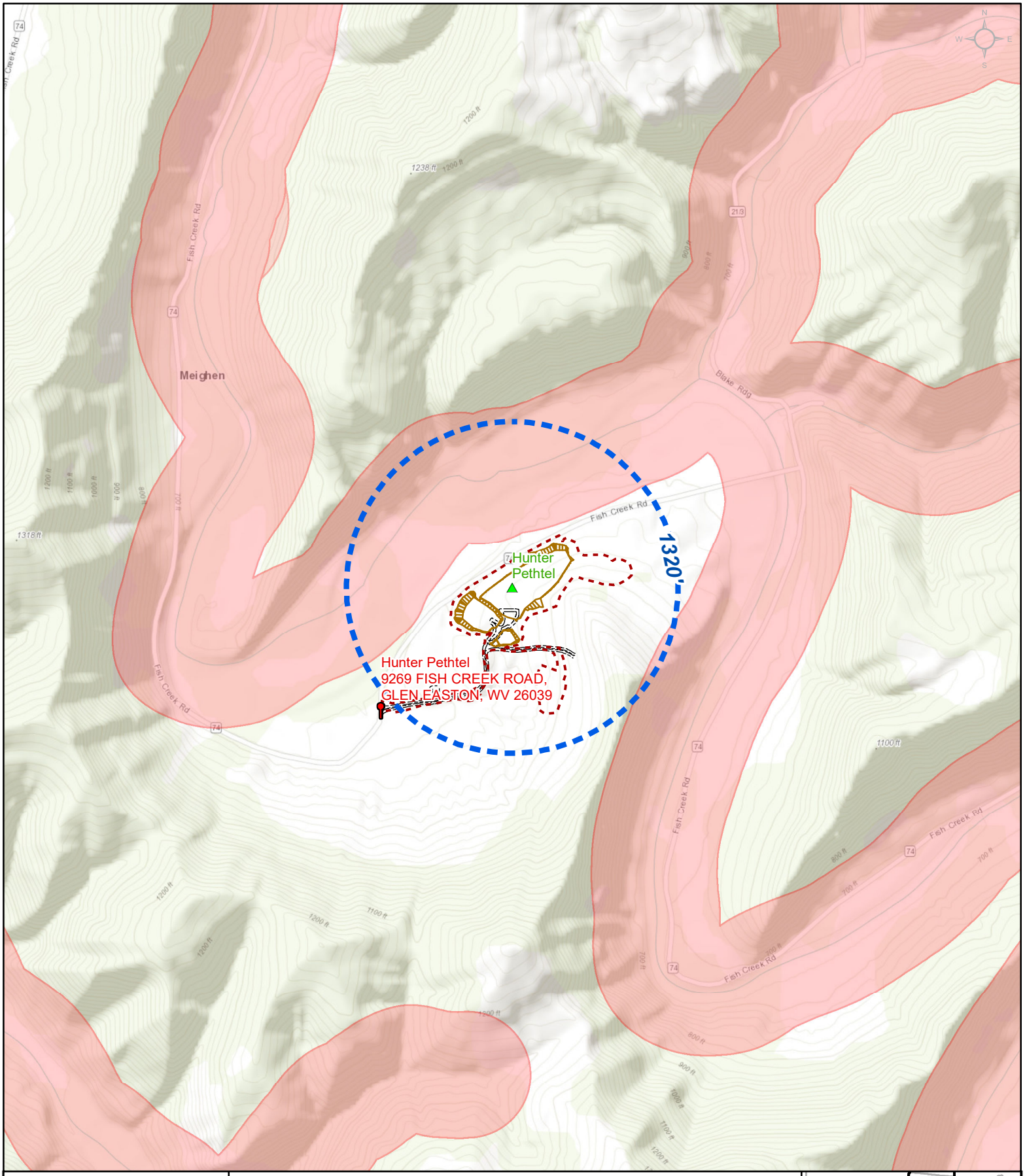
| TOPO SECTION: | | OPERATOR: | |
|---|---|---|---|
| GLEN EASTON 7.5' | | PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317 | |
| COUNTY | DISTRICT | | |
| MARSHALL | MEADE | | |
| DRAWN BY | JOB NO. | DATE | SCALE |
| K.G.M. | 8952 | 12/22/2020 | NONE |

TUG HILL OPERATING

04/14/2023

CAD FILE: R:\Data\CADD\WORK 8900-8999\8952 Hunter Pethtel Plats and Mapping\8952\Survey\Send Files\122220\5HM\Cadd Files\5HM\8952REC5HMR2.dwg LAYOUT: Layout2 USER: kmoyers

# Exhibit 5 – Zone of Critical Concern




**CONFIDENTIAL**

0 375 750 1,500 Feet

Coordinate System: NAD 1983 UTM Zone 17N - Units: Foot US

TUG HILL OPERATING

- Pad
- Access Road Intersection
- Limits of Disturbance
- Pad Boundary
- Padsite Road
- Quarter Mile Radius
- zcc

04/14/2023

A:\GIS\Projects\EHSR\MXD\ZCC\PAD SPECIFIC\THQA_PADS_ZCC_DDP.mxd
Map Created By: dcreighton on 10/15/2021

# Exhibit 8 – County List of Regional Resources

**TUG HILL OPERATING – PRODUCTION PADS**

**EMERGENCY NUMBER 800-921-9745**

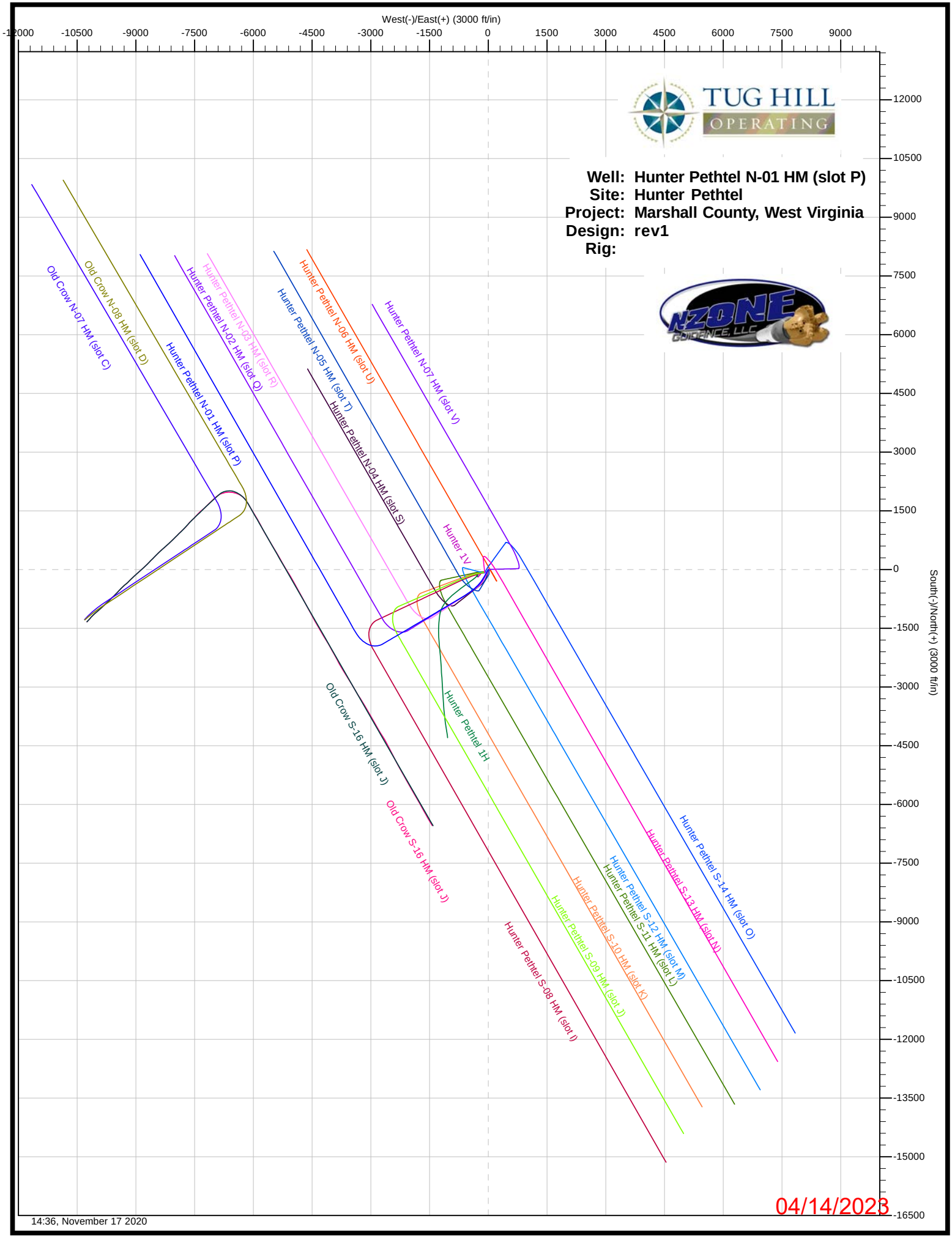
**Key Personnel, Agency and Emergency Contact List**

## MEDICAL SERVICES

| Agency | Address | Phone |
|---|---|---|
| **Reynolds Memorial Hospital** | 800 Wheeling Avenue<br>Glen Dale (Moundsville), WV 26038 | 304-845-3211 |
| **Reynolds Rapid Care** | 215 North Lafayette Avenue<br>Moundsville, WV 26041<br>Open Mon – Saturday<br>• 9:00 AM – 7:00 PM Mon – Fri.<br>• 8:00 AM – 4:00 PM Sat. & Sun. | (304) 843-3435 |
| **Wheeling Hospital** | 1 Medical Park, Wheeling, WV 26003 | (304) 243-3000 |
| **Med Express New Martinsville** | 260 Russell Ave, New Martinsville, WV 26155<br>Open Mon – Saturday<br>• 8:30 AM – 6:30 PM Mon – Fri.<br>• 9:00 AM – 4:30 PM Saturday<br>• Closed Sunday | 304-398-4949 |
| **EZ CARE** | 260 Russell Avenue<br>New Martinsville, WV 26155<br>• M-F 8:30 AM-7:00 PM<br>• S 9:00 AM – 5:00 PM | 304-398-4949 |
| **Wetzel County Hospital** | 2705 3E Benjamin Drive<br>New Martinsville, WV 26155<br>• 2318 Whiteman Hill Road, New Martinsville, WV 26155 (North Entrance)<br>• Head North on Whiteman Hill Rd. (Cty. Rt. 30) (2.3 mi.)<br>• Slight Right onto Pike Street and then 1st Left on Central Street (300 ft.)<br>• Turn Right onto WV-2 Energy Rd. (3.3 mi.) (Pass Pizza Hut on Left in 3.1 mi)<br>• Turn Right on E Benjamin Drive (0.4 mi.) | 304-455-8000 |
| | | |

# Figure 1 – Collision Avoidance

# Well Bore Spider Plot


West(-)/East(+) (3000 ft/in)
South(-)/North(+) (3000 ft/in)
TUG HILL OPERATING
Well: Hunter Pethtel N-01 HM (slot P)
Site: Hunter Pethtel
Project: Marshall County, West Virginia
Design: rev1
Rig:
NZONE FOOTPRINT, LLC
Old Crow N-07 HM (slot C)
Old Crow N-08 HM (slot D)
Hunter Pethtel N-01 HM (slot P)
Hunter Pethtel N-02 HM (slot Q)
Hunter Pethtel N-03 HM (slot R)
Hunter Pethtel N-05 HM (slot T)
Hunter Pethtel N-06 HM (slot U)
Hunter Pethtel N-07 HM (slot V)
Hunter Pethtel N-04 HM (slot S)
Hunter 1V
Hunter Pethtel 1H
Old Crow S-16 HM (slot J)
Old Crow S-16 HM (slot J)
Hunter Pethtel S-08 HM (slot I)
Hunter Pethtel S-09 HM (slot J)
Hunter Pethtel S-10 HM (slot K)
Hunter Pethtel S-11 HM (slot L)
Hunter Pethtel S-12 HM (slot M)
Hunter Pethtel S-13 HM (slot N)
Hunter Pethtel S-14 HM (slot O)
04/14/2023
14:36, November 17 2020

# Figure 2 – Casing and Cementing

**Tug Hill Operating, LLC Casing and Cement Program**

**Van Winkle N-6HM**

# Casing

| | String | Grade | Bit Size | Depth (Measured) | Cement Fill Up |
|---|---|---|---|---|---|
| Conductor | 30" | BW | 36" | 120' | CTS |
| Surface | 13 3/8" | J55 | 17 1/2" | 515' | CTS |
| Intermediate | 9 5/8" | J55 | 12 1/4" | 2,227' | CTS |
| Production | 5 1/2" | CYHP110 | 8 7/8 x 8 3/4 | 22,349' | CTS |

# Cement

| | |
|---|---|
| Conductor: | Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2 |
| Surface: | Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2 |
| Intermediate: | Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.19 |
| Kick Off Plug: | Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L - KOP Plug |
| Production: | 50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 15.2ppg, Y = 1.19 |

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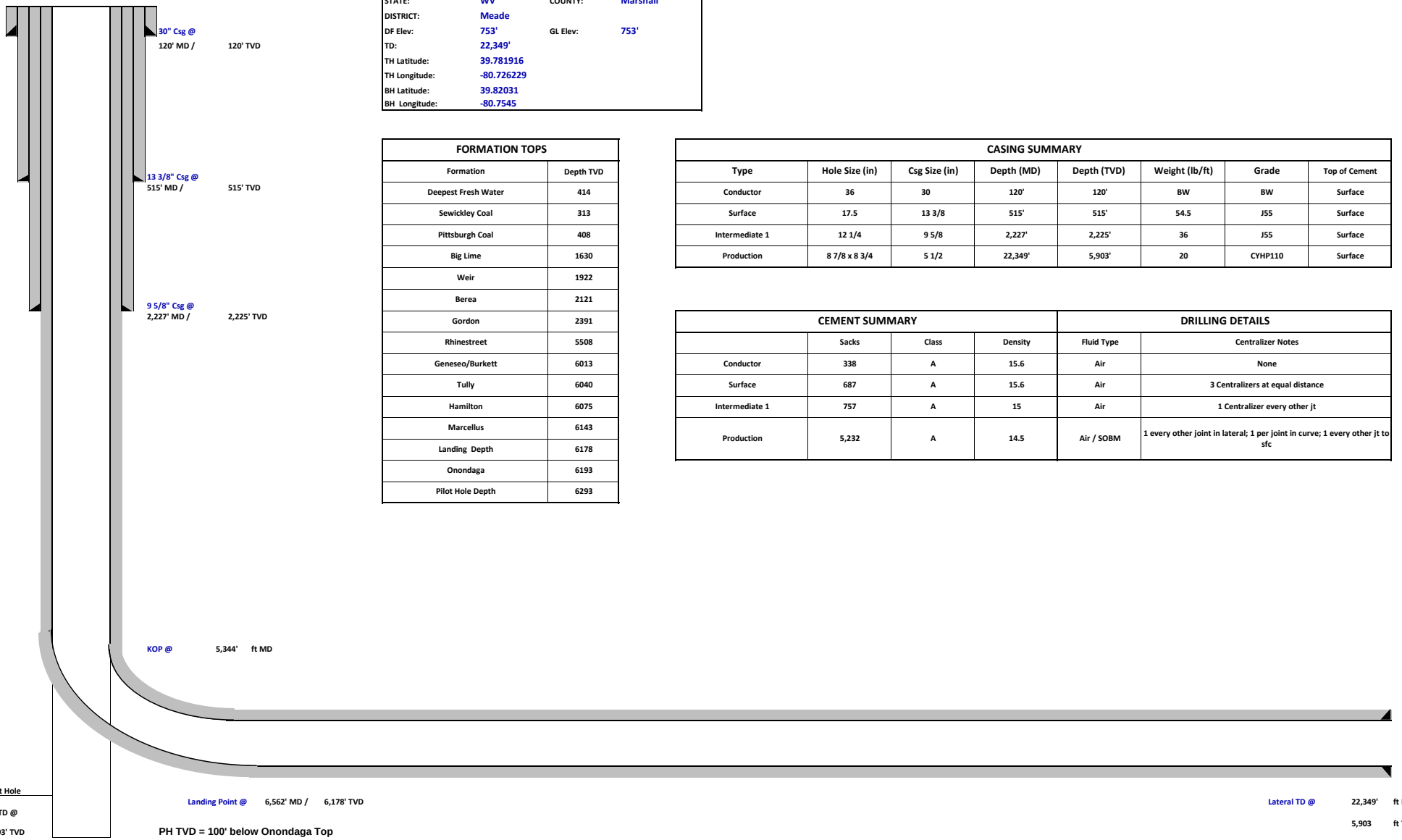
# Figure 3 – Well Bore Layout Program

| | | | |
|---|---|---|---|
| WELL NAME: | Van Winkle N-6HM | | |
| STATE: | WV | COUNTY: | Marshall |
| DISTRICT: | Meade | | |
| DF Elev: | 753' | GL Elev: | 753' |
| TD: | 22,349' | | |
| TH Latitude: | 39.781916 | | |
| TH Longitude: | -80.726229 | | |
| BH Latitude: | 39.82031 | | |
| BH Longitude: | -80.7545 | | |




PH TVD = 100' below Onondaga Top

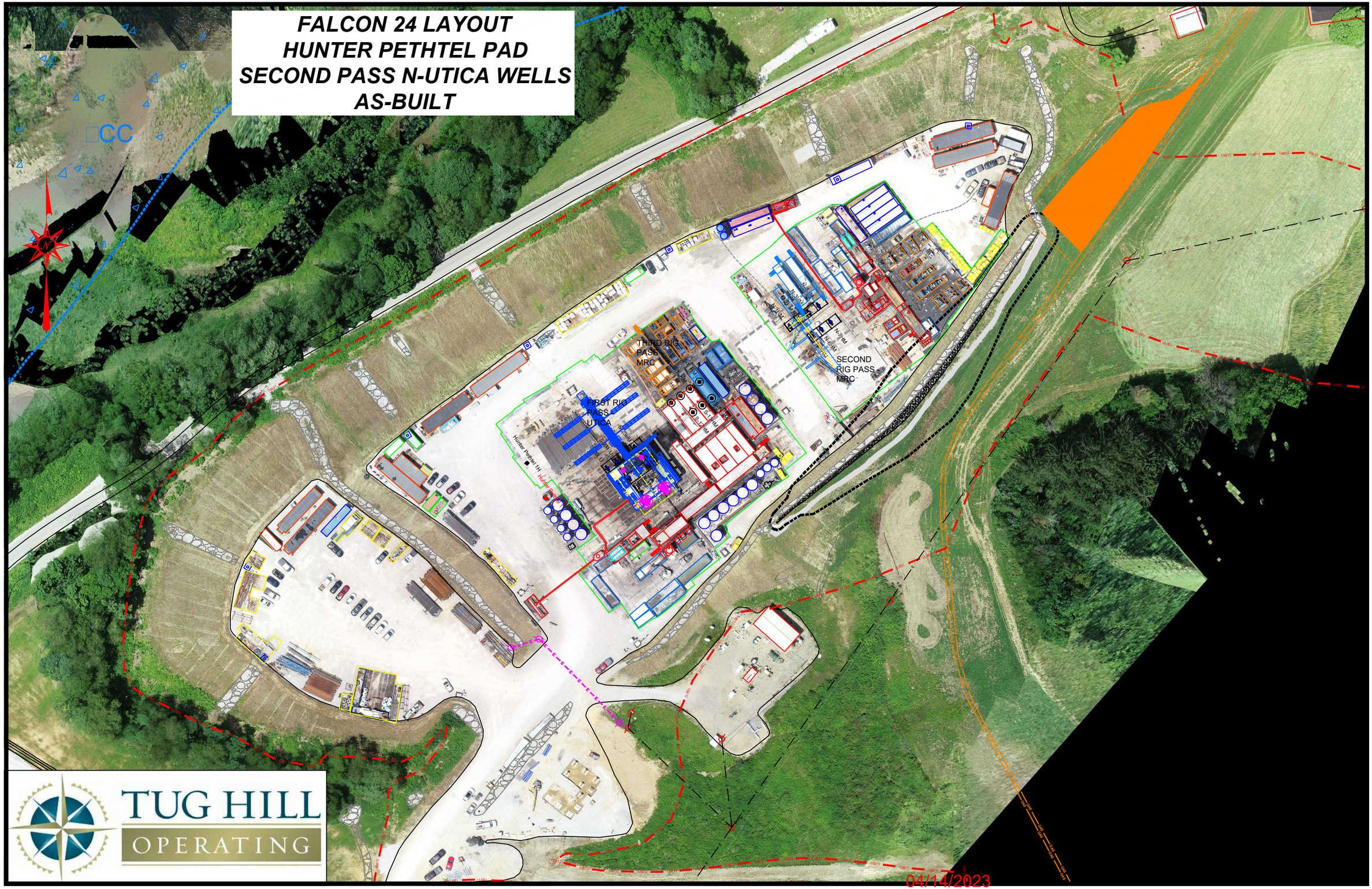
| FORMATION TOPS | |
|---|---|
| Formation | Depth TVD |
| Deepest Fresh Water | 414 |
| Sewickley Coal | 313 |
| Pittsburgh Coal | 408 |
| Big Lime | 1630 |
| Weir | 1922 |
| Berea | 2121 |
| Gordon | 2391 |
| Rhinestreet | 5508 |
| Geneseo/Burkett | 6013 |
| Tully | 6040 |
| Hamilton | 6075 |
| Marcellus | 6143 |
| Landing Depth | 6178 |
| Onondaga | 6193 |
| Pilot Hole Depth | 6293 |

| CASING SUMMARY | | | | | | | |
|---|---|---|---|---|---|---|---|
| Type | Hole Size (in) | Csg Size (in) | Depth (MD) | Depth (TVD) | Weight (lb/ft) | Grade | Top of Cement |
| Conductor | 36 | 30 | 120' | 120' | BW | BW | Surface |
| Surface | 17.5 | 13 3/8 | 515' | 515' | 54.5 | J55 | Surface |
| Intermediate 1 | 12 1/4 | 9 5/8 | 2,227' | 2,225' | 36 | J55 | Surface |
| Production | 8 7/8 x 8 3/4 | 5 1/2 | 22,349' | 5,903' | 20 | CYHP110 | Surface |

| CEMENT SUMMARY | | | | DRILLING DETAILS | |
|---|---|---|---|---|---|
| | Sacks | Class | Density | Fluid Type | Centralizer Notes |
| Conductor | 338 | A | 15.6 | Air | None |
| Surface | 687 | A | 15.6 | Air | 3 Centralizers at equal distance |
| Intermediate 1 | 757 | A | 15 | Air | 1 Centralizer every other jt |
| Production | 5,232 | A | 14.5 | Air / SOBM | 1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc |

# Figure 4 – Anticipated Rig Layout

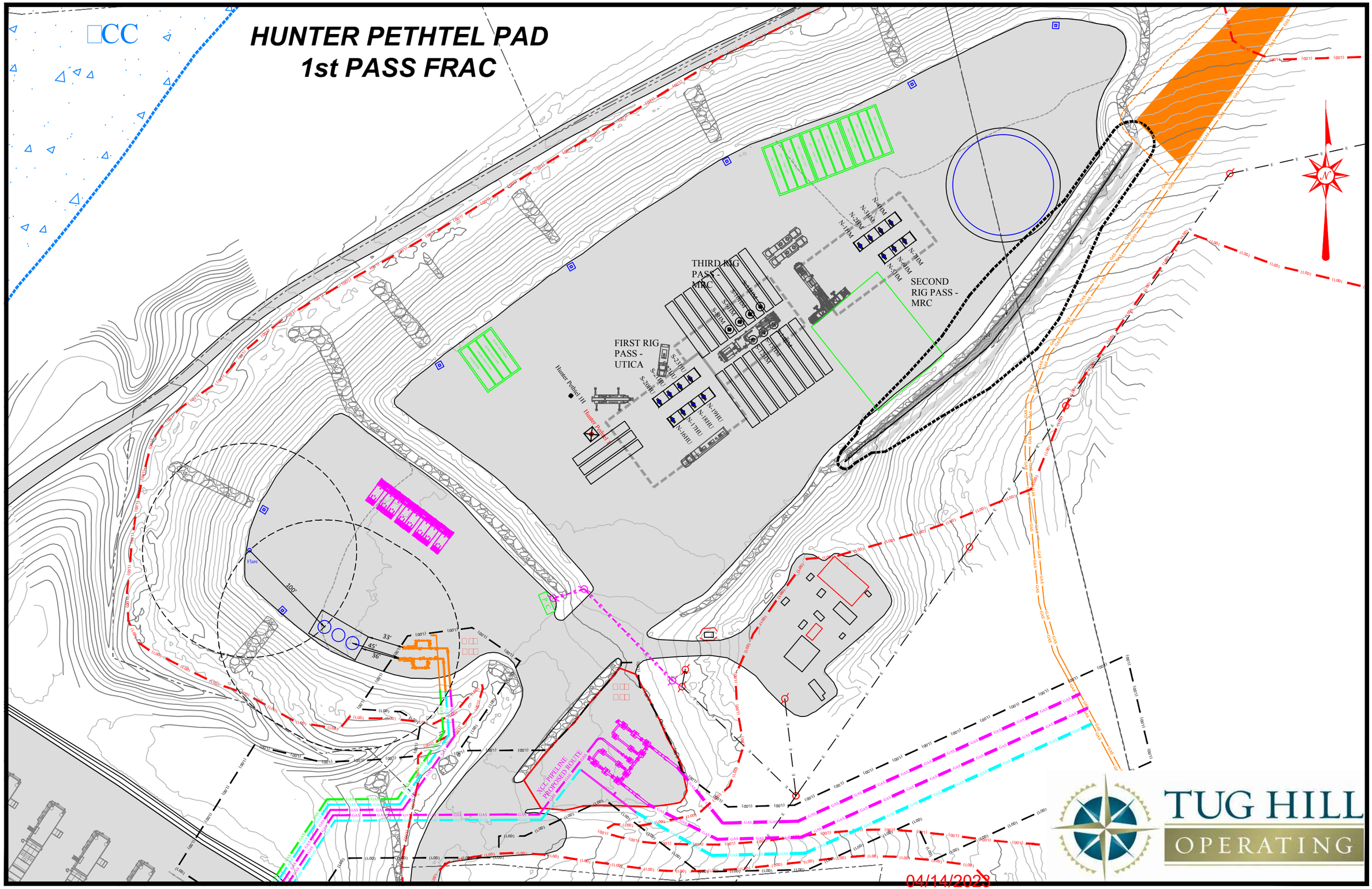
# FALCON 24 LAYOUT
# HUNTER PETHTEL PAD
# SECOND PASS N-UTICA WELLS
# AS-BUILT



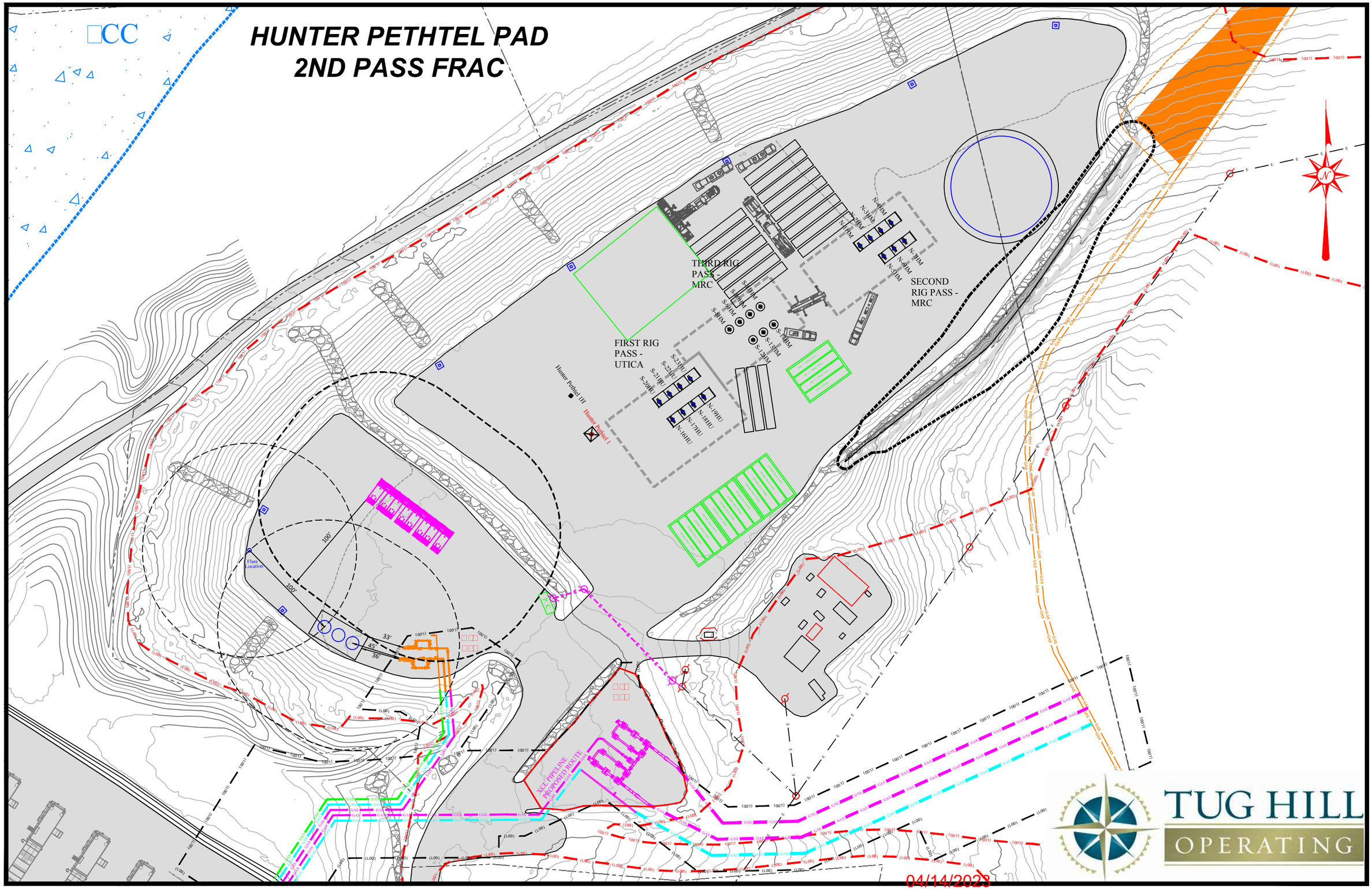

TUG HILL OPERATING

# Figure 5 – Anticipated Frac layout

# HUNTER PETHTEL PAD
# 1st PASS FRAC

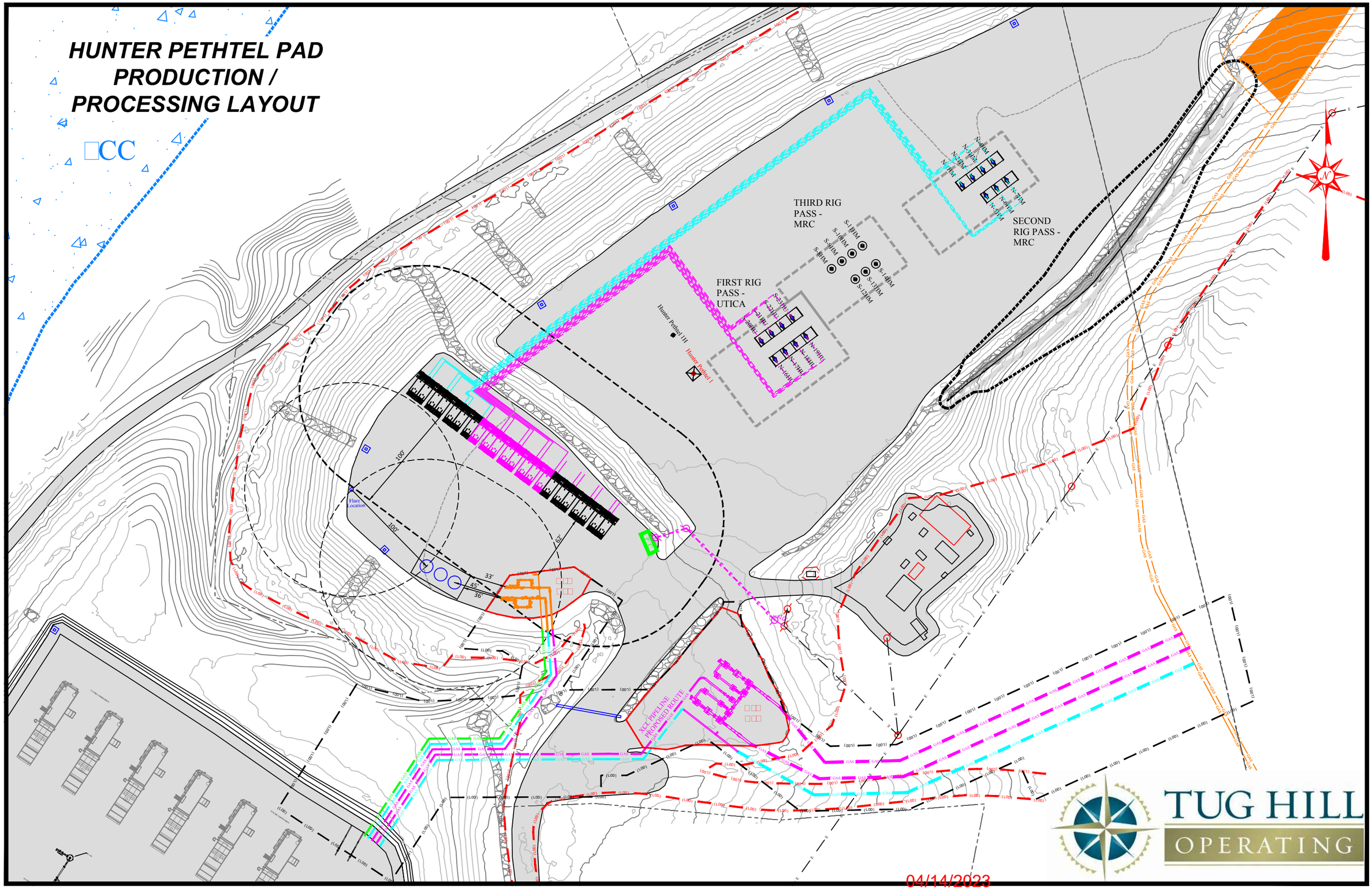


# HUNTER PETHTEL PAD
# 2ND PASS FRAC



# Figure 6 – Planned Production Facilities

# HUNTER PETHTEL PAD PRODUCTION / PROCESSING LAYOUT



## Tug Hill List of Chemicals by Formula Name and Maximum on Location
## Updated March 2020

| Construction Chemical | Max. on Location | | Units |
|---|---|---|---|
| **Diesel Fuel** | 500 | | gal. |
| **Hydraulic Fluid** | 150 | | gal. |
| **10w30 or 10w40 Oil** | 55 | | gal. |
| **Grease** | 10 | | gal. |

| Drilling Chemicals | Max. on Location | | Units |
|---|---|---|---|
| **Paints** | 50 | | gal. |
| **Spatz M-150** | 40 | | gal. |
| **Krylon BBQ & Stove Paint *** | 12 | | pounds |
| **Krylon OSHA Colors** | 36 | | pounds |
| **Kem Kromik Metal Primer** | 10 | | gal. |
| **Mineral Spirits** | 5 | | gal. |
| **D322-Rigwash** | 100 | | gal. |
| **2-26 Multi-Purpose Precision Lubricant** | 12 | | pounds |
| **Ammonium Bisulfite** | 42 | | gal. |
| **Calcium Chloride** | 2500 | | pounds |
| **Chemplex 710 /** Fumed Silica | 280 | | gal. |
| **Dow Corning 700 Industrial Grade** | 5 | | pounds |
| **Formula 151** | 31.5 | | gal. |
| **HRP** | 9 | | pounds |
| **Mar-T126 /** Tetrachloroisophthalonitrile | 9 | | pounds |
| **MC-122 /** Methyl Alcohol | 42 | | gal. |
| **Marathon No. 2 Ultra Low Sulfur** | 30000 | | gal. |
| **SPX 800 Series AW Hydraulic Oil** | 300 | | gal. |
| **SXP Extended Life Coolant** | 300 | | gal. |
| **SPX Gear Oil EP** | 300 | | gal. |
| **Tekusolv II Red, MM** | 50 | | gal. |
| **Citric Acid Anhydrous** | 1600 | | pounds |
| **Synfloc-SC-Neutral** | 550 | | gal. |
| **ABS 40 NE Base Oil** | 16800 | | gal. |
| **ABS MUI** | 2200 | | gal. |
| **AES Sperse** | 550 | | gal. |
| **AES Vis III** | 6000 | | pounds |
| **AES vis LS** | 6000 | | pounds |
| **AES WA II** | 2200 | | gal. |
| | | | |

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| Drilling Chemicals | Max. on Location | | Units |
|---|---|---|---|
| **Barite** | 42000 | | pounds |
| **CalCarb Mix** | 2500 | | pounds |
| **BlueMax** | 550 | | gal. |
| **CalciumChloride Powder** | 22400 | | pounds |
| **GXM** | 2500 | | pounds |
| **KCL** | 22400 | | pounds |
| **Lime** | 20000 | | pounds |
| **Nut Plug** | 5000 | | pounds |
| **Pipelax** | 250 | | gal. |
| **Sodium Chloride** | 10000 | | pounds |
| **Silverseal** | 2500 | | pounds |
| **Soda Ash** | 2500 | | pounds |
| **WCI 1013** | 660 | | gal. |
| **CJ020 Bentonite** | 500 | | pounds |
| **CJ110 Calcium Chloride** | 2115 | | pounds |
| **CJ600 - Super Flake** | 188 | | pounds |
| **CJ910 Class A Cement** | 70500 | | pounds |
| **Sugar / Sucrose** | 400 | | pounds |
| **Dolomite Quick Lime** / Calcium magnesium oxide | 18 | | Tons |

| Completions Chemical | Max. on Location | | Units |
|---|---|---|---|
| **Citgo Aluminum Complex PL 000 Grease** | **1980** | | **gal.** |
| **Final ChargeGlobal 50/50 Prediluted Antifreeze & coolant** | **990** | | **gal.** |
| **Hyrochloric acid - <37%** | **9000** | | **pounds** |
| **Mineral Oil** | **990** | | **gal.** |
| **Mobil Delvac1300 Super 15W-40** | **1650** | | **gal.** |
| **Mobilfluid 424** | **1320** | | **gal.** |
| **Calcium Chloride** | **2500** | | **pounds** |
| **StimSTREAM FR 9800** | **4500** | | **gal.** |
| **Dynaseal** | **275** | | **gal.** |
| **Zep Brake Flush 55GL** | **5** | | **gal.** |
| **Zepreserve NC Aero DZ** | **5** | | **gal.** |

| Production Chemicals | Max. on Location | | Units |
|---|---|---|---|
| **SCW8234 Scale Inhibitor** | 300.0 | | gal. |
| **Methanol** | 300 | | gal. |
| | | | |

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# Well Site Safety Plan (WSSP)

# Part B – Emergency Procedures

# Emergency Response Plan (ERP)
# Hydrogen Sulfide ($H_2S$) Plan
# Attachments

## Part B Pertains to
## All Well Pads and Sites

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## WSSP PART B – EMERGENCY PROCEDURES AND ATTACHMENTS

### Attachment 1 – Standard Wellhead Assemblies Figures

- Standard Marcellus Blow Out Preventor (BOP) Assembly
- Standard Marcellus Wellhead Assembly
- Standard Utica Frac Stack BOP Testing Procedure
- Standard Utica Wellhead Assembly

### Attachment 2 – Emergency Response Plan

- Incident Response and Notification Procedure
- Incident Command Structure (ICS)
- Incident Severity Assessment & Emergency Levels
- Incident Action Planning Process
- Site Access, Visitor Management, and Communication
- Evacuation
- Emergency Response by Scenario
- Attachments
    - U.S. DOT Emergency Response Guidebook Guides
    - Blank Kill Sheet
    - Family Information Gathering Form
    - Marshall County Family Resource Guide
    - NIMS ICS Forms (select initial forms)

### Attachment 3 – $H_2S$ Contingency Plan


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# 1.0 PURPOSE

See the introductory section of **WSSP PART A -- SITE-SPECIFIC DATA** for a discussion regarding the purpose of the this Well Site Safety Plan (WSSP), the Emergency Response Plan (ERP), and other "Companion Documents"; which are collectively referred to as the Tug Hill Integrated Contingency Plan (ICP).

## 1.1 Well Site Safety Plan Organization

Plan organization is provided in the introductory section of **PART A -- SITE-SPECIFIC DATA.** For ease of reference, therefore, the WSSP is separated into two parts:

### 1.1.2 <u>WSSP PART B – EMERGENCY PROCEDURES AND ATTACHMENTS</u>

- Standard policies and procedures required under W.Va. Rule 35 CSR 8-5.7 which apply to all Tug Hill well pads in West Virginia.
- Standard Wellhead Assemblies Figures
- Emergency Response Procedures
- Hydrogen Sulfide planning

The Emergency Response Plan (ERP) is provided as an attachment to **PART B**. Components of the ERP include Emergency Response scenarios and the Incident Command System (ICS) – which is an organizational hierarchy and description of the division of responsibilities for large-scale, severe incidents such as a well control incident.

As shown above, the ERP is provided in the **PART B – EMERGENCY PROCEDURES AND ATTACHMENTS**.

# 2.0 CONTACTS, SCHEDULES, AND MEETINGS

## 2.1 Emergency Contact Information

The Tug Hill Emergency Contacts List presented within **PART A -- SITE-SPECIFIC DATA section** of this WSSP. Emergency Contacts are updated as pad development proceeds through the relevant Operational phases and periodically as personnel changes may occur within Tug Hill and externally with Agency representatives.

## 2.2 Incident and Emergency Notifications

Incident notifications commence by following the Tug Hill **Initial Incident Response and Notification Procedure**, which is provided in **PART A -- SITE-SPECIFIC DATA** of this WSSP and in the ERP/ICP binder. Contractors and Employees alike are required to report all and every incident as soon as practicable.

Pursuant to the Tug Hill executive management EH&S policy directive, **all incidents** (e.g., safety or environmental related accidents and near miss events, equipment failure, vehicle accidents, injuries, illnesses, and/or spills, releases, or leaks involving loss of fuels, petroleum, chemical fluids, and other hazardous materials used, stored, produced, or transported on-site) must be reported immediately to the either Tug Hill Company Man/Completions Consultant or other Tug Hill Person-in-Charge (PIC), **AND** to the on-duty EHS Coordinator.

The observer of the condition or incident of concern continue attempting contacts until a person is reached. Voicemail, texts, emails are **NOT** sufficient contact.

The Tug Hill Company Man/Completions Consultant/PIC or EHS Coordinator will enter the FIRST ALERT REPORT into the Tug Hill EHS Insight database. The FIRST ALERT will automatically disseminate via email to the Tug Hill Operations Management team. The EHS Coordinator on-duty is to report to the scene and complete Incident SUBMISSION details in EHS Insight and will coordinate response actions in concert with the Company Man/PIC, EHS Director, and Tug Hill Operations management.

## 2.3 Emergency Response and Event Levels

Included in the ERP is a discussion of the NIMS Incident Command System (ICS), the procedures to be followed in the event of specific types of emergencies, including fire/explosion, power loss, natural disasters, well control, and spill/fluid release, as well as action lists for "Emergency Levels" (1, 2, and 3) based upon the degree of risk presented by the circumstances, procedures for evacuation, and NIMS forms.

See **Section 5.0 – EMERGENCY RESPONSE AND EVACUATION PLANS** for a more detailed discussion on Emergency Levels and activation of the ERP.

# 3.0 SITE ACCESS, VISITOR MANAGEMENT, AND COMMUNICATION

## 3.1 Security and Site Access

Access and egress to the well pad is provided via a site access road. During the Drilling and Completions Operational phases of well development, Security Guard stations are typically located at the beginning or along the access road. The Security and Site Access is controlled pursuant to the **Tug Hill Site Security Standard Operating Procedure** (SOP).

This Site Security SOP requires the presence of security on location during Drilling and Completions activities, and for significant operations during which there are simultaneous operations "SIMOPS" involving multiple contractors onsite and/or which may be working in the hot work zone while wells are in Production.

A copy of the Incident Response and Notification Procedure and **PART A -- SITE-SPECIFIC DATA section** of this WSSP with site layout and location figures and Emergency Contact List is to be maintained in the Security Guard Shack.

## 3.2 Accounting for Personnel

The Security Guard Contractor is shown in the Emergency Contact list provided in **PART A -- SITE-SPECIFIC DATA** section of this WSSP. Security Guards are required to ask questions of workers entering the location and screen visitors and vendors. Security Guards also keep a running log of personnel on location.

All parties entering or leaving the site (e.g., visitors, Tug Hill personnel, and contractors) are required to sign in and sign out when entering or leaving the worksite during drilling, completion, and work-over activities. All visitors are required to have pre-approval from the Company Man/PIC to enter the location and are directed to report directly to the Company Man or Completions Consultant office. Visitors may not travel within the site unapproved.

This sign-in sheets maintained by Security will be used for account for visitors and personnel in the event of a well site emergency or significant incident. This log will be maintained for the duration of operations by contracted gate guards or the Tug Hill On-Site Supervisor or their designee.

For production facilities where there is no Security Guard and employees or service company individuals may be performing work alone, the employee is to maintain periodic contact with their supervisors or peers and make them aware of their location and routes and any changes to those routes that may occur.

### 3.3 Communications On-site

As always, communications are the key to a safe and successful worksite. Communications starts with site induction and CEM Safety Orientation. During site orientation, the muster locations, evacuation routes and alarm sounds shall be communicated. Additionally, daily safety meetings are held at the commencement of each work shift so that workers on location understand the planned activities and hazards anticipated. See Section 4.2 below regarding Safety Meetings.

Need of communications equipment is dictated by the activities and project's needs. Two-way radios are typically used on Drilling and Completions sites where well work is underway. On large and multi-disciplinary SIMOPS worksites, hand-held two-way radios will be issued to ensure crews working on the pad will have adequate means of communication in the event of emergency.

To address emergency situations, the drilling rig and completions site is equipped and alarm, horn, or siren. Additionally, gas monitoring systems on location are equipped with an audible and visual siren and flashing light to alert workers on location that a hazardous atmosphere condition has been detected.

For transportation with trucking, Tug Hill D&C Operations and Production Department employee vehicles are equipped with cellular telephones, cell phone boosters, and Citizen Band (CB) radios. Security Guards on each D&C Operations pads are equipped with cellular telephones and CB radios. CB radio signs are posted along Tug Hill Bonded Routes and the CB channel number designated for the well pad is included in the Pre-Spud and Pre-Frac hand-outs provided to Contractors and workers.

### 3.4 Communication with Outside Media

There will be no non-participants and outsiders other than emergency services allowed on the well pad during an emergency, and no statements will be issued to the media or other interested parties except by designated Tug Hill management.

Any media statements will be provided by the Tug Hill Public Information Officer pursuant to the ERP. Tug Hill field workers and Contractor personnel are directed to be courteous to media representatives and direct them to the designated company spokesperson.

# 4.0 SITE SAFETY

## 4.1 Safety Orientation and Expectations for Workers and Contractors

All Contractors are required to participate in the Tug Hill Contractor Safety Management Program (CSMP) and either have a Master Services Agreement (MSA) by and between Tug Hill or be subcontracted directly with a primary Contractor who is bound by the MSA. Under the terms and conditions of the MSA, the Contractor is required to acknowledge receipt and abide by Contractor Expectation Manual (CEM). The CEM outlines Tug Hill safety and environmental performance expectations.

Upon first reporting to service for Tug Hill, all workers are required to participate in CEM Safety Orientation prior to be permitted to work on a Tug Hill location. During CEM Orientation, workers are informed of stop work authority, safe work practice expectations, requirements for Permits-to-Work (PTW), spill containment requirements, incident notification procedures, and emergency response procedures. Site specific information such as pad layout and muster points will be reviewed during the CEM Orientation. Workers who have not had CEM Orientation or SIMOPS Induction must report to the PIC or the EHS Coordinator.

## 4.2 Safety Meetings

Safety meetings are typically held on-site at the following frequency:

1. Prior to commencement of Drilling and/or Completions Operations (Pre-Spud; required)
2. Pre-shift for Day and Night shifts
3. During new or changing Operations (e.g., casing runs, cement jobs, wellhead work)
4. Weekly
5. Pre-Workover
6. Post-Accident / High Potential Near Miss
7. As deemed necessary by the PIC based upon operational conditions
8. Prior to drilling into potentially high-pressure zones
9. Prior to SIMOPS

At a minimum, safety meetings will be held on a weekly basis, prior to drilling, prior to the start of subsequent Operational phases (e.g., handover from Drilling to Completions). Personnel involved in ongoing operations (Tug Hill staff, key contractors, safety personnel, on-site support staff, etc.) shall be included in the safety meetings.

The District WVDEP Office of Oil & Gas County Inspector shall be notified at least 48 hours prior to the Pre-Spud, Pre-Stim, and Pre-Workover safety meetings so that they or their designated representative may attend the meeting if desired.



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Typically, the Tug-Hill Company Man/Completions Consultant/PIC will conduct the on-site safety meetings in conjunction with the Tug Hill EHS Coordinators and Contractor Supervisors. On-site workers and visitors are required to participate. A record of personnel and others attending the safety meetings will be recorded on the Safety Meeting Sign-In Sheet. Once completed, the forms will be maintained onsite or in the Tug Hill archived files.

### 4.3 SIMOPS Induction Meetings

When SIMOPS involving Drilling, Completions, or Work-Over Operations are planned simultaneous with Production, a site specific SIMOPS Plan will be developed to ensure mitigation of hazards associated with concurrent Operations. Each Contractor and its respective workers will attend an initial SIMOPS Induction Safety Orientation regarding the activities and procedures outlined in the SIMOPS Plan. This is in addition to or combined with standard CEM Safety Orientation provided by the EHS Coordinators.

During the Induction, the Tug Hill SIMOPS agenda topics shall be review and hazard identification, risk mitigation procedures, reporting, management of change, and emergency response procedures outlined in the ICP, ERP, and WSSP. Specific factors relevant to the activities and areas in which the Contractor's personnel are working will be reviewed.

### 4.4 SIMOPS Meetings

**STANDARD SIMOPS MEETING SCHEDULE**

| Activity | Attendees/Time | Brief Agenda | Lead by |
|---|---|---|---|
| **Pre-Work SIMOPS Meeting** | All Key SIMOPS Mgmt. and Personnel | SIMOPS Pre-Work Meeting Agenda | SIMOPS PIC, Activity Supervisor, and EHS |
| **Site Induction** | All Workers New to Site -- Upon site entry EHS | General Rules. Emergency Procedures and Hazards Management; PTW; Buffer & Exclusion Zones; Communications; CEM Safety Orientation | Pad Owner/PIC/Activity Supervisor and/or EHS |
| **Daily Site Safety meeting** | Activity workforce Daily or as required. EHS (as available) | Day's activities, Incident Reports, Hazards Reported, Inspection Results; Other Current Issues; | PIC and/or Activity Supervisor |
| **Operations Calls** | Project supervisors, all projects, and EHS | Coordination of projects planned and activities of the day; Identify conflicts Permit requirements/EHS issues traffic movements, traffic community issues | Operations Manager; PIC |
| **Weekly SIMOPS or at PIC Discretion for MOC** | PIC, Site Supervisors, and EHS (as available) | 3 to 4 day look ahead at planned activities, potential conflicts, shared services, permit requirements | PIC |

Additionally, the SIMOPS Plan and Hazard Risk Mitigation actions shall be communicated to new contractors during on-boarding prior to working on the location.

The daily Safety Meeting is mandatory participation for all SIMOPS parties and site supervisors. Instances When an "all-hands" Safety Stand-down is required:

1. After a Muster Event or ESD (other than sensor malfunction)
2. Any Level 2 or 3 major, or severe incident events (after any major event (e.g., serious OSHA "Recordable" Injury, serious Reportable Spill requiring remedial action, or serious "High Potential" Near Miss, acts of violence or terrorism)
3. Stop Work Orders because of safety concern being identified on location
4. Activation of the ERP or Incident Command System for any reason
5. Any instance at the discretion of the Company Man, PIC, or Tug Hill Management

## 4.5 Management of Change – Extra Emphasis on SIMOPS

Management of Change (MOC) is critical to proper communications and to mitigate risks on the well pad. The PIC, Company Men and the Managers or Supervisors of the Operational teams are all equally responsible to ensure that MOC practices are followed.

Especially during SIMOPS, utilization of hand over notes and checklist between groups and Operational departments, work scope confirmations, and safety review meetings, are critical during instances involving any significant change in equipment, operations plans and schedules that differ from what was previously approved and communicated, and significant personnel changes.

The SIMOPS Plan shall be reviewed and approved prior to the commencement of SIMOPS. This Plan is to be distributed to the Safety or Operations Manager/Supervisor for each Contractor and Operational Division working on the location. Others who are in a decision-making capacity who may never visit the field Operations should be considered as well.

## 4.6 Personal Protective Equipment (PPE)

Workers on Operation and Production well pads must be outfitted with the appropriate level of protection as defined by OSHA 29 CFR 1910.132, Personal Protective Equipment.

A summary of PPE requirements is shown below. The full list of PPE requirements and expectations are listed in the Tug Hill Contractor Expectation Manual.

Additional PPE may be assigned dependent on the site conditions and shall be required at the discretion of the EH&S Coordinator and the Tug Hill Company Man. Additional PPE requirements will be communicated to all personnel, if required, during the Pre-Spud, Pre-Frac, and daily safety meetings.

**Note:** This list is not intended to be exhaustive nor representative of all PPE requirements to remain in compliance with all applicable federal, state, and local laws and regulations and/or industry standard or "best management" practices.

4.6.1 Basic PPE is required to be worn in the following circumstances:

a. When working on equipment at any Tug Hill Operations site where well work has commenced and at all Production pad where there is a presence of flammable gas and/or liquids. Basic PPE is also required on Construction sites.

b. When using hand or powered tools and operating mobile equipment.

c. Exceptions include office areas, parking areas, inside trucks and cars.

4.6.2 Basic PPE

All forms of PPE must meet the appropriate ANSI, ASTM and NFPA specification. Basic PPE on all Tug Hill sites and Operational areas includes:

a. Long pants

b. Shirt with sleeves

c. Hard-toed boots (steel or composite)

d. Safety glasses with permanent side shields

e. Hard hats

4.6.3 Head Protection

a. Hard hats that meet the requirements as defined in the most recent version of ANSI Z89.1 must be worn.

4.6.4 Eye Protection

a. All eye protection equipment (i.e., safety glasses/ goggles) must meet the current specification contained in the most recent version of ANSI Standard Z87.1 and be properly equipped with side shields.

b. Safety glasses/goggles must be inspected prior to use for cracked or damaged lenses, missing or damaged side shields, or other impairments.

c. There is no single type of eye protection that will offer protection from all hazards. Many Operations require a special type or a combination of types. Examples include, but are not limited to, the following:

   i. Welding hood or goggles for welding and burning Operations
   ii. Face shields for grinding
   iii. Face shields or goggles for chemical splash
   iv. When welding or burning, eye protection must be equipped with filter lenses which have a shade number appropriate for the work being performed for protection from potentially injurious light radiation
   v. Shaded lenses are only to be used during daylight hours

d. Workers who wear prescription lenses while engaged in Operations that involve eye hazards are to wear eye protection that incorporates the

prescription in its design or wears eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

4.6.5 Foot Protection

a. Hard-toed boots must meet the requirements as defined in the most recent version of ASTM F2413.

b. Additional foot protection, such as metatarsal guards, may be necessary when performing certain tasks, such as operating a jackhammer. Foot protectors must also meet the most recent version of ASTM F2413.

4.6.6 Hearing Protection and Conservation Programs

a. All Tug Hill employees and Contractors are required to wear hearing protection when noise exposure equals or exceeds those set forth by Table G-16 of OSHA 29 CFR 1910.95 (a - b).

b. Hearing protection must reduce the noise exposure to decibel below 90 dBa.

4.6.7 Face Protection

a. All face protection shall comply with the most recent version of ANSI Z87.1.

b. Face protection shall be worn in addition to approved safety glasses or goggles when the work activity includes one or more of the following hazards:

   i. Handling metal or other materials that can whip or spring, striking the face;

   ii. Exposure to flame, sparks, or radiant heat;

   iii. Exposure to chemical splash, drips, or spray;

   iv. Pressure spraying or cleaning;

   v. Grinding, chipping, or cutting Operations that cause flying sparks, chips, or particles; and/or

   vi. Exposure to potential electrical arc flash.

4.6.8 Hand Protection

Personnel shall wear hand protection, commensurate with the hazards associated with the task. Selection of the appropriate hand protection will be determined by the chemical and physical nature of the materials handled. Basic tasks that require the use of gloves include, but are not limited to, the following:

a. Welding, cutting, burning.

b. Handling sharp edged steel and cables.

c. Working with corrosive or caustic chemicals.

d. Cold or hot temperature extremes.

e. Exposure to chemical splash, drips, or spray.

f. Pressure spraying or cleaning.

4.6.9 Flame Resistant (FR) Clothing

FR clothing shall be worn at all times by all Tug Hill employees and Contractor personnel while working on Tug Hill sites when:

a. Drilling has commenced and/or a well is installed (regardless of whether it is completed).

b. Where equipment and/or facilities contain or otherwise have the potential to convey natural gas or condensate.

FR clothing shall consist of FR-rated pants and long-sleeve shirt or coveralls conforming to NFPA 2112 and 2113 for Flash Fire protective clothing (the garment tag must read "NFPA 2112/HRC 2 for Flash Fire") with the exception of HRC1 rated raincoats worn over HRC 2 rated shirts and pants. NFPA 70E Arc Flash clothing is heavier and is not required on Tug Hill sites unless performing electrical work triggering NFPA 70E requirements.

The sleeves and shirt shall be buttoned, or coveralls zipped up when FR clothing is required to be worn and must be the outer most layer of clothing.

Reflective, high visibility safety vests are required on construction sites and pipeline projects where excavators, cranes, and heavy mobile equipment is being used. A high visibility safety vest worn in areas within 100 feet of where equipment may contain gas, these must be FR-rated fabric as well.

FR clothing heavily stained with oils and petroleum are not acceptable and can be rejected at the discretion of the Tug Hill EHS Coordinator or other Tug Hill representative. Workers are reminded that they should follow care instructions when laundering FR-rated fabrics as the fire-resistant qualities can be lost with improper washing.
Clothing made of synthetic materials, such as polyester, has been shown to contribute to the severity of burns received from fires, because it melts and sticks to the skin. Synthetic materials are prohibited on locations in Production or where there is equipment with the potential of containing gas. Underclothing made of certain natural fabrics, such as 100% cotton, can provide additional burn protection in flash fires.

4.6.10 Respiratory Protection

a. Respiratory protection must be worn when working in potentially harmful environments due to displaced oxygen, the presence of harmful or toxic gases, or while performing Operations that generate dusts, fibers or fumes that are above the applicable OSHA Permissible Exposure Limits (PELs).

b. When the use of respirator protection is required, the Contractor shall establish and implement a respirator protection program in accordance with OSHA 29 CFR 1910.134 Respiratory Protection. The Contractor shall ensure that the program includes:

i. Medical evaluation on personnel required to wear a respirator;

ii. Procedures for the proper selection of a respirator, annual fit testing;

iii. Training in the proper use, and care of the respirator; and

iv. Head and facial hair limitations.

c. Contractors are to enforce a "no facial hair" policy for workers who may be required to wear respiratory protection equipment. Pursuant to OSHA regulations 1910.134(g)(1)(i) and (g)(1)(i)(A) facial hair may not come between the sealing surface of the facepiece and the face.

## 4.7 Atmospheric Testing/Monitoring (LEL, H2S, CO and O2 Meters)

Note: All monitoring equipment must be functional, maintained, and calibrated per manufacturer specifications. Workers must wear personal monitors in strategic body placement per NIOSH, API, OSHA and manufacturer's specifications and guidelines. (see Gas Meter Alarm Cards attached to this CEM)

### 4.7.1 LEL Meters and 4-Gas Monitors

Unless site-wide or area radius Lower Explosive Limit (LEL) monitoring is being performed using stationary monitors, during the circumstances listed below, **LEL meters shall be worn by all personnel working within 40 feet** of wells, pipelines, separators, or other equipment that contains or has the potential to contain natural gas and/or condensate:

a. Where there is active construction or Operations involving mobile equipment (e.g., cranes, excavators, forklifts/telehandlers, skid steers, truck loading/unloading, rig moves, etc.).

b. **During SIMOPS** situations such as drilling, completions, or workover Operations on well pads that are actively flowing gas.

c. During any instance that meets the requirements for a Hot Work Permit.

d. During flowback Operations.

Workers may opt to wear 4-Gas monitors when merely an LEL monitor is required. Tug Hill employees are outfitted with 4-Gas monitors. Four Gas Meters ($H_2S$, $CO_2$, LEL, and $O_2$) are required by all personnel entering a an $H_2S$ Operations Pad or when entering Confined Space or otherwise directly involved in performance of Operations requiring a Confined Space Entry Permit.

When stationary LEL monitoring devices have been installed and/or other risk mitigation measures have been implemented, the Contractor may request approval from the Tug Hill PIC, Company Man, or EHS Coordinator to reduce the requirement for personal LEL meters. It is recommended that those individuals whose duties involve working within API defined Hazard Class 1 Division 1 or Division 2 areas continue to wear LEL or 4-gas monitors.

### 4.7.2 H2S Meters

$H_2S$ meters are required under the same circumstances as above if and when Operations involve working in regions or on well pads involving wells that penetrate a known hydrogen sulfide ($H_2S$)

containing formation or one containing $H_2S$ gas in concentrations greater than 10 parts per million (ppm) in the atmosphere.

Personnel shall be properly protected from the effects of $H_2S$ and shall receive proper training in the hazards of $H_2S$ and in the protective measures required.

The Tug Hill $H_2S$ Contingency Plan with appropriate operating and emergency procedures in included in the WSSP and ICP binder. When personal $H_2S$ monitors are required, a properly calibrated and functional monitor must be worn in the breathing zone (9" – 12" sphere– chest to forehead / forward the shoulders). (See Hydrogen Sulfide Danger Action Levels attached to the $H_2S$ Contingency Plan).

# 5.0 EMERGENCY RESPONSE AND EVACUATION PLANS

## 5.1.1 Introduction to the Emergency Response Plan (ERP)

The ERP is a stand-alone document to the WSSP. See **WSSP PART B – Attachment 2.**

For all events requiring on-site Muster, response actions will be consistent with the "**Emergency Response Level**" of incident severity as defined in the ERP Emergency Response, Evacuation/Shut-down Plan attached to this WSSP and provided in the ICP binder. All Level 3 events will require moving all non-essential personnel to the secondary Muster point pursuant to the ERP. Typically, the secondary Muster point is located at the Guard Shack located along the site access road. The location will be specified on in the Exhibits shown in **PART A -- SITE-SPECIFIC DATA.**

For all Emergency Response Level 3 events (e.g., $H_2S$ Emergencies, Well Control events, other conditions presenting an Immediately Dangerous to Life or Health [IDLH]) or when there is a need to activate state or federal Emergency Response Agencies (e.g., an uncontrolled fire, serious injury, or other emergency), the observer is to immediately call **911** to reach external emergency response services. County Dispatch will alert the appropriate emergency response agencies depending on the nature and extent of the emergency.

At the first notice of a detection of a well control issue, contact the Company Man/PIC, then management and they will contact the Tug Hill Well Control Contractor identified in the Emergency Contact List. Every situation is unique, and steps may be taken to eliminate the issues at hand but when the ultimate well control situation occurs, there are procedures that will need to be followed to establish a well control intervention.

In all emergency incident situations, safety and preservation of life is paramount. Well site personnel shall not perform duties/functions for which they are not trained and appropriately qualified to perform and, therefore, shall not perform response efforts that may put themselves or others in a situation that threatens human health and safety. This may range from a well control event to a hazardous materials spill that would require hazardous waste clean-up.

Upon activation of the ERP for any Level 3 event, the Incident Command System will be employed pursuant to the ERP. Tug Hill Operations Management and/or EHS Director will make notifications to the WVDEP Department of Oil & Gas and the County EMA and the on-scene Incident Commander (e.g., Company Man/PIC) will work in concert with these agencies to establish Unified Incident Command (UIC).

## 5.1.2 Identification of Emergency Levels

Incidents are reported pursuant to the Tug Hill Incident Response and Notification Procedure and are classified in the EHS Insight Incident Reporting Module. Incident Classification is based upon

Incident Severity and nature of Consequences (e.g., People, Asset Environment, and Reputational/Community impact).

Actual Severity (AP)

| Consequence | People | Environment | Asset | Reputation | |
|---|---|---|---|---|---|
| 1 | No injury or health effect | No effect, integral or primary equipment containment effective | No damage | No impact to landowner; No report to Agency; no reputation impact expected | ☐ Low |
| 2 | Slight injury (First Aid) or health effect; OR agitated outside 3rd party; no threats; no medical treatment | No effect, <1 bbl. brine or petroleum in 2nd Containment; <5 gal. brine or petroleum or <1 gal. other haz. sub. to soils; no water impact or air impact offsite | Only minor or limited equipment or facilities damage <$10,000 | Limited concern; local resident aware but no concerns; No Agency involvement | ☑ Low |
| 3 | Minor injury or health effect w/ medical aid (Recordable); DART but not LTI; Stop Work; General threats from landowner or 3rd party | Slight/minor effect; gas or fluid release limited to pad but clean-up by hands onsite; Soils only; No offsite water impact or air impact offsite; Agency report not required | Minor asset/equip damage $10 - $50K; possible limited impact to Ops or Production <24 hours; possible minor vandalism | Moderate concern; local resident concerns or impact to landowner; Land Dept. engagement; Regulator involvement but no media or public attention | ☐ Medium |
| 4 | Severe injury (LTI) or multiple minor injuries; Short-term health impact w/ hospitalization; Off site Muster event; Violent threats but no weapon observed | Reportable release/spill to air/water/soils but not outsite Lease LOD/ROW; Impacted soils & impact onsite water/groundwater; engaged spill Contractor; Agency report is required | Moderate damage; Production loss 1-5 days; Damage >$50K - $1MM; Moderate vandalism/theft; pot. "materially sig." insurance claim | Company-wide attention; multiple contractor; On social media; Brief local media attention; Minor/admin. Agency action | ☐ Medium |
| 5 | Singular party potential fatality, serious injury/disability (OSHA Reportable); or Incident involves violent threat of injury or terrorism but not action. Weapon(s) observed. Evacuation | Sig. release w/ offsite impacts to air/water/soils or wetland; product in a stream; Impact reversible w/ site Inv.; Muster/evacuation; Contractor clean-up; Agency report req.; NOV | Major damage; Production loss 1-3 Weeks; Damage >$1MM - <$3MM; Substantial vandalism/theft | Moderate local media coverage & brief regional attention; Social media coverage; adjacent resident evac.; Agency action & fines; sig. landowner relations impact | ☐ High |
| 6 | Singular party potential fatality, serious injury/disability (OSHA Reportable); or Incident involves violent threat of injury or terrorism but not action. Weapon(s) observed. Evacuation | Permanent imacts to water/groundwater or sensitive environ; Gas release causes regional evac.; Extensive impact & long-term monitoring/clean-up, NOVs, penalties or pot. Litigation | Serious Damage; Production Outage 1 Month or more; Production loss >$3MM; Terrorism Attack/attempt; Impact downstream stakeholders | In the news regional/national media; Unified Incident Command; Multiple Agencies; regional evac.; significant NOVs & fines >$1MM; pot. litigation; possible loss of permits | ☐ High |

Detailed examples of the three emergency level definitions are provided in the ERP. The following is a truncated listing of the definitions.

**<u>Level 1 events</u>** ("Green"; Consequence Levels 1-2 in EHS Insight Incident Reporting Module) involve situations that are either common to routine operations or do not pose significant risk to personnel. In most instances, Level 1 events can be resolved using standard operating/drilling procedures, commonly available equipment, personnel, and techniques.

**<u>Level 2 events</u>** ("Yellow"; Consequence Levels 3-4 in EHS Insight Incident Reporting Module) involve circumstances that are not commonly encountered during routine operations and pose the potential for significant risk to onsite personnel, equipment and/or the environment. A Level 2 event may require specialized well control personnel, equipment and/or techniques in order to be safely resolved.

**IF IT IS DETERMINED THAT UNCONTROLLED LOSS OF CONTAINMENT OF GAS HAS OCCURED PROCEED TO LEVEL 3 INCIDENT.**

**<u>Level 3 events</u>** ("Red"; Consequence Levels 5-6 or "RED" in EHS Insight Incident Reporting Module) present serious and immediate risks to personnel, assets, the surrounding community, and environment onsite and likely offsite as well. These situations require the immediate application of specialized techniques and well-developed safety assessment and hazard mitigation programs.

Examples of Level 3 events include, but are not limited to, the following scenarios:

1. Surface blowout (drill-pipe, BOP, production tree, broach, etc. with or without fire)



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2. Underground blowout with insufficient casing set so that the well cannot be brought under control by pumping heavy mud simultaneously down the drill-string and annulus using rig pumps.
3. Surface pressure beyond the pressure rating of equipment (including tubulars)
4. Other situations that constitute a clear and present danger to personnel, environment or equipment that cannot be resolved via conventional means
5. IDLH Situation; Violent Unauthorized Persons on Location; Any Imminent Uncontrolled Threat to Location and Operations (including severe weather)
6. Uncontrollable release of gas! (>50% LEL in ambient air)

Level 3 events will warrant the immediate activation of the ERP, mobilization of well control specialists/engineers and other specialist personnel and equipment. Tug Hill Operations Management will contact its well control contractor immediately upon the determination of a Level 3 incident. Requested well control information will be gathered and provided to the well control contractor along with any other pertinent and/or related information.

### 5.1.3 Initial Response Actions

Initial response actions are those taken by personnel immediately upon becoming aware of an emergency incident. Timely reporting and implementation of these initial steps is of the utmost importance because they can greatly affect the overall response operation. Pursuant to the Incident Response and Report Procedure, all events are to be reported ASAP once the observer is safe to do so.

It is important to note that these actions are intended only as guidelines. The appropriate response to a particular incident may vary depending on the nature and severity of the incident and on other factors that are not readily addressed. Note that without exception, personnel and public safety is first priority.

The person functioning as Incident Commander during the initial response period has the authority to take the steps necessary to control the situation and must not be constrained by these general guidelines.

The **Initial Response Actions Acting Supervisor** should at a minimum:

- Personnel will be accounted for and moved to a safe upwind location.
- Medical attention will be provided for any injured personnel.
- Activate the appropriate alarms and operations shutdowns, as necessary.
- Further notifications by Tug Hill incident command structure (ICS) team.
- Notification to local/state/federal authorities (See Emergency Notification List).
- The well site will be secured.
- Activate response resources.

- Information gathering and assessment of the situation will be initiated.
- Monitor and manage the emergency situation.
- Assist responding agencies as necessary.

### 5.4 Incident Command

Once the ERP has been activated and evacuation of the location is deemed necessary, Incident Command will be established, and Tug Hill contract Well Control specialists will be consulted and/or activated as appropriate.

The highest-ranking competent person on location will assume the role of Incident Commander until they are relieved. In some cases, that person may be a contractor or service company representative who will begin managing the incident until a Tug-Hill representative relieves them. If a company employee is on site at the time of an accident, that person shall act as Incident Commander unless otherwise instructed.

All individuals remaining behind to shut down critical systems or utilities must be capable of recognizing when to abandon the operation or task and evacuate themselves. The systems to be shut down will be dependent on the operations being performed and will be decided upon after notification of an emergency evacuation by the PIC or the designated Incident Commander.

If the situation is of immediate danger to life and health, Unfired Command/Incident Command ("UIC") will be established pursuant the Incident Command System (ICS) in the ERP.

The person functioning as Incident Commander during the initial response period has the authority to take the steps necessary to control the situation and must not be constrained by these general guidelines.

See the ERP attached to this WSSP for more detailed emergency response procedures.

### 5.5 On-site Muster Points for Workers

Muster Points have been established as personnel gathering points in a Level 2 or 3 emergency. Once at the muster point, accounting for all employees following an evacuation is critical.

The Primary Muster Point is typically at the edge of pad where the access road meets the entrance of the pad.

The Secondary Muster Point is used for more serious events requiring clearing personnel from the pad. This is typically established at the Security Guard Shack along the access road or at the point of the access road/municipal road junction.

Muster points are shown on the Plan View Map (Exhibit 4) and Vicinity Plan and Evacuation Route (See Exhibits 1, 2, and 5), located in the **PART A -- SITE-SPECIFIC DATA** section of this WSSP and the ICP binder. This information will be communicated during the Pre-Spud or Pre-Frac Meeting and during the required CEM Safety Orientation – which is provided to each person working on

location at their first time of arrival to the worksite and/or when changes to muster point locations are made.

### 5.6 Establishment of Protection Zones and Evacuations

Most situations can be managed; however, a well control event at a Level 3 will cause the well site to be the evacuated. As stated initially, all evacuations require that personnel proceed to the muster point to be accounted for.

UIC will assess and determine if evacuation is desired and the size of protective zone for local residents. In the absence of UIC, the On-Scene Incident Commander, or his designee, shall determine protective zones to limit the risk of exposure to workers, local responders, and residents surrounding the work area.

The Safety Zone Map and Parcel Owners listed is provided in the **PART A -- SITE-SPECIFIC DATA** section of the WSSP and ICP binder for each location.

Life safety impacts to the environment, and property conservation are priorities. The Emergency Protection Zones based on the following information on the scene:

- Magnitude of the incident
- Wind Direction
- MSDS of applicable materials
- Current and forecasted weather conditions
- Topography and land conditions
- Other influences specific to the incident

If the agency directs, on-site Tug Hill personnel and Contractors will be engaged to notify all local potentially impacted residents of the incident by dispatching workers to each potentially affected residence. If the public emergency responder does not direct this notification to be made by the Operator, then the public response agency will be responsible for this notification.

Tug Hill commits it full cooperation and assistance in making notifications to residents and assisting to maintain the designated protective zone. Tug Hill resources include the workers onsite and other Operations personnel, as well as our Incident Command Structure, EHS Department personnel and contractors, and the Tug Hill Land Department Land Agents.

Once established, these zones will be maintained until a determination is made by the Emergency Coordinator to alter or discontinue them. Tug Hill will contact local residents and will post personnel on all roads within the zone to prevent entrance to the area until an all clear has been issued. The initial contact will be conducted by telephone and, for those that cannot be reached, a drive by will be initiated.

### 5.7 Assisting Others in Evacuations

All personnel performing work shall be fit for duty. In the event of an emergency evacuation, all hazardous areas are to be avoided and any injured individual requiring assistance must be assisted provided that the assist does not place those assisting in immediate danger to health or life.

If an injured individual requires assistance to evacuate that would place the rescuer in immediate danger to health and life, personnel should first evacuate themselves as necessary, assess the situation, don any necessary protective equipment, and provide rescue if they are trained and capable.

# 6.0 WELL WORK PLAN

The following Well Work Plan will be reviewed with Tug Hill staff, contractors, and support staff prior to beginning work at the Well Pad. Any required changes will be inserted in **PART A -- SITE-SPECIFIC DATA** to this WSSP.

## 6.1 Plan Assimilation and Dissemination

Pursuant to Section 1.2 – Distribution of this WSSP, a copy of this Plan will be made available in the following locations:

- In an on-site mailbox and/or with the Security Guard controlling access
- On-site, in the drilling, completion, or workover office
- WVDEP Office of Oil and Gas
- Marshall County Office of Emergency Response
- Local Tug Hill Office

Tug Hill, or their designee, shall be responsible for providing a copy of this WSSP to the Marshall County EMA within at least 7 days prior to land disturbance or well work. A representative of the Marshall County OER will be asked to sign a receipt documenting that they have received a copy of the plan.

## 6.2 Drilling

1. The anticipated drilling procedure to be followed for each well is presented below:
2. Ensure that appropriate signage listing Emergency Contact info, the well name and API for all wells to be drilled is in place at the entrance to location.
3. Install primary and secondary containment as required
4. Conduct Pre-Job Safety Meeting pursuant Section 3.0 of this WSSP
5. Review and confirm well slot and directional plan prior to spud
6. Take surveys and monitor anti-collision throughout the operations
7. Notify DEP 24 hours before Spud
8. Move-in, Rig-Up (MIRU) drilling rig
9. Drill surface hole to TD
    a. Surface section is to be drilled only with freshwater and benign soap
    b. At TD, notify DEP of upcoming casing & cement run
10. Run surface casing
11. Set depth minimum 50’ below deepest fresh water
12. Set depth maximum 150’ below deepest fresh water



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13. Cement surface casing
    a. Circulate cement to surface
    b. WOC minimum of 8 hrs per state regulations

14. Drill first intermediate hole to TD
    a. At TD, notify DEP of upcoming casing & cement run

15. Cement intermediate casing
    a. Circulate cement to surface
    b. WOC minimum of 8 hrs per state regulations

16. NU 13 5/8" 10M BOP & rotating head (Bttm to Top below)
    a. Cameron U-Type Variable Ram 13 5/8" 10M
    b. Mud Cross (Left to Right)
        i. 2 1/16" 10M Check
        ii. 2 1/16" 10M Manual Gate
        iii. 2 1/16" 10M Manual Gate
        iv. 2 1/16" 10M Manual DSA
        v. 13 5/8" 10M Spool
        vi. 4 1/16" 10M Manual Gate
        vii. 4 1/16" 10M HCR
    c. Cameron U-type Blind Ram 13 5/8" 10M
    d. Cameron U-type Pipe Ram 13 5/8" 10M
    e. Cameron 13 5/8" 5Mx10M Annular
    f. 5M Rotating Head

17. Test BOPE Stack (15 min low / 30 min high)
    a. Run test plug & land in lower bowl
    b. Test annular to 250 psi low / 3,500 psi high
    c. Test rams to 250 psi low / 8,000 psi high
    d. Test choke & kill lines & valves to 250 psi low / 8,000 psi high
    e. Test choke manifold to 250 psi low / 8,000 psi high
    f. Retrieve test plug
    g. Keep the original BOPE test charts on the rig (to be signed & dated by Well Site Supervisor)
        i. 80% of 13 3/8" MU Torque

18. For Utica wells, drill second intermediate hole to TD
    a. At TD, notify DEP of upcoming casing & cement run

19. Cement second intermediate casing
    a. Circulate cement to surface

b. WOC minimum of 8 hrs per state regulations

20. Test BOPE Stack (15 min low / 30 min high)

21. Drill curve and lateral to TD per directional plan
    a. At TD, notify DEP of upcoming casing & cement run
    b. Circulate and condition hole



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22. Run production casing with redundant toe sleeves
23. Cement production casing
24. ND BOP, NU and Test B section
25. Install dry hole flange and prepare to RDMO

## 6.3 Stimulation

1. Install primary and secondary containment as required
2. Notify DEP 24 hours before start of operations
3. Hold PJSM
4. MIRU e-line
5. RIH with gauge ring & junk basket
6. RIH with CBL
7. Pressure test casing and open toe sleeves
8. NU 7-1/16" frac stack
9. Torque stack flanges and pressure test stack per manufacturer specifications
10. MIRU pressure pumping services, wireline, pressure control equipment, water transfer, and water tanks
11. Equipment in containment as required
12. Pressure test all surface iron
13. Frac well per design
14. Pump down wireline and set frac plug/perforate per design
15. After the completion of final stage, set (2) kill plugs
16. After the completion of all wells on pad, RDMO associated frac operations equipment
17. ND frac stack leaving master valves in preparation for cleanout operations

## 6.4 Cleanout

1. Install primary and secondary containment as required
2. Notify DEP 24 hours before start of operations
3. Hold PJSM
4. MIRU standalone snubbing unit, BOP stack, mud pumps, and flowback equipment.

5. NU BOPs on top of master valve as follows (bottom-top)
    a. 7-1/16” 10M Primary SG BOP
    b. 7-1/16” 10M Flow Cross
    c. 7-1/16” 10M Primary DG BOP
    d. 7-1/16” 10M Primary DG BOP
    e. 7-1/16” 10M Primary SG BOP
    f. 7-1/16” 15M x 7-1/16” 10M XO Spool
    g. 7-1/16” 15M Stripping BOP
    h. 7-1/16” 15M Bleed Off/EQ Working Spool
    i. 7-1/16” 15M Stripping BOP
    j. 7-1/16” 5M Working Annular
6. Pressure test BOPs per manufacturer specifications
7. Pressure test all surface iron
8. PU bit and motor
9. TIH and drill out kill plugs and all frac plugs
10. Land production tubing and BPV/hanger in wellhead
11. RDMO standalone snubbing unit, BOP stack, and all associated equipment
12. ND master valves and NU production tree
13. Torque all flanges to manufacturer specifications
14. Perform low/high shell pressure test on tree after installation. Tests must be charted and recorded.
15. Lubricate out BPV
16. Prep to bring well online



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# 7.0 CHEMICAL INVENTORY AND SAFETY DATA SHEETS (SDS)

## 7.1 Safety Data Sheets (SDS):

Community Right-to-Know ("Tier II") reporting of chemicals and flammable materials on location is necessary so first responders, such as fire departments and emergency response personnel, know in advance what hazardous materials are on location. This is determined by the Contractor submitting a list of hazardous materials they will have on location, the anticipated quantities, and the Safety Data Sheets (SDS) for each chemical on location. Maintaining these records on location and submittal of notices to the county and state agencies is required by laws and regulations.

Contractors are to submit to Tug Hill a copy of **all SDS sheets** for chemicals to be brought onsite along with quantity estimations (average and maximum at any one time). Any changes to the chemical list should be reported to the Tug Hill EHS Coordinators immediately. Please submit this information to the Tug Hill EHS Coordinators, Company Man, or Tug Hill Representative ASAP with, if applicable, locations shown on the pad layout drawings (showing rig, chemical storage, and tanks).

SDSs for all materials and chemicals on-site will provided in **PART A -- SITE-SPECIFIC DATA section** of this WSSP. An electronic storage device with a copy of the SDS is submitted to the agencies with Plan.

## 7.2 Mud Information

Mud information for wells addressed by this section of the WSSP is presented below, along with the SDS section of the ICP, as well as an inventory of on-site mud mixing chemicals.

| Mud Usage | |
|---|---|
| Mix Mud Amount | 2000 - 3500 bbls |
| Mud Weights | 8.5 – 14 ppg |

There will be one induction style mud hopper on location for mixing the fluid. Below table contains the inventory of on-site materials for mixing mud.

# 8.0 SPILLS AND RELEASES

## 8.1 Chemical Management Policy

Contractors and Tug Hill employees are to comply with all relevant and applicable regulations regarding spills and releases of pollutants and hazardous chemicals as defined by federal, state, and local laws and regulations. Contractors bringing chemicals to location are required to provide the SDS to the EHS Coordinator or the PIC. Those Contractors using and storing bulk quantities of hazardous substances and petroleum products are required to implement an SPCC plan for the materials under their control.

Contractors shall additionally adhere to any Tug Hill-issued policies and procedures pertaining to the work performed by Contractors including, but not limited to:

- The Tug Hill Incident Response and Notification Procedure.
- The Emergency Response Procedure.
- Production and other sites where applicable, the Tug Hill SPCC Plan for chemical and petroleum storage on the location.
- Additional state specific spill response procedures and guidelines may apply.

## 8.2 Chemical Storage and Containment

To prevent any releases of chemicals or tainted fluids from impacting the soils, surface water or groundwater during drilling, hydraulic fracturing, and flowback operations, as well as any Operational activities generating fluids or involving fuel or hazardous chemical storage, Tug Hill has developed a Master Containment Plan (MCP) for implementation of temporary secondary containment practices.

The MCP outlines the SOPs for work areas to be underlain with an impermeable liner (referred to as “master containment”, “secondary containment”, or “tertiary containment”). These temporary containments are inspected weekly by Tug Hill EHS Coordinators pursuant to WVDEP regulation and Corrective Actions/Preventative Actions (CAPAs) orders are issued in the EHS Insight management system as needed to ensure containment integrity. Operational crews are trained on performing small project patch and repair and third-party contractors are activated to the field to rectify more significant modifications and repairs.

On Production pads, bulk above ground storage (ASTs) containing brine water and/or condensate produced by the wells are required to be situated within a permanent secondary containment to ensure that, in the event of a leak or spill, pollutants to not impact the surface or groundwater. The tank containment is inspected monthly pursuant to state and federal regulations. Inspections are recorded in EHS Insight and CAPAs are issued as needed to ensure regulatory compliance and to mitigate risk. Management of bulk storage secondary containment is described in the Tug Hill SPCC Plan, which is required by the USEPA and WVDEP regulations.

## 8.3 Spill Response Procedures



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8.3.1 Small, Minor to Moderate Spill Events

Smaller and minor spill events that can be safety cleaned-up with onsite personnel and equipment may be managed by the Contractor with the consent of the Company Man or Tug Hill Representative **AND** the Tug Hill EH&S Department. When the clean-up work is performed by a Contractor which is not specified in the Tug Hill ICP, all such clean-up actions will be supervised and performed to the satisfaction of the EHS Coordinator and/or the Tug Hill Director of EH&S Affairs.

8.3.2 Larger, Major, More Serious/Significant and Crisis Spill Events

Larger, Major, More Serious/Significant and Crisis Spill Events generally include those spills that trigger a reporting requirement, and:

a. will likely require a site investigation and remediation;

b. will likely result in a Notice of Violation (NOV); and/or

c. likely require a Root Cause Assessment (RCA). More significant spill events will be managed and coordinated by the EHS Department and clean-up action will be performed by a professional environmental spill response Contractor.

Response Contractors are in the Emergency Contact List shown in the Tug Hill WSSP and ICP binder.

The Tug Hill Director, EH&S Affairs and the EHS Coordinators, will manage clean-up activities of all Level 3 (e.g., major and severe release events per classification) pursuant this **Tug Hill Incident Response and Notification Procedure**. Smaller spills may be cleaned-up by personnel on location if the spill is within certain specific parameters.

Under no circumstances are spills of materials that constitute a **hazardous waste** to be cleaned-up by workers not trained in hazardous waste operations pursuant to OSHA regulation.

## 8.4 Spill Reporting

As applicable, pursuant to WVDEP spill and release reporting requirements, releases of petroleum and hazardous substances will be reported to the WVDEP Emergency Spill Reporting line. This determination will be made by the Tug Hill Director of EH&S Affairs and/or other company management representative.

In accordance with 40 CFR 302.6, those spill or release events involving a regulatory-defined reportable quantity (RQ) and/or releases to waters of the state will also trigger reporting to the **National Response Center** (**NRC**) **at 1-800-424-8802**.

# 9.0 BLOW-OUT PREVENTER (BOP) AND WELL CONTROL

## 9.1 BOP Equipment

The following is a list of BOP equipment with types, sizes, and ratings to be utilized and available during the drill, completion, and work-over of the well.

5M System**

- Annular preventer
- Pipe ram, blind ram, and if conditions warrant as specified by the authorized officer, another pipe ram shall also be required.
- A second pipe ram preventer shall be used with a tapered drill string.
- Drilling spool or blow out preventer with 2 side outlets (choke side shall be a 3-inch minimum diameter, kill side shall be at least 2-inch diameter).
- 3-inch diameter choke line.
- Kill line (2 inch minimum).
- 2 chokes with 1 remotely controlled rig floor.
- 2 kill line valves and a check valve (2 inch minimum).
- Upper kelly cock valve with handle available.
- When the expected pressures approach working pressure of the system, 1 remote kill line tested to stack pressure (which shall run to the outer edge of the substructure and be unobstructed).
- Lower kelly cock valve with handle available.
- Safety valve(s) and subs to fit all drill string connections in use.
- All BOP equipment connections subject to well pressure shall be flanged, welded, or clamped.
- Fill-up line above the uppermost preventer.

If repair or replacement of the BOP equipment is required after testing, this work shall be performed prior to drilling out the casing shoe.

When the BOP equipment cannot function to secure the hole, the hole shall be secured using cement, retrievable packer, or a bridge plug packer, bridge plug, or other acceptable approved method to assure safe well conditions.

### 9.1.1 Minimum Standards for Choke Manifold Equipment

1. Choke lines shall be straight lines unless turns use tee blocks or are targeted with running tees and are anchored to prevent whip and reduce vibration.
2. Choke manifold equipment configuration shall be functionally equivalent to the appropriate pressure ratings. The actual configuration of the chokes may vary.



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All valves (except chokes) in the kill line choke manifold, and choke line shall be a type that does not restrict the flow (full opening) and that allows a straight through flow.

Pressure gauges in the well control system shall be a type designed for drilling fluid service.

**These are typical design features for 5M systems; however, the actual field equipment may vary.

5M and higher system accumulator shall have sufficient capacity to open the hydraulically controlled gate valve (if so equipped) and close all rams plus the annular preventer (for 3 ram systems add a 50 percent safety factor to compensate for any fluid loss in the control system for preventers) and retain a minimum pressure of 200 psi above pre-charge on the closing manifold without use of the closing unit pumps. The fluid reservoir capacity shall be double the usable fluid volume of the accumulator system capacity and the fluid level of the reservoir shall be maintained at the manufacturer's recommendations. Two independent sources of power shall be available for powering the closing unit pumps. Sufficient nitrogen bottles are suitable as a backup power source only and shall be recharged when the pressure falls below manufacturer's specifications.

### 9.1.2 Accumulator Pre-charge Pressure Test

This test shall be conducted prior to connecting the closing unit to the BOP stack and at least once every six (6) months. The accumulator pressure shall be corrected if the measured pre-charge pressure is found to be above or below the maximum or minimum limit specified below (only nitrogen gas may be used to pre-charge):

| Accumulator Working Pressure Rating | Minimum Acceptable Operating Pressure | Desired Pre-chargePressure | Maximum AcceptablePre-charge Pressure | Minimum Acceptable Pre-chargePressure |
|---|---|---|---|---|
| 1,500 psi | 1,500 psi | 750 psi | 800 psi | 700 psi |
| 2,000 psi | 2,000 psi | 1,000 psi | 1,100 psi | 900 psi |
| 3,000 psi | 3,000 psi | 1,000 psi | 1,100 psi | 900 psi |

### 9.1.3 Power Availability

Power for the closing unit pumps shall be available to the unit at all times so that the pumps shall automatically start when the closing valve manifold pressure has decreased to the pre-set level.

### 9.1.4 Accumulator Pump Capacity

Each BOP closing unit shall be equipped with sufficient number and sizes of pumps so that, with the accumulator system isolated from service, the pump shall be capable of opening the

hydraulically operated gate valve (if equipped), plus closing the annual preventer on the smallest size drill pipe to be used within 2 minutes and obtain a minimum of 200 psi above specified accumulator pre-charge pressure.

9.1.5 Locking Devices

A manual locking device (i.e., hand wheels) or automatic locking devices shall be installed on all systems of 2M or greater. A valve shall be installed in the closing line as close as possible to the annular preventer to act as a locking device. This valve shall be maintained in the open position and shall be closed when the power source for the accumulator system is inoperative.

9.1.6 Remote Controls

Remote controls shall be readily accessible to the driller. Remote controls for all 3M or greater systems shall be capable of closing all preventers. Remote controls for 5M or greater systems shall be capable of both opening and closing all preventers. Master controls shall be at the accumulator and shall be capable of opening and closing all preventers and the choke line valve (if equipped). No remote control for a 2M system is required.

## 9.2 Procedure and Schedule for Testing BOP Equipment

9.2.1 Well Control Equipment Testing

1) The procedure and schedule for testing the BOP stack as follows:
   a. for the bottom and horizontal wellbore drilling phase,
   b. the BOP equipment shall be function tested upon initial installation,
   c. weekly, and after each bit trip unless otherwise authorized by the Office as part of a well work permit.
   d. It shall be pressure tested upon initial installation and every twenty-one (21) days thereafter.
   e. All pressure tests shall be performed for thirty (30) minutes.
   f. Annular preventers should be tested to seventy percent (70%) of the rated capacity and ram preventers should be tested to eighty percent (80%) of the rated capacity.
2) Valves shall be tested from working pressure side during BOP equipment tests with all downstream valves open.
3) When testing the kill line valve(s), the check valve shall be held open, or the ball removed.
4) Annular preventers shall be functionally operated at least weekly.
5) Pipe and blind rams shall be activated each trip; however, this function need not be performed more than once a day.
6) A BOP equipment pit level drill (exercise) shall be conducted weekly for each drilling crew.
7) Pressure tests shall apply to all related well control equipment.

8) All the above-described tests and/or drill shall be recorded in the drilling log.
9) For intermediate wellbore drilling phase, the BOP equipment will be pressure and function tested upon initial installation.

9.2.2 Criterial for Testing

1) This test procedure must be followed at all times.
2) The operator's representative, the rig manager, and the driller must be present during the entire testing process. Any other personnel must be approved by the rig manager before assisting in any BOP testing operation.
3) If any test fails, the rig manager is to inform the operator's representative and the drilling contractor's superintendent.
4) An acceptable low-pressure test shall be achieved before attempting a high-pressure test.
5) Pressure testing acceptance requirements:
    a. All BOPs, with an ID of 18-3/4" or less, are required to close within 30 seconds.
    b. Pressure tests shall be in 5- and 5-minute durations.
        i. A low pressure (250 psi) test for 5 min will be allowed no greater than a 15 psi drop during the duration of the test.
        ii. A high pressure (8,000 psi) test for 30 min will be allowed no greater than a 100 psi drop during the entire test.
6) The annular will be tested to 70% of its rated working pressure.
7) A copy of the final test reports will be provided to the operator's representative.
8) The rig must maintain a copy of the final BOP test reports on the workstation in the rig manager's office and a printed copy in the well folder.
9) Note that adjustable chokes (manual and remotely operated) are not required to be full sealing devises; therefore, are not required to be pressure tested (API STD 53 6.5.5.5). Adjustable chokes shall be function tested.

9.2.3 Pre-Test Preparation

1) Complete approved JSA prior to beginning any work.
2) Ensure that BOP is properly sized for the tubing and wellhead and that it is installed correctly.
3) Verify that the appropriate packer is on location and readily available.
4) Verify that the test unit has been inspected and is in the proper condition to perform pressure testing.

5) Verify that fresh water or fresh water/glycol mixture tote is on location with the proper fill volume needed to perform pressure testing.
6) Verify that a buffer zone has been established, all personnel have been cleared from the test area.

9.2.4 Pre-Test Set-up

1) Circulate fresh water through the entire well control system. Drilling mud has more compressibility than water and can lead to pressure drops during testing.
2) Remove the wellhead bushing.
3) Pick up Designated 5" or 4" test joint with pre torqued cross over.
4) Attach pup joint to the joint of 5" drill pipe that will be used for testing. Torque connection appropriately per thread type recommended specifications.
5) Open the 2" casing valve (open to atmosphere) under the test plug to prevent any case for trapping pressure. Monitor this valve while open but maintain a buffer zone while any equipment is exposed to pressure.
6) Screw the joint of drill pipe into the wellhead test plug (operator supplied equipment). Ensure that the test plug is appropriate to the wellhead's size and profile, then land the plug into the wellhead. Mark a reference line on test joint to help count thread rounds when backing out/spinning in of test plug. Secure the test plug into the wellhead as appropriate to the application. *NOTE: Securely screw the joint of drill pipe into the test plug, but DO NOT torque this connection as you will have to back out of the test plug at a later time to test the blind rams.
7) Verify that the gauge block on the choke manifold assembly has at least one union open to atmosphere.
8) Fill the Bop with fresh water or glycol/freshwater mixture until Bop is full.

9.2.5 Testing Procedure

**1) BOP testing will be performed in the following test sequence:**

o **Test #1:** Make up 5" drill pipe to test sub, screw into test plug and set in stack.
**Equipment being tested** – Annular.
**Equipment to close** - HCR, outside kill, annular, lwcv
**Equipment to open**-
Pressure up and test to 250 psi for 15 minutes. Ensure test chart has tracked properly before increasing pressure. Document test results. Increase pressure to 3,500 psi for 30 minutes. Ensure test chart has tracked properly before decreasing pressure. Document test results. Release pressure from the system. **Note: Do not exceed 7.5 ft pounds of torque in the closed position for the dump valve.**



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- **Test # 2:**
  **Equipment being tested** - Upper pipe rams, HCR, outside kill, lwcv
  **Equipment to close** - Upper pipe rams
  **Equipment to open** - Annular
  Pressure up and test to 250 psi for 15 minutes. Ensure test chart has tracked properly before increasing pressure. Document test results. Increase pressure to 8,000 psi for 15 minutes. Check super choke gauges once again. Ensure test chart has tracked properly before decreasing pressure. Document test results. Release pressure from the system. **Note: Do not exceed 7.5 ft pounds of torque in the closed position for the dump valve**.

- **Test # 3:**
  **Equipment being tested** - Upper pipe rams, manual 4" HCR, inside kill, ibop
  **Equipment to close** - manual 4" hcr, inside kill, ibop
  **Equipment to open** - hcr, outside kill, lwcv
  Pressure up and test to 250 psi for 15 minutes. Ensure test chart has tracked properly before increasing pressure. Document test results. Increase pressure to 8,000 psi for 30 minutes. Check super choke gauges once again. Ensure test chart has tracked properly before decreasing pressure. Document test results. Release pressure from the system. **Note: Do not exceed 7.5 ft pounds of torque in the closed position for the dump valve**.

- **Test #4**
  **Equipment being tested** - lower pipe rams
  **Equipment to close** - Lower pipe rams, lwcv
  **Equipment to open** - Upper pipe rams, ibop
  Pressure up and test to 250 psi for 15 minutes. Ensure test chart has tracked properly before increasing pressure. Document test results. Increase pressure to 8,000 psi for 30 minutes. Check super choke gauges once again. Ensure test chart has tracked properly before decreasing pressure. Document test results. Release pressure from the system. **Note: Do not exceed 7.5 ft pounds of torque in the closed position for the dump valve**.

- **Test #5:** Put check valve guts back in it.
  **Equipment being tested** - Blinds, and check valve
  **Equipment to close** - Blinds after pipe has been removed from stack.
  **Equipment to open** - 4" manual choke, inside kill, lower pipe rams
  Pressure up and test to 250 psi for 15 minutes. Ensure test chart has tracked properly before increasing pressure. Document test results. Increase pressure to 8,000 psi for 30 minutes Ensure test chart has tracked properly before decreasing pressure... Document test results. Release pressure from the system. **Note: Do not exceed 7.5 ft pounds of torque in the closed position for the dump valve**.



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**2) Accumulator Test**

- **Test# 5:** Turn off all accumulator pumps. Record the initial accumulator, manifold, and annular pressures. Time and record the closing time of the BOPs and the HCR (must be less than 30 seconds). Open the HCR. Close annular and lower pipe/VBR rams. Open the lower pipe/VBR rams. Observe final pressure after 5 minutes and verify that it has stayed above 1,500 psi. Turn on one accumulator pump and record the time for a 200-psi increase, then turn on the second pump and keep time going until full pressure shutdown. Open preventers.

**3) Offline Chokehouse**

**OFFLINE TEST ON CHOKEHOUSE Close -** 4" manual choke on stack. Fill choke with test fluid to get air out valves. 14 and 11 open while bleed air out, fluid will go in at valve 3. Remove blind flange from below #3 valve and remove one 1502 flange from top of #3 valve. Place 1502 flange below #3 valve for test 1. Once done with first test put back in original position for last 3 tests. Screw dart to top of pump through sub and tiw to bottom of pump through sub. Use second test port to test this while doing Test #1 offline

- **TEST#1 OFFLINE CHOKEHOUSE.**
  **Equipment being tested** - Valves 12, 15, 9, 3, tiw, dart
  **Equipment to close** - Valves 12, 15, 9, 3, tiw, dart
  **Equipment to open** - Open all other valves on choke manifold at this time
  Pressure up and test to 250 psi for 15 minutes. Ensure test chart has tracked properly before increasing pressure. Document test results. Increase pressure to 8,000 psi for 30 minutes Ensure test chart has tracked properly before bleeding off Document test results. Release pressure from the system. **Note: Do not exceed 7.5 ft pounds of torque in the closed position for the dump valve**.

- **TEST#2 OFFLINE CHOKEHOUSE.**
  **Equipment being tested** - 11, 14, 8
  **Equipment to close** - 11, 14, 8
  **Equipment to open** - 12, 15, 9
  Pressure up and test to 250 psi for 15 minutes. Ensure test chart has tracked properly before increasing pressure. Document test results. Increase pressure to 8,000 psi for 30 minutes Ensure test chart has tracked properly before bleeding off Document test results. Release pressure from the system.
  **Note: Do not exceed 7.5 ft pounds of torque in the closed position for the dump valve**.

- **TEST#3 OFFLINE CHOKEHOUSE.**
  **Equipment being tested** - 5, 7
  **Equipment to close** - 5, 7
  **Equipment to open** - 10, 13
  Pressure up and test to 250 psi for 15 minutes. Ensure test chart has tracked properly before increasing pressure. Document test results. Increase pressure to 8,000 psi for 30

minutes Ensure test chart has tracked properly before bleeding off Document test results. Release pressure from the system. **Note: Do not exceed 7.5 ft pounds of torque in the closed position for the dump valve**.

- **TEST#4 OFFLINE MUDLINE.**
  **Equipment being tested** - MUDLINE, kill line
  **Equipment to close** - LWCV, Outside kill line valve
  **Equipment to open** -

  Remove guts from check valve and shut outside kill line valve. Attach 1502 test port to standpipe above 4" standpipe valve. Fill mudline with fluid using mud pump. Once full shut down pumps and isolate mud pumps from the mud line. Pressure up and test to 250 psi for 15 minutes. Ensure test chart has tracked properly before increasing pressure. Document test results. Increase pressure to 8,000 psi for 30 minutes Ensure test chart has tracked properly before bleeding off Document test results. Release pressure from the system.

  **Note: Do not exceed 7.5 ft pounds of torque in the closed position for the dump valve**.

**ACCUMULATOR FUNCTION TEST**

**TO CHECK THE USABLE FLUID STORED IN THE NITROGEN BOTTLES ON THE ACCUMULATOR (O.S.O. #2 section III.A.2c.i. or ii or iii)**

1. Make sure all rams and annular are open and if applicable HCR is closed.
2. Ensure accumulator is pumped up to working pressure! (Shut off all pumps)
3. Open HCR valve. (if applicable)
4. Close annular.
5. Close **ALL** pipe rams.
6. Open one set of the pipe rams to simulate closing the blind ram.
7. If you have a 3-ram stack, open the annular to achieve the 50+/- % safety factor for 5M and greater systems.
8. Accumulator pressure should be 200psi over desired pre-charged pressure. (Accumulator working pressure (1000 + 200 = 1200 psi))
9. Record the remaining pressure in psi.

If annular is closed, open it at this time and close HCR.

**TO CHECK THE PRECHARGE ON BOTTLES OR SPHERICAL (O.S.O. #2, section III.A.2.d.)**

1. With power to pumps shut off, open bleed line to the tank.
2. Watch and record where the pressure drops, **(accumulator psi).**
3. Record the pressure drop in psi.

If pressure drops below **MINIMUM (MIN)** pre-charge, 900psi, each bottle shall be independently checked with a gauge.

**TO CHECK THE CAPACITY OF THE ACCUMULATOR PUMPS (O.S.O. #2, section III.A.2.f)**

Shut the accumulator bottles or spherical, (isolate them from the pumps & manifold) open the bleed off valve to the tank, (manifold psi should go th 0psi) close the bleed valve.

1. Open the HCR valve, (if applicable).
2. Close annular.
3. With the **PUMPS** only, time how long it takes to regain manifold pressure to 200psi over desired pre-charge pressure! = 1200 psi.

Record elapsed time. (2minutes or less)

## 9.3 BOP Installation Schedule

The BOP will be installed after running surface casing as well as after running intermediate casing. BOP equipment shall be installed on the innermost string of casing after the surface casing.

## 9.4 Well Control Training

All Tug-Hill Company Men are required to hold International Association of Drilling Contractors (IADC) well control certification relevant to the Operational phase underway. A well control certified Company Man/Completions Consultant shall be the PIC present during the Drilling and Completions operations. Training certificates are to be submitted to Tug Hill EHS Department. The list of well control certified personnel will be maintained in EHS Insight for record keeping and access as needed.

## 9.5 Drilling Records

The Tug Hill On-Site Supervisor will maintain detailed records of significant drilling events such as lost circulation, hydrogen sulfide gas, fluid entry, kicks, and abnormal pressures, which will be reported to the DEP as per the requirements of the WSSP regulations.

This WSSP requires the Tug Hill On-Site Supervisor to notify the district oil and gas inspector or the designated Office of Oil and Gas representative in the event of the presence of $H_2S$ gas at a concentration of ten parts per million (10 ppm), any blow-out, Loss of circulation, Flaring or a significant kick.

## 9.6 Schematic and Description of the Rig Layout and Wellhead Assembly

Over the life of a well, the wellhead system may be exposed to many different load conditions. During the well design process, wellhead fatigue risks are assessed based on operational and environmental conditions which are anticipated during both the construction and long-term production phases. A schematic of the proposed drilling rig and diagram of the wellhead assembly are provided in Well Development figures in **PART A -- SITE-SPECIFIC DATA section** of this WSSP, and in the ICP.

## 9.7 Kill Procedures

In the event of a well control situation:

1) Driller is to secure the well and notify company man / on-site drilling consultant
2) On-site consultant will direct all operations on the pad and the appropriate well control procedures will be followed
3) On-site consultant will contact Tug Hill V.P of Operations
4) V.P. of Operations will notify the appropriate personnel within Tug Hill and disseminate information internally.

Should gas be encountered when drilling on air:

1) PU off bottom
2) Divert through choke/flare
3) If gas/flare dies off, gas was drilled
4) If gas continues, load hole and swap to fluid

BOP Testing Schedule:

1) Test BOPE Stack per Prog
2) Upon initial installation
3) Every 21 days (minimum)
4) After any BOP equipment maintenance or repair
5) Pipe rams shall be function tested daily and blinds should be function tested every trip

BOP / Choke Drill Schedule:

1) Choke drill should be performed after each BOP test (minimum)
2) Break circulation and pump through choke every trip
3) Standard drilling configuration calls for manual choke line to be open, HCR to be closed, and manifold chokes to be closed.

Background Gas:

1) When gas is observed while drilling, watch for pit gains, change in cuttings (popping shale), and PVT changes as an indication that gas influx has occurred.
    a. Do not assume that all gas is background gas.
2) Drilled gas is expected but all steps must be taken to ensure that the handling of this gas is never treated with complacency.
3) Target MW for the Utica is .5 over gradient

Once a kick is detected, a prompt shut in of the well is essential. The exact shut-in method will be dictated by the operation being performed at the time of the kick, available equipment, as well as other extenuating circumstance. The types of kill operations listed below may be performed to bring the well back under control, and are methods recognized by the IADC.

Kill Procedures:

- Drillers Method
- Wait and Weight Method
- Circulate and Weight Method
- Concurrent Method
- Reverse Circulation Method
- Dynamic Kill Method
- Bull-heading Method
- Volumetric Method

The Blank Well Kill Sheet is provided as an attachment to the ERP attached hereto as **WSSP PART B –EMERGENCY PROCEDURES AND ATTACHMENTS -- Attachment 2**. The Blank Well Kill Sheet contains a calculation guide used to determine the correct kill procedure.

# 10.0 HYDROGEN SULFIDE ($H_2S$)

## 10.1 $H_2S$ Program

The **Tug Hill $H_2S$ Contingency Plan** is included in **WSSP PART B – EMERGENCY PROCEDURES AND ATTACHMENTS – Attachment 3** to this WSSP and included in the ICP binder. The $H_2S$ Drilling Contingency Plan describes the training, equipment, and procedures to be employed in the event that H2S is encountered during drilling operations.

The overriding purpose of this plan is to ensure the safety of all on-site personnel as well as those residents in close proximity. Hazards associated with the possibility of encounters with $H_2S$ and the warning signs of $H_2S$ exposure will be covered.

Not all situations can be foreseen, however, nor can detailed instructions be provided for every situation that might be encountered. The guidelines set forth in the **$H_2S$ Contingency Plan** should be considered as a minimum set of requirements for preparing for and dealing with $H_2S$ exposure at a Tug Hill site.

This **$H_2S$ Contingency Plan** is a Companion Document to the Tug Hill WSSP and ICP, as well as the Hydrogen Sulfide section of the Tug Hill Operating Contractor Expectation Manual (CEM). Contractors may have additional requirements and are expected to comply with their established corporate policies in addition to the Tug Hill $H_2S$ Contingency Plan and the Contractor Expectation Manual (CEM).

Pursuant to WVDEP requirements, the attached Tug Hill $H_2S$ Contingency Plan addresses:

- $H_2S$ Hazard Conditions and Exposure
- Hazard Determination and Training
- Detection and Monitoring Sensors, Alarms and Breathing Apparatus Equipment
- Operating Conditions and Responsibilities
- $H_2S$ Response and Notifications
- Establishment of Zones of Protection
- List of Personal Protective Equipment on location and the quantities of each
- Special concerns

Included in the **WSSP PART A – SITE-SPECIFIC DATA** section of this WSSP and in the ICP binder are:

- The Exhibits detailing directions to the site, evacuation routes, bonded routes, safety briefing areas, prevailing wind direction.
- Topographic Maps plat locating the Tug Hill facility and the location of private dwellings, residential areas and public facilities within the potential area of exposure.
- List of **EMERGENCY CONTACTS**

## 10.2 Tug Hill H2S Policy

The guidelines and requirements stipulated in the $H_2S$ Contingency Plan are to be implemented (e.g., $H_2S$ detection equipment, training materials, warning signs, etc.) on any well pad where Operations have encountered or are projected to encounter $H_2S$ based upon advisement of the Tug Hill Geosciences Department and/or previously observed conditions.

The Tug Hill $H_2S$ Policy is to consider every encounter with $H_2S$ as potentially lethal until proven otherwise. Operations conducted at Tug Hill locations where work area atmospheric concentrations of $H_2S$ (known or suspected) could exceed 10 PPM are to be conducted in compliance with applicable governmental regulations and in accordance with industry recommended practices.

Upon encountering $H_2S$, Tug Hill employees or contractors(s) will determine the concentration of $H_2S$ and report this information to Tug Hill Operations Management and the EH&S Department for further evaluation.

When appropriate, Tug Hill will implement the response procedures outlined in the **Tug Hill $H_2S$ Contingency Plan**, which will provide for safe rig operation/shutdown, respiratory protection, and/or evacuation, if warranted. The site will be secured, and only trained emergency response personnel will be permitted to enter the site.

If $H_2S$ is detected and confirmed at sustained elevated concentrations, Tug Hill will notify via telephone the local Office of Oil & Gas Chief, the County Oil & Gas Inspector, and the County EMA. Contacts are in the EMERGENCY CONTACTS LIST Section of this WSSP and the ICP.

## 10.3 $H_2S$ EXPECTATIONS

Currently there is no expectation of encountering hydrogen sulfide gas in the Marshall or Wetzel County region of West Virginia. Analysis of gas produced in the area has revealed no significant findings of hydrogen sulfide. Tug Hill conducts continuous $H_2S$ monitoring on all drilling pads. Since 2017 to date of issuance of this WSSP, Tug Hill has not encountered $H_2S$ at noteworthy or actionable concentrations.

See the Attachment 3, **Tug Hill $H_2S$ Contingency Plan** in **PART B –EMERGENCY PROCEDURES AND ATTACHMENTS** to this WSSP for further detail.

# 11.0 WELL FLARING

## 11.1 Flaring

Well flaring occurs during drilling and testing of gas wells. This practice is used to determine the types of fluids the well can produce, the pressure and flow rates of gas, and other characteristics of the underground reservoir. The pressure, flow, and composition of the gas will be determined before it can be safely handled by the pipelines and processing plants. Also, additional flaring during under balanced drilling operations is performed to manage gas that comes to the surface. This process can speed up drilling and help to reduce potential damage to the producing formation by the drilling fluids. Prior to commencement of flaring operations, Tug Hill on site supervisor will contact the WVDEP Office of Oil and Gas inspector and County EMA.

The flare duration should not exceed the maximum time requirements required to complete drilling operations.

In **PART A -- SITE-SPECIFIC DATA** section of this WSSP of the ICP binder is a Plan View Map (See Exhibit 4) depicting the proposed flare and flare line location. Prevailing wind direction is also shown.

## 11.2 Flaring Activities

### 11.2.1 Size, Construction and Length of Flare Line

The flare line will be a 4” diameter steel line that extends 100 ft. (or, if not possible, to the edge of pad) from the nearest wellhead. The line will be anchored to the surface of the ground by cross pinning itin place using metal stakes at multiple points along the line.

### 11.2.2 Flare Lighting System

The system for lighting the flare will be an automatic flare igniter using Shore power and/or a solar collection panel and battery charging system. A secondary igniter will be installed as a backup in the event flaring is required or needed. The onsite Drilling Supervisor shall notify the local fire department prior to lighting the flare or as soon as possible thereafter.

### 11.2.3 Flare Safe Distance

The flare line discharge will be located no less than 100 ft. from the nearest wellhead (or, if not possible, to the edge of pad) and shall be positioned downwind of the drilling rig and trailers in terms of the prevailing wind direction. The flare system shall have an effective method for ignition. Flammable material beyond the end of the flare will be cleared to a minimum distance of fifty (50) feet.

# 12.0 COLLISION AVOIDANCE

## 12.1 Surveys

Collision avoidance is managed by utilizing gyro tools, downhole steering tools (MWD/EM), and anti-collision software by engineers. Every well planned to be drilled has a surface plot diagram, 2-D plot diagram, and a pad plot diagram prepared. (Plots attached under "Collision Avoidance Diagrams") North seeking gyro tools, MWD/EM tools, and anti-collision processes are utilized to mitigate the risk of downhole collisions.

Anti-collision processes include confirmation of gyro accuracy, evaluation of anti-collision software (Compass, Longbow, or equivalent program), and 2-D/3-D model plotting. It is Tug Hill's standard operating procedure (SOP) for the on-site supervisor of Tug-Hill and the directional drilling company supervisor to confirm the orientation of the directional tools and ensure that the tools are orientated consistent with the directional motor's high side. When anti-collision is a risk and directional assemblies are required to navigate utilizing a gyro tool, it is Tug Hill's SOP to use the Gyro company's muleshoe to ensure the accuracy of the gyro seat in the muleshoe. In addition, when using this muleshoe, it is Tug Hill's SOP to have the Tug Hill's on-site supervisor, directional drilling company supervisor, and gyro company supervisor confirm the alignment and orientation of the tool and ensure that the tools are orientated consistent with the directional motor's high side. This ensures the azimuthal direction is correct when steering the well.

Each well will have directional surveys recorded for the entirety of the wellbore. These surveys will be monitored in real-time and used in conjunction with anti-collision software to ensure that all anti-collision risks are effectively mitigated. At the end of each hole, the third-party directional company will certify that the surveys taken are true and accurate. If multiple surface holes are to be drilled on the same pad, or if the active well is planned within 300 ft. of an existing wellbore, survey frequency over the at-risk interval will be increased and surveys will be recorded at a minimum of 30 ft. intervals or until risk of collision is mitigated.

If, at any time an active wellbore comes within 14 ft. or a SF <2 (Level 3) from an existing wellbore, survey frequency will be increased and actively monitored until the wells are clear of potential collision. If spatial separation of less than 5 ft. or SF <1.1 (Level 1) are encountered, an email notification will be sent by the Tug Hill to the WVDEP County OOG Inspector.

In the event that a wellbore collision cannot be avoided, Tug Hill will properly secure each well and evaluate the most prudent plan forward while communicating plans to the WVDEP County OOG Inspector via phone and email.

## 12.2 Vertical Section:

- Each hole is drilled to KOP by either the top-hole rig or bottom hole rig. While drilling, directional surveys are taken at the appropriate intervals to ensure that the appropriate SFs and separation distances are maintained. A SF of 1.5 or greater will be obtained as early in the directional plan as is practical and maintained for the duration of the vertical.



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- A combination of MWD and gyro surveys are used to determine the wellbore's position.
- Due to wellhead spacing on the surface, anti-collision risks are elevated and require constant monitoring. In order to mitigate this risk, nudges or tangents are drilled in order to maintain the appropriate spatial separation and SFs.

### 12.3 Curve Section:

- Each hole is drilled from KOP to the landing point by the bottom hole rig. While drilling, directional surveys are taken at the appropriate intervals to ensure that the appropriate SFs and separation distances are maintained.
- MWD surveys are generally used to determine the wellbore's position as the curve is drilled.
- Anti-collision risks decrease in this section, but directional surveys are taken at a high frequency to ensure that the well is drilled in accordance with the prescribed directional plan.

### 12.4 Horizontal Section:

- Each hole is drilled from the landing point to TD by the bottom hole rig. While drilling, directional surveys are taken at the appropriate intervals to ensure that the appropriate SFs and separation distances are maintained.
- MWD surveys are generally used to determine the wellbore's position as the lateral is drilled.
- Anti-collision risks are minimal or eliminated in this section, and directional surveys are taken to ensure that the well is drilled in accordance with the permitted well path.

Both the onsite supervisor and the drilling engineer for the active well will be responsible for actively monitoring anti-collision risks and communicating any necessary updates to the appropriate state inspector.

See **PART A -- SITE-SPECIFIC DATA** section of this WSSP of the ICP binder for attached Collision Avoidance Well Bore Spider Plot and Well bore Layout Program (See Figures 1 and 3, respectively) with site specific details and information pertaining to collision avoidance.

# 13.0 ADDITIONAL REQUIREMENTS

## 13.1 Geologic Prognosis

A list of anticipated freshwater, saltwater, oil and gas, hydrogen sulfide, thief zones, and high pressure and high-volume zones, including their expected depth are provided the Well Development permit application form WW- 6B.

| Estimated Formation Tops (From DF Elevation) | | | | |
|---|---|---|---|---|
| **Formation** | **Top TVD ft** | **Top Subsea ft** | **Lithology** | **Comments** |
| **Sewickley Coal** | **325** | **445** | **Coal** | Sewickley Coal |
| **Pittsburgh Coal** | **407** | **363** | **Coal** | Pittsburgh Coal |
| Deepest Fresh Water | 413 | 357 | | |
| **Fresh Water Casing Point** | **480** | | | |
| Potential Red Rock interval | 414 | 356 | **Red shale** | Unstable red shale from base of Pittsburgh Coal to top of the Maxton |
| Maxton | 1458 | -688 | Sandstone | |
| Big Lime | 1637 | -932 | Limestone | Possible gas/oil show, historical producer in area |
| Big Injun | 1702 | -932 | Sandstone | *possible water, Offset Producer |
| Weir | 1922 | -1152 | Sandstone | |
| Berea | 2124 | -1354 | Sandstone | Possible gas/oil show, historical producer in area |
| **Intermediate Casing Point 1** | **2200** | | | |
| Gordon | 2385 | -1615 | Sandstone | Offset Producer |
| Fifty Foot | 2468 | -1698 | Sandstone | Possible gas/oil show, historical producer in area |
| Speechley | 3054 | -2284 | Sandstone | Possible gas/oil show, historical producer in area |
| Benson | 4500 | -3730 | Sandstone | Possible gas/oil show, historical producer in area |
| Alexander | 4917 | -4147 | Siltstone | |
| Rhinestreet | 5546 | -4776 | Black shale | |
| Middlesex | 6016 | -5246 | Black shale | Possible Gas Shows |
| Geneseo/Burkett | 6085 | -5315 | Black shale | Possible Gas Shows |
| Tully | 6118 | -5348 | Limestone | |
| Hamilton | 6151 | -5381 | Gray shale | |
| Marcellus | 6218 | -5448 | Black shale | Gas Show |
| Onondaga | 6268 | -5498 | Limestone | Very hard, resistant chert beds |
| Oriskany | 6501 | -5731 | Sandstone | |
| Helderberg | 6625 | -5855 | Limestone | Hard resistant Limestone |
| Salina | 6979 | -6209 | Shale/LS/Salt/Anhydrite | Potential fluid reactive and washout zones |
| Salina Salt A | 7200 | -6430 | Salt | |
| Salina Salt B | 7787 | -7017 | Salt | |
| Lockport | 8105 | -7335 | Dolomite | |
| Rose Hill | 8478 | -7708 | Shale | Red Shale, unstable, interbedded lithology |
| Packer Shell | 8756 | -7986 | Limestone | Interbedded Limestone, Sandstone and Shale |
| Clinton/Tuscarora | 8976 | -8206 | Sandstone | Very hard, resistant sandstone |
| Juniata/Queenston | 9082 | -8312 | Red Shale | Gray to Red Shale |
| Reedsville | 9873 | -9103 | Gray Shale | |
| **Intermediate Casing Point 2** | **10000** | | | |
| Utica | 10864 | -10094 | Black Shale | |
| Point Pleasant | 11097 | -10327 | Shale/Limestone | Gas Show |
| **Target Top** | **11137** | **-10367** | | |
| **Lateral Landing Point** | **11147** | **-10377** | | 11146.99' TVD @ 91° inclination |
| **Target Base** | **11157** | **-10387** | | |
| Lexington | 11186 | -10416 | Limestone | |
| Trenton | 11216 | -10446 | Limestone | |
| **Pilot Hole TD** | **11366** | | | Assumes 150' of rathole based on Trenton top |

## 13.2 Casing and Cementing Program



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In developing the Casing and Cementing Program, designers must consider the presence of hydrocarbon-bearing intervals and any depleted or flow zones requiring isolation. Additional casing strings may be required to isolate highly pressure-depleted zones with associated low fracture gradients.

Typically, if no trouble zones exist within a drilling interval, casing is set when the mud density required to safely manage the formation pressure approaches the fracture gradient of the weakest exposed formation (normally at the previous casing shoe). Casing may also be set based on geologic considerations.

The Casing and Cementing Program proposed by Tug Hill in Form WW-6B outlines the detailed casing and cementing requirements, which meets the standards of the American Petroleum Institute (API). The proposed plan employs a minimum of three (3) strings of casing which are of sufficient weight, quantity, and quality for the anticipated conditions to be encountered.

The proposed wellbore diagram is provided in **PART A -- SITE-SPECIFIC DATA** section of this WSSP of the ICP binder.

## Casing

| | String | Grade | Bit Size | Depth (Measured) | Cement Fill Up |
|---|---|---|---|---|---|
| Conductor | 30" | BW | 36" | 120' | CTS |
| Surface | 20" | J55 | 26" | 1,070' | CTS |
| Intermediate 1 | 13 3/8" | J55 | 17 1/2" | 2,850' | CTS |
| Intermediate 2 | 9 5/8" | HPP110 | 12 1/4" | 11,070' | CTS |
| Production | 5 1/2" | HCP110 | 8 1/2" | 25,606' | CTS |

## Cement

| | |
|---|---|
| Surface: | Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2 |
| Intermediate 1: | Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.2 |
| Intermediate 2: | Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.99 |
| Production: | 50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 15.2ppg, Y = 1.18 |



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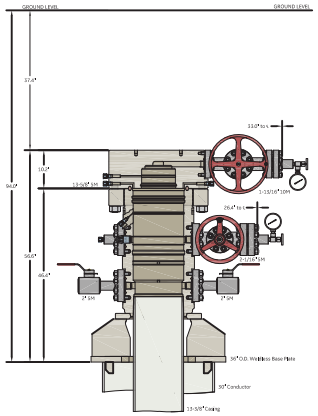
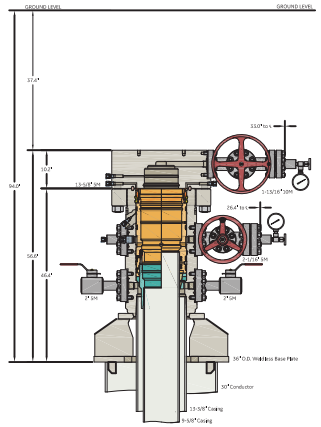
# Attachments

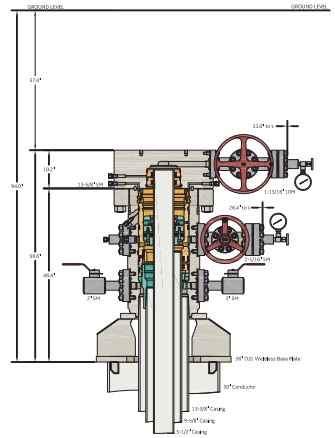
# Attachment 1

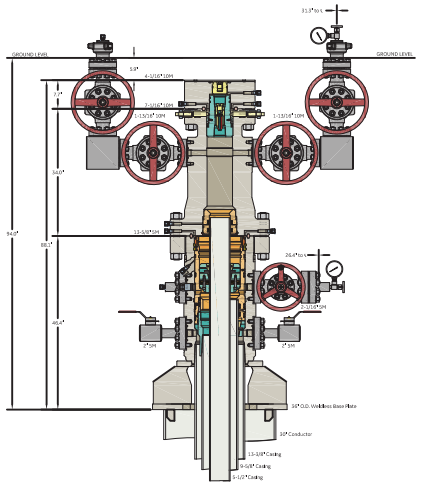
## Standard Wellhead Assemblies Figures

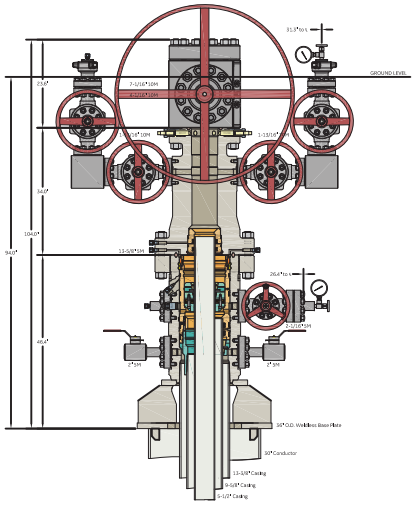
- Standard Marcellus Blow Out Preventor (BOP) Assembly
- Standard Marcellus Wellhead Assembly
- Standard Utica Frac Stack BOP Testing Procedure
- Standard Utica Wellhead Assembly

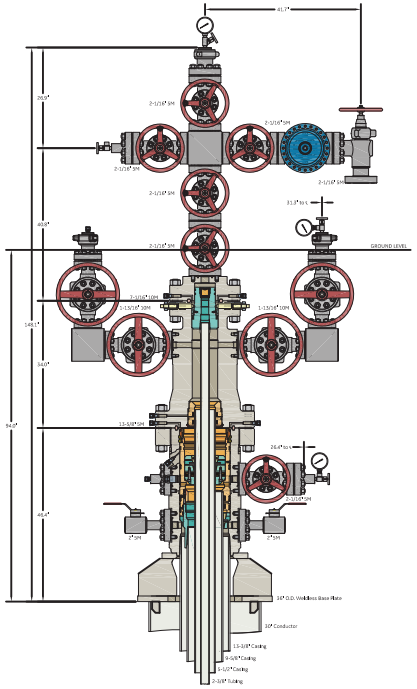
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# Pressure Control

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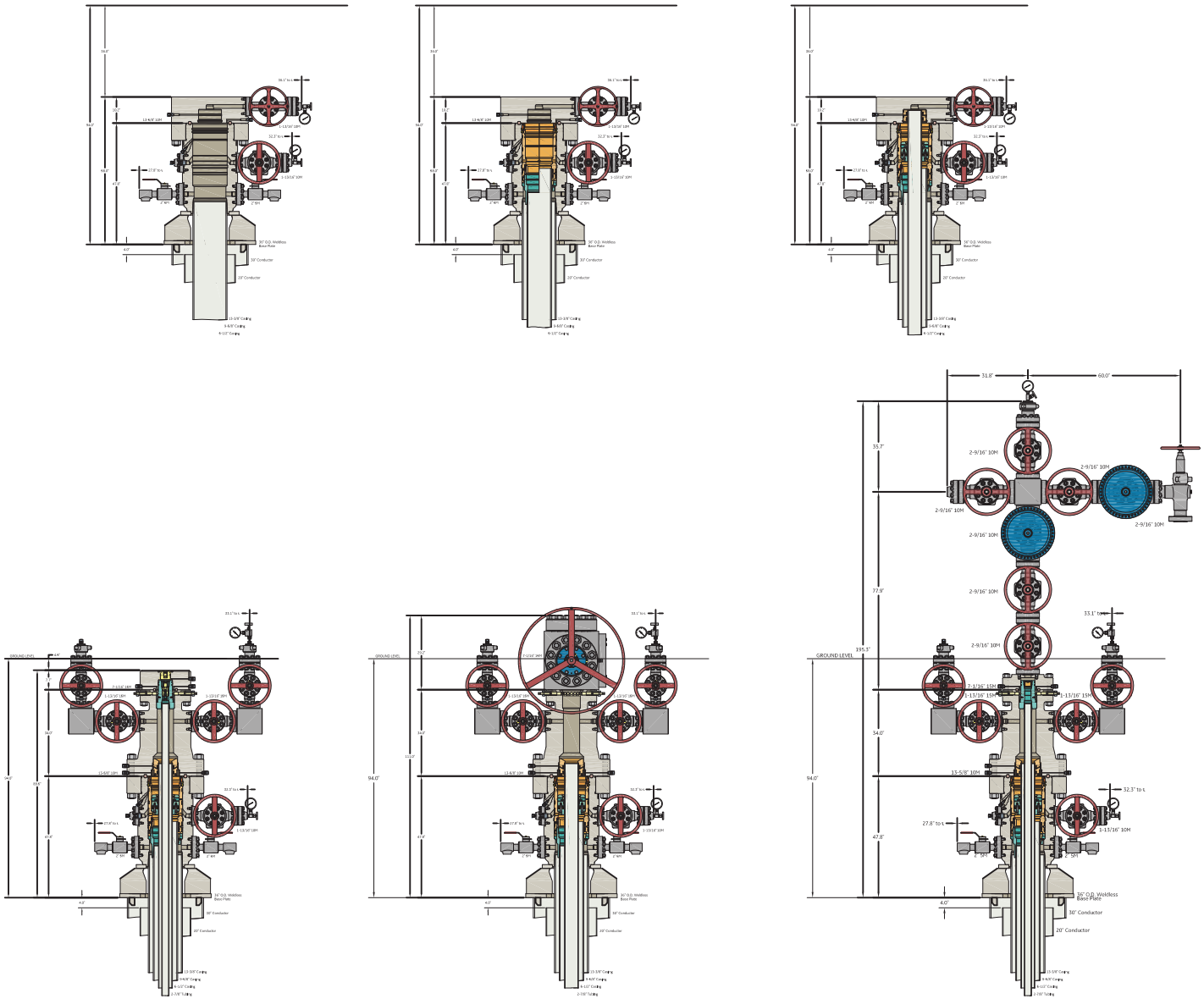
| REVIEWED BY: | | Rev. NC | Sht. 1 of 1 |
| APPROVED BY: | | DATE: | 12FEB20 |

MARCELLUS




# Pressure Control

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| APPROVED BY: | | DATE: | 12FEB20 |

UTICA

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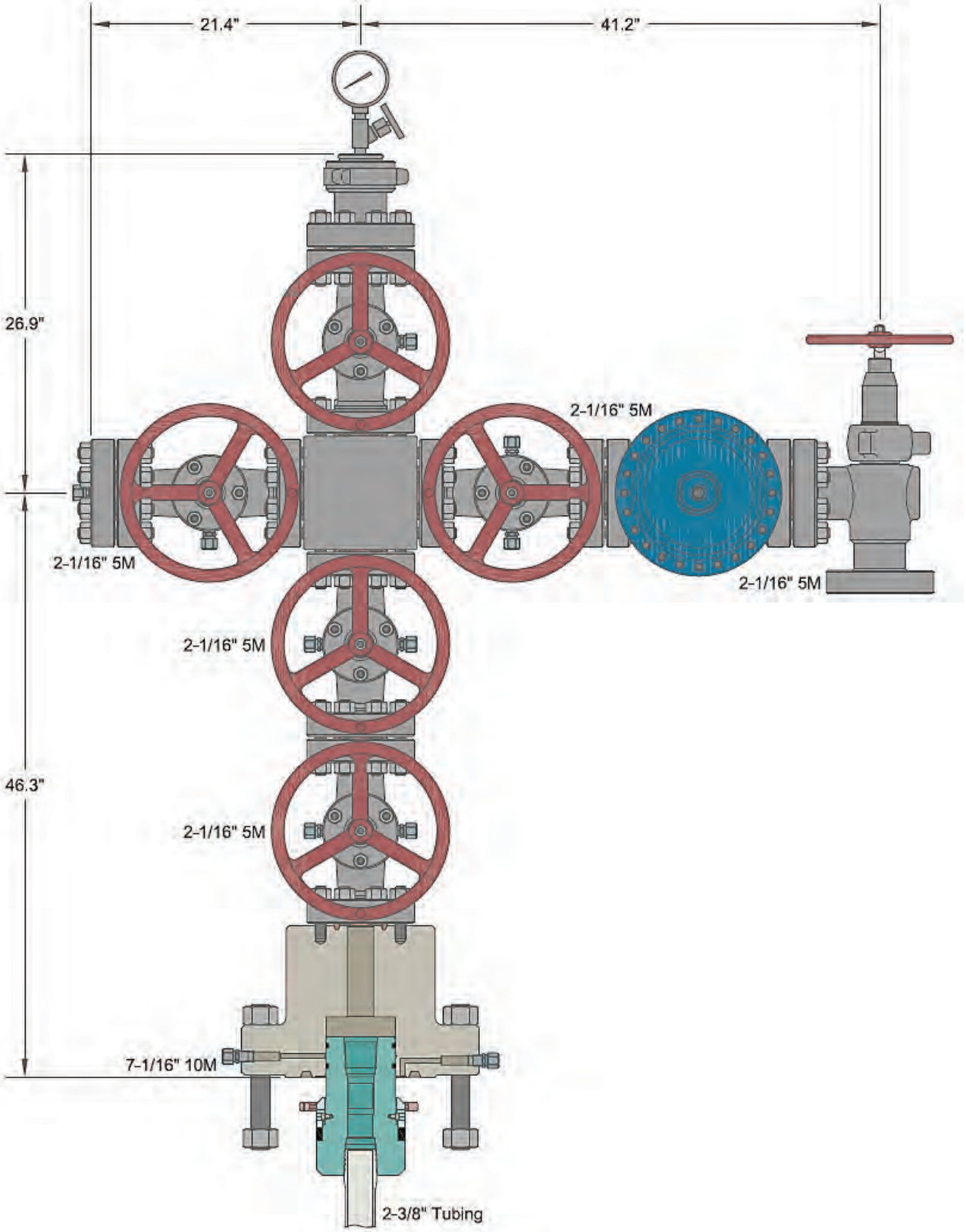
**MARCELLUS – POST COMPLETION**

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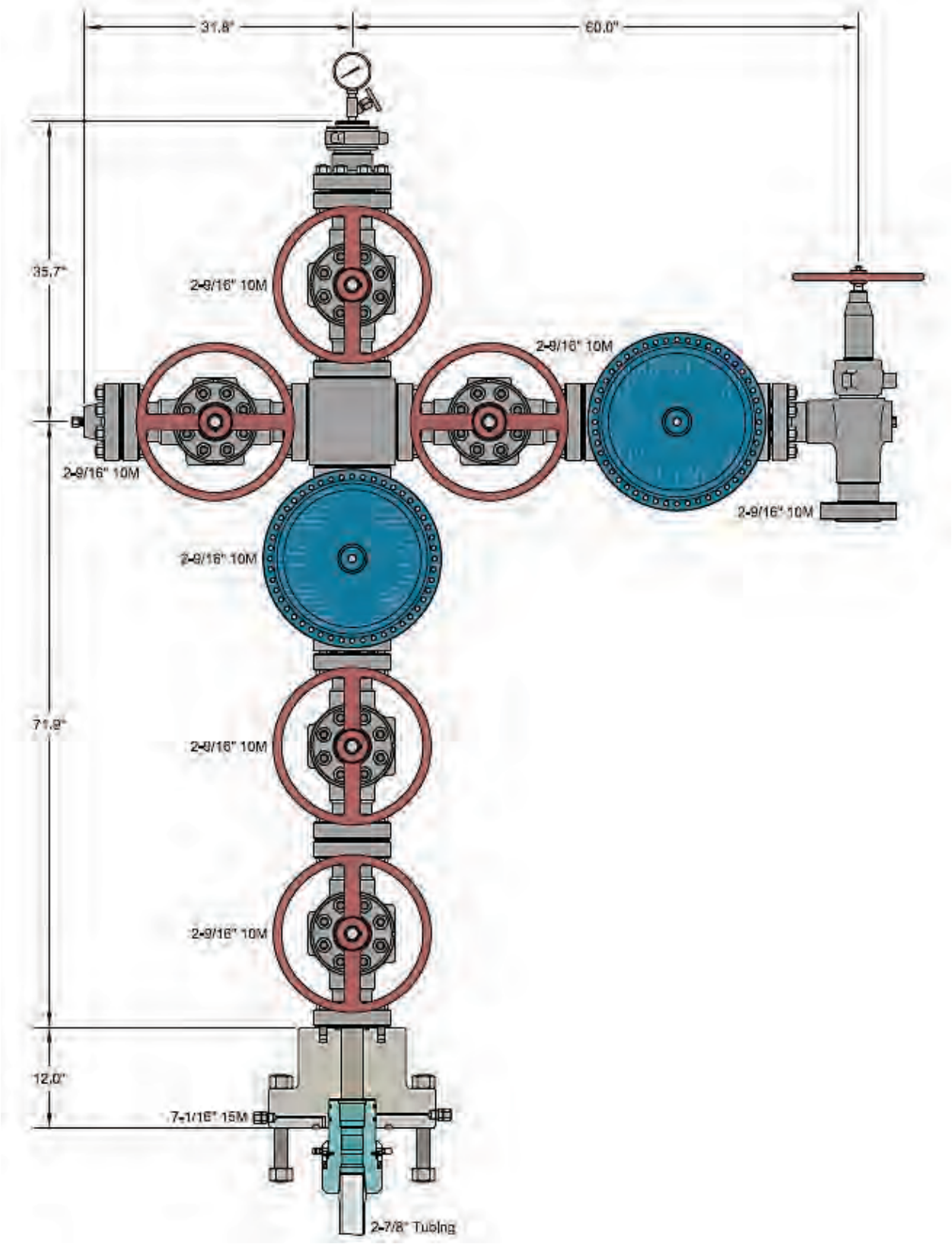
**UTICA – POST COMPLETION**

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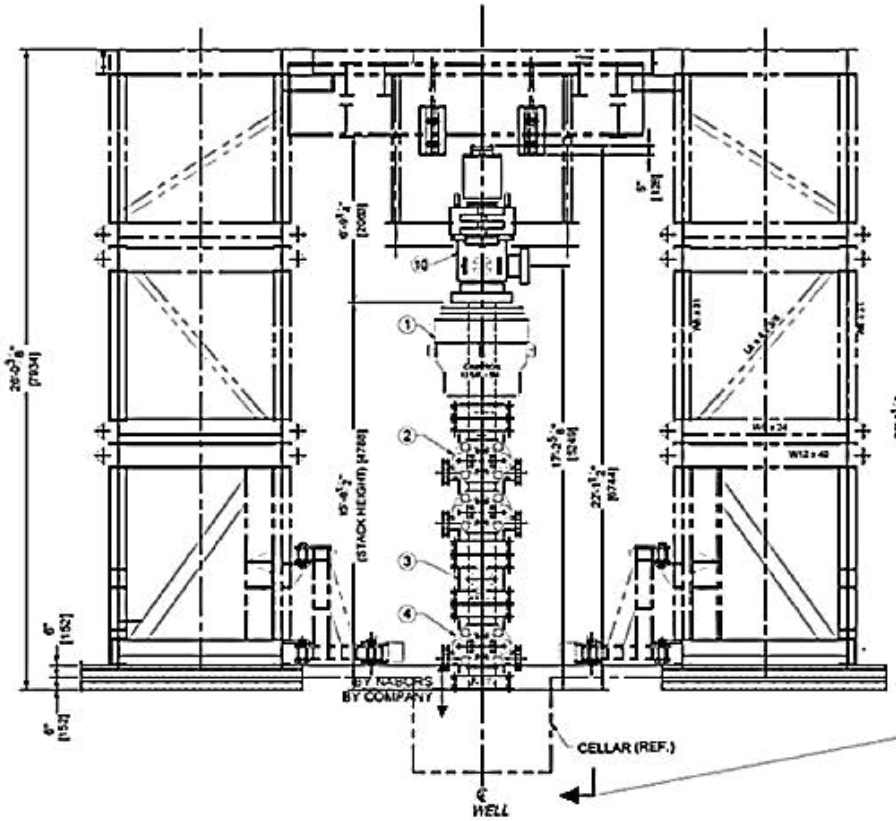
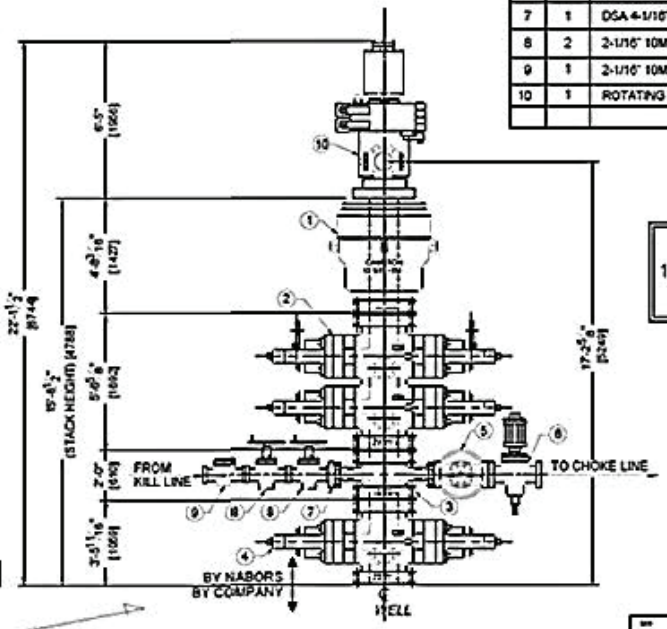
| BILL OF MATERIALS | | |
|---|---|---|
| NO | QTY | DESCRIPTION |
| 1 | 1 | CAMERON ANNULAR, 13-5/8", 5M WP<br>TOP CONNECTION STUDDED 13-5/8" 5M<br>BOTTOM CONNECTION FLANGED 13-5/8" 10M |
| 2 | 1 | CAMERON "U" DOUBLE RAM, 13-5/8, 10M WP |
| 3 | 1 | DRILLING SPOOL, 13-5/8" 10M, 24" Lg<br>w/ (2) 4-1/16", 10 M FLANGED SIDE OUTLETS |
| 4 | 1 | CAMERON "U" SINGLE RAM, 13-5/8, 10M WP |
| 5 | 1 | 4-1/16" 10M MANUAL GATE VALVE |
| 6 | 1 | 4-1/16" 10M HCR VALVE |
| 7 | 1 | DSA 4-1/16" 10M 2-1/16" 10M |
| 8 | 2 | 2-1/16" 10M MANUAL GATE VALVE |
| 9 | 1 | 2-1/16" 10M CHECK VALVE |
| 10 | 1 | ROTATING HEAD (MAKE AND MODEL TO BE CONFIRMED) |
| | | |




13 5/8" - 10M B.O.P. STACK with 5M ANNULAR
V-DOOR SIDE ELEVATION VIEW




13 5/8" - 10M B.O.P. STACK LAYOUT

**OPTION-1**
**13 5/8" - 10M B.O.P. STACK with 5M ANNULAR**

**PRELIMINARY FOR INFORMATION ONLY**

THIS DRAWING IS REFERENCE TO ENG. REQUEST TICKET NO. F1772104

NABORS PACE® B28
13 5/8" - 10M B.O.P. STACK with 5M ANNULAR
TUG HILL

THIS DRAWING IS SHOWN TRUE SCALE ONLY WHEN PRINTED ON THIS SIZE PAPER

| REV | DESCRIPTION | DATE | BY | APP |
|---|---|---|---|---|
| A | ISSUED FOR REVIEW | 06-DEC-16 | JR | * |

NABORS

B

NTS

15890-0-01

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## Frac Stack Schematic

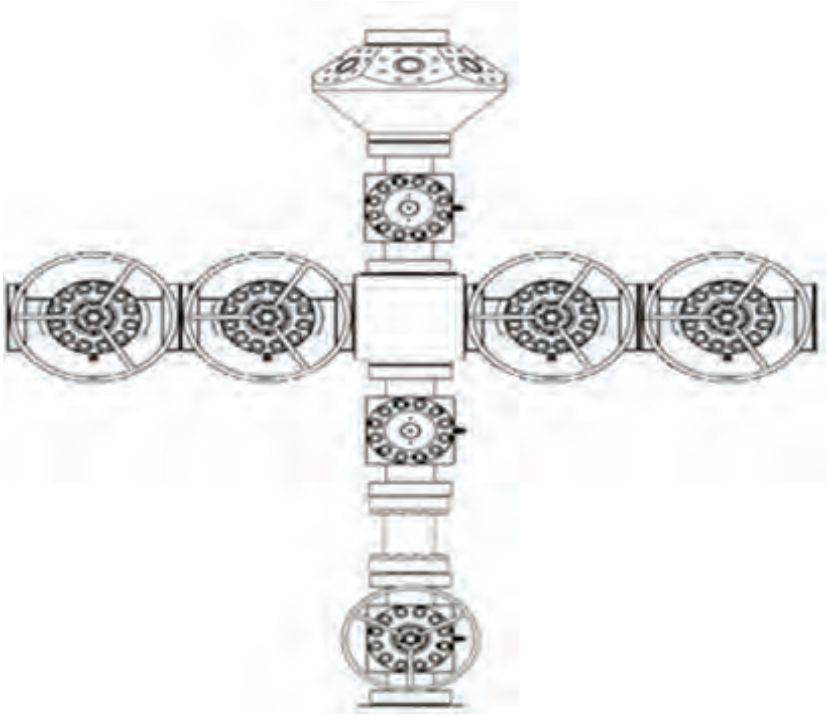
1) Dress wellhead in preparation for frac.

2) Grade location and install containment. Check 9-5/8" x 5-1/2" annulus psi & note on first report. Plumb line from annulus valve and install pressure gauge.

3) Bleed off any pressure and remove 7-1/16" 15K psi night cap. RU 7 1/16" 15K frac stack as follows (top to bottom):

- 4 x 4" goathead
- 7 1/16" 15K Hydraulic
- 7 1/16" 15K x (2x4 1/16" 15K) x (2x4 1/16 " 15K)flow cross double valved and capped
- 7 1/16" 15K Hydraulic (working)
- 7 1/16" 15K Manual
- 13 5/8" 10K x 7 1/16" 15K wellhead

**SUBJECT TO CHANGE. VERIFY CONFIGURATION WITH SUPERINTENDENT**



4) Torque frac stack flanges to spec. Digitally record torque valves for all flanges. PIC to verify that all flanges are torqued to the correct values prior to starting any pumping operations.

5) Test frac stack to 15,000 psi per mfg spec. Once positive pressure test has been achieved, cycle lower master valve closed checking for leakes and to ensure that valve will operate under pressure. Record full open/close turns in daily report. Return valve to opened state and continue testing remainder of frac stack per mfg spec (see attached).

6) MIRU pressure pumping services with pressure monitoring/recording. Close upper 7-1/16" valve and pressure test iron ande PSV to 15,000 psi. Bleed off pressure and fully open 7-1/16" valve.

# Attachment 2

## Emergency Response Plan

- Incident Response and Notification Procedure
- Incident Command Structure (ICS)
- Incident Severity Assessment & Emergency Levels
- Incident Action Planning Process
- Site Access, Visitor Management, and Communication
- Evacuation
- Emergency Response by Scenario
- Attachments
    - U.S. DOT Emergency Response Guidebook Guides
    - Blank Kill Sheet
    - Family Information Gathering Form
    - Marshall County Family Resource Guide
    - NIMS ICS Forms (select initial forms)

# Emergency Response Plan

## OWNER/OPERATOR

**Tug Hill Operating, LLC**

**380 Southpointe Blvd., Suite 200**
**Canonsburg, PA 15317**

## KEY CONTACT FOR EMERGENCY RESPONSE PLAN DEVELOPMENT AND MAINTENANCE

**Jerry V. DeRosa, Director EH&S Affairs**
**(724) 338-2029 (office)**
**(412) 736-5767 (cellular)**

## 24-HOUR EMERGENCY PHONE NUMBER
## (800) 921-9745

**Updated: May 16, 2022**



04/14/2023

**EMERGENCY RESPONSE PLAN**
**Tug Hill Operating, LLC**

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**ATTACHMENTS**

1. **U.S. DOT Emergency Response Guidebook Guides**
2. **Blank Kill Sheet**
3. **Family Information Gathering Form**
4. **Marshall County Family Resource Guide**
5. **NIMS Incident Command System (ICS) Forms**

# 1.0 EMERGENCY RESPONSE PLAN

## 1.1 Purpose

The purpose of this Emergency Response Plan (ERP) is to provide the procedures to be followed to facilitate the rapid deployment of resources during an emergency condition at the Tug Hill Operating ("Tug Hill") well pad development site. The primary objectives are to minimize risk and potential for negative impacts to the surrounding community, environment, and personnel working onsite. This ERP and the defined emergency levels and corresponding response actions apply to all stages of development, from construction through plugging and abandonment.

This ERP will be a stand-alone "Companion Document" to the Tug Hill Well Site Safety Plans (WSSP) to provide the guidelines and protocols to following during emergency conditions. This ERP is intended to be activated and utilized during incidents that may cause materially significant severe consequences to equipment, personnel, community, and/or the environment, as well as instances which require involvement, coordination, and resources of local, county, regional, state, and/or federal agencies.

This ERP is specifically designed to address the requirements of the West Virginia Department of Environmental Protection (WV DEP) Office of Oil and Gas legislative rule 35 CSR 8, as well as OSHA CFR 1910.38 (Emergency Action Plans, Fire Prevention Plans, and Exit Routes).

Additionally, the Tug Hill ERP draws upon the protocol established through Federal Emergency Management Agency (FEMA) National Incident Management System (NIMS). The NIMS is a systematic, proactive approach to guide departments and agencies of government, nongovernmental organizations, and the private sector, to work together seamlessly and manage incidents involving all threats and hazards, regardless of cause, size, location, or complexity, to reduce loss of life, property, and harm to the environment.

## 1.2 ERP Organization

This ERP will be found in each WSSP as **WSSP PART A – Attachment 2.** Site specific documents and figures pertaining to the design and layout of the well pad are provided in **WSSP PART B - SITE-SPECIFIC DATA Section.** These and other Companion Documents governing environmental, health and safety practices and Standard Operating Procedures (SOPs) relevant to the well site development comprise the Integrated Contingency Plan (ICP) binder prepared for each site.

Part of the ERP includes Emergency Response scenarios and the Incident Command System (ICS) – which is an organizational hierarchy and description of the division of responsibilities for large-scale, severe incidents such as a well control incident. The ERP also provides the procedures to be followed in the event of specific types of emergencies, including fire/explosion, power loss, natural disasters, well control, and spill/fluid release, as well as action lists for "Emergency Levels" (1, 2, and 3) based upon the degree of risk presented by the circumstances, procedures for evacuation, and the NIMS ICS forms.



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### 1.3 Distribution

The ERP will be distributed with the WSSP for each Well Work Permit Application. Copies of the WSSP will also be provided by Tug Hill to the County Office of the Emergency Management Agency (EMA) prior to the commencement of well work or site preparation work that involves any disturbance of land.

The WSSP and ICP binder of Companion Documents are to be maintained in the Company Man trailer on Drilling and Completions ("D&C Operations") pads. The **PART B -- SITE-SPECIFIC DATA** section of the WSSP (e.g., Emergency Contacts List, Site Layout, Emergency Evacuation, Helicopter Landing Zone, and Incident Response and Notification Procedure) are also to be kept in the Operations Pad Security Guard Shack for readily available access during a well control event. A hard copy of the WSSP will also be placed in the in the well pad site access road mailbox. All personnel working on location and managers making decisions about activities on-site, even if such manager does not visit the site, are to be cognizant of the contents of the WSSP and ICP Companion Documents.

### 1.4 Revisions

Revisions and updates to the WSSP relating to changes of Operational phases and/or personnel will occur in the **PART B - SITE-SPECIFIC DATA** section. Revisions to this the ERP include:

**ERP Record of Review & Revision Index**

| Date | Description of Changes | Reviewer / Revised by: |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
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| | | |



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## 2.0 GAS WELL DEVELOPMENT PHASES

The general phases of gas well development, hazards and anticipated number of persons on-site during each phase, are discussed below.

### 2.1 Development Phases, Equipment and Personnel

Personnel and equipment on-site during each of the above phases are summarized below:

| Natural Gas Development Operational Phase Description Table | | | |
|---|---|---|---|
| **Phase** | **Personnel headcount (approx.)** | **Equipment** | **Description of Activity** |
| **Construction** | 8-12 | Logging, Excavators and other heavy machinery, Cranes, dump trucks, auger/conductor rig. | Build location to code, install cellars and conductor casing |
| **Drilling**<br><br>**Rig Move** | 25-35<br><br>30-40 | Drilling Rig, temporary living quarters with septic, generators, light-plants, compressors, diesel fuel storage, drill cutting waste boxes, cuttings excavator, various ancillary equipment. | Spud and drill horizontal well. Capture drill cuttings and mud. |
| **Completions** | 30-40 | High Pressure pump tractor trailers, blending equipment, water and sand storage, high weight sand fork-lift, mobile office, cased hole wireline unit, crane, and various ancillary equipment. | Perforate and Frac horizontal well. Large quantity of acids on-site; friction reducer and other chemicals, fuels are utilized. |
| **Drill Out** | 20-25 | Coil Tubing unit, Snubbing Unit, Crane, high pressure pump, water storage & various ancillary equipment | Drill out Frac plugs and clean well up for flowback operations |
| **Flow back** | 10-15 | Water storage, high pressure flowback iron, sand traps | Flow back water and sand for final well clean-up |
| **Production Normal Ops**<br><br>**Production Repairs** | 1-2<br><br>4-6 | Wellheads, and production facilities | Production |



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## 3.0 ERP TRAINING AND REVIEW

Communication of the emergency response and notification procedures encompassed in detail in the WSSP, and ERP are communicated to Tug Hill employees and contractors at various points in the well development process. See the Site Safety Section of the WSSP for a full discussion of all safety orientation and meetings.

All Contractors are required to participate in the Tug Hill Contractor Safety Management Program (CSMP) and either have a Master Services Agreement (MSA) by and between Tug Hill or be subcontracted directly with a primary Contractor who is bound by the MSA. Under the terms and conditions of the MSA, the Contractor is required to acknowledge receipt and abide by Contractor Expectation Manual (CEM). The CEM outlines Tug Hill safety and environmental performance expectations.

Upon first reporting to service for Tug Hill, all workers are required to participate in CEM Safety Orientation prior to be permitted to work on a Tug Hill location. During CEM Orientation, workers are informed of stop work authority, safe work practice expectations, requirements for Permits-to-Work (PTW), spill containment requirements, incident notification procedures, and emergency response and notification procedures. Site specific information such as pad layout and muster points will be reviewed during the CEM Orientation. Workers who have not had CEM Orientation must report to the Person-in-Charge (PIC) or the EHS Coordinator.

All Company Men who will serve as the Tug Hill contracted Company Man/PIC on the well pad are required to go through EHS Onboarding upon initially reporting to duty. All Tug Hill field Operations employees likewise receive EHS Onboarding. During the EHS Onboarding, the contents of the WSSP and Companion Documents including, but not limited to, the ERP, are reviewed. Tug Hill employees are to annually review the WSSP and ICP binder and/or participate in training. The WSSP and ERP are also reviewed with supervisors of all contractors during Pre-Spud and Pre-Frac meetings that are held for each well site Drilling & Completions (D&C) Operations.

Visitors should also be informed when on-site on ERP basics including how to contact the EHS Coordinator or Company Man/PIC and of muster points and evacuation routes.



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# 4.0 INCIDENT SEVERITY ASSESSMENT

## 4.1 Identification of Emergency Levels

Incidents are reported pursuant to the Tug Hill Incident Response and Notification Procedure and are classified in the EHS Insight Incident Reporting Module. Incident Classification is based upon Incident Severity and nature of Consequences (e.g., People, Asset Environment, and Reputational/Community impact).

| Severity | | | | |
|---|---|---|---|---|
| | **People / Health** | **Environment** | **Asset** | **Community** |
| **1** | No injury | No effect | No damage | No impact |
| **2** | 1st Aid only | In containment | Minor; <$10,000 | Limited/Minor concern |
| **3** | Minor injury but medical aid (OSHA Recordable), not Lost Time Incident | Slight/minor effect; Outside containment but on well pad. Minor soil clean-up. No off-site or water impact | Limited Asset damage ($10K - $50K); Impact to Ops <24 hrs. or less lost Production; possible vandalism | Moderate concern; Local resident impact; Land Dept. involvement; no media |
| **4** | Serious injury, LTI or hospitalization; OSHA Recordable; potential Off-Site Muster | Reportable release but inside the LOD/ROW; impact to soil and water; potentially Materially Significant" clean-up required; agency NOV unlikely | Moderate damage; Production loss 1-5 days; potentially "Materially Significant" Asset damage = $100K - $1MM | Significant local community disruption; multi. Contractor response action; Media attention; Social Media visibility; Limited local Govt./Agency action or involvement |
| **5** | Severe injury potentially leading to fatality or disability; OSHR Reportable; Evacuation required; violent threat of injury or act of terrorism | Sig. release w/ off-site & serious impact to air/water/soils or sensitive environ (wetland); Agency Reportable and likely NOV; protracted clean-up >$100,000 | Major damage; Production loss est. between 1 – 3 wks.; Asset damage >$1MM - <$3MM; substantial vandalism/theft | Local resident evacuation; Moderate local or regional media coverage; substantial social media; Agency NOV and penalties likely; potential legal action |
| **6** | One or more fatalities; or multi. severe OSHA Reportable injuries; acts of violence w/ severe injury; act of terrorism committed | permanent impacts to water/groundwater or sensitive environ; gas release causing regional evacuation; extensive long-term env. Monitoring/clean-up; NOVs/penalties & pot. Legal actions | Severe damage; Production outage 1 month or more; Losses >$3MM; terrorism attack; impact to Midstream or other 3rd party assets | IN the regional or national news; Unified Incident Command w/ multi. Agency response; regional evacuation; sig. NOVs/penalties pot. >$1MM; pot. Litigation; possible loss of permits |

This ERP addresses actions to be taken specifically during Level 2 and Level 3 events. In all emergency incident situations, safety and preservation of life is paramount. Well site personnel shall not perform duties/functions for which they are not trained and appropriately qualified to



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perform and, therefore, shall not perform response efforts that may put themselves or others in a situation that threatens human health and safety. This may range from a well control event to a hazardous materials spill that would require hazardous waste clean-up.

Upon activation ERP for any Level 3 event, the Incident Command System will be employed pursuant to the ERP.

**Level 1 events** ("Green"; Consequence Levels 1-2 in EHS Insight Incident Reporting Module) involve situations that are either common to routine operations or do not pose significant risk to personnel. In most instances, Level 1 events can be resolved using standard operating/drilling procedures, commonly available equipment, personnel, and techniques.

**Level 2 events** ("Yellow"; Consequence Levels 3-4 in EHS Insight Incident Reporting Module) involve circumstances that are not commonly encountered during routine operations and pose the potential for significant risk to onsite personnel, equipment and/or the environment. A Level 2 event may require specialized well control personnel, equipment and/or techniques in order to be safely resolved.

**IF IT IS DETERMINED THAT UNCONTROLLED LOSS OF CONTAINMENT OF GAS HAS OCCURED PROCEED TO LEVEL 3 INCIDENT.**

**Level 3 events** ("Red"; Consequence Levels 5-6 or "RED" in EHS Insight Incident Reporting Module) present serious and immediate risks to personnel, assets, the surrounding community, and environment onsite and likely offsite as well. These situations require the immediate application of specialized techniques and well-developed safety assessment and hazard mitigation programs.

Examples of Level 3 events are provided in Section 11 of this ERP.

Level 3 events will warrant the immediate activation of the ERP, likely mobilization of well control specialists/engineers and other specialist personnel and equipment. Tug Hill Operations Management will contact and consult with well control contractor immediately upon the determination of a Level 3 incident. Requested well control information will be gathered and provided to the well control contractor along with any other pertinent and/or related information.

A complete list of Key Personnel, Agency and Emergency Contacts, and Evacuation Routes are included in the **WSSP PART B – SITE-SPECIFIC DATA** section in this ICP binder.



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## 5.0 INCIDENT COMMAND

The Incident Command System (ICS) is a standardized approach to the command, control, and coordination of on-scene incident management that provides a common hierarchy within which personnel from multiple organizations can be effective. ICS specifies an organizational structure for incident management that integrates and coordinates a combination of procedures, personnel, equipment, facilities, and communications. Using ICS for every incident helps hone and maintain skills needed to coordinate efforts effectively. ICS applies across disciplines and enables incident managers from different organizations to work together seamlessly. This system includes five major functional areas, staffed as needed, for a given incident:

1. **Incident Command**
2. **Operations**
3. **Planning**
4. **Logistics**
5. **Finance/Administration**

In an incident command organization, the command staff typically includes an Operations Coordinator, Public Information Coordinator, and the Emergency EHS&S Coordinator who report directly to the IC/UIC. The Incident Command team will report up to the Executive Management Team. Additional positions may be required, depending on the nature, scope, complexity, and location(s) of the incident(s) or according to specific requirements established by the IC/UIC.

Once the ERP has been activated and evacuation of the location is deemed necessary, Incident Command will be established, and Tug Hill contract Well Control specialists will be consulted and/or activated as appropriate.

The highest-ranking competent person on location will assume the role of On-scene Incident Commander until they are relieved. In some cases, that person may be a contractor or service company representative who will begin managing the incident until a Tug-Hill representative relieves them. If a company employee is on site at the time of an accident, that person shall act as Incident Commander unless otherwise instructed.

All individuals remaining behind to shut down critical systems or utilities must be capable of recognizing when to abandon the operation or task and evacuate themselves. The systems to be shut down will be dependent on the operations being performed and will be decided upon after notification of an emergency evacuation by the PIC or the designated Incident Commander.

If the situation is of immediate danger to life and health, Unified Command/Incident Command ("UIC") will be established pursuant the Incident Command System (ICS) in the ERP.

The person functioning as Incident Commander during the initial response period has the authority to take the steps necessary to control the situation and must not be constrained by these general guidelines.



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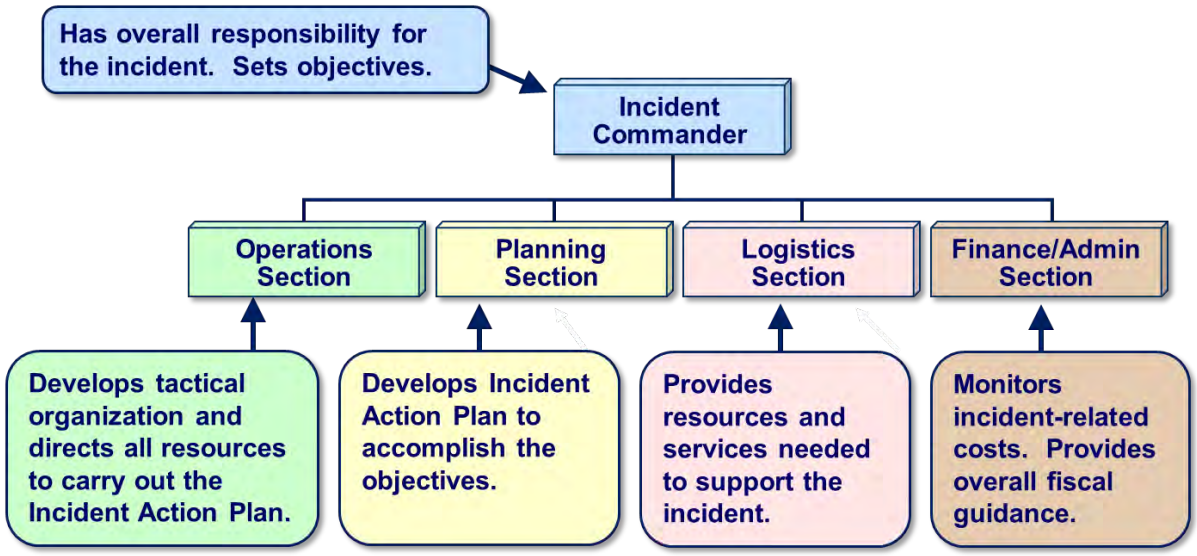
The Vice President of Operations and/or Emergency EHS&S Coordinator will establish a team of personnel who are responsible for immediately responding to the emergency and who will be cognizant of physical or process changes at the site that would require a response procedure to be modified.

## 5.1 Overall Organizational Functions

ICS was designed by identifying the primary activities or functions necessary to effectively respond to incidents. As incidents became more complex, difficult, and expensive, the need for an organizational manager became more evident. Thus, in ICS, and especially in larger incidents, the Incident Commander manages the organization and not the incident.

In addition to the Command function, other desired functions and activities are to:

- Delegate authority and provide a separate organizational level within the ICS structure with sole responsibility for the tactical direction and control of resources.
- Provide logistical support to the incident organization.
- Provide planning services for both current and future activities.
- Provide cost assessment, time recording, and procurement control necessary to support the incident and the managing of claims.
- Promptly and effectively interact with the media, and provide informational services for the incident, involved agencies, and the public.
- Provide a safe operating environment within all parts of the incident organization.
- Ensure that assisting and cooperating agencies' needs are met, and to see that they are used in an effective manner.





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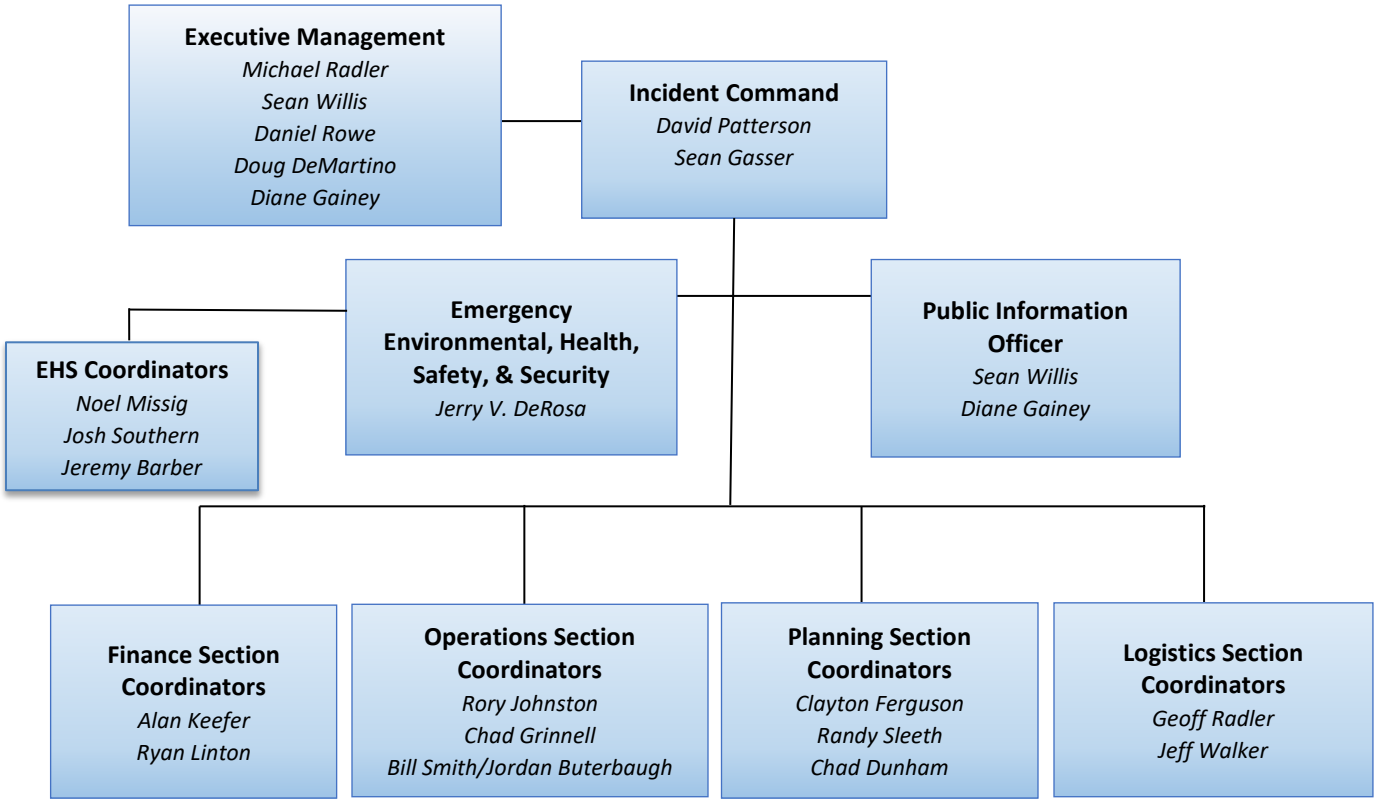
**Tug Hill Operating**
**Incident Command Structure**




## 5.2 Incident Commander/Unified commander (IC/UIC)

Once the ERP has been activated and evacuation of the location is deemed necessary, Incident Command will be established. The highest-ranking competent person on location will assume the role of On-scene Incident Commander (IC) until they are relieved. In some cases, that person may be a contractor or service company representative who will begin managing the incident until a Tug-Hill representative relieves them. If a company employee is on site at the time of an accident, that person shall act as Incident Commander unless otherwise instructed.

The IC is responsible for overall onsite and field management of the emergency and will be responsible for determining when to upgrade the level of emergency response.

Overall management includes Executive Management Team, the IC, and Command Staff. The IC is responsible for overall onsite and field management of the emergency and will be responsible for determining when to upgrade the level of emergency response. Additionally, Tug Hill maintains a contractual relationship with Well Control specialists and these parties will be consulted and/or activated as appropriate.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The IC and Command Staff are typically located at the Incident Command Post (ICP) or at the emergency location, as appropriate, and a remote Command Center for the Public Information Office and agency meetings.

All individuals remaining behind to shut down critical systems or utilities must be capable of recognizing when to abandon the operation or task and evacuate themselves. The systems to be shut down will be dependent on the operations being performed and will be decided upon after notification of an emergency evacuation by the PIC or the designated IC.

The primary function of the IC may be conducted as a Single Incident Commander when there is no jurisdictional or functional agency overlap, or a Unified Command (UIC) where multijurisdictional or multiagency jurisdiction exists. The roles, division of responsibilities, and employment of UIC will be discussed further in the section below.

The IC is technically not a part of either the General or Command Staff. The Incident Commander is responsible for:

- Having clear authority and knowing Tug Hill policy.
- Ensuring incident safety.
- Establishing an Incident Command Post.
- Setting priorities and determining incident objectives and strategies to be followed
- Establishing the ICS organization needed to manage the incident.
- Approving the Incident Action Plan.
- Coordinating Command and General Staff activities.
- Approving resource requests and use of volunteers and auxiliary personnel.
- Ensuring after-action reports are completed.
- Authorizing information release to the media.
- Ordering demobilization as needed.

Additional Command Staff positions may also be necessary, depending on the nature and location(s) of the incident or specific requirements established by the IC/UIC.

### 5.3 Public Information Coordinator

To ensure consistent communications which are accurate and controlled, it is essential that personnel understand that interaction with the public and media is to go through the Public Information Coordinator. Any other interaction or communication with the public or media is strictly prohibited and a direct violation of this document.



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The Public Information Coordinator may also perform a key public information-monitoring role. Whether the command structure is single or unified, only one Public Information Coordinator should be designated per incident. Assistants may be assigned from other involved agencies, departments, or organizations.

The Public Information Coordinator is responsible for interfacing with the public, media, and/or with other agencies with incident-related information requirements. The Public Information Coordinator will gather, verify, coordinate, and disseminate information on the incident's cause, size, and current situation; resources committed; and other matters of general interest for both internal and external audiences.

Specific functions of the Public Information Coordinator include, but are not limited to:

- Determine, according to direction from the IC, any limits on informationrelease.
- Develop accurate, accessible, and timely information for use in press/mediabriefings.
- Obtain IC's approval of news releases.
- Conduct periodic media briefings.
- Arrange for tours and other interviews or briefings that may be required.
- Monitor and forward media information that may be useful to incidentplanning.
- Maintain current information, summaries, and/or displays on the incident.
- Make information about the incident available to incident personnel.
- Participate in planning meetings.

Members of the media must be treated with respect and fairness. At the approval of the Executive Management team, a nearby hotel with the ability to supply the following accommodations shall be used for all press releases:

- Sheltered environment with heating/air conditioning.
- An appropriately sized meeting space with seating, tables and water.
- Audio-Visual Equipment including a podium.
- Dependable Wi-Fi connection.

The IC/UIC must approve the release of incident-related information and any meetings or communication with the public or media. In large-scale incidents or where multiple command posts are established, the Public Information Coordinator should participate in or lead the Joint Information Center in order to ensure consistency in the provision of information to the public.



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## 5.4 Environmental, Health, Safety & Security Coordinator

The Environmental, Health, Safety & Security (EHS&S) Coordinator has immediate authority to stop and/or prevent unsafe acts during incident operations. This will include working closely with the Incident Command team member to ensure all onsite equipment and operational matters are considered.

General duties of the Emergency EHS&S Coordinator include:

- Ensuring employees and contractors at the site have been given orientation on response procedures and are advised of evacuation routes, muster points, the locations of fire extinguishers and first aid supplies.
- The Emergency EHS&S Coordinator will ensure that new employees and contractors are given EHS Onboarding to review the WSSP and ERP.
- Assigning an employee or specialized crisis management contractor to notify emergency response personnel (such as an ambulance, the fire department, or the police) and/or to alert other employees of impending danger or necessary evacuation.

The EHS&S Coordinator will monitor incident operations and advise the IC/UIC on matters relating to operational safety, including the health and safety of emergency responder personnel. The ultimate responsibility for the safe conduct of incident management operations rests with the IC/UIC and supervisors at each level of incident management. This will include working closely with the Incident Command team member to ensure all onsite equipment and operational matters are considered.

The EHS&S Coordinator is responsible to the IC/UIC for the systems and procedures necessary to ensure ongoing assessment of hazardous environments, coordination of multi-agency safety efforts, and implementation of measures to promote emergency responder safety as well as the general safety of incident operations.

It is important to note that the agencies, organizations, operational team members, or jurisdictions that contribute to joint safety management efforts do not lose their individual identities or responsibility for their own programs, policies, and personnel. Rather, each contributes to the overall effort to protect responder personnel involved in incident operations.

The Emergency EHS&S Coordinator or designated alternative may respond to an imminent or actual emergency in the following manner:

- Ensure all impacted employees and contractors are given emergency care or the proper emergency care.
- Identify the character, source, amount, and area affected by the situation.
- Assess the danger and risk to employees, the public, and the environment.
- Take reasonable steps to prevent the emergency situation from occurring, re-occurring, or spreading to other areas where materials are stored. This may involve containing


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and collecting the released material and removing or isolating the storage vessels or containers. With regards to managing onsite equipment, this will require close coordination with the Incident Command team member(s).

- Continue monitoring the equipment for leaks, pressure build-up, etc.
- Coordinate the disposal of waste materials, contaminated soil, used sorbent material, etc.
- Ensure that incompatible wastes are kept separate.
- Clean or decontaminate equipment used for clean-up.

Emergency EHS&S Coordinator notification responsibilities during an emergency are listed below:

- Ensure that government and emergency agencies are notified as required.
- Inform local emergency responders of the evacuation status of the site.
- Establish a secure and confidential perimeter around the impacted area. Ensure all personnel and vehicle entry/exit is monitored and recorded.
- Ensure any unauthorized personnel are removed or not granted entry to the impacted area. Media and/or local residents shall not be granted access to the impacted area unless authorized by Public Relations. To achieve this goal, it may require security contractors to be stationed at or near the impacted area.
- Informing local emergency responders of hazards associated with field operations including drilling or completions procedures, equipment / rigging, and/or chemicals used when the event occurs in the field.
- Informing local emergency responders of equipment that may still be running or in operation at the site.

In the event of a spill or release at the site, the Emergency EHS&S Coordinator will mobilize to the site to coordinate activities or will send a designee. The Emergency EHS&S Coordinator or his designee will plan for the disposal of recovered spill material, impacted water, soil, or absorbents. This will include working closely with the Incident Command team member to ensure all onsite equipment and operational matters are considered.

Upon completion of the cleanup and restoration, the Emergency EHS&S Coordinator will prepare a Remediation Completion Report, which will be reviewed and approved by Executive Management. Also, a complete log of events and activities during and after the spill will be kept, and photographs if possible, for legal purposes and critical review of events at a later date. Specific emergency and spill response and hazardous materials management procedures are included in the **ERP** and the **SPCC PLAN** which are included in the ICP binder.



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## 5.5 Operations Section Coordinator

The Operations Section Coordinator is responsible for managing all tactical operations at an incident. The need to expand the Operations Section is generally dictated by the number of tactical resources involved and is influenced by span of control considerations.

Major responsibilities of the Operations Section Chief are to:

- Assure safety of tactical operations.
- Manage tactical operations.
- Develop the operations portion of the IAP.
- Supervise execution of operations portions of the IAP.
- Request additional resources to support tactical operations.
- Approve release of resources from active operational assignments.
- Make or approve expedient changes to the IAP.
- Maintain close contact with IC, subordinate Operations personnel, and other agencies involved in the incident.

The Operations Coordinator reports to the IC/UIC for the direct management of incident-related tactical activities. The Operations Coordinator is responsible for activities focused on reducing the immediate hazard, saving lives and property, establishing situational control, and restoring normal operations.

The Operations Coordinator will establish tactics for the assigned operational period. Safety of tactical operations personnel is the highest priority and the first objective. Personnel in the ICS organization shall support the Operations Coordinator to succeed in this objective.

An Operations Coordinator should be designated for each operational period and the responsibilities that are assigned during that operational period.

## 5.6 Planning Section Coordinator

The Planning Section (Planning Coordinator) will collect, evaluate, and disseminate incident situation information and intelligence to the IC/UIC and incident management personnel. The Planning Coordinator will then prepare status reports, display situation information, maintain the status of resources assigned to the incident, and prepare documents based on Operations Section input and guidance from the IC/UIC.

The Planning Section is comprised of five primary units, as well as a number of technical specialists to assist in evaluating the situation, developing planning options, and forecasting requirements for additional resources.


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Within Planning, the following primary units fulfill functional requirements:

- **Resources Unit**: Responsible to evaluate resources needed and currently committed to the incident, the effects additional responding resources will have on the incident and anticipated resources needed.
- **Situation Unit**: Responsible for the collection, organization, and analysis of incident status information and for the analysis of the situation as it progresses.
- **Documentation Unit**: Responsible for collecting, recording, and safeguarding documents relevant to the incident.
- **Technical Specialist(s)**: Personnel with special skills that can be used anywhere within the organization.
- **Demobilization Unit**: Responsible for ensuring orderly, safe, and efficient demobilization of incident resources.

Planning is normally responsible for gathering and disseminating information and intelligence critical to the incident unless the IC/UIC places this function elsewhere. The Planning Section is also responsible for assembling the Incident Action Plan (IAP). The IAP will include the overall incident objectives and strategies established by the IC/UIC.

### 5.7 Logistics Section Coordinator

The Logistics Section (Logistics Coordinator) is responsible for service support requirements needed to facilitate effective and efficient incident management, including ordering resources from off-incident locations.

The Logistics Coordinator will also provide facilities, transportation, supplies, equipment maintenance and fuel, food services, communications and information technology support, and emergency responder medical services. Within the Logistics Section, six primary Units fulfill functional requirements:

- **Supply Unit:** Orders, receives, stores, and processes incident related resources, personnel, and supplies.
- **Ground Support Unit**: Provides ground transportation during an incident. In conjunction with providing transportation, the unit is also responsible for maintaining and supplying vehicles, keeping usage records, and developing incident traffic plans.
- **Facilities Unit**: Sets up, maintains, and demobilizes facilities used in support of incident operations. The unit also provides facility maintenance required to support incident operations.
- **Food Unit**: Determines food and water requirements, plans menus, orders food, provides cooking facilities, cooks, serves, maintains food service areas, and manages food concerns.


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- **Communications Unit**: Organizes effective communications planning as well as acquiring, setting up, maintaining, and accounting for communications equipment.
- **Medical Unit**: Responsible for the effective and efficient provision of medical services to incident personnel.

### 5.8 Finance Section Coordinator

The Finance Section (Finance Coordinator) will be established when the incident management activities require on-scene or incident-specific finance and other administrative support services. Some of the functions that fall within the scope of the Finance Section are recording personnel time, maintaining vendor contracts, administering compensation and claims, invoice coding for EH&S response costs, and conducting an overall cost analysis for the incident. If a separate Section is established, close coordination with Planning and Logistics is also essential so that operational records can be reconciled with financial documents. Expedited payment of invoices may be required by contractors who are unable to front-load the cost of intensified services during an emergency operation.

Finance is a critical part of the ICS in large, complex incidents involving significant funding originating from multiple sources. In addition to monitoring multiple sources of funds, the Finance Section must track and report to the IC/UIC the accrued cost as the incident progresses. This allows the IC/UIC to forecast the need for additional funds before operations are negatively affected. When such a Section is established, the depicted units may be staffed as required.

Within the Finance Section, primary functional requirements include:

- Manage all financial aspects of an incident.
- Responsible for tracking costs, analyzing cost data, making estimates, and recommending cost saving measures.
- Ensure that all financial obligation documents initiated at the incident are properly prepared and completed. For example:
- Vendor contracts.
- Recording time for incident personnel and hired equipment.
- Coding of invoices and costs, including the proper approval routing.
- Ensure compensation and claims functions are being addressed relative to the incident.
- Responsible for financial concerns resulting from property damage, injuries, or fatalities at the incident.
- Maintain daily contact with Tug Hill management on finance matters.


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# 6.0 UNIFIED COMMAND

Unified Command improves unity of effort for incidents involving multiple agency response (e.g., the County Emergency Management Agency, the WVDEP, local Fire Departments, and potentially other agencies such as the U.S. Coast Guard and U.S. Environmental Protection Agency). The use of Unified Command enables jurisdictions and those with authority or functional responsibility for the incident (called members of the Unified Command) to jointly manage and direct incident activities through the establishment of a common set of incident objectives, strategies, and a single IAP. However, each participating partner maintains authority, responsibility, and accountability for its personnel and other resources, and each member of Unified Command is responsible for keeping other members of Unified Command informed.

## 6.1 Responsibilities of the Incident Commander and Unified command

Whether using a single Incident Commander or a Unified Command, the command function:

- Establishes a single ICP for the incident.
- Establishes consolidated incident objectives, priorities, and strategic guidance, and updating them every operational period.
- Selects a single Section Chief for each position on the General Staff needed based on current incident priorities.
- Establishes a single system for ordering resources.
- Approves a consolidated IAP for each operational period.
- Establishes procedures for joint decision making and documentation.
- Captures lessons learned and best practices.

## 6.2 Advantages of Using Unified Command

The advantages of using Unified Command include:

- A single set of objectives is developed for the entire incident.
- A collective approach is used to develop strategies to achieve incident objectives.
- Information flow and coordination is improved between all jurisdictions and agencies involved in the incident.
- All agencies with responsibility for the incident have an understanding of joint priorities and restrictions.
- No agency's legal authorities will be compromised or neglected.
- The combined efforts of all agencies are optimized as they perform their respective assignments under a single Incident Action Plan


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## 7.0 INCIDENT ACTION PLANNING PROCESS

The incident action planning process and IAPs are central to managing incidents. The incident action planning process helps synchronize operations and ensure that they support incident objectives. Incident action planning is more than producing an IAP and completing forms—it provides a consistent rhythm and structure to incident management.

Personnel managing the incident develop an IAP for each operational period. A concise IAP template is essential to guide the initial incident management decision process and the continuing collective planning activities. The IAP is the vehicle by which leaders on an incident communicate their expectations and provide clear guidance to those managing the incident.

### 7.1 The IAP Objectives:

- Informs incident personnel of the incident objectives for the operational period, the specific resources that will be applied, actions taken during the operational period to achieve the objectives, and other operational information (e.g., weather, constraints, limitations, etc.).
- Informs the IC/UIC, Command Staff, and various Emergency Response partners regarding the objectives and operational activities planned for the coming operational period.
- Identifies work assignments and provides a roadmap of operations during the operational period to help individuals understand how their efforts affect the success of the operation.
- Shows how specific supervisory personnel and various operational elements fit into the organization.
- Often provides a schedule of the key meetings and briefings during the operational period.

The IAP provides clear direction and includes a comprehensive listing of the tactics, resources, and support needed to accomplish the objectives. The various steps in the process, executed in sequence, help ensure a comprehensive IAP. These steps support the accomplishment of objectives within a specified time.

The development of IAPs is a cyclical process, and personnel repeat the planning steps every operational period. The Operational Period Planning Cycle (Planning P) is a graphic depiction of this cycle. Personnel develop the IAP using the best information available at the time of the Planning Meeting. Personnel should not delay planning meetings in anticipation of future information.

In the Planning P, the leg of the “P” describes the initial stages of an incident, when personnel work to gain awareness of the situation and establish the organization for incident management.


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During the initial stage of incident management, the Incident Commander typically develops a simple plan and communicates the plan through concise oral briefings. In the beginning of an incident, the situation can be chaotic and situational awareness hard to obtain, so the Incident Commander often develops this initial plan very quickly and with incomplete situation information. As the incident management effort evolves, additional lead time, staff, information systems, and technologies enable more detailed planning and cataloging of events and lessons learned. The steps of the planning process are essentially the same for the first responders on scene determining initial tactics and for personnel developing formal written IAPs.

Incident personnel perform the steps in the leg of the "P" only one time. Once they are accomplished, incident management shifts into a cycle of planning and operations, informed by ongoing situational awareness and repeated each operational period.

The following are brief descriptions of the meetings and briefings that are repeated each operational cycle until the conclusion of the incident or event.

- **Objectives Development/Update:** The IC/UIC establishes the incident objectives for the initial operational period. After the initial operational period, the IC/UIC reviews the incident objectives and may validate them, modify them, or develop new objectives.
- **Strategy Meeting/Command and General Staff Meeting:** After developing or revising the incident objectives, the IC/UIC typically meets with the Command and General Staff, and sometimes others, to discuss the incident objectives and provide direction.
- **Preparing for the Tactics Meeting:** Once the approach to achieving or working toward achieving the incident objectives is determined, the Operations Section Chief and staff prepare for the Tactics Meeting by developing tactics and determining the resources that will be applied during the operational period.
- **Tactics Meeting**: In the Tactics Meeting, key players review the proposed tactics developed by the Operations Section and conduct planning for resource assignments. The OPS Section Chief leads the Tactics Meeting, and key participants include the LOG Section Chief, Safety Officer, a Planning representative and other invitees.
- **Preparing for the Planning Meeting:** Following the Tactics Meeting, staff collaborate to identify support needs and assign specific resources to accomplish the plan.
- **Planning Meeting:** The Planning Meeting serves as a final review and approval of operational plans and resource assignments developed during and after the Tactics Meeting. At the end of the Planning Meeting, Command and General Staff confirm that they can support the plan.
- **IAP Preparation and Approval:** Based on concurrence from all elements at the end of the Planning Meeting, the Incident Commander or Unified Command approves the plan.
- **Operational Period Briefing:** Each operational period starts with an Operational Period Briefing. Incident supervisory and tactical personnel receive the IAP during the briefing. Members of the Command and General Staff present the incident objectives, review the current situation, and share information related to communications or safety.


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Following the Briefing, supervisors brief their assigned personnel on their respective assignments.

## Operational Period Planning Cycle (Planning P)

## 8.0 ICS FORMS

**Attached to this ERP are select ICS forms for the purposes of initiating gathering critical information at the onset of the incident.**

**In the event of an Emergency, the following ICS Forms are to be employed. Strict adherence to this requirement shall be enforced by the IC/UIC.**

| Form | Component |
|---|---|
| ICS 201 | **Incident Briefing** |
| ICS 202 | **Incident Objectives** |
| ICS 204 | **Assignment List** |
| ICS 205 A | **Communications List** |
| ICS 206 | **Medical Plan** |
| ICS 208 HM | **Site Safety and Control Plan** |
| ICS 214 | **Activity Log** |
| ICS 215 A | **Incident Action Plan Safety Analysis** |
| **Other ICS Forms are available but are not attached to this ERP.** https://training.fema.gov/icsresource/icsforms.aspx | |



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# 9.0 SITE ACCESS, VISITOR MANAGEMENT, AND COMMUNICATION

## 9.1 Security and Site Access

Access and egress to the well pad is provided via a site access road. During the Drilling and Completions Operational phases of well development, Security Guard stations are typically located at the beginning or along the access road. The Security and Site Access is controlled pursuant to the **Tug Hill Site Security Standard Operating Procedure** (SOP).

**During Level 2 and Level 3 events**, access to the well pad will be strictly prohibited except for response contractors, first responders and agency representatives. All persons provided access will be approved by the IC/UIC prior to proceeding beyond the Security Guard checkpoint.

## 9.2 Accounting for Personnel

There are always at least two muster points for a well development pad; the Primary Muster Point at or near the access road entrance to the pad, and the Secondary Muster Point along the access road to the pad.

Security Guards also keep a running log of personnel on location. This sign-in sheets maintained by Security will be used for account for visitors and personnel in the event of a well site emergency or significant incident. This log will be maintained for the duration of operations by contracted gate guards or the Tug Hill Company Man/PIC or On-Scene IC or their designee.

For production facilities, a Security Guard checkpoint will be established as needed during Level 2 events and will be mandatory during ALL Level 3 events.

## 9.3 Communications On-site

Alarm systems and communications are reviewed with Tug Hill employees and contractors during operational activities. Contractors working on the Well Pad Site who employ their own distinctive means of identifying and communicating operational alarm signals are required to inform the Emergency EHS&S Coordinator and/or Tug Hill Company Man prior to beginning operations.

To address Level 2 and Level 3 emergency situations, the drilling rig and completions site is equipped and alarm, horn, or siren. Additionally, gas monitoring systems on location are equipped with an audible and visual siren and flashing light to alert workers on location that a hazardous atmosphere condition has been detected.

During completions operations, Tug Hill employees and contractors will use radio and cellular communications to communicate what is happening on-site. Everyone on-site is to be informed as soon as practicable.

For transportation with trucking, Tug Hill D&C Operations and Production Department employee vehicles are equipped with cellular telephones, cell phone boosters, and Citizen Band (CB) radios.



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Security Guards on each D&C Operations pads are equipped with cellular telephones and CB radios. CB radio signs are posted along Tug Hill Bonded Routes and the CB channel number designated for the well pad is included in the Pre-Spud and Pre-Frac hand-outs provided to Contractors and workers.

### 9.4 Communication with Outside Media

There will be no non-participants and outsiders other than emergency services allowed on the well pad during an emergency, and no statements will be issued to the media or other interested parties except by designated Tug Hill Public Information Coordinator or Tug Hill Executive Management.

Any media statements provided the Tug Hill Public Information Officer must be approved by the IC/UIC and the Executive Management Team.

Tug Hill field workers and Contractor personnel are directed to be courteous to media representatives and direct them to the designated company spokesperson. Contractors are to follow the guidelines for media and resident inquiries are provided in the CEM.

These CEM Media Relations Guidelines are as follows:

Workers may occasionally encounter members of the news media. Your role in this situation is to help reporters get in touch with Tug Hill Public Information Coordinator and, unless expressly approved in writing by Tug Hill, **CONTRACTORS ARE NOT to serve as a Tug Hill spokesperson**.

Any worker approached by the media or public (on site or by phone) under circumstances when you absolutely cannot defer them to the Tug Hill Public Information Coordinator or the Tug Hill Director of EH&S Affairs, follow these guidelines below:

- **IN EVERY RESPONSE, DO THE FOLLOWING**:

  - Politely gather the reporter(s) name and contact information.
  - Explain that someone from Tug Hill will contact them by saying the following:

    "I can help you best by putting you in touch with the Tug Hill Public Information Coordinator or Tug Hill Director of EH&S Affairs."
  - Politely keep reporter(s) in designated muster area or site guard shack for safety reasons.
  - Gather reporter(s) name, news organization, phone number and inquire about deadline; then immediately provide this information to Public Information Coordinator, IC/UIC or a Tug Hill Manager or the Director of EH&S Affairs.



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- Do not make any statements on behalf of Tug Hill but, in any comments even between co-workers, ABSOLUTELY avoid any speculation and negative terminology (i.e., explosion, blowout, dangerous).
- If an incident or emergency is ongoing, indicate that Tug Hill policies and procedures that dictate the response, communication, and incident command during such situations and these procedures are being followed.
- Any additional information will be provided by the Public Information Coordinator or other Executive Management.



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# 10.0 EVACUATION

## 10.1 Initial Response Actions

Initial response actions are those taken by personnel immediately upon becoming aware of an emergency incident. Pursuant to the Incident Response and Report Procedure, all events are to be reported ASAP once the observe is safe to do so. Timely reporting and implementation of these initial steps is of the utmost importance because they can greatly affect the overall response operation.

It is important to note that these actions are intended only as guidelines. The appropriate response to a particular incident may vary depending on the nature and severity of the incident and on other factors that are not readily addressed. Note that without exception, personnel and public safety is first priority.

The person functioning as PIC/On-scene IC during the initial response period has the authority to take the steps necessary to control the situation and must not be constrained by these general guidelines.

The **Initial Response Actions Acting Supervisor** should at a minimum:

- Personnel will be accounted for and moved to a safe upwind location.
- Medical attention will be provided for any injured personnel.
- Activate the appropriate alarms and operations shutdowns as necessary.
- Further notifications by Tug Hill incident command structure (ICS) team.
- Notification to local/state/federal authorities (See Emergency Notification List)
- The well site will be secured.
- Activate response resources.
- Information gathering and assessment of the situation will be initiated.
- Monitor and manage the emergency situation.
- Assist responding agencies as necessary.

## 10.2 Evacuation

All Level 3 events will require moving all non-essential personnel to the secondary Muster point pursuant to the ERP. Typically, the secondary Muster point is located at the Guard Shack located along the site access road. The location will be specified on in the **Exhibits 1-5** shown in **PART B – SITE-SPECIFIC DATA** section of the WSSP.

If an evacuation of the Well Pad Site is required, the following steps will be taken:

- **CALL 911**
- The EHS Coordinator, Tug Hill Company Man, or designated worker will notify other personnel via cellular phone, radio, or other means of communication.



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- Tug Hill employees, contractors and visitors will leave their respective areas immediately and move towards the Muster Area (or other safe location if designated Muster Area is not safe).
- In the event of a chemical release or heavy smoke during an emergency, Tug Hill employees, contractors, and visitors will evacuate the area by going crosswind and upwind of the direction of the windsock (or other wind indicator) to a safe location (free of vapors). A windsock or other wind indicator will be installed at the Well Pad Site.
- Upon evacuation, Tug Hill employees, contractors, and visitors will meet in the designated Muster Area. Muster points are shown on the General Site Plan and Vicinity Plan and Evacuation Route, which are located in the **WSSP PART B - SITE-SPECIFIC DATA** of the ICP binder. This information will be communicated to those working on location at their time of arrival to the worksite and when changes to muster point locations are made.
- The Operations PIC, on-duty EHS Coordinator, or other individual designated by On-scene IC will require a head count of employees, contractors, and visitors to ensure that everyone has been safely evacuated.
- Employees are not permitted to return to their respective work areas until the "All Clear" signal has been given by the Emergency EHS&S Coordinator or their designee or the local emergency responders.
- Site Supervisors should be aware and assist employees, contractors and or visitors with mobility impairments.

### 10.3 Establishment of Protection Zones and Evacuations

A Level 3 event typically requires that the well site to be the evacuated. Establishment of Protective Zones will initially occur on the incident site to be protective of workers. Protective Zones should follow the prescribed distances in the U.S. Department of Transportation Emergency Response Guidebook (ERG).

**Initial loss of containment of gas requires an initial minimum safe distance of 330 ft. and large spill of flammable petroleum liquids (e.g., condensate) of 150 ft.**

UIC will assess and determine if local resident evacuation is required and the size of protective zone. In the absence of UIC, the On-Scene Incident Commander, or his designee, shall determine protective zones to limit the risk of exposure to workers, local responders, and residents surrounding the work area.

The Safety Zone Map and Parcel Owners listed is provided in **Exhibit 2, WSSP PART B – SITE-SPECIFIC DATA** section of the WSSP and ICP binder for each location.


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Life safety impacts to the environment, and property conservation are priorities. The Emergency Protection Zones based on the following information on the scene:

- Magnitude of the incident
- Wind Direction
- SDS of applicable materials
- Current and forecasted weather conditions
- Topography and land conditions
- Other influences specific to the incident

If the agency directs, on-site Tug Hill personnel and Contractors will be engaged to notify all local potentially impacted residents of the incident by dispatching workers to each potentially affected residence. If the public emergency responder does not direct this notification to be made by the Operator, then the public response agency will be responsible for this notification.

Local Residents and other Emergency Contacts are shown in **Exhibit 2, PART B – SITE SPECIFIC DATA** section of the WSSP.

Tug Hill commits it full cooperation and assistance in making notifications to residents and assisting to maintain the designated protective zone. Tug Hill resources include the workers onsite and other Operations personnel, as well as our Incident Command Structure, EHS Department personnel and contractors, and the Tug Hill Land Department Land Agents.

Once established, these zones will be maintained until a determination is made by the IC/UIC to alter or discontinue them. Tug Hill will contact local residents and will post personnel on all roads within the zone to prevent entrance to the area until an all clear has been issued. The initial contact will be conducted by telephone and, for those that cannot be reached, a drive by will be initiated.

### 10.4 Resident and Animal Evacuation

In the event that emergency conditions require the evacuation of local residents in the vicinity of the well pad, the EH&S Director or designee will contact the County Office of Emergency Management (OEM). The County OEM will provide support for notification and evacuation of residents, coordinate with the West Virginia State Police and other local agencies to provide logistical support and traffic control.

In an evacuation situation, Tug Hill personnel may be the first contact with local residents. Under these circumstances, an Evacuation Notice will be provided by the County OEM shall be used to aid in providing information to residents.

Certain evacuees may require special services or accommodations to address physical disabilities, prescriptions, multiple dependents, or services for pets. The Family Information and



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Requirement Questionnaire in the appended to this ERP may be used by aid staff to determine special needs of evacuees and their dependents.

Should livestock require relocation, the County Animal Control Office will aid in locating shelter, food, and care for displaced animals. See the County Animal Control Office listed in the Marshall County Family Resource Guide attached hereto.

### 10.5 Evacuation Routes

Evacuation routes have been established and are designated in **Exhibits 1-5, PART B – SITE-SPECIFIC DATA** section of the WSSP and ICP binder for each location. The primary evacuation route should be utilized unless wind direction or other condition makes this route unfavorable or unusable. One or more secondary evacuation routes have been identified for use in the event that the primary evacuation route is blocked or otherwise unsafe. These routes will be communicated prior to start of operations at the Well Pad Site. Tug Hill employees, contractors, and visitors will be made aware of these evacuation procedures.

### 10.6 Isolation of the Emergency Hazard Area

If an evacuation is ordered by the UIC, roadblocks will be established to isolate the Emergency Hazard Area. Roadblocks may be relocated based on monitoring data. Roadblocks will set up and manned to restrict non-essential personnel from entering the Emergency Hazard Area. Additional personnel may be called out from a safety company if required. The roadblock personnel should be equipped with a radio or mobile telephone, reflective clothing, road barriers, copy of the evacuation route map and local road map, flashlights and, if appropriate, air monitors and respiratory protection. Local and /or state police may assume traffic control.

Local residents must be notified of the situation and advised of any evacuation order. Consideration must be given to notifying transients (i.e., hunters, trappers, recreational users, non-resident landowners, etc.) of hazards and evacuation.

- Request of early evacuation of special needs residents.
- Identify an evacuation center for the public.
- Determine the locations of appropriate and relevant air monitoring based upon the nature of the incident.
- Evacuation of the public should begin downwind of the release.
- Local landowners shall be contacted by phone, using a scripted statement, and leaving notices on vacant homes and vehicles.
- Large industrial operations and public facilities may also require notification and/or evacuation.



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## 10.7 No-Fly Zone

In well control events, it may be necessary to establish a No-Fly Zone over the Hazard Response Zone (HRZ). The determination to establish a NO-Fly Zone should be made by UIC.

The IC should consider notifying the 911 center of the potential hazard to air traffic. Pilots should be notified of restrictions in the airspace through local channels.

It is also important to control the use of drones in a flammable atmosphere.

# EMERGENCY RESPONSE BY SCENARIO

## 11.0 EMERGENCY RESPONSE BY SCENARIO

The following sections are intended to provide guidance on initial response actions to manage site conditions and account for personnel working on the well pad based upon the incident scenario. This information is general guidance and intended to list initial response actions. The needs of each response will be dictated by the circumstances of the event and initial response actions specified by the PIC/On-scene IC at the time of the event.

Company Men and other Operational PICs are to be familiar with the response guides and follow this ERP unless site specific conditions that affect environmental, health and safety require deviation from the guidelines provided.

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**Tab 1 – FIRE AND/OR EXPLOSION**

**Tab 2 – WELL CONTROL – Events by Incident Level**

**Tab 3 – HYDROGEN SULFIDE ($H_2S$) AND COMBUSTIBLE GASES**

**Tab 4 – MEDICAL EMERGENCIES/INJURY REPORTING**

**Tab 5 – NATURAL DISASTERS**

**Tab 6 – SPILL OR FLUID RELEASE**

**Tab 7 – PERSONAL THREATS AND WORKPLACE VIOLENCE**

**Tab 8 – BOMB THREATS**



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# FIRE AND/OR EXPLOSION

## 11.1 FIRE AND/OR EXPLOSION

This is a summary of the reactions and responses required when there is a fire and/or explosion on an active well site. This could be one or more of the following emergencies:

- Explosive atmospheres and gas release without fire
- Actual explosions
- Fires on the rig
- Fires off the rig (structural)
- Vehicle or equipment fires
- Other fires

### 11.1.1 Hazard Analysis

A possibility of exposure to natural gas, H2S, combustible products, flying debris, extreme heat, oxygen depleted atmospheres, and the potential for fire and/or explosions.

### 11.1.2 Personal Protective Equipment

As required for specific tasks. Required equipment may include firefighting equipment such as extinguishers, clothing, and respiratory protection. Only trained personnel should engage in these activities. The fire can be extinguished by Operations personnel using fire extinguishers located on-site only if it is safe to do so and if the fire is limited in scope and size; otherwise, the fire will be managed by the local township fire department.

### 11.1.3 Response Actions

Upon witnessing a fire:

- Shout "FIRE" to alert others in the immediate area.
- Eliminate possible sources of ignition immediately.
    - Sparks
    - Combustion engines
    - Electric motors or tools not rated for hydrocarbon atmospheres.
    - Electronic equipment such as radios, phones and flashlights not rated for intrinsic safety.


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### 11.1.4 Early-Stage Incipient Fires

- For early stage "Incipient" fires, the fire can be extinguished by Operations personnel using fire extinguishers located on-site only if it is safe to do so and if the fire is limited in scope and size; otherwise, the fire will be managed by the local township fire department.
- Portable Fire Extinguisher Use – Use the PASS Acronym for extinguisher use:
  - Pull the pin.
  - Aim the Nozzle at the base (bottom) of the fire.
  - Squeeze the Handle or trigger.
  - Sweep the nozzle back and forth quickly at the base of the fire.
- NEVER fully extinguish a fuel fed fire!

### 11.1.5 Beyond Incipient Fires – Growth and Fully Developed Stage

For fires that are in the "Growth" or "Fully Developed" stage, or burning persistently:

- Signal the evacuation alarm/notification system and **call 911 ASAP.**
- If safe to do so:
  - shut down critical ongoing equipment/processes/operations, including motorized traffic and spark-producing equipment in the area.
  - Isolate utilities, if possible, to the affected area(s).
  - Isolate, if possible, the source of the leak(s).
  - Remove injured persons to the Muster Area.
- Fire Extinguisher Use for Escape
  - Portable fire extinguishers may be used to develop and/or maintain an escape route.
  - When necessary, multiple portable fire extinguishers may be used to develop and/or maintain an escape route.
- Immediately evacuate the area and report to the pre-designated Muster Area for a head count. Account for wind direction and exposure to smoke.
- **Call 911 ASAP** (as soon as safe to do so) to activate emergency first responders and arrange for emergency transportation/medical attention.
- Follow Tug Hill Incident Response and Notification Procedure discussed above.
- Account for all personnel and evacuate the affected area immediately.
- Evacuate all personnel from IDLH atmospheres.

  Initial loss of containment of gas requires an initial minimum safe distance of 330 ft. and large spill of flammable petroleum liquids (e.g., condensate) of 150 ft.
- Never enter an area alone, develop and maintain a buddy system and maintain communications with the Emergency Coordinator at all times.

- Always back away from a fire and monitor its progress. Never put the fire between you and an exit or path of egress.
- Be alert for falling/flying debris and seek refuge.
- Follow other emergency action plans as needed to respond to any issues that occur as a result of the fire.
- Secure all equipment in such a manner so as not to create a hazard to the emergency first responders.
- Maintain a safe distance away from the fire and monitor growth.
- Shield personnel from a possible explosion/blast by seeking refuge behind a solid object.
- If trained, monitor the atmosphere with detecting equipment and avoid areas >20% LEL.
- Monitor weather conditions and wind directions.
- Initiate the Incident Command System, if necessary.
- Follow Evacuation procedures in this ERP and the WSSP.

### 11.1.6 Additional Evacuation Considerations

Follow Evacuation procedures outlined in Section 10.0 in this ERP and the WSSP.

Proceed to the pre-determined primary Muster Point or as directed by the PIC/On-scene IC. The route taken will be determined by the site condition and the prevailing wind. Seek the safest and quickest path to the Muster Point.

Evacuated employees will be immediately accounted for by the Emergency Coordinator, team leader, or somebody assigned by Tug Hill supervision to do so. Anyone unaccounted for at the re-location point will have their names given to the On-scene IC.

The EHS Coordinator or other person designated by the On-scene IC will be responsible for accountability must immediately convey this information. The On-scene IC shall then notify the appropriate resources to search for those unaccounted personnel.

Evacuation of the well pad to the secondary Muster Point is required Level 3 Emergencies involving uncontrolled fires, release of gas or condensate, and/or when there is a potential for explosion or exposure to hazardous atmospheric conditions that present risk to life or health. In such conditions, the PIC/On-Scene IC or EHS Coordinator will call of all personnel to proceed to the pre-determined Secondary Muster Point as per the same directions above.

At the Muster Point, account for personnel. Immediately convey those unaccounted for to the EHS Coordinator or On-scene IC.


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### 11.1.7 Following the Incident

An "All-Clear" signal is given by the On-scene IC/UIC including the fire department when fire and/or hazards have been extinguished and personnel are no longer in danger.
Only after the All-Clear determination can the well pad/site be entered by Tug Hill employees, contractors and visitors.

- Be alert for weakened floors, stairways and structures.
- Fire extinguishers used in the emergency must be re-inspected by a third-party contractor before they may be returned to service.
- Inspect and re-commission all equipment and facilities on location for possible damage caused by heat and/or energy releases before returning to Operations.

Tug Hill EH&S Director will complete an incident investigation at the conclusion of the event and will be responsible for follow-up with governmental agencies as required.


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# WELL CONTROL – Events by Incident Level

## 11.2 WELL CONTROL

### 11.2.1 Level 1 Well Events

Level 1 events involve situations that are either common to routine operations or do not pose significant risk to personnel. In most instances, Level 1 events can be resolved using standard operating/drilling procedures, commonly available equipment, personnel and techniques.

Level 1 examples are included here because they pose the potential for escalation into a Level 2 or 3 event. Level 1 events might include, but are not limited to, the following scenarios:

a) Well "kicks" (influxes) of manageable volume and intensity (usually < 1 ppg) that are not complicated by mitigating circumstances.

b) Mild to moderate loss of circulation

c) Loss of production tubing integrity resulting in sustained pressure on production casing < 50% of casing burst rating. Loss of tubing integrity includes failure of wellhead seals and downhole equipment.

d) Loss of production casing integrity resulting in sustained pressure on intermediate casing < 25% of casing.

e) Burst rating. Loss of casing integrity includes failure of wellhead seals.

f) Pressure release valve trip or other malfunction of Completions, Workover equipment, or facilities.

g) Minor surface leaks at wellhead, flowlines, or production equipment that can be isolated via remote means or accessed and isolated manually without significant risk to personnel. Ambient gas **<20% LEL**.

h) Minor Recordable Injury, moderate Environmental Release, serious Near-Miss Incident

i) DURING CONFINED SPACE WORK, EVACUATE SPACE AT >10% LEL.

### 11.2.2 Level 1 Response

Level 1 events will be corrected through the use of standard industry operating/drilling procedures. No specialized equipment or personnel will be required unless the Level 1 event escalates.

**1.** Drilling Company Man, Completions Site Manager, Production Operator or other Person-in-Charge (PIC) evaluate situation, determine best course of action.

**2.** Follow Tug Hill Incident Response and Notification Procedure. Company Man/PIC/Site Manager to notify Tug Hill Operations Management and Safety Department. Issue Incident First Alert in EHS Insight. EHS Coordinator to report to the scene and complete Incident Submission in EHS Insight.


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**3.** Follow Well Control Protocol.

### 11.2.3 Level 1 Well Control Considerations

- Weighting materials and mud chemicals will be evaluated for kick circulation (consider using driller's method if materials are low or if suspected swabbed kick).
- Monitor surface equipment during kick circulation in order to quickly identify any leaks.
- Monitor pressure on outer casing string during kick circulation in order to quickly identify pressure communication between the strings of pipe.
- Be prepared to immediately close pipe ram if annular begins to leak.
- If productive zones are exposed, monitor well closely for signs of flow during circulation losses.
- Closely monitor outer casing strings if sustained pressure results from tubing or downhole equipment failures.
- Small surface leaks that can be isolated will be isolated remotely if possible. Adequate safety precautions will be in place before approaching even small surface leaks in pressurized equipment and lines.

### 11.2.4 Resuming Work

To resume operations, approval must be granted by the PIC. If this is a site with simultaneous operations ("SIMOPS"), as specified in Roles and Responsibilities section of SIMOPS Plan.



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### 11.2.5 Level 2 Well Control Incident

### 11.2.6 Definition

Level 2 events involve circumstances that are not commonly encountered during routine drilling operations and pose the potential for significant risk to personnel, equipment and/or the environment. A Level 2 event may require specialized well control personnel, equipment and/or techniques in order to be safely resolved.

Examples of Level 2 events include, but are not limited to, the following scenarios:

a) Well kicks complicated by influx size or intensity (under-balance), pipe off bottom, plugged tubing/ drill-string, washout, plugged choke, etc.

b) Severe loss of circulation

c) Loss of production tubing integrity resulting in sustained pressure on production casing >50% of casing burst rating. Loss of tubing integrity includes failure of wellhead seals and downhole equipment.

d) Loss of production casing integrity resulting in sustained pressure on intermediate casing >25% of casing burst rating. Loss of casing integrity includes failure of wellhead seals.

e) Loss of protective casing integrity resulting in sustained pressure on surface casing (any pressure).

f) Wash-out of equipment causing non-well control incident.

g) Activation of pressure relief valve, over-pressurization of a tank.

h) Surface leaks that cannot be easily or safely isolated.

i) Leak on equipment causing **>20% but <50% LEL** alarm triggered; any Medium Risk gas detection per LEL Card.

j) Severe Injury meeting definition of "OSHA Reportable" and requiring medivac or ambulatory services, or third-party threats or acts of terroristic violence.

k) DURING CONFINED SPACE WORK, EVACUATE SPACE AT >25 - <50% LEL.

**IF IT IS DETERMINED THAT UNCONTROLLED LOSS OF CONTAINMENT OF GAS HAS OCCURED PROCEED TO LEVEL 3 INCIDENT.**

### 11.2.7 Level 2 Response

Certain Level 2 events can be dealt with according to established procedures; others require special consideration be given to personnel safety while implementing these procedures as well as specialized techniques. If warranted, the Tug Hill ICP/ERP will be activated for Level 2 events and the appropriate Operations Management and EHS personnel will mobilize to the company office and well site. The Tug Hill response team will remain in engaged until the situation is resolved or downgraded to a Level



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1 event. Specific procedures will be incident circumstance dependent. Basic procedures are outlined below.

Tug Hill Operations Management may opt to advise their contract well control specialists/engineers at the onset of a Level 2 event. As needed, Tug Hill Operations Management will consult with the well control specialists/engineers for advice on safe handling of the situation.

If deemed necessary, arrangements for the mobilization of well control specialists/engineers will be decided upon to ensure the most expedient mobilization route until the Level 2 event is resolved or downgraded to Level 1.

If mobilization of well control specialists/engineers is not deemed necessary, Tug Hill will communicate with the well control contractor's office as deemed appropriate.

### 11.2.8 Level 2 – If Operations Shut-down is required:

**If Drilling, Procedure**

1. Driller pick up off bottom, space out and prepare to shut in well.
2. Activate ESD on producing wells.
3. Driller sound alarm. Continual rig horn blast.
4. Drilling Site Manager establish communication with Completion or Production Supervisor.
5. Drilling Site Manager muster non-essential personnel at muster point. Account for all personnel.
6. Drilling Site Manager & HSE Supervisor investigate and evaluate situation, determine best course of action.

Follow Tug Hill Incident Response and Notification Procedure. Drilling Site Manager notify Drilling, Completions, and Production Coordinator and Safety Department. EHS Coordinator issues Incident First Alert in EHS Insight.

**If Completion, Procedure**

1. Completions Site Manager shut down completion operation.
2. Activate ESD on producing wells.
3. Completions Site Manager establish communication with Operational Supervisors.
4. Completions Site Manager muster non-essential personnel at muster point. Account for all personnel
5. Completions Site Manager investigate, evaluate situation, determine best response.
6. Follow Tug Hill Incident Response and Notification Procedure. Completions Site Manager notify Drilling, Completions, and Production Coordinator and Safety Department. EHS Coordinator issues Incident First Alert in EHS Insight.


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**<u>If Frac Plug DO, Procedure</u>**

1. Driller shut in well.
2. Activate ESD on producing wells.
3. Driller sound alarm. Continual workover rig horn blast.
4. Production Operator establishes communication with Completion or Drilling Supervisor.
5. Production Operator muster non-essential personnel at muster point.
6. Production Operator investigate then evaluate situation, determine best course of action.
7. Follow Tug Hill Incident Response and Notification Procedure. Company Man/PIC/Site Manager to notify Tug Hill Operations Management and Safety Department. Issue Incident First Alert in EHS Insight. EHS Coordinator to report to the scene and complete Incident Submission in EHS Insight.

### 11.2.9 <u>Level 2 Drilling Considerations</u>

1. Weighting materials and mud chemicals will be evaluated for kick circulation (consider using driller's method if material supplies are low or if suspected swab kick).
2. Monitor surface equipment during kick circulation in order to quickly identify any leaks.
3. Monitor pressure on outer casing during kick circulation to quickly identify pressure communication.
4. Be prepared to immediately close pipe ram if annular begins to leak.
5. If productive zones are exposed, monitor well closely for signs of flow during circulation losses.
6. If the thrust created by the current or anticipated surface pressure acting on the cross-sectional area of the pipe approaches or exceeds an amount equal to the buoyed weight of the pipe string, the pipe will be secured at the surface. This may require the use of conventional equipment such as drill pipe clamps, chains and/or cables.
7. The situation may eventually require the use of slip rams and other measures. The well control specialists/ engineers may be consulted and mobilized if such a situation develops.
8. Monitor mud/gas separator equipment for signs of overload while circulating large gas influxes.
9. Consider mobilizing additional liquid mud and loss circulation material (LCM) if conventional lost circulation techniques are ineffective.
10. Consider the possibility of stripping/snubbing of slick bottom hole assembly (BHA) versus perforating or severing drill collars to accommodate high concentration LCM placement and/or barite pills, gunk pills, etc.


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11. Evaluate the possibility of casing failure due to wear as a cause of lost circulation. Note that this could quickly become a Level 3 event if an influx is taken.
12. Consider using temperature log to determine exact point(s) of losses (ambient temperature fluid pumped from the surface will enhance identification)
13. Prepare to deal with gas migration while preparing to strip pipe to bottom (water-based mud systems)
14. Annular BOP failure can be expected while stripping if closing pressure is not reduced. Consult with BOP manufacturer for recommended procedures and practices for stripping.
15. Improper bleed-off during pipe stripping can lead to underground blowouts or additional influxes. Review procedures carefully before attempting to strip pipe to bottom. Allowances must be made for gas migration and influx elongation due to pipe entry in water-based systems.
16. If no pressure increases or a transient pressure fluctuation is observed while lowering pipe (stripping), an underground flow may be in progress. If this is confirmed, a Level 3 event will be declared.
17. If surface pressures are too high for safe stripping operations (including situations where the pipe is "light"), an off-bottom kill will be considered using volumetric and circulation techniques (i.e., volumetric control until influx is above bit then constant bottom hole pressure circulation)

### 11.2.10 Resuming Work

To resume operations, approval must be granted by Tug Hill Operations Management. Additionally, if SIMOPS situation, as specified in Roles and Responsibilities section of SIMOPS Plan.



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### 11.2.11 Level 3 Well Control Events

Level 3 events present serious and immediate risks to personnel, the environment and assets. These situations require the immediate application of specialized techniques and well-developed safety assessment and hazard mitigation programs.

Examples of Level 3 events include, but are not limited to, the following scenarios:

a) Surface blowout (drill-pipe, BOP, production tree, broach, etc. with or without fire).

b) Underground blowout with insufficient casing set so that the well cannot be brought under control by pumping heavy mud simultaneously down the drill-string and annulus using rig pumps.

c) Surface pressure beyond the pressure rating of equipment (including tubulars).

d) Other situations that constitute a clear and present danger to personnel, environment or equipment that cannot be resolved via conventional means.

e) IDLH Situation; Violent Unauthorized Persons on Location; Any Imminent Uncontrolled Threat to Location and Operations (including severe weather).

f) **Uncontrollable release of gas! (>50% LEL in ambient air)**

**In the case of the loss of well control of a gas well, actions should be implemented to protect human life and control the incident as rapidly as possible.**

The Well Pad Sites utilizes blowout prevention (BOP) assemblies and well control systems on each well to assure the safety of Tug Hill employees, contractors, and visitors working on there well sites. These systems are described in the WSSP PART A and associated Attachments.

Level 3 events will warrant the immediate activation of the emergency response plan, mobilization of well control specialists/engineers from Wild Well Control, Inc. and other specialist personnel and equipment. Tug Hill Operations Management will contact well control specialists/engineers immediately upon the determination of a Level 3 incident. Requested well control information will be gathered and provided to Wild Well Control along with any other pertinent and/or related information.

The activities defined in the intervention action plan section of this emergency response plan will be initiated immediately. These include, but are not limited to:

- Personnel will be accounted for and moved to a safe upwind location.
- Medical attention will be provided for any injured personnel.
- The well site will be secured.
- Further notifications by Tug Hill incident command structure (ICS) team.
- Notification to local/state/federal authorities.
- Information gathering and assessment of the situation will be initiated.



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### 11.2.12 Complete or partial rig evacuation is likely under most Level 3 events.

Re-manning of the rig will be attempted only under the direction of on-site well control specialists/engineers.

If the arrival of the well control specialists/engineers is delayed, such action(s) will be discussed in detail and agreed upon with the well control specialists/engineers before being attempted by the Tug Hill COO, Vice President Operations, and EHS Director.

The first task will be to determine the critical aspects of the situation, perform a hazard analysis and establish safe working principles for the intervention (i.e., hot zones, safe areas, access control and accounting, emergency evacuation plans, etc.).

A minimum number of personnel will enter the location.

A well site command center will be designated in a safe area, and all operations will be directed from it. Restrictions will be placed on personnel movement between command post and the rest of the location; personnel accounting procedures will be established to monitor the personnel on location at all times.

Rig evacuation and shutdown will render critical equipment unusable. A plan will need to be developed to identify components that will be required for intervention purposes and to provide sufficient power.

The equipment that may be needed during such an event includes, but is not limited to:

- Draw-works
- Top drive
- Mud pumps
- BOP hoists
- Air/hydraulic winches Hydraulic chokes
- BOP accumulator charge pumps
- Iron roughneck

### 11.2.13 Level 3 Immediate Field Response Actions

While intervention activities will be dictated by an event's severity and magnitude, the immediate response will be consistent and uniform for any event. This action plan does not intend to replace sound logic or engineering judgment — it is a guideline only.

Well control emergencies require common sense and professional judgment on the part of all personnel involved in the intervention.

**1. Evacuate all rig personnel**

- Sound Alarms and/or otherwise notify persons on-site to evacuate the area and re-assemble at the pre-determined Secondary Muster Area(s).
- Evacuate rig and move personnel to designated safe area.
- Account for all on-site personnel.
- DO NOT re-enter area until authorized.
- Secure Location.

**2. Emergency Shut-down**

- Perform Emergency Stop Work and Emergency Shut-Down of equipment and any producing wells on location.
- All fired (or non-intrinsically safe) equipment will be shut down as per established Drilling rig, Completions, Work-Over rig, Flowback contractor guidelines and procedures.
- BOP equipment will be engaged by authorized personnel during the evacuation.
- **NOTE! THE ABOVE ACTIONS WILL ONLY BE UNDERTAKEN IF THEY DO NOT INVOLVE RISK TO THE SAFETY OF PERSONNEL.**

**3. Establish Hot Zone, Warm Zone, and Safe Zone**

**Hot Zone:** Based on various criteria, the area immediately around the wellhead is designated the hot zone. Access to the hot zone is strictly limited to well control personnel. Based on wind and other conditions, the hot zone may change throughout the course of the event. The boundaries will be closely monitored, and changes made accordingly. The safe zone is located away from the well and has minimal impact from the blowout.

**Safe Zone:** The command center will be located within the safe zone. The safe zone will have two means of ingress and egress.

**Warm Zone:** Between the hot zone and the safe zone is the warm zone. Access to the warm zone will be monitored and restricted to essential support personnel only.

**Secure the location and perimeter to prevent area population, news media, etc. from accessing the well site area. Seek assistance from the local police/sheriff agency.**

**4. Initiate fire watch**

Identify any engines that may have been left running. Identify any other possible ignition sources.



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**5. Implement Tug Hill ICP, including Incident Command System and Emergency Response Plan**

- Follow Tug Hill Incident Response and Notification Procedure.
- Company Man/PIC/Site Manager to notify Tug Hill Operations Management and Safety Department. Issue Incident First Alert in EHS Insight.
- EHS Coordinator to report to the scene and complete Incident Submission in EHS Insight.
- The On-Scene IC with contact the designated Incident Command structure to activate Well Control Specialist Contractor(s). See the Emergency Contact List in **PART B – SITE SPECIFIC DATA** section of the WSSP in this binder.
- Once the Incident Commander is on-site, discussions will begin with the Public Information Officer to address issues with the media.

**6. Identify hazardous materials on-site**

Identify the material and location on the well site of any hazardous material. Present information to the well control specialists upon their arrival at the well site.

**7. Monitor well conditions**

Appoint a rig crew member to observe the well from a safe location outside the hot zone and record all changes in the flow at the wellhead. Recorded changes will include changes in flow, noise, etc. The collected information will be important to the well control specialists/engineers in completing their investigation and analysis of the situation.

**8. Implement pollution abatement measures**

Working in the safe zone only, use heavy equipment to establish the safe drainage and storage of well flow away from the wellhead area.

Prevent any well flow runoff from entering any public ditch, drainage, culvert or septic system, streams, waterways, roadways, etc.

A fluid containment plan will be discussed with the well control specialists/ engineers and implemented as quickly as possible.

### 11.2.14 Initial Level 3 evaluation and information gathering

- Utilize **ICS Forms** attached to the ERP to gather information needed by Well Control Specialists.
- Certain information is crucial in developing an effective intervention plan and immediate response. This duty will fall upon Tug Hill 's personnel at the rig. The following information will be gathered and documented so that it can be passed on to well control specialists.



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- Forms from the federal NIMS emergency response program and/or well control forms as provided by the Tug Hill contract well control specialists/ engineers for the collection of this information.
    a) Operation at the time of the incident
    b) Last observed pressures
    c) Present configuration of the well bore – casing, drill pipe, drill collars, packers, depths, geology, fluids, etc. at the time of the incident.
    d) BOP equipment in use at the time of the incident – position of all rams, subsea BOP pod status, and top drive safety valves, etc.
    e) Last known status of wellhead or BOP components – open, closed, locked, damaged, etc.
    f) Rig equipment shutdown level initiated, well control actions implemented.
    g) Estimate of flow rates and flow characteristics (gas and water)
    h) Extent of damage sustained by the rig.
    i) Size and location of any boil at the surface.
    j) Other information as dictated by the situation.

The information from the initial evaluation will be conveyed to Tug Hill contract well control specialists/ engineers for planning purposes and will be included in the permanent records.

In the initial stages, the information will be used to determine the feasibility of a quick resolution (i.e., pumping kill fluids, bridging agents, etc.) if it exists.

If possible, this will be done before the situation deteriorates, eliminating this type of intervention.

### 11.2.15 On-Scene Incident Commander Checklist

- Develop solutions to problems that addresses the following areas of concern:
    - Protection of people
    - Protection of surrounding residents
    - Protection of the environment
    - Protection of Assets
    - Control the Source

- Identify Tasks and Assign Tasks Leaders
- Brief each Task Leader on:
    - Nature and location of task and its relationship to strategy
    - Safety considerations
    - Communication procedures, including chain-of-command


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- Provide Logistics Officer information on un-met resource needs
- Receive safety status reports from Site Safety Officer

11.2.16 Communications

- Work direct reports (e.g., Task Leaders) to establish and maintain tactical network and tactical network communications protocol:
  - Who talks to whom
  - About what
  - When and how
- Work with Deputy On-Scene Commander to establish and maintain command network and command network communications protocol:
  - Who talks to whom
  - About what
  - When and how
- Designate Aide(s) for compiling field and/or setting up and maintaining communication equipment, and/or for providing assistance on technical matters. Answer questions raised by Aide(s) responsible for compiling field reports.
- Provide the IC with field reports approximately 30-45 minutes before IMT assessment meetings; ensure reports provide current information on location of incident facilities, including:
  - Tactical Command Post
  - Logistics
  - Decontamination Stations
  - First Aid Stations
  - Security check points
  - Nature, location and characteristics of spilled/emitted material(s)
  - On-Scene weather
  - Tactical response organization down to task level
  - Strategy
  - Nature and status of tasks broken down by Branch and/or Division
  - "Assigned" resources broken down by logistics
  - Progress being made
  - Problems encountered
  - Needs


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### 11.2.17 Immediate Response Actions – Office

Upon notification from the field, the Incident Commander (the person designated to manage well control emergencies) shall review the information and, if deemed necessary, enact the Tug Hill ICP/ERP which activates the Tug Hill Incident Command team.

An Executive Management Team Command Center will be designated within the Tug Hill offices, if possible, and the designated Command Staff and operations staff shall meet to review the current situation and initiate the various assigned tasks and duties.

The Tug Hill IC or Executive Management will immediately contact the Tug Hill well control contractor to discuss the incident and possible mobilization of well control personnel and equipment.

Discussion with well control specialists regarding the initial mobilization of equipment and personnel will be done at this time. A list of all equipment and services ordered will be noted. Information regarding the location, route details, trucking or flying time and a full manifest, etc. will need to be gathered and properly documented.

### 11.2.18 Environmental Considerations

- Once the emergency is under control, the Emergency EHS&S Coordinator will contact safety and environmental consultants to assess damage and mitigate further damage from occurring. These consultants should be in direct contact with the Incident Commander and other appropriate persons within the Incident Command System.
- Ensure notification requirements are being met by the Emergency EHS&S Coordinator or Public Information Officer to applicable Federal, State, and local regulatory agencies. This will include OSHA, the U.S. EPA Emergency Response Center, and U.S. Coast Guard, if necessary.
- The Emergency EHS&S Coordinator, with the help of safety and environmental consultants, will document the scene and determine root cause of the incident.
- Tug Hill, with the help of safety and environmental consultants, will gather information and prepare responds to the applicable Federal, State, and local regulatory agencies inquires.

# HYDROGEN SULFIDE ($H_2S$) AND COMBUSTIBLE GASES

## 11.3 HYDROGEN SULFIDE ($H_2S$) AND COMBUSTIBLE GASES

The **Tug Hill $H_2S$ Contingency Plan** is included in **PART A – ATTACHMENTS** to this WSSP and included in the ICP binder. The $H_2S$ Drilling Contingency Plan describes the training, equipment, and procedures to be employed in the event that H2S is encountered during drilling operations.

The **$H_2S$ Contingency Plan** is a Companion Document to the Tug Hill WSSP and ICP, as well as the Hydrogen Sulfide section of the Tug Hill Operating Contractor Expectation Manual (CEM). The **$H_2S$ Contingency Plan** has been prepared in accordance with regulatory agency requirements and best industry practices and takes precedence over the ERP.

A summary of action levels and associated responses for $H_2S$ is provided below. The locations of $H_2S$ monitoring stations and emergency equipment are provided in the **WELL SITE SAFETY PLAN PART B** of this ICP binder.

### 11.3.1 Initial Emergency Response

If elevated concentrations of $H_2S$ or combustible gas are detected by either fixed area monitors or on a personal 4-gas monitor, the Company Man/PIC and/or Rig or Frac Manager is to be notified immediately.

| Gas | Tug Hill Procedural Risk Actions |
|---|---|
| **Medium Risk** | |
| $O_2$ >23.5% | Extremely Flammable. No Hot Work. Control and Evacuate |
| $H_2S$ >10 ppm | Stop Work & attempt to identify source |
| $H_2S$ >15 ppm | Evacuate after 5 min. if $H_2S$ remains >15 ppm and uncontrollable |
| LEL > 10% | No Hot Work; Implement intrinsically safe work environment. Notify EHS |
| LEL > 20% | Stop Work. Shut-in or ESD the wells or equipment. Muster until conc. drops |
| CO > 100 ppm | Stop Work. Shut-in or ESD the wells or equipment. Muster until conc. drops |
| **High Risk** | |
| **$O_2$ <18.5%** | **Evacuate to Muster Point. Go to high ground this upwind & watch for wind direction changes. Notify site management and EHS Coordinator. No Re-Entry without approval.**<br><br>**Note: IDLH: $H_2S$ = 100 ppm; CO = 1,200 ppm** |
| **$O_2$ >24.5%** | |
| **$H_2S$ >25 ppm** | |
| **LEL >50%** | |
| **CO >200 ppm** | |
| | |



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Based upon the concentrations detected, area alarm stations will flash either yellow for CAUTION or red EVACUATION or the audible alarm is sounded during an active operation (such as drilling or completions).

**Unexpected $H_2S$ or Combustible Gas Release**

Regardless of the source, the emergency alarm will be audible should be detectable by all personnel on location. All personnel are advised to following these initial guidelines:

- DO NOT PANIC! Identify your best route of escape.
- If available, put on a 5-minute escape unit or Breathing Apparatus, Supplied Air Respirator; (hold your breath while evacuating if supplied air breathing equipment such as 5-minute escape units are not available).
- Rapidly evacuate the area and move upwind or cross wind if possible and evacuate anyone who may be affected by the gas to a safe area.
- Put on air breathing equipment before helping anyone overcome by $H_2S$.
- Assemble at Primary Muster Point or alternate upwind Muster Point and wait to receive instructions.
- Drilling/coring operations remain suspended until the source of $H_2S$ is located and the atmospheric level falls to a level <10 ppm.
- All personnel remaining in the potential danger area are required to wear appropriate respirator protection and have appropriate requisite training and medical clearance to work in hazardous atmospheres while wearing a supplied air respirator.

### 11.3.2 Muster Points

- The Primary Muster Point is located either at the Company Man Trailer or entrance of the pad where the access road meets the pad opening. The Guard Shack on the Access Road to the Pad is the Secondary Muster Point.
- Be cognizant of the wind direction. If the wind direction is towards the Primary Muster location and you are on the upwind side of the $H_2S$ release, use the 5-minute escape pack or SCBA to proceed to the Muster location.
- If you DO NOT have access to an escape pack or SCBA, do your best to communicate to someone who has a radio or to your supervisor of your location and evacuate the pad in the upwind direction.
- Muster Areas will be monitored throughout the response. All personnel not assigned emergency duties will proceed to the Secondary Muster Point or Safe Zone. Personnel must avoid entering areas designated as potential Danger Zone areas as they proceed to the safe-briefing areas.


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- Muster personnel and confirm that all personnel are accounted for based upon Pad sign-in sheet and other records of personnel on location.

### 11.3.3 Incident Reporting and Activation of the $H_2S$ Contingency Plan

- If dangerous levels of $H_2S$ are detected, report the incident as soon as it is safe to do so, pursuant the Tug Hill Incident Response and Notification Procedure and implement the procedures described in the $H_2S$ Contingency Plan.
- After initial assessment of the situation, if $H_2S$ gas is detected and confirmed at sustained concentrations above 10 ppm, the Tug Hill Operations management or the Director EH&S Affairs will notify the County EMA and the WVDEP Inspector. If the Director of EH&S Affairs cannot be reached, the EHS Coordinator or the Company Man will make the notification as soon as practicable.
- If the situation is of immediate danger to life and health, Unfired Command/Incident Command ("UIC") will be established pursuant the Incident Command System (ICS) in the ERP.
- UIC will assess and determine if evacuation is desired and the size of protective zone for local residents (e.g., 1,500 feet from center of pad – See Well Siting Exhibits 1-5 in **WSSP PART B – SITE-SPECIFIC DATA** in this ICP binder.



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# MEDICAL EMERGENCIES/INJURY REPORTING

## 11.4 MEDICAL EMERGENCIES/INJURY REPORTING

This is a summary of the reactions and responses required when there is an illness or injury of personnel on an active well site. This could be one or more of the following emergencies:

- General Illness
- General Injury
- Vehicle collisions with injuries
- Operational accidents
- Fall injury
- Exposures to chemicals or environments

### 11.4.1 Personal Protective Equipment

Universal Precautions include, but are not limited to, one or more of the following: Glasses or face-shield, gown, medical gloves, and facemask.

### 11.4.2 Hazard Analysis

A possibility of exposure to bloodborne pathogens and infectious disease is possible when aiding those who are ill or injured. Proper precautions, training, and equipment shall be used to protect the worker(s) from exposure.

### 11.4.3 Scene Safety

Scene Safety is the ultimate goal of all personnel responding to an ill or injured person. If the scene is not safe, steps should be immediately taken to make it safe before placing additional persons' safety at risk. Responding personnel should initiate the necessary steps to provide for the safety of all personnel. This may include shutting down equipment in the immediate area and securing it in such a manner so as not to create additional hazards.

### 11.4.4 General Illness and Injuries

- Make notifications pursuant the Tug Hill Incident Response and Notification Procedure.
- Conduct a quick initial assessment of the injured personnel and determine the need for off-site emergency first responders and the method(s) of evacuating.


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- Treat the ill personnel based upon reported illness and on level of training of attending personnel.
- Transport the person off-site to see a medical professional if there is uncertainty of condition and perceived potential for condition to worsen.

### 11.4.5 Serious, Critical-Situation Injuries Requiring Immediate Medical Attention

- **CALL 911** to activate first responders. Remember to stay on the line until help arrives, if possible.
- Conduct a quick initial assessment of the injured personnel and determine the need for off-site emergency first responders and the method(s) of evacuating.
- Provide first aid and/or CPR to the injured worker as needed.
- Do not move a person who has suffered serious head, neck or back injury, or who has been injured by caught-between, struck-by incidents, energy releases, of vehicle/equipment accidents, unless safety considerations necessitate movement or transportation to a safer location.
- If bleeding is excessive or life threatening apply continues pressure and/or tourniquet to slow or stop bleeding
- Someone must meet the emergency responders at the access road to the well site. If you are providing first aid to the injured person, send someone to the end of the lease road to meet the emergency responders.
- In the event of a medical emergency requiring helicopter evacuation, an emergency helicopter landing zone must be marked, and all safety precautions must be followed.
- See the Helicopter Landing Zone figure in **Exhibit 3, WSSP PART B – SITE-SPECIFIC DATA** in this ICP binder.
- When help arrives, allow responding units to take control of situation.

### 11.4.6 Vehicle Collisions with Injury

In addition to the above guidelines for Serious, Critical Situation Injuries (shown above), consider the following guidelines:

- DO NOT move persons with severe neck, head, or back trauma unless there is an imminent threat to life by remaining in-place.
- If a life safety threat exists, then the person should be removed from the area regardless of their injuries.
- If the person is trapped in the vehicle, notify outside emergency first responders of the situation.
- Treat the injured personnel based on level of training.
- Make notifications pursuant the Tug Hill Incident Response and Notification Procedure.


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- Drive the damaged vehicle to another location on site if the vehicle is blocking access to the site or movement on the site. The vehicle should only be driven if it is safe to do so. A vehicle should be considered capable of being normally and safely driven if it does not require towing and can be operated under its own power, in its customary manner without further damage or hazard to itself, other traffic elements, or the site.
- Call a tow truck if the vehicle may not be driven to another location.
- Use available equipment appropriately to push or pull the damaged vehicle out of the way if it creates an unsafe condition (e.g., blocking access to the site by emergency vehicles). This should only be done if the time to move the damaged vehicle is less than the time for a tow to arrive, the front loader is capable of moving the vehicle, and the damaged vehicle does not contain a hazardous, flammable or combustible cargo.
- A recovery service or heavy machinery should be summoned if large parts are spilled from the vehicle.
- Remove, secure, repair damaged site equipment.

### 11.4.7 Operational Accidents

In addition to the above guidelines for Serious, Critical Situation Injuries (shown above), consider the following guidelines:

- Secure all equipment in such a manner so as not to create a hazard to the emergency first responders.
- If a life safety threat exists, then the person should be removed from the area regardless of any injuries sustained.
- If the person is trapped, notify outside emergency first responders of the situation.
- Treat the injured personnel based on level of training.
- Make notifications pursuant the Tug Hill Incident Response and Notification Procedure.
- Shut down and then Secure Equipment in affected area using standard emergency shut-down procedures.
- Shut down any other equipment in the immediate affected area at the direction of the PIC/On-Scene IC using standard emergency shut-down procedures.
- Remove, secure, and repair damaged site equipment.

### 11.4.8 Fall Emergencies

In addition to the above guidelines for Serious, Critical Situation Injuries (shown above), consider the following guidelines:

- Conduct a quick initial assessment of the injured personnel and determine the need for off-site emergency first responders and the method(s) of evacuating.
- If self-rescue is possible, provide aid to the victim with ladders, vehicles or other means of removal.
- If the person is removed, conduct a secondary assessment and determine the extent of injuries and need for off-site emergency first responders.
- Note: Moving the person quickly into a horizontal position is likely to cause a large volume of deoxygenated blood to move to the heart, if the worker had been suspended for an extended period. The heart may be unable to cope with the abrupt increase in blood flow, causing cardiac arrest. Some authorities recommend that the person be transported with the upper body raised.
- If the person is trapped, notify outside emergency first responders of the situation.
- If the trapped person is conscious, have him/her:
    - Pump his/her legs to increase circulation.
    - Use a rope ladder or harness steps to relieve stress to legs.
- Notify outside emergency first responders if needed.
- Treat the injured personnel based on level of training.
- Transport the person, if necessary, according to the Transportation Procedure below.
- If rescue services are on-site:
    - Trained personnel should respond.
    - Gather needed equipment.
    - Attempt to safely remove the victim from suspension.
    - Evacuate the victim to the ground.
- Make notifications pursuant the Tug Hill Incident Response and Notification Procedure.
- Shut down any other equipment in the immediate affected area at the direction of the Emergency Coordinator using Emergency Shut-down Procedures.
- Secure all equipment in such a manner so as not to create a hazard to the emergency first responders.
- Assist emergency first responders as required.

### 11.4.9 Exposures to chemicals or environments

In addition to the above guidelines for Serious, Critical Situation Injuries (shown above), consider the following guidelines:

- Conduct a quick initial assessment of the injured personnel and determine the need for off-site emergency first responders and the method(s) of evacuating.
- If safe to do so, remove the victim from the environment and move him/her into a safedry place.
- If personnel are covered in chemical products, remove contaminated clothing, and decontaminate them by putting them in the shower or rinsing with large amounts of water.
- Refer to the product SDS for further information and treatment instructions.
- If the injured party is demonstrating unusual behavior or alter consciousness or has suffered chemical burns, **CALL 911** to activate emergency first responders if needed.
- Treat the injured personnel based on your level of training or those around you.
- Make notifications pursuant the Tug Hill Incident Response and Notification Procedure.

### 11.4.10 Transportation

Transportation of seriously ill or severely injured personnel may be transported in accordance with the following:

1. By Ambulance – The first choice should always be to have seriously ill or severely injured personnel transported to the nearest hospital or medical facility by Ambulance. The Company Man/PIC, On-Scene IC, or EHS Coordinator will notify the emergency services/ambulance dispatcher.
2. By persons trained in First Aid/CPR - The injured personnel may be transported to the nearest hospital or medical facility by persons trained in First Aid/CPR.
3. By Other Worker – Only those injured personnel with no life-threatening injuries may be transported to receive medical attention by a co-worker or person designated by the On-Scene IC, Company Man/PIC, or EHS Coordinator.

   **Note: Injured personnel should not drive themselves to medical care.**

### 11.4.11 Additional Evacuation Considerations

Follow Evacuation procedures outlined in Section 10.0 in this ERP and the WSSP.

Evacuation of the well pad to the secondary Muster Point is required Level 3 Emergencies involving uncontrolled fires, release of gas or condensate, and/or when there is a potential for explosion or exposure to hazardous atmospheric conditions that present risk to life or health. In



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such conditions, the PIC/On-Scene IC or EHS Coordinator will call of all personnel to proceed to the pre-determined Secondary Muster Point as per the same directions above.

At the Muster Point, account for personnel. Immediately convey those unaccounted for to the EHS Coordinator or On-scene IC.

### 11.4.12 Reporting

ALL Level 3 ("Red"; Consequence Levels 5-6 or "RED" in EHS Insight Incident Reporting Module): The Emergency EHS&S Coordinator, Vice President of Operations, and/or Executive Management must be notified immediately if there are multiple injuries that occur from the same incident or if there is a fatality.

### 11.4.13 Following the Incident

- If a critical injury or fatality occurs, the Tug Hill Public Information Coordinator or other designate will inform family of injury or death.
- The completed Incident Investigation Form will be retained in the Tug Hill EHS Insight Incident Module.
- The Tug Hill EH&S Director/Emergency EHS&S Coordinator will implement a root cause investigation.

Tug Hill EH&S Director will complete an incident investigation at the conclusion of the event and will be responsible for follow-up with governmental agencies as required.



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# Process damage from NATURAL DISASTERS

## 11.5 NATURAL DISASTERS

This is a summary of the responses required when there is a disruption or upset in the on-site utilities or processes as a result of Natural Disasters. This could occur from one or more of the following:

- Utility Loss of Power
- Outside Emergency impacting the site
- Weather Emergencies
- Mechanical Failure or defect
- System Failure or defect

### 11.5.1 Hazard Analysis:

A possibility of exposure to conditions, inclement weather, stored energy, faulty equipment, unexpected hazards introduced to the site, and other hazards generated by the loss of production on the worksite.

In case of a natural disaster, be prepared to shut-down Operations or shut-in the wells and move to the safest area, away from falling objects or equipment, then notify the EHS Coordinator.

Listen to weather reports. The National Weather Service will broadcast several types of messages to notify specific locations or general areas of impending or actual severe weather.

### 11.5.2 Floods and Mudslides

A large downpour or several continuous days of rain can cause flooding in low-lying areas and have the potential to cause mudslides. If flooding or mudslides are encountered on-site, along lease roads, or along public roads accessing the site, follow the Tug Hill Incident Response and Notification Procedure and take action to vacate the location safely.

- Monitor streams and drainage channels. Use a fixed point to record fluid levels over time.
- Do not leave loose equipment around the site; especially that which can float.
- Be prepared to remove computers and sensitive electronics.
- Avoid flood waters and electrical equipment that may be tied to electrical lines laying in water.


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- If evacuation is required, shut-down all machinery and electrical energized equipment. Take laptop computers, extra clothes, supplies, food, water, communication equipment and critically important documents.
- Avoid driving or walking through water of undetermined depth. They may be deeper than you perceive, and roads can be washed out, especially when near topographical drop-offs.

### 11.5.3 Lightning

Thunderstorms often generate lightning that can harm personnel and/or damage buildings and Operational rigs, Production facilities and equipment. Stay inside structures or a vehicle until the storm ends and avoid using phones and electronic devices if you are outside.

**When lightning is estimated to be within 3 miles** and travelling in the direction of the work site, the Company Man/PIC has the discretion to stop work if an imminent threat is apparent.

- Seek shelter indoors, in a vehicle, or crouch down (not lying) in a low place.
- Avoid water, single tall objects, and anything metal.
- Groups of people exposed and in the open should spread out.
- Turn-off electronics and sensitive electronic equipment.
- Avoid the use of plumbing.

Work may not resume until the imminent danger of lightning strikes has passed based upon weather alerts.

### 11.5.4 Tornados

Severe Weather/TORNADO WATCH means meteorological conditions are favorable for severe weather and the formation of tornadoes. Severe Weather/TORNADO WARNING means severe weather and tornado has actually been sighted.

Tornadoes generally occur near the trailing edge of a thunderstorm. Monitor weather conditions and forecasts for the area.

Indicators that a tornado is possible:

- Large Hail
- A large dark, low-lying cloud (particularly if rotating)
- Loud roar, similar to a freight train
- Dark and discolored clouds


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When under a Severe Weather/TORNADO WARNING in the immediate vicinity of the well pad:

- Cease operations if a tornado is sighted or if weather forecasts indicate that a tornado is heading toward the site.
- Secure outdoor objects that could blow away and cause damage.
- Move into a low-lying area or available storm shelter or take cover near objects that are low and securely anchored to the ground, such as culverts or low retaining walls.
- Take cover in a nearby ditch or depression. Wear your hard hat and cover your neck with your hands. Wear your gloves.

**Note: A vehicle, trailer or mobile home is not acceptable cover. No personnel should take cover in the drilling rig or site trailers. An interior room of a structure is an acceptable shelter area.**

- Monitor the movement of the tornado and confirm is has travelled out of the area.
- Notify the Emergency EHS&S Coordinator and the EHS Coordinator.
- Do not leave protective cover or resume operations until the Tornado Warning has been lifted for the area.

### 11.5.5 Earthquakes

Earthquakes occur without warning. Some earthquakes are instantaneous tremors and others are significant sustained events followed by aftershocks. Individuals should take emergency action immediately and additional actions will be implemented after the earthquake stops.

If outdoors:

- If you can, move away from on-site structures, equipment, and utility wires.
- Once in the open, drop, cover, and hold on until the shaking stops.

If in a moving vehicle:

- Stop as quickly as safety permits and stay in the vehicle. Avoid stopping near or under buildings, trees, overpasses, and utility wires.
- Proceed cautiously once the earthquake has stopped.
- Avoid roads with sharp topographical drop-offs and routes that might have been damaged by the earthquake.

Be prepared for aftershocks. Although smaller than the main shock, aftershocks cause additional damage and may bring weakened structures down. Aftershocks can occur in the first hours, days, weeks, or even months after the earthquake. Follow the same procedures as for earthquakes.


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### 11.5.6 Post-Earthquake Procedures:

Subsequent to an earthquake event, components of the facility will require inspection, testing, gas monitoring, and documented re-commissioning. Inspection and re-commissioning shall include, at a minimum:

- Determining integrity of BOPs, ESDs, and Production equipment.
- Monitoring of flanges, valves, and fittings using leak detection meters or infrared cameras.
- Pressure testing flowlines and production equipment.
- Testing completions related piping, connections, and other equipment.
- Check storage tanks containing fuel, Condensate, NGLs, chemicals, and Produced Water.

Inspections are to achieve final approval from the manager of Drilling and Completions or Production before resuming operations. See also local and state codes and standards.



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# Level 3 SPILL OR FLUID RELEASE events

## 11.6 LEVEL 3 SPILL OR FLUID RELEASE EVENTS

The purpose of the procedures described below is to provide the guidance to facilitate the rapid deployment of resources during severe spill Level 3 events ("Red"; Consequence Levels 5-6 or "RED" in EHS Insight Incident Reporting Module) that present serious and immediate risks to personnel, assets, the surrounding community, and environment onsite and likely offsite as well. These situations require the immediate application of specialized techniques and well-developed safety assessment and hazard mitigation programs.

Each employee at the Tug Hill well pads is required to be familiar with the response procedures and their responsibilities related to this Plan.

### 11.6.1 Description

This is a summary of the reactions and responses required when there is a hazardous substance and environmental emergency on an active well site. This could be an uncontrolled release of one or more of the following emergencies:

- Fuels, Condensate, or Oil Spill
- Acids or other chemicals defined as a "Hazardous Substance"
- Other chemicals having a regulatory-defined reportable quantity (RQ)

### 11.6.2 Hazard Analysis

A possibility of exposure to chemicals or fluids possessing physical or chemical properties that are hazardous, toxic, or present risk to human health or aquatic life. Refer to DOT Emergency Response Guidebook or SDS for specific hazards and precautions.

### 11.6.3 Personal Protective Equipment

As required for specific tasks. Required equipment may include chemical protective clothing and respiratory protection. Only trained personnel should engage in these activities.

Under no circumstances are spills of materials that constitute a **hazardous waste** to be cleaned-up by workers not trained in hazardous waste operations pursuant to OSHA regulation.

### 11.6.4 Initial Spill-Related Emergency Response Actions

- Notify personnel in the immediate area that a spill has occurred.
- Issue Stop Work and, if necessary, cease Operations.


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- Evacuate employees from the area and restrict entry into the area.
- Implement the Tug Hill Incident Response and Notification Procedure.
- In the event of an emergency caused by flooding, tornado, extreme snow, or acts of terrorism, remember these four simple guidelines:
    - Protect yourself.
    - Protect others.
    - Protect property.
    - Protect the Environment.
    - Make notifications as listed above.
- Never touch or smell any spilled material.
- Stay upwind of unknown spilled material and do not approach closer than necessary.
- Note any other chemicals stored in the immediate vicinity of the release (e.g., oxidizers and reactive chemicals), as other products may adversely react with the spilled material.
- If it safe to do so:
    - Attempt to define the area of the facility affected by the spill.
    - Contain the leak and/or spill with absorbent material, diking material, or soil, if necessary, providing containment can be done safely.
    - Identify and then stop the source of the spill.
- If there is any danger of a spill of any kind eventually reaching soils or surface waters, the following actions are to be taken immediately:
    - Deploy absorbents or spill sock/booms to control the migration.
    - Use earth moving equipment to create a earthen berm downgradient of the spill to prevent impact to a stream or waterbody or sensitive environ.
    - Assist with moving equipment to facilitate the cleanup contractors.
- Limit access to the site to persons involved in the emergency response.

### 11.6.5 Spill Countermeasures

Tug Hill has established agreements with response contractors (Contact numbers are provided in the **Emergency Contact List, WSSP PART B – SITE SPECIFIC DATA** section of this ICP binder).

Upon assessment of the spill incident, the Emergency EHS&S Coordinator or another member of the IC structure may activate one or more of the contractors to contain and/or remove the contaminated soil if it is determined that the response cannot be handled in-house.

The Tug Hill Director, EH&S Affairs and the EHS Coordinators, will manage clean-up activities of all Level 3 (e.g., major and severe release events per classification).


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If a Tug Hill Production Well Pad, following the Countermeasures and other procedural; requirements of the SPCC Plan for the site.

### 11.6.6 Off-Site Spills and Releases

Limiting off-site impacts to land of third parties and waterways are initial objectives. If the spill site is within or threatens to impact a waterway, rapid response is critical to prevent negative impact to water supplies.

For off-site spills or releases of chemicals or waste along public roadways:

- Follow the response and notification procedure which is appropriate for the severity of the incident. Refer to the Incident Response and Notification Procedure.
- If safe to do so and properly trained, attempt to stop and/or contain the release, and prevent the released material from entering sewers, ditches, or surface water.
- If there is an imminent risk of fire, explosion, or a condition that is immediately dangerous to life or health (IDLH), call 911 immediately.

The Director of EHS Affairs or Tug Hill management will determine whether Tug Hill will defer the remedial response to the contractor or lead the response actions. The EHS Coordinator will initiate contact with the West Virginia Department of Environmental Protection (WVDEP) and the local municipality or County EMA, notify a Tug Hill-approved remediation contractor, and arrange for traffic control to divert traffic around the incident location.

### 11.6.7 Restoration

Restoration of remediated areas located on the well pad will be performed by or at the direction of Tug Hill EH&S Director. Affected areas located within the limits of disturbance of the well pad or access road will be restored to as close to original condition as possible by Tug Hill -approved contractors under the direction of Tug Hill Operations or Director of EHS Affairs.

Restoration of off-site property and public roadways will be performed by the contractor involved in the incident, or Tug Hill -approved contractors in conjunction with stipulations of regulatory authorities (e.g., WVDEP, WVDOH, U.S. Coast Guard, and/or local agencies).

### 11.6.8 Agency Reporting

As applicable, pursuant to WVDEP spill and release reporting requirements, releases of petroleum and hazardous substances will be reported to the WVDEP Emergency Spill Reporting line. This determination will be made by the Tug Hill Director of EH&S Affairs and/or other company management representative.

In the event of a major chemical release, the County Office of Emergency Management (OEM) will be notified by the Director of EHS Affairs or the 911 dispatcher. If required, notification or


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evacuation of local residents will be coordinated with the County OEM, following the Evacuation Procedures described in this ERP.

In accordance with 40 CFR 302.6, those spill or release events involving a regulatory-defined reportable quantity (RQ) and/or releases to waters of the state will also trigger reporting to the **National Response Center** (**NRC**) **at 1-800-424-8802**.

### 11.6.9 Recordkeeping

The EHS Coordinator and contractors involved in the remediation and restoration will maintain a record of activities, contacts and quantities of labor hours and materials associated with the response. The records will be submitted to Tug Hill Director of EH&S Affairs.

# PERSONAL THREATS AND WORKPLACE VIOLENCE

## 11.7 PERSONAL THREATS AND WORKPLACE VIOLENCE

No one can predict human behavior and there is no "specific profile" of a potentially dangerous individual(s); however, indicators of increased risk of violent behavior have been identified by the Federal Bureau of Investigation's (FBI) National Center for the Analysis of Violent Crime, Profiling, and Behavioral Assessment Unit in its analysis of past incidents of workplace violence.

These are some of the indicators of hostility:

- Direct or veiled threats of harm.
- Intimidating, belligerent, harassing, bullying, or other inappropriate and aggressive behavior.
- Numerous conflicts with supervisors and other employees.
- Bringing a weapon to the workplace, brandishing a weapon in the workplace, making inappropriate references to guns, or fascination with weapons.
- Statements showing fascination with incidents of workplace violence, statements indicating approval of the use of violence to resolve a problem or statements indicating identification with perpetrators of workplace homicides.
- Statements indicating desperation (over family, financial and other personal problems) to the point of contemplating suicide.
- Drug and/or alcohol abuse.
- Extreme changes in behaviors.

Each of these behaviors could be a clear sign that something is wrong. **None should be ignored.** By identifying the problem and dealing with it appropriately, Tug Hill employees, contractors, and visitors may be able to prevent violence from happening.

Some behaviors require immediate police or security involvement; others constitute actionable misconduct and require disciplinary action. **In either case, CALL 9-1-1; contact your supervisor or the Emergency EHS&S Coordinator immediately if you feel threatened by another employee(s), visitor(s) or intruder(s).**


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# BOMB THREATS

## 11.8 BOMB THREATS

In the event someone is alerted to or notified of a potential bomb threat:

- **CALL 911** and follow the Tug Hill Incident Response and Notification Procedure.
- Help personnel **REMAIN CALM** and stay together.
- Do not evacuate the buildings or well pad sites unless instructed to do so by Police or emergency management personnel in charge.
- As soon as possible, notify the EHS Coordinator and the Emergency EHS&S Coordinator. The EHS Coordinator will initiate the Incident Notification procedure.
- The PIC or Director, EH&S Affairs, will notify the Tug Hill Executive Management Team ASAP.

### 11.8.1 Bomb Threat Event Details

If the threat is received in person or on the phone, the person should note the following information, if provided:

1. When is the suspected item going to explode?
2. Where is it right now?
3. What does it look like?
4. What kind of suspected item is it?
5. What will cause it to explode?
6. Did you place the suspected item?
7. Why?
8. What is your name?
9. What is your address?
10. What is your phone number?

**NOTE: DO NOT hang up your phone (a trace may be possible).**



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### 11.8.2 Bomb Threat Specifics

The receiver of the threat should note as many details as possible:

- Make notes of the exact words of the caller.
- Time of call.
- Background noises (e.g., street noises, bells, whistles, horns, banging, engines or motors running, voices, music, machinery, echoing)
- Description of caller's voice, does it sound familiar?
- Did the caller appear to be familiar with the site or facility?
- Description of caller's language skills (well spoken, educated, foul, irrational, incoherent, accent and/or taped).

### 11.8.3 Suspicious Items Encountered

**Precautions:**

- Do not disturb or touch a suspect item.
- Notify Tug Hill employees, contractors, and visitors, immediately.
- Do not use radios in close proximately to suspected bombs.
- If a suspected threat letter is opened, do not let anyone else touch the letter or envelope; place it in a bag, larger envelope, between clean pieces of paper, etc. and turn over to law enforcement for fingerprints and other tests.

### 11.8.4 Person Who Received the Call or Threat

- Document your Name, Phone, and Address, Employer
- Document where the call or threat was received or observed. If received by phone, specify the phone number and owner of the phone.
- Make notes to best of recollection of all details.
- Use complete sentences and full names.
- Provide additional comments such intuition and perceptions, but do not speculate nor use inflammatory terms.

# Attachments

# INITIAL INCIDENT RESPONSE AND NOTIFICATION PROCEDURE
## Tug Hill - Appalachia Based Operations

This procedure is designed for **INITIAL** internal reporting as a quick start guide to the Tug Hill WSSP/ERP/$H_2S$/SPCC/Stormwater Plans (which is part of the Tug Hill Integrated Contingency Plan or "ICP"). Please refer to the ICP for detailed instructions.

**ALL incidents (e.g., near-miss, injuries, truck accidents, vandalism, acts of violence, pollution control malfunction), and spills/releases (e.g., gas leaks, fluid spills of chemicals, fuels, brine, & other hazardous materials used, stored, produced, or transported) must be reported following the flow-chart below. Enter the event in EHS Insight First Report and follow-up with EHS Coordinator.** Reporting to agencies will be performed by the Tug Hill Director of EH&S Affairs or a designee.

**REPORT ALL INCIDENTS ASAP EVERY TIME**

1. **UNCONTROLLED FIRE, EMERGENCY or SERIOUS INJURY ➡ CALL 911**
2. **Emergency Number: 1-800-921-9745 (for External Use)**
3. **ALL INCIDENTS: Follow Reporting Below (for Internal Use)**

**Actions ⬇** **⬇ Reporting**

Observer of incident is to ***immediately*** contact **Tug Hill Company Man** or Tug Hill Person-in-Charge (PIC) and Contractor's Supervisor

For Spills, Stop and/or contain material and consult with EH&S

**Take these containment and clean up actions only if they can be performed safely**

**Small, Minor to Moderate Spill Events**

Clean-up with onsite personnel and equipment

EHS Coordinator is responsible for confirming clean-up is complete

Observer of incident is to ***immediately*** enter **First Report** into **EHS Insight** and call Tug Hill EHS Coordinator

Tug Hill EHS Coordinator to contact Tug Hill Operations Superintendent, Director or PIC to ensure collaboration

**Larger, Major, More Serious/Significant and Crisis Spill Events**

EH&S group to coordinate and manage clean-up and response actions using qualified response contractor pursuant to the Tug Hill ICP

Tug Hill EHS Coordinator to complete **EHS Insight Incident Submission** step and contact Tug Hill EHS Superintendent or Director

**Tug Hill Director** of EH&S to notify WVDEP via telephone **within 2 hours** of incident involving leak, spill or release of material

Tug Hill Director of EH&S to provide WVDEP with email followup **within 24 hours**

**Tug Hill EHS Coordinators**

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**Tug Hill EHS Superintendent**

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kwalz@tug-hillop.com

**Tug Hill Director, EH&S Affairs**

Jerry DeRosa: 412-736-5767 (c)
jderosa@tug-hillop.com

**WVDEP Hotline**
800-642-3074

**WVDEP Inspectors**
**Strader Gower – Marshall**
304-993-6188
**Stephen McCoy – Wetzel**
681-344-3265

**Marshall Co. EMA 24 hr.**
304-845-1920
**Wetzel Co. EMA 24 hr.**
304-455-6730

**Continue attempting contacts until a person is reached.**

**Voicemail, texts, emails are NOT sufficient contact.**

- Enter the **FIRST REPORT** into EHS Insight. EHS Coordinator will report to site & collect details for Report **SUBMISSION** and will support Operations management with response actions.
- For all events requiring Muster, activate and follow the **Tug Hill Well Site Safety Plan (WSSP).**
- **For Immediately Dangerous to Life or Health (IDLH)** conditions, off-site Muster, or when involving state or federal Emergency Response Agencies, activate and follow the **Tug Hill Emergency Response Plan (ERP) attached to the WSSP.**

## All incidents are to be recorded in the EHS Insight database.

Incident Reporting is a several step process. The first two (2) steps combined comprise the initial reporting:

- Step 1: **First Alert/First Report** – All personnel have a responsibility to make the First Report ASAP and contact the on-duty EHS Coordinator.
- Step 2: **Submission step** – the EHS Coordinator will report to the site and gather incident details. Complete:
  - **ASAP:** (e.g., within time less than 2 hours)
  - **Routinely:** Before the end of the shift
  - **ALWAYS:** No later than within **24 hours** (unless approved by the EHS Superintendent or EHS Director).

## Incident Severity Determination

- Incident severity will be determined pursuant to the **Incident Risk Matrix** in EHS Insight Step 2, Incident Details Submission. EHS Coordinators will enter the severity on the matrix when completing Step 2.
- High Severity Incidents, Hi-Potential Near Miss, and Reportable Injuries will typically require investigation.

## Spill Response Guide for Contractor Selection

Pursuant CEM and the Tug Hill Incident Response and Notification Procedures, clean-up of reportable spills, especially larger, higher severity spill events, will be managed and coordinated by the EHS Department. When deemed necessary, the EHS Department will engage a professional environmental spill response Contractor to perform the response action. Approved spill response contractors shown on the Operations Emergency Contact List and found in the ICP and the SPCC Plan.

Reportable spills, and those considered larger and higher severity events are those that trigger a reporting requirement, and one of the following:

a) Spills off containment sufficient to have the potential in impact surface and/or groundwater (e.g. >1 bbl.).
b) The release of outside the confines of berms on the Operations pad and/or the permitted Limit of Disturbance.
c) The release will likely result in contaminated soils requiring excavation based upon state requirements.
d) The release that may result in a Notice of Violation (NOV) issued from the state or federal government.
e) The release is into a water body and/or in defined protect environ (e.g. Zone of Critical Concern or wetland).

Smaller spills may be cleaned-up by personnel on location if the spill is within certain specific parameters.

Under no circumstances, however, are spills of materials that constitute a "**hazardous waste"** to be cleaned-up by workers not trained in hazardous waste operations pursuant to OSHA regulation.

Contractors are to comply with all relevant and applicable regulations regarding spills and releases of pollutants and hazardous chemicals as defined by federal, state, and local laws and regulations. Contractors shall additionally adhere to any Tug Hill-issued policies and procedures pertaining to the work performed including, but not limited to the following:

- **Tug Hill Integrated Contingency Plan (ICP) binder contains the**
  - **Well Site Safety Plan (WSSP)** (Drilling and Completions Sites only)
  - **Emergency Response Plan (ERP)**
  - **Incident Command System (ICS)**
  - **Hydrogen Sulfide Contingency Plan**
  - **Spill Prevention and Countermeasure Plan (SPCC) / Spill Prevention and Response Plan (SPRP)**
- **Storm Water Management Plans and Groundwater Protection Plans (GPP)** (where applicable)
- **The Tug Hill Operating Contractor Expectation Manual (CEM)** (see the Incidents section).

# U.S. DOT Emergency Response Guidebook

## Guide 115 – Gases Flammable

## Guide 130 – Flammable Liquids

# GUIDE 115 Gases - Flammable (Including Refrigerated Liquids)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- **EXTREMELY FLAMMABLE.**
- Will be easily ignited by heat, sparks or flames.
- Will form explosive mixtures with air.
- Vapors from liquefied gas are initially heavier than air and spread along ground.

**CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966), Methane (UN1971) and Hydrogen and Methane mixture, compressed (UN2034) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)**

- Vapors may travel to source of ignition and flash back.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

### HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Some may be irritating if inhaled at high concentrations.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire may produce irritating and/or toxic gases.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection**.
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

### EVACUATION

**Immediate precautionary measure**

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

**Large Spill**

- Consider initial downwind evacuation for at least 800 meters (1/2 mile).

**Fire**

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.
- In fires involving Liquefied Petroleum Gases (LPG) (UN1075), Butane (UN1011), Butylene (UN1012), Isobutylene (UN1055), Propylene (UN1077), Isobutane (UN1969), and Propane (UN1978), also refer to BLEVE – SAFETY PRECAUTIONS (Page 366).

In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

### FIRE

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

**CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Hydrogen and Methane mixture, compressed (UN2034) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)**

**Small Fire**

- Dry chemical or $CO_2$.

**Large Fire**

- Water spray or fog.
- If it can be done safely, move undamaged containers away from the area around the fire.

**CAUTION:** For **LNG - Liquefied natural gas (UN1972)** pool fires, DO NOT USE water. Use dry chemical or high-expansion foam.

**Fire Involving Tanks**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

### SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.

**CAUTION:** For **LNG - Liquefied natural gas (UN1972)**, DO NOT apply water, regular or alcohol-resistant foam directly on spill. Use a high-expansion foam if available to reduce vapors.

- Prevent spreading of vapors through sewers, ventilation systems and confined areas.
- Isolate area until gas has dispersed.

**CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.**

### FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Clothing frozen to the skin should be thawed before being removed.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.

# GUIDE 130 Flammable Liquids (Water-Immiscible/Noxious)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.**
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a **(P)** may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids will float on water.

### HEALTH

- May cause toxic effects if inhaled or absorbed through skin.
- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or asphyxiation.
- Runoff from fire control or dilution water may cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection**.

### EVACUATION

**Immediate precautionary measure**

- Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

**Large Spill**

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

**Fire**

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

## EMERGENCY RESPONSE

### FIRE

**CAUTION: The majority of these products have a very low flash point. Use of water spray when fighting fire may be inefficient.**

**Small Fire**

- Dry chemical, $CO_2$, water spray or regular foam.

**Large Fire**

- Water spray, fog or regular foam.
- Avoid aiming straight or solid streams directly onto the product.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

### SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Use clean, non-sparking tools to collect absorbed material.

**Large Spill**

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

### FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# Blank IADC Well Control and Kill Sheet

# IADC WellCAP Well Control Worksheet
# Surface Stack - Wait and Weight Method

IADC

**Well Name:** _____ **Completed By:** _____ **Date:** ____ / ____ / ____

## PRE-RECORDED INFORMATION

**TRUE PUMP OUTPUT:** _____ (m³/Stk @ 100%) x _____ (% Efficiency) = _____ (TPO (m³/Stk))

Surface Line: _____ (m³) Surface Line Capacity ÷ _____ True Pump Output (m³/Stk) = _____ Strokes to Pump

**DRILL STRING CAPACITY:**

Drill Pipe #1: _____ Size (mm) _____ Weight (kg/m) _____ m³/m x _____ Length (m) = _____ m³ DP

Drill Pipe #2: _____ Size (mm) _____ Weight (kg/m) _____ m³/m x _____ Length (m) = _____ m³ DP

HWDP: _____ Size (mm) _____ Weight (kg/m) _____ m³/m x _____ Length (m) = _____ m³ HWDP

Drill Collars #1: _____ Size (mm) _____ Weight (kg/m) _____ m³/m x _____ Length (m) = _____ m³ DC

Drill Collars #2: _____ Size (mm) _____ Weight (kg/m) _____ m³/m x _____ Length (m) = _____ m³ DC

_____ Total Drill String Capacity (m³)

**STROKES FROM SURFACE TO BIT:**

_____ Total Drill String Capacity (m³) ÷ _____ True Pump Output (m³/Stk) = _____ Strokes, Surface to Bit

**ANNULAR CAPACITY:**

Between CSG and DP: _____ m³/m x _____ m = _____ m³

Between Liner #1 and DP: _____ m³/m x _____ m = _____ m³

Between Liner #2 and DP: _____ m³/m x _____ m = _____ m³

Between OH and DP/HWDP: _____ m³/m x _____ m = _____ m³

Between OH and DC: _____ m³/m x _____ m = _____ m³

**STROKES FROM BIT TO SHOE:**

_____ Open Hole Annular Vol. (m³) ÷ _____ True Pump Output (m³/Stk) = _____ Strokes, Bit to Shoe

**STROKES FROM BIT TO SURFACE:**

_____ Total Annular Volume (m³) ÷ _____ True Pump Output (m³/Stk) = _____ Strokes, Bit to Surface

**TOTAL STROKES FROM SURFACE TO SURFACE:**

_____ Strokes, Surface to Bit + _____ Strokes, Bit to Surface = _____ Strokes, Surface to Surface

**MAXIMUM ALLOWABLE FLUID DENSITY (kg/m³)**

[_____ Surface LOT Pressure (kPa) ÷ ( _____ Shoe TVD (m) x 0.00981)] + _____ LOT Fluid Density (kg/m³) = _____ kg/m³ MAX. ALLOWABLE FLUID DENSITY

**MAXIMUM ALLOWABLE ANNULAR SURFACE PRESSURE (MAASP) (kPa)**

( _____ Max. Allowable Fluid Density (kg/m³) - _____ Current Fluid Density (kg/m³) ) x 0.00981 x _____ Shoe TVD (m) = _____ kPa MAX. ALLOWABLE ANNULAR SURFACE PRESSURE

## CURRENT WELL DATA

**PRESENT MUD WEIGHT:** _____ kg/m³

**SLOW CIRCULATION RATE (SCR):**

SCR taken @ _____ (m)

| | Stks/min | Pressure(kPa) | m³/min | Pressure(kPa) |
|---|---|---|---|---|
| Pump #1 | | | | |
| | | | | |
| | | | | |
| Pump #2 | | | | |
| | | | | |
| | | | | |
| Pump #3 | | | | |
| | | | | |
| | | | | |

**CASING DATA:**

CASING _____ size, _____ ID, _____ weight

SHOE DEPTH @ MD / TVD _____ / _____ m

**SHOE TEST DATA:**

Depth #1 _____ (kPa) @ Test MW of _____ (kg/m³)

Depth #2 _____ (kPa) @ Test MW of _____ (kg/m³)

Depth #3 _____ (kPa) @ Test MW of _____ (kg/m³)

LINER #1 _____ size, _____ ID, _____ weight

LINER #2 _____ size, _____ ID, _____ weight

LINER #1 TOP DEPTH _____ m

LINER #2 TOP DEPTH _____ m

LINER #1 SHOE DEPTH _____ m

LINER #2 SHOE DEPTH _____ m

TVD CASING or LINER _____ m

**HOLE DATA:**

TOTAL DEPTH (MD) _____ m

TOTAL DEPTH (TVD) _____ m

BIT DEPTH @ MD / TVD _____ / _____ m

BIT SIZE _____ inches

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04/14/2023

# KICK DATA

**SIDPP:** _____ **kPa** **SICP:** _____ **kPa** **PIT GAIN:** _____ **m³** **Time of Incident:** ____ : ____

# CALCULATIONS

**KILL FLUID DENSITY (kg/m³)**

[ _____ ÷ ( _____ **x** 0.00981)] **+** _____ **=** _____ kg/m³ KILL FLUID DENSITY

SIDPP (kPa) TVD (m) Current Fluid Density (Kg/m³)

**INITIAL CIRCULATING PRESSURE (ICP)**

_____ **+** _____ **=** _____ kPa INITIAL CIRCULATING PRESSURE

SIDPP (kPa) Pump Pressure (kPa) @ SCR of _____SPM

**FINAL CIRCULATING PRESSURE (FCP)**

_____ **x** _____ **÷** _____ **=** _____ kPa FINAL CIRCULATING PRESSURE

Pump Pressure (kPa) @ SCR of _____SPM Kill Mud Weight (kg/m³) Present Mud Weight (kg/m³)

# PRESSURE CHART

| Stroke or Volume | Theoretical Drill Pipe Pressure | Actual Drill Pipe Pressure | Actual Casing Pressure | Actual Pit Volume Deviation |
|---|---|---|---|---|
| SURFACE 0 | ICP | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| BIT | FCP | | | |

_____ **÷ 10 =** _____ (Strokes Surface to Bit / Strokes per Step)

_____ **-** _____ **÷ 10 =** _____ (Initial Circulation Pressure / Final Circulation Pressure / PSI per Step)

| | | | | |
|---|---|---|---|---|
| BIT | FCP | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| SURFACE | | | | |

_____ **÷ 10 =** _____ (Strokes Bit to Surface / Strokes per Step)

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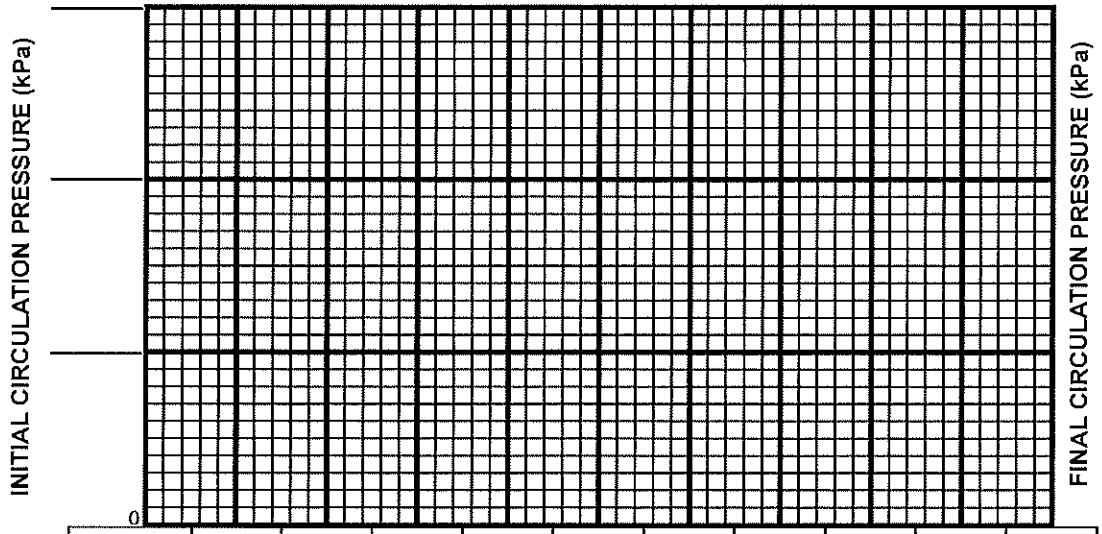
# GRAPHIC ANALYSIS




| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Stroke | | | | | | | | | | |
| Pressure | | | | | | | | | | |
| Time | | | | | | | | | | |

1. Pressure Gradient (kPa/m) = Fluid Density (kg/m³) x 0.00981

2. Hydrostatic Pressure (kPa) = Fluid Density (kg/m³) x 0.00981 x TVD (m)

3. Capacity (m³/m) = Inside Diameter$^2$ (mm) ÷ 1273

4. Annular Capacity (m³/m) = (Inside Diameter of Casing$^2$ (mm) or Hole Diameter$^2$(mm) - Outside Diameter of Pipe$^2$ (mm)) ÷ 1273

5. Pipe Displacement (m³/m) = (Outside Diameter of pipe$^2$ (mm) - Inside Diameter of pipe$^2$ (mm)) ÷ 1273

6. Maximum Allowable Fluid Density (kg/m³) = $\frac{\text{Surface LOT Pressure (kPa)}}{\text{Shoe TVD (m)} \times 0.00981}$ + LOT Fluid Density (kg/m³)

7. MAASP (kPa) = [Maximum Allowable Fluid Density (kg/m³) - Current Fluid Density (kg/m³)] x 0.00981 x Shoe TVD (m)

8. Pressure Drop per Metre Tripping Dry Pipe (kPa/m) = $\frac{\text{Drilling Fluid Density (kg/m}^3\text{)} \times 0.00981 \times \text{Metal Displacement (m}^3\text{/m)}}{\text{Riser/Casing Capacity (m}^3\text{/m)} - \text{Metal Displacement (m}^3\text{/m)}}$

9. Pressure Drop per Metre Tripping Wet Pipe (kPa/m) = $\frac{\text{Drilling Fluid Density (kg/m}^3\text{)} \times 0.00981 \times \text{Closed End Displacement (m}^3\text{/m)}}{\text{Riser/Casing Capacity (m}^3\text{/m)} - \text{Closed End Displacement (m}^3\text{/m)}}$

10. Formation Pressure (kPa) = Hydrostatic Pressure Mud in Hole (kPa) + SIDPP (kPa)

11. Equivalent Circulating Density (kg/m³) = $\frac{\text{Annular Pressure Loss (kPa)}}{\text{TVD (m)} \times 0.00981}$ + Fluid Density (kg/m³)

12. Kg of Barite Needed to Weight-Up Mud = $\frac{\text{m}^3\text{ of Mud in System} \times 4250 \times (\text{KMW} - \text{OMW})}{(4250 - \text{KMW})}$

13. Volume Increase from Adding Barite (m³) = $\frac{\text{Kg of Barite Needed to Weight-Up Mud}}{4250}$

14. Estimated New Pump Pressure at New Pump Rate (kPa) = Old Pump Pressure (kPa) x $\left[\frac{\text{New Pump Rate (SPM)}}{\text{Old Pump Rate (SPM)}}\right]^2$

15. Estimated New Pump Pressure with New Mud Weight (kPa) = Old Pump Pressure (kPa) x $\frac{\text{New Mud Weight (kg/m}^3\text{)}}{\text{Old Mud Weight (kg/m}^3\text{)}}$

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04/14/2023

# Family Information Gathering Form

TUG HILL OPERATING

# FAMILY INFORMATION AND REQUIREMENTS QUESTIONNAIRE

| | | |
|---|---|---|
| **Meeting Place** | **Phone / Email:** | **Date / Time:** |
| **Meeting Place** | **Phone / Email:** | **Date / Time:** |
| **Meeting Place** | **Phone / Email:** | **Date / Time:** |
| | | |

| **Family Members Names:** | **Phone / Email:** | **Daytime Location** | **Evening Location** | **Special Needs Info:** |
|---|---|---|---|---|
| **1.** | | | | |
| **2.** | | | | |
| **3.** | | | | |
| **4.** | | | | |
| **5.** | | | | |
| **6.** | | | | |
| **7.** | | | | |
| **8.** | | | | |
| **9.** | | | | |
| **10.** | | | | |

TUG HILL OPERATING

| Pets and Livestock Survey | | | | |
|---|---|---|---|---|
| **Animal Type** | **Pet Name if any** | **Number of Livestock** | **Location** | **Comments** |
| | | | | |
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| **Comments / Notes:** |
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# Marshall County Family Resource Guide

## Clothing Assistance:

| | |
|---|---|
| Blue & Gold Christian Center Thrift Store | 304-686-2210 |
| Gabriel Project (Child, Maternity) | 304-639-5039 |
| House of the Carpenter (M-Fri. 8-4) | 304-233-4640 |
| Shepherd's Pantry (Weds. 9-11:30) | 304-221-9510 |
| Salvation Army | 304-845-0510 |
| St. Vincent de Paul Thrift Store | 304-232-4230 |
| YWCA Women's Boutique | 304-232-0511 |
| Wellspring Pregnancy Center | 304-810-0292 |

## Food Distribution:

| | |
|---|---|
| Blue and Gold Christian Center | 304-686-2210 |
| Calvary United Methodist Church | 304-845-2732 |
| Cameron Baptist Church | 304-686-3301 |
| Catholic Charities Neighborhood Center | 304-232-7157 |
| Family Services, Senior Division x204 | 304-233-2350 |
| Feeding Body & Soul Community Kitchen Simpson UMC (M-Sat.) | 304-780-7266 |
| First Church of God – McMechen | 304-232-0388 |
| Glen Dale United Methodist Church | 304-845-1140 |
| Marshall Co. WIC (Women Infant & Children) | 304-845-7426 |
| Mount Olivet United Methodist Church | 304-242-3162 |
| Temple Baptist Church | 304-280-6630 |
| Salvation Army – Marshall County | 304-845-0510 |
| Shepherd's Pantry (Weds. Only) | 304-221-9510 |

## Emergency Shelter or Housing Needs:

| | |
|---|---|
| Benwood-McMechen Housing Authority | 304-233-0830 |
| Blue & Gold Christian Center (Cameron) | 304-686-2210 |
| Change, Inc. Weatherization | 304-845-8269 |
| Greater Wheeling Coalition for the Homeless | 304-232-6105 |
| Habitat for Humanity | 304-233-0887 |
| Helping Heroes – Veterans | 304-810-4291 |
| Hill View Apartments | 304-843-2271 |
| Moundsville Housing Authority | 304-845-3141 |
| Northwood Homeless Shelter | 304-233-3502 |
| Salvation Army | 304-845-0510 |
| USDA Rural Development | 304-238-5651 |
| Washington Lands Ltd | 304-845-6485 |
| Wesley Park (Senior Housing) | 304-845-9701 |
| Woodland Knolls Apartments | 304-843-1575 |
| WV DHHR | 304-843-4120 |
| YWCA | 304-232-0511 |

## Youth Shelters, Residential Programs, Foster Home Programs, Intensive Home-based Services:

| | |
|---|---|
| Children's Home of Wheeling | 304-233-2367 |
| Children's Home Society of WV | 304-218-2893 |
| Crittenton Services – Wellspring Family Services | 304-242-7060 |
| National Youth Advocate Program-WV | 304-243-1865 |
| St. John's Home for Children | 304-242-5633 |
| Youth Services System | 304-233-9627 |

## Victim Assistance Services:

| | |
|---|---|
| CASA for Children | 304-233-0333 |
| Harmony House Child Advocacy Center | 304-230-2205 |
| Sexual Assault Help Center | 304-234-1783 |
| YWCA Family Violence Prevention Program | 304-232-2748 |

## Transportation Services:

| | |
|---|---|
| Dan Van (Veterans transp. VA hospital) | 412-439-0209 |
| Faith in Action Caregivers | 304-243-5420 |
| Family Services | 304-233-2350 |
| Hometown Transportation | 304-845-6070 |
| Marshall County Senior Center | 304-845-8200 |
| National Church Residence Transportation | 740-425-9001 |
| Non-Emergency Medical Transportation | 844-549-8353 |
| OVRTA | 304-232-2190 |
| Wheeling Hospital (Benwood City Limits) | 304-243-7123 |

## Specialized Trainings & Employment Services:

| | |
|---|---|
| Adult Education Center | 304-845-7890 |
| WorkForce West Virginia Career Center | 304-232-6280 |
| WorkForce WV Job Service & Unemployment | 304-238-1035 |
| WV DHHR | 304-843-4120 |
| WV Division of Rehabilitation Services | 304-238-1092 |
| WV Northern Community College | 304-233-5900 |
| WVU Extension | 304-843-1170 |

## Legal Services:

| | |
|---|---|
| Drug Court | 304-551-2986 |
| Fair Housing Law Center | 877-725-4472 |
| Family Court | 304-455-0903 |
| Legal Aid of WV | 304-232-1260 |
| Marshall County Public Defender | 304-843-4074 |
| Marshall County Prosecuting Attorney | 304-845-3580 |

## After-school Program/ Literacy Assistance:

| | |
|---|---|
| Blue & Gold Christian Center-Kidz Kamp | 304-686-2210 |
| YSS Community Cares at McNinch | 304-233-9627 |

## Prenatal, Infant & Child Services:

| | |
|---|---|
| Gabriel Project | 304-639-5039 |
| Marshall County FRN Parents As Teachers | 304-845-3300 |
| Northern Panhandle Parents As Teachers | 304-810-4522 |
| Right from the Start | 304-845-7726 |
| Wellspring Pregnancy Center | 304-810-0292 |

## City Buildings:

| | |
|---|---|
| Benwood City Building | 304-232-4320 |
| Cameron City Building | 304-686-2366 |
| Glen Dale City Building | 304-845-5511 |
| Marshall County Courthouse | 304-845-1220 |
| Moundsville City Building | 304-845-6300 |
| McMechen City Building | 304-232-3140 |

To Report Child Abuse please call Centralized Intake 1-800-352-6513

Like us or follow us!

This directory is for informational purposes only. Information provided is believed to be accurate at the time of printing. Any exclusions are purely accidental and do not reflect disapproval. The Marshall County FRN is funded in part by the West Virginia Department of Health & Human Resources. 2020

marshall county frn

# Resource Guide

Working together to make Marshall County a better place to live and work.

1501 Second Street
Moundsville, WV 26041
304-845-3300

www.marshallcountyfrn.com

## Emergency Services:

| | |
|---|---|
| American Red Cross | 304-232-0711 |
| Cameron Police Department | 304-686-2213 |
| Center for Missing and Exploited Children | 800-843-5678 |
| Emergency Management Office: (24hr.843-1500) | 304-843-1130 |
| Flood Plain Management Office | 304-845-0482 |
| Marshall County Fire, Police & Sheriff | 911 |
| Marshall Co. Sheriff's Dept. Crime Line | 304-843-5422 |
| McMechen Police Department | 304-232-3140 |
| Moundsville Police Department | 304-845-1611 |
| National Suicide Prevention Life Line | 800-273-8255 |
| Northwood Crisis Unit | 304-234-3583 |
| Poison Control Center | 800-222-1222 |
| Project Safe Childhood (internet safety) | 304-234-0100 |
| Safe Schools Helpline | 866-723-3982 |
| Veterans Crisis Hotline (text 838255) | 800-273-8255 |
| WV DHHR | 304-843-4120 |
| YWCA Family Violence Prevention | 304-232-2748 |
| WV State Police-Marshall Co. Detachment | 304-843-4100 |

## Hospitals:

| | |
|---|---|
| Reynolds Memorial Hospital | 304-845-3211 |
| Reynolds Rapid Care – Benwood | 304-221-3014 |
| Reynolds Rapid Care – Moundsville | 304-843-3435 |
| MedExpress | 304-843-5381 |
| Wheeling Hospital | 304-243-3000 |

## Schools:

| | |
|---|---|
| Cameron Elementary | 304-686-3305 |
| Cameron High School | 304-686-3336 |
| Center McMechen Elementary | 304-232-6530 |
| Central Elementary | 304-843-4425 |
| Gateway Achievement Center | 304-843-4526 |
| Glen Dale Elementary | 304-843-4427 |
| Hilltop Elementary | 304-232-8640 |
| John Marshall High School | 304-843-4444 |
| Marshall County Board of Education | 304-843-4400 |
| Marshall Co. School Delays/Closing | 304-843-4424 |
| McNinch Primary | 304-843-4431 |
| Moundsville Middle School | 304-843-4440 |
| Our Lady of Peace | 304-242-1383 |
| Sand Hill Elementary | 304-547-5041 |
| Sherrard Middle School | 304-233-3331 |
| Washington Lands Elementary | 304-843-4420 |

## Utility Assistance:

| | |
|---|---|
| Catholic Charities Neighborhood Center | 304-232-7157 |
| Change, Inc. | 304-845-8269 |
| House of the Carpenter | 304-233-4640 |
| Information Helpline | 304-233-6300 |
| Salvation Army | 304-845-0510 |
| St. Vincent de Paul | 304-232-4230 |
| WV DHHR | 304-843-4120 |

## Utilities:

| | |
|---|---|
| American Electric Power | 800-852-6942 |
| Benwood Municipal Water Works | 304-232-4320 |
| Cameron Water Department | 304-686-2366 |
| Comcast | 800-934-6489 |
| Frontier Phone Services | 800-921-8101 |
| Glen Dale Water Works | 304-845-4740 |
| Moundsville Water Department | 304-845-0380 |
| Mountaineer Gas | 800-834-2070 |
| Verizon Phone Service | 800-837-4966 |

## Information & Referral Services:

| | |
|---|---|
| Altenheim Resource & Referral Services | 304-243-0996 |
| Change Inc. | 304-845-8269 |
| Child Care Resource Center | 304-232-1603 |
| Gabriel Project of WV | 304-639-5039 |
| Helping Heroes – Veterans | 304-810-4291 |
| Information Helpline | 304-233-6300 |
| Marshall County Family Resource Center | 304-845-3300 |
| Marshall County Family Resource Network | 304-845-3300 |
| NAMI | 304-238-8277 |
| WV 211 Information & Referral | 211 |

## Adult /Senior Services:

| | |
|---|---|
| AARP WV | 866-227-7458 |
| Cameron Senior Center | 304-686-2119 |
| Cameron Nursing & Rehab | 304-686-3318 |
| Coordinated Council for Independent Living | 304-843-2306 |
| Family Services of the Upper Ohio Valley | 304-233-2350 |
| Marshall Co. Senior Center/Services | 304-845-8200 |
| Mound View Care Center | 304-843-1035 |
| Social Security Administration | 800-772-1213 |
| WVU Extension | 304-843-1170 |

## Programs for Children, Youth & Adults with Special Needs & their Families:

| | |
|---|---|
| Adena Industries (Northwood) | 304-843-1111 |
| Augusta Levy Learning Center | 304-242-6722 |
| Autism Speaks/ Autism Response Team | 888-288-4762 |
| Easter Seals Rehabilitation Services | 304-242-1390 |
| Parent Educator Resource Center | 304-843-4457 |
| Marshall Co. Special Needs Preschool (Ext. 356) | 304-843-4400 |
| MDA Program | 614-841-1014 |
| REM Community Options | 304-233-3474 |
| Russell Nesbitt | 304-232-0233 |
| Seeing Hand Association | 304-232-4810 |
| Special Needs & Autism Parent Support (SNAPS) | 304-232-5600 |
| WATCH | 304-232-1750 |
| WV Birth to Three | 304-214-5775 |
| WV Children with Special Health Care Needs | 304-232-4411 |
| WV Division of Rehabilitation Services | 304-238-1092 |
| WVU Ctr. For Excellence in Disabilities | 888-829-9426 |

## Early Childhood Child Care/Early Education:

| | |
|---|---|
| Glen Dale UM Child Development Center | 304-845-1450 |
| Higher Hills Children's Center | 304-905-9541 |
| Hunny Pot Child Care Center | 304-233-9744 |
| Moundsville Baptist Church Pre-School | 304-845-5316 |
| Northern Panhandle Head Start | 304-233-3290 |

## Health Programs:

| | |
|---|---|
| Adolescent Health Initiative Program | 304-845-3300 |
| Adolescent Pregnancy Prevention | 800-642-8522 |
| AIDS Task Force | 304-232-6822 |
| American Lung Association of WV | 304-342-6600 |
| Cameron Community Health Center | 304-686-3376 |
| Cancer Resource Center at RMH | 304-780-9864 |
| Children's Health Insurance Program | 877-982-2447 |
| Dental Hygiene Program of WLU | 304-336-8030 |
| Family Medical Care (Change, Inc.) | 304-748-2828 |
| Lions Club (Glasses/Eye Exams) | 304-559-7917 |
| Marshall County Health Department | 304-845-7840 |
| Marshall County WIC | 304-845-7426 |
| Mountain Health Trust | 800-449-8466 |
| Osiris Shrine Temple | 304-242-2911 |
| Valley Hospice | 304-242-1977 |
| Wheeling Health Right | 304-233-9323 |
| WV Division of Rehabilitation Services | 304-238-1092 |
| WV DHHR | 304-843-4120 |
| WV Breast & Cervical Cancer Program | 800-642-8522 |
| WVU Center for Excellence in Disabilities | 800-829-9426 |

## Addiction Counseling/ Drug & Alcohol Support Services:

| | |
|---|---|
| Al-Anon | 888-490-1970 |
| Alcoholics Anonymous (AA) | 800-333-5051 |
| BreakThru (withdrawal services) | 304-221-4528 |
| Gambler's Anonymous | 800-426-2537 |
| HealthWays – Miracles Happen | 304-242-0217 |
| Help 4WV | 844-435-7498 |
| Mothers Against Drunk Driving | 800-438-6233 |
| Narcotics Anonymous | 800-251-2426 |
| Northwood Health Systems | 304-234-7777 |
| Ohio Valley Recovery Unity Center | 304-232-3888 |
| Wellspring Family Services | 304-242-7060 |
| WV Tobacco Quitline | 800-966-8784 |
| Youth Services System, Adolescent IOP | 304-233-9627 |
| YWCA Wind Program (ext. 42 or 45) | 304-232-0511 |

## Counseling Services:

| | |
|---|---|
| Apprisen – Bankruptcy Counseling | 800-355-2227 |
| Crittenton – Wellspring Family Services | 304-242-7060 |
| Fox Run | 800-245-2131 |
| Harmony House Child Advocacy Center | 304-230-2205 |
| Northwood Health Systems | 304-845-3000 |
| Park Valley Behavioral Health Care | 304-218-2023 |
| YWCA Family Violence Prevention Program | 304-232-2748 |
| WV Saves | 304-234-9221 |

## Youth Programs:

| | |
|---|---|
| Boy Scouts of America | 304-277-2660 |
| 4-H Extension Services | 304-843-1170 |
| The Sanford Center | 304-281-4550 |
| WVU Extension | 304-843-1170 |
| YMCA | 304-242-8086 |

# NIMS ICS Forms

# National Incident Management System Incident Command System

September 2010

FEMA

ICS Forms

04/14/2023

# NATIONAL INCIDENT MANAGEMENT SYSTEM
# INCIDENT COMMAND SYSTEM

## ICS FORMS BOOKLET
## FEMA 502-2

**September 2010**

04/14/2023

# INTRODUCTION TO ICS FORMS

The National Incident Management System (NIMS) Incident Command System (ICS) Forms Booklet, FEMA 502-2, is designed to assist emergency response personnel in the use of ICS and corresponding documentation during incident operations. This booklet is a companion document to the NIMS ICS Field Operations Guide (FOG), FEMA 502-1, which provides general guidance to emergency responders on implementing ICS. This booklet is meant to complement existing incident management programs and does not replace relevant emergency operations plans, laws, and ordinances. These forms are designed for use within the Incident Command System, and are not targeted for use in Area Command or in multiagency coordination systems.

These forms are intended for use as tools for the creation of Incident Action Plans (IAPs), for other incident management activities, and for support and documentation of ICS activities. Personnel using the forms should have a basic understanding of NIMS, including ICS, through training and/or experience to ensure they can effectively use and understand these forms. These ICS Forms represent an all-hazards approach and update to previously used ICS Forms. While the layout and specific blocks may have been updated, the functionality of the forms remains the same. It is recommended that all users familiarize themselves with the updated forms and instructions.

A general description of each ICS Form's purpose, suggested preparation, and distribution are included immediately after the form, including block-by-block completion instructions to ensure maximum clarity on specifics, or for those personnel who may be unfamiliar with the forms.

The ICS organizational charts contained in these forms are examples of how an ICS organization is typically developed for incident response. However, the flexibility and scalability of ICS allow modifications, as needed, based on experience and particular incident requirements.

These forms are designed to include the essential data elements for the ICS process they address. The use of these standardized ICS Forms is encouraged to promote consistency in the management and documentation of incidents in the spirit of NIMS, and to facilitate effective use of mutual aid. In many cases, additional pages can be added to the existing ICS Forms when needed, and several forms are set up with this specific provision. The section after the ICS Forms List provides details on adding appendixes or fields to the forms for jurisdiction- or discipline-specific needs.

It may be appropriate to compile and maintain other NIMS-related forms with these ICS Forms, such as resource management and/or ordering forms that are used to support incidents. Examples of these include the following Emergency Management Assistance Compact (EMAC) forms: REQ-A (Interstate Mutual Aid Request), Reimbursement Form R-1 (Interstate Reimbursement Form), and Reimbursement Form R-2 (Intrastate Reimbursement Form).

# ICS FORMS LIST

This table lists all of the ICS Forms included in this publication.

**Notes:**

- In the following table, the ICS Forms identified with an asterisk (*) are typically included in an IAP.
- Forms identified with two asterisks (**) are additional forms that could be used in the IAP.
- The other ICS Forms are used in the ICS process for incident management activities, but are not typically included in the IAP.
- The date and time entered in the form blocks should be determined by the Incident Command or Unified Command. Local time is typically used.

| ICS Form #: | Form Title: | Typically Prepared by: |
|---|---|---|
| **ICS 201** | **Incident Briefing** | Initial Incident Commander |
| ***ICS 202** | **Incident Objectives** | Planning Section Chief |
| ***ICS 203** | **Organization Assignment List** | Resources Unit Leader |
| ***ICS 204** | **Assignment List** | Resources Unit Leader and Operations Section Chief |
| ***ICS 205** | **Incident Radio Communications Plan** | Communications Unit Leader |
| ****ICS 205A** | **Communications List** | Communications Unit Leader |
| ***ICS 206** | **Medical Plan** | Medical Unit Leader (reviewed by Safety Officer) |
| **ICS 207** | **Incident Organization Chart** *(wall-mount size, optional 8½" x 14")* | Resources Unit Leader |
| ****ICS 208** | **Safety Message/Plan** | Safety Officer |
| **ICS 209** | **Incident Status Summary** | Situation Unit Leader |
| **ICS 210** | **Resource Status Change** | Communications Unit Leader |
| **ICS 211** | **Incident Check-In List** *(optional 8½" x 14" and 11" x 17")* | Resources Unit/Check-In Recorder |
| **ICS 213** | **General Message** *(3-part form)* | Any Message Originator |
| **ICS 214** | **Activity Log** *(optional 2-sided form)* | All Sections and Units |
| **ICS 215** | **Operational Planning Worksheet** *(optional 8½" x 14" and 11" x 17")* | Operations Section Chief |
| **ICS 215A** | **Incident Action Plan Safety Analysis** | Safety Officer |
| **ICS 218** | **Support Vehicle/Equipment Inventory** *(optional 8½" x 14" and 11" x 17")* | Ground Support Unit |
| **ICS 219-1 to ICS 219-8, ICS 219-10** ***(Cards)*** | **Resource Status Card (T-Card)** *(may be printed on cardstock)* | Resources Unit |
| **ICS 220** | **Air Operations Summary Worksheet** | Operations Section Chief or Air Branch Director |
| **ICS 221** | **Demobilization Check-Out** | Demobilization Unit Leader |
| **ICS 225** | **Incident Personnel Performance Rating** | Supervisor at the incident |

# ICS FORM ADAPTION, EXTENSION, AND APPENDIXES

The ICS Forms in this booklet are designed to serve all-hazards, cross-discipline needs for incident management across the Nation. These forms include the essential data elements for the ICS process they address, and create a foundation within ICS for complex incident management activities. However, the flexibility and scalability of NIMS should allow for needs outside this foundation, so the following are possible mechanisms to add to, extend, or adapt ICS Forms when needed.

Because the goal of NIMS is to have a consistent nationwide approach to incident management, jurisdictions and disciplines are encouraged to use the ICS Forms as they are presented here – unless these forms do not meet an organization's particular incident management needs for some unique reason. If changes are needed, the focus on essential information elements should remain, and as such the spirit and intent of particular fields or "information elements" on the ICS Forms should remain intact to maintain consistency if the forms are altered. Modifications should be clearly indicated as deviations from or additions to the ICS Forms. The following approaches may be used to meet any unique needs.

## ICS Form Adaptation

When agencies and organizations require specialized forms or information for particular kinds of incidents, events, or disciplines, it may be beneficial to utilize the essential data elements from a particular ICS Form to create a more localized or field-specific form. When this occurs, organizations are encouraged to use the relevant essential data elements and ICS Form number, but to clarify that the altered form is a specific organizational adaptation of the form. For example, an altered form should clearly indicate in the title that it has been changed to meet a specific need, such as "ICS 215A, Hazard Risk Analysis Worksheet, Adapted for Story County Hazmat Program."

## Extending ICS Form Fields

Particular fields on an ICS Form may need to include further breakouts or additional related elements. If such additions are needed, the form itself should be clearly labeled as an adapted form (see above), and the additional sub-field numbers should be clearly labeled as unique to the adapted form. Letters or other indicators may be used to label the new sub-fields (if the block does not already include sub-fields).

Examples of possible field additions are shown below for the ICS 209:

- Block 2: Incident Number.
  - Block 2A (adapted): Full agency accounting cost charge number for primary authority having jurisdiction.
- Block 29: Primary Materials or Hazards Involved (hazardous chemicals, fuel types, infectious agents, radiation, etc.).
  - Block 29A (adapted): Indicate specific wildland fire fuel model number.

## Creating ICS Form Appendixes

Certain ICS Forms may require appendixes to include additional information elements needed by a particular jurisdiction or discipline. When an appendix is needed for a given form, it is expected that the jurisdiction or discipline will determine standardized fields for such an appendix and make the form available as needed.

Any ICS Form appendixes should be clearly labeled with the form name and an indicator that it is a discipline- or jurisdiction-specific appendix. Appendix field numbering should begin following the last identified block in the corresponding ICS Form.

# INCIDENT BRIEFING (ICS 201)

| 1. Incident Name: | 2. Incident Number: | 3. Date/Time Initiated:<br>Date: Time: |
|---|---|---|

**4. Map/Sketch** (include sketch, showing the total area of operations, the incident site/area, impacted and threatened areas, overflight results, trajectories, impacted shorelines, or other graphics depicting situational status and resource assignment)**:**

**5. Situation Summary and Health and Safety Briefing** (for briefings or transfer of command)**:** Recognize potential incident Health and Safety Hazards and develop necessary measures (remove hazard, provide personal protective equipment, warn people of the hazard) to protect responders from those hazards.

**6. Prepared by:** Name: _____ Position/Title: _____ Signature: _____

 Date/Time: _____

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# INCIDENT BRIEFING (ICS 201)

| 1. Incident Name: | 2. Incident Number: | 3. Date/Time Initiated:<br>Date: Time: |
|---|---|---|

**7. Current and Planned Objectives:**

**8. Current and Planned Actions, Strategies, and Tactics:**

| Time: | Actions: |
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**6. Prepared by:** Name: _____ Position/Title: _____ Signature: _____

**ICS 201, Page 2** Date/Time: _____

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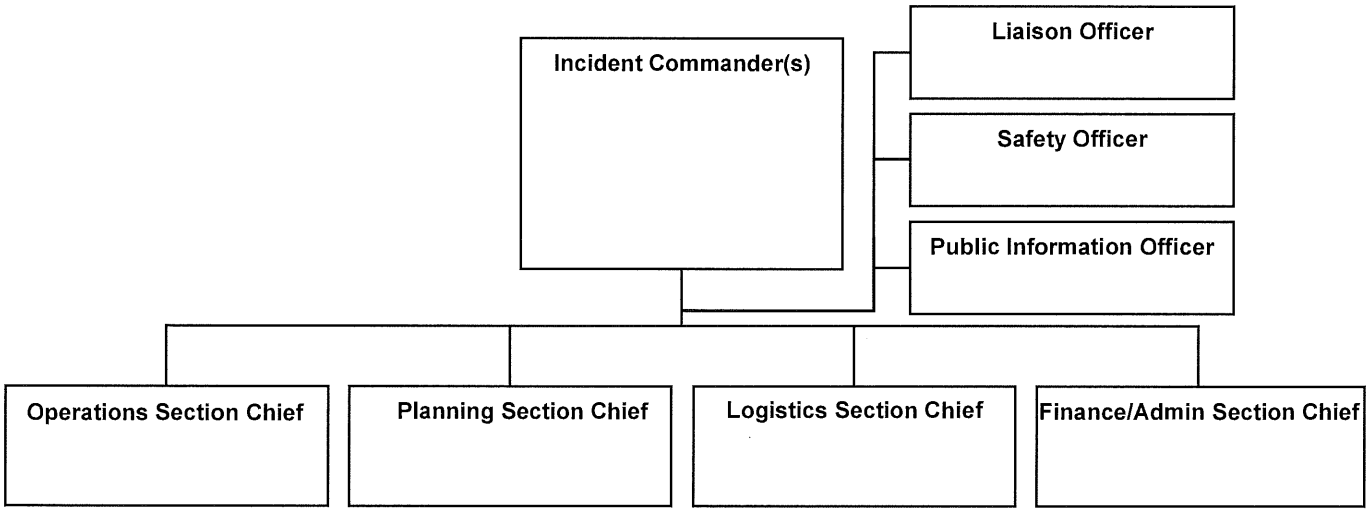
# INCIDENT BRIEFING (ICS 201)

| 1. Incident Name: | 2. Incident Number: | 3. Date/Time Initiated:<br>Date: Time: |
|---|---|---|

**9. Current Organization** (fill in additional organization as appropriate):




**6. Prepared by:** Name: _____ Position/Title: _____ Signature: _____

**ICS 201, Page 3** Date/Time: _____

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# INCIDENT BRIEFING (ICS 201)

| 1. Incident Name: | 2. Incident Number: | 3. Date/Time Initiated:<br>Date: Time: |
|---|---|---|

**10. Resource Summary:**

| Resource | Resource Identifier | Date/Time Ordered | ETA | Arrived | Notes (location/assignment/status) |
|---|---|---|---|---|---|
| | | | | ☐ | |
| | | | | ☐ | |
| | | | | ☐ | |
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| | | | | ☐ | |

**6. Prepared by:** Name: _____ Position/Title: _____ Signature: _____

**ICS 201, Page 4** Date/Time: _____

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## ICS 201
## Incident Briefing

**Purpose.** The Incident Briefing (ICS 201) provides the Incident Commander (and the Command and General Staffs) with basic information regarding the incident situation and the resources allocated to the incident. In addition to a briefing document, the ICS 201 also serves as an initial action worksheet. It serves as a permanent record of the initial response to the incident.

**Preparation.** The briefing form is prepared by the Incident Commander for presentation to the incoming Incident Commander along with a more detailed oral briefing.

**Distribution.** Ideally, the ICS 201 is duplicated and distributed before the initial briefing of the Command and General Staffs or other responders as appropriate. The "Map/Sketch" and "Current and Planned Actions, Strategies, and Tactics" sections (pages 1–2) of the briefing form are given to the Situation Unit, while the "Current Organization" and "Resource Summary" sections (pages 3–4) are given to the Resources Unit.

**Notes:**

- The ICS 201 can serve as part of the initial Incident Action Plan (IAP).
- If additional pages are needed for any form page, use a blank ICS 201 and repaginate as needed.

| Block Number | Block Title | Instructions |
|---|---|---|
| 1 | **Incident Name** | Enter the name assigned to the incident. |
| 2 | **Incident Number** | Enter the number assigned to the incident. |
| 3 | **Date/Time Initiated**<br>• Date, Time | Enter date initiated (month/day/year) and time initiated (using the 24-hour clock). |
| 4 | **Map/Sketch** (include sketch, showing the total area of operations, the incident site/area, impacted and threatened areas, overflight results, trajectories, impacted shorelines, or other graphics depicting situational status and resource assignment) | Show perimeter and other graphics depicting situational status, resource assignments, incident facilities, and other special information on a map/sketch or with attached maps. Utilize commonly accepted ICS map symbology.<br>If specific geospatial reference points are needed about the incident's location or area outside the ICS organization at the incident, that information should be submitted on the Incident Status Summary (ICS 209).<br>North should be at the top of page unless noted otherwise. |
| 5 | **Situation Summary and Health and Safety Briefing** (for briefings or transfer of command): Recognize potential incident Health and Safety Hazards and develop necessary measures (remove hazard, provide personal protective equipment, warn people of the hazard) to protect responders from those hazards. | Self-explanatory. |
| 6 | **Prepared by**<br>• Name<br>• Position/Title<br>• Signature<br>• Date/Time | Enter the name, ICS position/title, and signature of the person preparing the form. Enter date (month/day/year) and time prepared (24-hour clock). |
| 7 | **Current and Planned Objectives** | Enter the objectives used on the incident and note any specific problem areas. |

| Block Number | Block Title | Instructions |
|---|---|---|
| 8 | **Current and Planned Actions, Strategies, and Tactics**<br>• Time<br>• Actions | Enter the current and planned actions, strategies, and tactics and time they may or did occur to attain the objectives. If additional pages are needed, use a blank sheet or another ICS 201 (Page 2), and adjust page numbers accordingly. |
| 9 | **Current Organization** (fill in additional organization as appropriate)<br>• Incident Commander(s)<br>• Liaison Officer<br>• Safety Officer<br>• Public Information Officer<br>• Planning Section Chief<br>• Operations Section Chief<br>• Finance/Administration Section Chief<br>• Logistics Section Chief | • Enter on the organization chart the names of the individuals assigned to each position.<br>• Modify the chart as necessary, and add any lines/spaces needed for Command Staff Assistants, Agency Representatives, and the organization of each of the General Staff Sections.<br>• If Unified Command is being used, split the Incident Commander box.<br>• Indicate agency for each of the Incident Commanders listed if Unified Command is being used. |
| 10 | **Resource Summary** | Enter the following information about the resources allocated to the incident. If additional pages are needed, use a blank sheet or another ICS 201 (Page 4), and adjust page numbers accordingly. |
| | • Resource | Enter the number and appropriate category, kind, or type of resource ordered. |
| | • Resource Identifier | Enter the relevant agency designator and/or resource designator (if any). |
| | • Date/Time Ordered | Enter the date (month/day/year) and time (24-hour clock) the resource was ordered. |
| | • ETA | Enter the estimated time of arrival (ETA) to the incident (use 24-hour clock). |
| | • Arrived | Enter an "X" or a checkmark upon arrival to the incident. |
| | • Notes (location/ assignment/status) | Enter notes such as the assigned location of the resource and/or the actual assignment and status. |

# INCIDENT OBJECTIVES (ICS 202)

| 1. Incident Name: | 2. Operational Period: Date From: Date To: Time From: Time To: |
|---|---|

**3. Objective(s):**

**4. Operational Period Command Emphasis:**

General Situational Awareness

**5. Site Safety Plan Required?** Yes ☐ No ☐

**Approved Site Safety Plan(s) Located at:**

**6. Incident Action Plan** (the items checked below are included in this Incident Action Plan):

| | | |
|---|---|---|
| ☐ ICS 203 | ☐ ICS 207 | Other Attachments: |
| ☐ ICS 204 | ☐ ICS 208 | ☐ _____ |
| ☐ ICS 205 | ☐ Map/Chart | ☐ _____ |
| ☐ ICS 205A | ☐ Weather Forecast/Tides/Currents | ☐ _____ |
| ☐ ICS 206 | | ☐ _____ |

**7. Prepared by:** Name: _____ Position/Title: _____ Signature: _____

**8. Approved by Incident Commander:** Name: _____ Signature: _____

| ICS 202 | IAP Page _____ | Date/Time: _____ |
|---|---|---|

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## ICS 202
## Incident Objectives

**Purpose.** The Incident Objectives (ICS 202) describes the basic incident strategy, incident objectives, command emphasis/priorities, and safety considerations for use during the next operational period.

**Preparation.** The ICS 202 is completed by the Planning Section following each Command and General Staff meeting conducted to prepare the Incident Action Plan (IAP). In case of a Unified Command, one Incident Commander (IC) may approve the ICS 202. If additional IC signatures are used, attach a blank page.

**Distribution.** The ICS 202 may be reproduced with the IAP and may be part of the IAP and given to all supervisory personnel at the Section, Branch, Division/Group, and Unit levels. All completed original forms must be given to the Documentation Unit.

**Notes:**

- The ICS 202 is part of the IAP and can be used as the opening or cover page.
- If additional pages are needed, use a blank ICS 202 and repaginate as needed.

| Block Number | Block Title | Instructions |
|---|---|---|
| 1 | **Incident Name** | Enter the name assigned to the incident. If needed, an incident number can be added. |
| 2 | **Operational Period**<br>• Date and Time From<br>• Date and Time To | Enter the start date (month/day/year) and time (using the 24-hour clock) and end date and time for the operational period to which the form applies. |
| 3 | **Objective(s)** | Enter clear, concise statements of the objectives for managing the response. Ideally, these objectives will be listed in priority order. These objectives are for the incident response for this operational period as well as for the duration of the incident. Include alternative and/or specific tactical objectives as applicable.<br>Objectives should follow the SMART model or a similar approach:<br>**S**pecific – Is the wording precise and unambiguous?<br>**M**easurable – How will achievements be measured?<br>**A**ction-oriented – Is an action verb used to describe expected accomplishments?<br>**R**ealistic – Is the outcome achievable with given available resources?<br>**T**ime-sensitive – What is the timeframe? |
| 4 | **Operational Period Command Emphasis** | Enter command emphasis for the operational period, which may include tactical priorities or a general weather forecast for the operational period. It may be a sequence of events or order of events to address. This is not a narrative on the objectives, but a discussion about where to place emphasis if there are needs to prioritize based on the Incident Commander's or Unified Command's direction. Examples: Be aware of falling debris, secondary explosions, etc. |
| | General Situational Awareness | General situational awareness may include a weather forecast, incident conditions, and/or a general safety message. If a safety message is included here, it should be reviewed by the Safety Officer to ensure it is in alignment with the Safety Message/Plan (ICS 208). |
| 5 | **Site Safety Plan Required?**<br>Yes ☐ No ☐ | Safety Officer should check whether or not a site safety plan is required for this incident. |
| | **Approved Site Safety Plan(s) Located At** | Enter the location of the approved Site Safety Plan(s). |

| Block Number | Block Title | Instructions |
|---|---|---|
| 6 | **Incident Action Plan** (the items checked below are included in this Incident Action Plan):<br>☐ ICS 203<br>☐ ICS 204<br>☐ ICS 205<br>☐ ICS 205A<br>☐ ICS 206<br>☐ ICS 207<br>☐ ICS 208<br>☐ Map/Chart<br>☐ Weather Forecast/ Tides/Currents<br>Other Attachments: | Check appropriate forms and list other relevant documents that are included in the IAP.<br>☐ ICS 203 – Organization Assignment List<br>☐ ICS 204 – Assignment List<br>☐ ICS 205 – Incident Radio Communications Plan<br>☐ ICS 205A – Communications List<br>☐ ICS 206 – Medical Plan<br>☐ ICS 207 – Incident Organization Chart<br>☐ ICS 208 – Safety Message/Plan |
| 7 | **Prepared by**<br>• Name<br>• Position/Title<br>• Signature | Enter the name, ICS position, and signature of the person preparing the form. Enter date (month/day/year) and time prepared (24-hour clock). |
| 8 | **Approved by Incident Commander**<br>• Name<br>• Signature<br>• Date/Time | In the case of a Unified Command, one IC may approve the ICS 202. If additional IC signatures are used, attach a blank page. |

# ASSIGNMENT LIST (ICS 204)

| 1. Incident Name: | 2. Operational Period:<br>Date From: Date To:<br>Time From: Time To: | 3.<br>Branch:<br>Division:<br>Group:<br>Staging Area: |
|---|---|---|

**4. Operations Personnel:** Name Contact Number(s)

Operations Section Chief: _____

Branch Director: _____

Division/Group Supervisor: _____

**5. Resources Assigned:**

| Resource Identifier | Leader | # of Persons | Contact (e.g., phone, pager, radio frequency, etc.) | Reporting Location, Special Equipment and Supplies, Remarks, Notes, Information |
|---|---|---|---|---|
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**6. Work Assignments:**

**7. Special Instructions:**

**8. Communications** (radio and/or phone contact numbers needed for this assignment):

| Name/Function | Primary Contact: indicate cell, pager, or radio (frequency/system/channel) |
|---|---|
| / | |
| / | |
| / | |
| / | |

**9. Prepared by:** Name: _____ Position/Title: _____ Signature: _____

| ICS 204 | IAP Page _____ | Date/Time: _____ |
|---|---|---|

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## ICS 204
## Assignment List

**Purpose.** The Assignment List(s) (ICS 204) informs Division and Group supervisors of incident assignments. Once the Command and General Staffs agree to the assignments, the assignment information is given to the appropriate Divisions and Groups.

**Preparation.** The ICS 204 is normally prepared by the Resources Unit, using guidance from the Incident Objectives (ICS 202), Operational Planning Worksheet (ICS 215), and the Operations Section Chief. It must be approved by the Incident Commander, but may be reviewed and initialed by the Planning Section Chief and Operations Section Chief as well.

**Distribution.** The ICS 204 is duplicated and attached to the ICS 202 and given to all recipients as part of the Incident Action Plan (IAP). In some cases, assignments may be communicated via radio/telephone/fax. All completed original forms must be given to the Documentation Unit.

**Notes:**

- The ICS 204 details assignments at Division and Group levels and is part of the IAP.
- Multiple pages/copies can be used if needed.
- If additional pages are needed, use a blank ICS 204 and repaginate as needed.

| Block Number | Block Title | Instructions |
|---|---|---|
| 1 | **Incident Name** | Enter the name assigned to the incident. |
| 2 | **Operational Period**<br>• Date and Time From<br>• Date and Time To | Enter the start date (month/day/year) and time (using the 24-hour clock) and end date and time for the operational period to which the form applies. |
| 3 | **Branch**<br>**Division**<br>**Group**<br>**Staging Area** | This block is for use in a large IAP for reference only.<br><br>Write the alphanumeric abbreviation for the Branch, Division, Group, and Staging Area (e.g., "Branch 1," "Division D," "Group 1A") in large letters for easy referencing. |
| 4 | **Operations Personnel**<br>• Name, Contact Number(s)<br>– Operations Section Chief<br>– Branch Director<br>– Division/Group Supervisor | Enter the name and contact numbers of the Operations Section Chief, applicable Branch Director(s), and Division/Group Supervisor(s). |
| 5 | **Resources Assigned** | Enter the following information about the resources assigned to the Division or Group for this period: |
| | • Resource Identifier | The identifier is a unique way to identify a resource (e.g., ENG-13, IA-SCC-413). If the resource has been ordered but no identification has been received, use TBD (to be determined). |
| | • Leader | Enter resource leader's name. |
| | • # of Persons | Enter total number of persons for the resource assigned, including the leader. |
| | • Contact (e.g., phone, pager, radio frequency, etc.) | Enter primary means of contacting the leader or contact person (e.g., radio, phone, pager, etc.). Be sure to include the area code when listing a phone number. |
| 5 (continued) | • Reporting Location, Special Equipment and Supplies, Remarks, Notes, Information | Provide special notes or directions specific to this resource. If required, add notes to indicate: (1) specific location/time where the resource should report or be dropped off/picked up; (2) special equipment and supplies that will be used or needed; (3) whether or not the resource received briefings; (4) transportation needs; or (5) other information. |

| Block Number | Block Title | Instructions |
|---|---|---|
| 6 | **Work Assignments** | Provide a statement of the tactical objectives to be achieved within the operational period by personnel assigned to this Division or Group. |
| 7 | **Special Instructions** | Enter a statement noting any safety problems, specific precautions to be exercised, dropoff or pickup points, or other important information. |
| 8 | **Communications** (radio and/or phone contact numbers needed for this assignment)<br>• Name/Function<br>• Primary Contact: indicate cell, pager, or radio (frequency/system/channel) | Enter specific communications information (including emergency numbers) for this Branch/Division/Group.<br><br>If radios are being used, enter function (command, tactical, support, etc.), frequency, system, and channel from the Incident Radio Communications Plan (ICS 205).<br><br>Phone and pager numbers should include the area code and any satellite phone specifics.<br><br>In light of potential IAP distribution, use sensitivity when including cell phone number.<br><br>Add a secondary contact (phone number or radio) if needed. |
| 9 | **Prepared by**<br>• Name<br>• Position/Title<br>• Signature<br>• Date/Time | Enter the name, ICS position, and signature of the person preparing the form. Enter date (month/day/year) and time prepared (24-hour clock). |

# COMMUNICATIONS LIST (ICS 205A)

| 1. Incident Name: | 2. Operational Period: Date From: Time From: | Date To: Time To: |
|---|---|---|

**3. Basic Local Communications Information:**

| Incident Assigned Position | Name (Alphabetized) | Method(s) of Contact (phone, pager, cell, etc.) |
|---|---|---|
| | | |
| | | |
| | | |

## ICS 205A
## Communications List

**Purpose.** The Communications List (ICS 205A) records methods of contact for incident personnel. While the Incident Radio Communications Plan (ICS 205) is used to provide information on all radio frequencies down to the Division/Group level, the ICS 205A indicates all methods of contact for personnel assigned to the incident (radio frequencies, phone numbers, pager numbers, etc.), and functions as an incident directory.

**Preparation.** The ICS 205A can be filled out during check-in and is maintained and distributed by Communications Unit personnel. This form should be updated each operational period.

**Distribution.** The ICS 205A is distributed within the ICS organization by the Communications Unit, and posted as necessary. All completed original forms must be given to the Documentation Unit. If this form contains sensitive information such as cell phone numbers, it should be clearly marked in the header that it contains sensitive information and is not for public release.

**Notes:**

- The ICS 205A is an optional part of the Incident Action Plan (IAP).
- This optional form is used in conjunction with the ICS 205.
- If additional pages are needed, use a blank ICS 205A and repaginate as needed.

| Block Number | Block Title | Instructions |
|---|---|---|
| 1 | **Incident Name** | Enter the name assigned to the incident. |
| 2 | **Operational Period**<br>• Date and Time From<br>• Date and Time To | Enter the start date (month/day/year) and time (using the 24-hour clock) and end date and time for the operational period to which the form applies. |
| 3 | **Basic Local Communications Information** | Enter the communications methods assigned and used for personnel by their assigned ICS position. |
| | • Incident Assigned Position | Enter the ICS organizational assignment. |
| | • Name | Enter the name of the assigned person. |
| | • Method(s) of Contact (phone, pager, cell, etc.) | For each assignment, enter the radio frequency and contact number(s) to include area code, etc. If applicable, include the vehicle license or ID number assigned to the vehicle for the incident (e.g., HAZMAT 1, etc.). |
| 4 | **Prepared by**<br>• Name<br>• Position/Title<br>• Signature<br>• Date/Time | Enter the name, ICS position, and signature of the person preparing the form. Enter date (month/day/year) and time prepared (24-hour clock). |

# MEDICAL PLAN (ICS 206)

| 1. Incident Name: | 2. Operational Period: Date From: Time From: Date To: Time To: |
|---|---|

**3. Medical Aid Stations:**

| Name | Location | Contact Number(s)/Frequency | Paramedics on Site? |
|---|---|---|---|
| | | | ☐ Yes ☐ No |
| | | | ☐ Yes ☐ No |
| | | | ☐ Yes ☐ No |
| | | | ☐ Yes ☐ No |
| | | | ☐ Yes ☐ No |
| | | | ☐ Yes ☐ No |

**4. Transportation** (indicate air or ground)**:**

| Ambulance Service | Location | Contact Number(s)/Frequency | Level of Service |
|---|---|---|---|
| | | | ☐ ALS ☐ BLS |
| | | | ☐ ALS ☐ BLS |
| | | | ☐ ALS ☐ BLS |
| | | | ☐ ALS ☐ BLS |

**5. Hospitals:**

| Hospital Name | Address, Latitude & Longitude if Helipad | Contact Number(s)/ Frequency | Travel Time | | Trauma Center | Burn Center | Helipad |
|---|---|---|---|---|---|---|---|
| | | | Air | Ground | | | |
| | | | | | ☐ Yes Level:_____ | ☐ Yes ☐ No | ☐ Yes ☐ No |
| | | | | | ☐ Yes Level:_____ | ☐ Yes ☐ No | ☐ Yes ☐ No |
| | | | | | ☐ Yes Level:_____ | ☐ Yes ☐ No | ☐ Yes ☐ No |
| | | | | | ☐ Yes Level:_____ | ☐ Yes ☐ No | ☐ Yes ☐ No |
| | | | | | ☐ Yes Level:_____ | ☐ Yes ☐ No | ☐ Yes ☐ No |

**6. Special Medical Emergency Procedures:**

☐ Check box if aviation assets are utilized for rescue. If assets are used, coordinate with Air Operations.

**7. Prepared by** (Medical Unit Leader)**:** Name: _____ Signature: _____

**8. Approved by** (Safety Officer)**:** Name: _____ Signature: _____

| ICS 206 | IAP Page _____ | Date/Time: _____ |
|---|---|---|

# ICS 206
# Medical Plan

**Purpose.** The Medical Plan (ICS 206) provides information on incident medical aid stations, transportation services, hospitals, and medical emergency procedures.

**Preparation.** The ICS 206 is prepared by the Medical Unit Leader and reviewed by the Safety Officer to ensure ICS coordination. If aviation assets are utilized for rescue, coordinate with Air Operations.

**Distribution.** The ICS 206 is duplicated and attached to the Incident Objectives (ICS 202) and given to all recipients as part of the Incident Action Plan (IAP). Information from the plan pertaining to incident medical aid stations and medical emergency procedures may be noted on the Assignment List (ICS 204). All completed original forms must be given to the Documentation Unit.

**Notes:**

- The ICS 206 serves as part of the IAP.
- This form can include multiple pages.

| Block Number | Block Title | Instructions |
|---|---|---|
| 1 | **Incident Name** | Enter the name assigned to the incident. |
| 2 | **Operational Period**<br>• Date and Time From<br>• Date and Time To | Enter the start date (month/day/year) and time (using the 24-hour clock) and end date and time for the operational period to which the form applies. |
| 3 | **Medical Aid Stations** | Enter the following information on the incident medical aid station(s): |
| | • Name | Enter name of the medical aid station. |
| | • Location | Enter the location of the medical aid station (e.g., Staging Area, Camp Ground). |
| | • Contact Number(s)/Frequency | Enter the contact number(s) and frequency for the medical aid station(s). |
| | • Paramedics on Site?<br>☐ Yes ☐ No | Indicate (yes or no) if paramedics are at the site indicated. |
| 4 | **Transportation** (indicate air or ground) | Enter the following information for ambulance services available to the incident: |
| | • Ambulance Service | Enter name of ambulance service. |
| | • Location | Enter the location of the ambulance service. |
| | • Contact Number(s)/Frequency | Enter the contact number(s) and frequency for the ambulance service. |
| | • Level of Service<br>☐ ALS ☐ BLS | Indicate the level of service available for each ambulance, either ALS (Advanced Life Support) or BLS (Basic Life Support). |

| Block Number | Block Title | Instructions |
|---|---|---|
| 5 | **Hospitals** | Enter the following information for hospital(s) that could serve this incident: |
| | • Hospital Name | Enter hospital name and identify any predesignated medivac aircraft by name a frequency. |
| | • Address, Latitude & Longitude if Helipad | Enter the physical address of the hospital and the latitude and longitude if the hospital has a helipad. |
| | • Contact Number(s)/ Frequency | Enter the contact number(s) and/or communications frequency(s) for the hospital. |
| | • Travel Time<br>  • Air<br>  • Ground | Enter the travel time by air and ground from the incident to the hospital. |
| | • Trauma Center<br>☐ Yes Level:_____ | Indicate yes and the trauma level if the hospital has a trauma center. |
| | • Burn Center<br>☐ Yes ☐ No | Indicate (yes or no) if the hospital has a burn center. |
| | • Helipad<br>☐ Yes ☐ No | Indicate (yes or no) if the hospital has a helipad.<br>Latitude and Longitude data format need to compliment Medical Evacuation Helicopters and Medical Air Resources |
| 6 | **Special Medical Emergency Procedures** | Note any special emergency instructions for use by incident personnel, including (1) who should be contacted, (2) how should they be contacted; and (3) who manages an incident within an incident due to a rescue, accident, etc. Include procedures for how to report medical emergencies. |
| | ☐ Check box if aviation assets are utilized for rescue. If assets are used, coordinate with Air Operations. | Self explanatory. Incident assigned aviation assets should be included in ICS 220. |
| 7 | **Prepared by** (Medical Unit Leader)<br>• Name<br>• Signature | Enter the name and signature of the person preparing the form, typically the Medical Unit Leader. Enter date (month/day/year) and time prepared (24-hour clock). |
| 8 | **Approved by** (Safety Officer)<br>• Name<br>• Signature<br>• Date/Time | Enter the name of the person who approved the plan, typically the Safety Officer. Enter date (month/day/year) and time reviewed (24-hour clock). |

| **SITE SAFETY AND CONTROL PLAN** ICS 208 HM | 1. Incident Name: | 2. Date Prepared: | 3. Operational Period: Time: |
|---|---|---|---|

**Section I. Site Information**

4. Incident Location:

**Section II. Organization**

| 5. Incident Commander: | 6. HM Group Supervisor: | 7. Tech. Specialist - HM Reference: |
|---|---|---|
| 8. Safety Officer: | 9. Entry Leader: | 10. Site Access Control Leader: |
| 11. Asst. Safety Officer - HM: | 12. Decontamination Leader: | 13. Safe Refuge Area Mgr: |
| 14. Environmental Health: | 15. | 16. |

| 17. Entry Team: (Buddy System) Name: | PPE Level | 18. Decontamination Element: Name: | PPE Level |
|---|---|---|---|
| Entry 1 | | Decon 1 | |
| Entry 2 | | Decon 2 | |
| Entry 3 | | Decon 3 | |
| Entry 4 | | Decon 4 | |

**Section III. Hazard/Risk Analysis**

| 19. Material: | Container type | Qty. | Phys. State | pH | IDLH | F.P. | I.T. | V.P. | V.D. | S.G. | LEL | UEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Comment:

**Section IV. Hazard Monitoring**

| 20. LEL Instrument(s): | 21. $O_2$ Instrument(s): |
|---|---|
| 22. Toxicity/PPM Instrument(s): | 23. Radiological Instrument(s): |

Comment:

**Section V. Decontamination Procedures**

24. Standard Decontamination Procedures: YES: ☐ NO: ☐

Comment:

**Section VI. Site Communications**

| 25. Command Frequency: | 26. Tactical Frequency: | 27. Entry Frequency: |
|---|---|---|

**Section VII. Medical Assistance**

28. Medical Monitoring: YES: ☐ NO: ☐ 29. Medical Treatment and Transport In-place: YES: ☐ NO: ☐

Comment:



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## Section VIII. Site Map

30. Site Map:

Weather ☐ Command Post ☐ Zones ☐ Assembly Areas ☐ Escape Routes ☐ Other ☐

## Section IX. Entry Objectives

31. Entry Objectives:

## Section X. SOP S and Safe Work Practices

32. Modifications to Documented SOP s or Work Practices: YES: ☐ NO: ☐

Comment:

## Section XI. Emergency Procedures

33. Emergency Procedures:

## Section XII. Safety Briefing

34. Asst. Safety Officer - HM Signature: Safety Briefing Completed (Time):

35. HM Group Supervisor Signature:

36. Incident Commander Signature:



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## INSTRUCTIONS FOR COMPLETING THE SITE SAFETY AND CONTROL PLAN
## ICS 208 HM

**A Site Safety and Control Plan must be completed by the Hazardous Materials Group Supervisor and reviewed by all within the Hazardous Materials Group prior to operations commencing within the Exclusion Zone.**

| Item Number | Item Title | Instructions |
|---|---|---|
| 1. | Incident Name/Number | Print name and/or incident number. |
| 2. | Date and Time | Enter date and time prepared. |
| 3. | Operational Period | Enter the time interval for which the form applies. |
| 4. | Incident Location | Enter the address and or map coordinates of the incident. |
| 5 - 16. | Organization | Enter names of all individuals assigned to ICS positions. (Entries 5 & 8 mandatory). Use Boxes 15 and 16 for other functions: i.e. Medical Monitoring. |
| 17 - 18. | Entry Team/Decon Element | Enter names and level of PPE of Entry & Decon personnel. (Entries 1 - 4 mandatory buddy system and back-up.) |
| 19. | Material | Enter names and pertinent information of all known chemical products. Enter UNK if material is not known. Include any which apply to chemical properties. (Definitions: ph = Potential for Hydrogen (Corrosivity), IDLH = Immediately Dangerous to Life and Health, F.P. = Flash Point, I.T. = Ignition Temperature, V.P. = Vapor Pressure, V.D. = Vapor Density, S.G. = Specific Gravity, LEL = Lower Explosive Limit, UEL = Upper Explosive Limit) |
| 20 - 23. | Hazard Monitoring | List the instruments which will be used to monitor for chemical. |
| 24. | Decontamination Procedures | Check NO if modifications are made to standard decontamination procedures and make appropriate Comments including type of solutions. |
| 25 - 27. | Site Communications | Enter the radio frequency(ies) which apply. |
| 28 - 29. | Medical Assistance | Enter comments if NO is checked. |
| 30. | Site Map | Sketch or attach a site map which defines all locations and layouts of operational zones. (Check boxes are mandatory to be identified.) |
| 31. | Entry Objectives | List all objectives to be performed by the Entry Team in the Exclusion Zone and any parameters which will alter or stop entry operations. |
| 32 - 33. | SOP s, Safe Work Practices, and Emergency Procedures | List in Comments if any modifications to SOP s and any emergency procedures which will be affected if an emergency occurs while personnel are within the Exclusion Zone. |
| 34 - 36. | Safety Briefing | Have the appropriate individual place their signature in the box once the Site Safety and Control Plan is reviewed.<br>Note the time in box 34 when the safety briefing has been completed. |



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# ACTIVITY LOG (ICS 214)

| 1. Incident Name: | 2. Operational Period: Date From: Date To: Time From: Time To: |
|---|---|

**7. Activity Log** (continuation):

| Date/Time | Notable Activities |
|---|---|
| | |
| | |
| | |

# ICS 214
# Activity Log

**Purpose.** The Activity Log (ICS 214) records details of notable activities at any ICS level, including single resources, equipment, Task Forces, etc. These logs provide basic incident activity documentation, and a reference for any after-action report.

**Preparation.** An ICS 214 can be initiated and maintained by personnel in various ICS positions as it is needed or appropriate. Personnel should document how relevant incident activities are occurring and progressing, or any notable events or communications.

**Distribution.** Completed ICS 214s are submitted to supervisors, who forward them to the Documentation Unit. All completed original forms must be given to the Documentation Unit, which maintains a file of all ICS 214s. It is recommended that individuals retain a copy for their own records.

**Notes:**

- The ICS 214 can be printed as a two-sided form.
- Use additional copies as continuation sheets as needed, and indicate pagination as used.

| Block Number | Block Title | Instructions |
|---|---|---|
| 1 | **Incident Name** | Enter the name assigned to the incident. |
| 2 | **Operational Period**<br>• Date and Time From<br>• Date and Time To | Enter the start date (month/day/year) and time (using the 24-hour clock) and end date and time for the operational period to which the form applies. |
| 3 | **Name** | Enter the title of the organizational unit or resource designator (e.g., Facilities Unit, Safety Officer, Strike Team). |
| 4 | **ICS Position** | Enter the name and ICS position of the individual in charge of the Unit. |
| 5 | **Home Agency** (and Unit) | Enter the home agency of the individual completing the ICS 214. Enter a unit designator if utilized by the jurisdiction or discipline. |
| 6 | **Resources Assigned** | Enter the following information for resources assigned: |
| | • Name | Use this section to enter the resource's name. For all individuals, use at least the first initial and last name. Cell phone number for the individual can be added as an option. |
| | • ICS Position | Use this section to enter the resource's ICS position (e.g., Finance Section Chief). |
| | • Home Agency (and Unit) | Use this section to enter the resource's home agency and/or unit (e.g., Des Moines Public Works Department, Water Management Unit). |
| 7 | **Activity Log**<br>• Date/Time<br>• Notable Activities | • Enter the time (24-hour clock) and briefly describe individual notable activities. Note the date as well if the operational period covers more than one day.<br>• Activities described may include notable occurrences or events such as task assignments, task completions, injuries, difficulties encountered, etc.<br>• This block can also be used to track personal work habits by adding columns such as "Action Required," "Delegated To," "Status," etc. |
| 8 | **Prepared by**<br>• Name<br>• Position/Title<br>• Signature<br>• Date/Time | Enter the name, ICS position/title, and signature of the person preparing the form. Enter date (month/day/year) and time prepared (24-hour clock). |

# INCIDENT ACTION PLAN SAFETY ANALYSIS (ICS 215A)

| 1. Incident Name: | 2. Incident Number: |
|---|---|

| 3. Date/Time Prepared: | 4. Operational Period: Date From: | Date To: |
|---|---|---|
| Date: Time: | Time From: | Time To: |

| 5. Incident Area | 6. Hazards/Risks | 7. Mitigations |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
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| | | |
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| | | |
| | | |
| | | |

**8. Prepared by** (Safety Officer): Name: _____ Signature: _____

**Prepared by** (Operations Section Chief): Name: _____ Signature: _____

| ICS 215A | Date/Time: _____ |
|---|---|

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## ICS 215A
## Incident Action Plan Safety Analysis

**Purpose.** The purpose of the Incident Action Plan Safety Analysis (ICS 215A) is to aid the Safety Officer in completing an operational risk assessment to prioritize hazards, safety, and health issues, and to develop appropriate controls. This worksheet addresses communications challenges between planning and operations, and is best utilized in the planning phase and for Operations Section briefings.

**Preparation.** The ICS 215A is typically prepared by the Safety Officer during the incident action planning cycle. When the Operations Section Chief is preparing for the tactics meeting, the Safety Officer collaborates with the Operations Section Chief to complete the Incident Action Plan Safety Analysis. This worksheet is closely linked to the Operational Planning Worksheet (ICS 215). Incident areas or regions are listed along with associated hazards and risks. For those assignments involving risks and hazards, mitigations or controls should be developed to safeguard responders, and appropriate incident personnel should be briefed on the hazards, mitigations, and related measures. Use additional sheets as needed.

**Distribution.** When the safety analysis is completed, the form is distributed to the Resources Unit to help prepare the Operations Section briefing. All completed original forms must be given to the Documentation Unit.

**Notes:**

- This worksheet can be made into a wall mount, and can be part of the IAP.
- If additional pages are needed, use a blank ICS 215A and repaginate as needed.

| Block Number | Block Title | Instructions |
|---|---|---|
| 1 | **Incident Name** | Enter the name assigned to the incident. |
| 2 | **Incident Number** | Enter the number assigned to the incident. |
| 3 | **Date/Time Prepared** | Enter date (month/day/year) and time (using the 24-hour clock) prepared. |
| 4 | **Operational Period**<br>• Date and Time From<br>• Date and Time To | Enter the start date (month/day/year) and time (24-hour clock) and end date and time for the operational period to which the form applies. |
| 5 | **Incident Area** | Enter the incident areas where personnel or resources are likely to encounter risks. This may be specified as a Branch, Division, or Group. |
| 6 | **Hazards/Risks** | List the types of hazards and/or risks likely to be encountered by personnel or resources at the incident area relevant to the work assignment. |
| 7 | **Mitigations** | List actions taken to reduce risk for each hazard indicated (e.g., specify personal protective equipment or use of a buddy system or escape routes). |
| 8 | **Prepared by** (Safety Officer and Operations Section Chief)<br>• Name<br>• Signature<br>• Date/Time | Enter the name of both the Safety Officer and the Operations Section Chief, who should collaborate on form preparation. Enter date (month/day/year) and time (24-hour clock) reviewed. |

# Attachment 3

# $H_2S$ Contingency Plan

# West Virginia Field Operations

# Hydrogen Sulfide ($H_2S$) Contingency Plan

## OWNER/OPERATOR

**Tug Hill Operating, LLC**

**380 Southpointe Blvd., Suite 200**
**Canonsburg, PA 15317**

## KEY CONTACT FOR $H_2S$ DRILLING CONTINGENCY PLAN DEVELOPMENT AND MAINTENANCE

**Jerry V. DeRosa, Director EH&S Affairs**
**(724) 338-2029 (office)**
**(412) 736-5767 (cellular)**

## 24-HOUR EMERGENCY PHONE NUMBER

## (800) 921-9745

**Update Version**
**April 2021**

**$H_2S$ DRILLING CONTINGENCY PLAN**
**Tug Hill Operating, LLC**
**West Virginia Operations**

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**$H_2S$ DRILLING CONTINGENCY PLAN**
**Tug Hill Operating, LLC**
**West Virginia Operations**

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## ATTACHMENT


**TUG HILL – MULTI-GAS METER ALARM CARD**

# 1.0 INTRODUCTION

## 1.1 PURPOSE

This Hydrogen Sulfide ($H_2S$) Contingency Plan (Contingency Plan) is intended to guides personnel in recognizing, preparing, and responding to potentially dangerous $H_2S$ situations during exploration and production operations at Tug Hill Operating (THQA) facilities. The overriding purpose of this plan is to ensure the safety of all on-site personnel as well as those residents in close proximity. Hazards associated with the possibility of encounters with $H_2S$ and the warning signs of $H_2S$ exposure will be covered.

Not all situations can be foreseen, however, nor can detailed instructions be provided for every situation that might be encountered. The guidelines set forth in this document should be considered as a minimum set of requirements for preparing for and dealing with $H_2S$ exposure at a THQA site.

This Contingency Plan is a companion document to and incorporates by reference the Tug Hill Well Site Safety Plan (WSSP) and Integrated Contingency Plan (ICP), as well as the Hydrogen Sulfide section of the Tug Hill Operating Contractor Expectation Manual. Contractors may have additional requirements and are expected to comply with their established corporate policies in addition to THQA's Contingency Plan and the Contractor Expectation Manual (CEM). Personnel should consult the onsite Environmental, Health & Safety (EHS) Coordinator or "Safety Representative" for instruction and guidance on specific situations.

In addition, these guidelines can be used with other heavier-than-air toxic gases, provided that the proper gas detector systems have been installed and calibrated for the specific gas.

## 1.2 $H_2S$ EXPECTATIONS

Currently there is no expectation of encountering hydrogen sulfide gas in the Marshall or Wetzel County region of West Virginia. Analysis of gas produced in the area has revealed no significant findings of hydrogen sulfide. THQA conducts continuous $H_2S$ monitoring on all drilling pads. Since 2017 to date of issuance of this WSSP, THQA has not encountered $H_2S$ at noteworthy or actionable concentrations.



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## 2.0 $H_2S$ POLICY

The guidelines and requirements stipulated in this $H_2S$ Contingency Plan are to be implemented (e.g., $H_2S$ detection equipment, training materials, warning signs, etc.) on any well pad where Operations have encountered or are projected to encounter $H_2S$ based upon advisement of the THQA Geosciences Department and/or previously observed conditions.

The THQA $H_2S$ Policy is to consider every encounter with $H_2S$ as potentially lethal until proven otherwise. Operations conducted at THQA locations where work area atmospheric concentrations of $H_2S$ (known or suspected) could exceed 10 PPM are to be conducted in compliance with applicable governmental regulations and in accordance with industry recommended practices.

Upon encountering $H_2S$, THQA employees or contractors(s) will determine the concentration of $H_2S$ and report this information to THQA Operations Management and the EH&S Department for further evaluation.

# 3.0 HYDROGEN SULFIED CONTINGENCY PLAN ADMINISTRATION

## 3.1 SCOPE

The $H_2S$ Contingency Plan provides guidelines for:

- Training
- $H_2S$ Hazard Conditions and Exposure
- Hazard Determination
- Sensors, Alarms and Breathing Apparatus Equipment
- Operating Conditions and Responsibilities
- $H_2S$ Response
- Special concerns

$H_2S$ safety equipment as described herein will be made available when working in a known or suspected $H_2S$ bearing zone. During such instances, the THQA Company Man/Person-in-Charge (PIC) and/or EHS Coordinator will review training records and verify that each employee and contractor has completed required $H_2S$ training.

Included in the Well Site Safety Plan and the **SITE-SPECIFIC DATA** section in the ICP binder are:

- The Figures detailing evacuation routes, safety briefing areas, prevailing wind direction.
- A plat locating the THQA facility and the location of private dwellings, residential areas and public facilities within the potential area of exposure.
- List of **EMERGENCY CONTACTS**

## 3.2 DISTRIBUTION

A copy will also be provided to the County Office of Emergency Management (OEM) and the West Virginia Department of Environmental Protection (WVDEP) as part of the WSSP submittal.

A hard copy of this Contingency Plan will be kept in the ICP binder onsite.

An electronic copy of this Contingency Plan will be kept on file with the Director of EH&S Affairs for review upon request.

## 3.3 PERIODIC REVIEW AND UPDATES

The $H_2S$ Contingency Plan will be reviewed as needed. Updates will be implemented and redistributed by the Director of EHS Affairs.



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## 4.0 TRAINING

All THQA personnel and contractors who may be onsite during drilling, completions, and production Operations will be trained at an $H_2S$ awareness level to be familiar with the properties and hazards associated with $H_2S$. THQA provides awareness-level $H_2S$ training for its employees and this training expectation is communicated to contractors as part of the Contractor Safety Management Program (CSMP) at the time of engagement. Contractors are responsible for training their employees prior to assignment and meet the same objectives consistent with this Plan.

If $H_2S$ has been determined present or projected to be encountered, $H_2S$ safety training certification will be required for all personnel onsite. Only those personnel who have been properly trained and certified in the hazards of $H_2S$ will be allowed on location during Operations when such an $H_2S$ risk is present. In such cases, Contractors are to submit records of training for their workers and all workers would be required to present their training certification card or documentation prior working on-site. These records will be kept onsite with the Company Man.

When warranted, THQA will arrange for on-site certification training to the fulfill the requirement of this policy. The training will be completed prior to spudding the well or commencing with completions Operations. $H_2S$ safety training certification records are kept for all who attend and the Company Man or EHS Coordinator will issue the worker a yellow $H_2S$ hardhat stickers as visual confirmation for those who have received training.

If $H_2S$ has been determined present or projected to be encountered, an $H_2S$ safety briefing prior to start of each shift or tower and hazards and currently readings of $H_2S$ will be documented on the pre-job safety meeting and JSA.

### 4.1 TRAINING OBJECTIVES

When greater than awareness-level training and certification requirements are implemented, training objectives for workers and supervisory personnel will include:

- Understand the purpose and the function of the $H_2S$ Contingency Plan
- Understand the $H_2S$ related roles and responsibilities of personnel on-site
- Understand the hazards, properties, characteristics, symptoms, and toxicity of exposure to $H_2S$, as well as associated safety precautions
- Know the potential sources of $H_2S$ on-site and testing/monitoring procedures
- Know the location, use and care of:
    - Windsocks and wind indicators
    - Mechanical blowers
    - Respiratory protection equipment
    - Fixed and portable $H_2S$ detection equipment
    - Fixed and portable LEL gas detection equipment
    - Resuscitation equipment and first aid supplies



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  - Portable fire extinguishers
  - Emergency alarm system

- Know the meaning of $H_2S$ warning signs and alarms
- Know emergency rescue and first aid/CPR procedures

## 4.2 FREQUENCY

**Initial Training** – Employees and contractors shall be initially trained to ensure familiarity with the $H_2S$ Program prior to working in a $H_2S$ environment. Training is to be provided to employees whose work responsibilities involve operations where atmospheric concentrations of $H_2S$ could exceed 10 PPM.

**Retraining** – Employees and contractors shall receive retraining whenever:

- Activities that impose hazards for which an employee has not been previously trained;
- The THQA $H_2S$ Program, the Contingency Plan, regulatory requirements change; or
- Retraining shall also be conducted whenever there are inadequacies in an employee's knowledge or deviations from the $H_2S$ Program are observed. The retraining shall re-establish employee proficiency and shall introduce new or revised methods and procedures as necessary.

**Refresher Training** - Employees shall receive annual refresher training in the $H_2S$ Program in accordance with their assigned responsibilities. Contractors are responsible for training their employees prior to assignment and meet the same objectives consistent with this Plan.

**Verification** – THQA will verify that the training outlined in the $H_2S$ Program has been accomplished. The verification will contain the employee's name and signature, the signature of the trainer, the dates of training and documentation of the employee's understanding of the material.

## 4.2 TRAINING IDENTIFICATION

In addition to training documentation on file, once the employee or contractor has completed or shown proof of training, a yellow $H_2S$ hardhat sticker is to be placed on the individual's hardhat. Workers are expected to have training certification card available indicating that they have completed training.

## 4.3 $H_2S$ SAFETY DRILLS

If $H_2S$ has been determined present or projected to be encountered, the Company Man/PIC will periodically perform safety drills to test equipment, personnel, and overall responsiveness at the location.



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## 5.0 $H_2S$ HAZARD EXPOSURE AND DETERMINATIONS

H2S or sour gas is often found in oil and gas formations. It is a colorless gas that is highly toxic and extremely flammable. It is heavier than air and may travel along the ground or accumulate in low-lying areas. At low concentrations, it smells like "rotten eggs," but at higher concentrations it does not have a noticeable odor. At higher concentrations it can quickly – almost immediately – overcome unprotected workers, including rescue workers. This swift unconsciousness is often referred to as "knockdown."

### 5.1 EXPOSURE TO $H_2S$ BY INHALATION

Exposure by breathing (inhalation of) $H_2S$ is a primary concern when $H_2S$ is present. $H_2S$ fires and explosions occur at much higher concentrations than exposure limits (i.e., death can result from $H_2S$ inhalation exposures of 700-1000 ppm, while fire and explosion hazards are at levels above 40,000 ppm).

$H_2S$ accompanies the release of any oil or gas from a well system where $H_2S$ exists. $H_2S$ gas causes a wide range of health effects depending on how much $H_2S$ is inhaled, and for how long. Exposure to high concentrations can quickly lead to incapacitation and death. The NIOSH IDLH (Immediately Dangerous to Life and Health) limit is only 100 parts per million (ppm).

Heallth effects of $H_2S$ exposure are listed by concernation in Table 4 attached to this Plan. The OSHA permissible exposure limit (PEL) to H2S for general industry is 20 ppm, which is not to be exceeded at any time during an 8-hour shift, except that an exposure of 50 ppm $H_2S$ is allowed for up to 10 minutes per 8-hour period as long as no other measurable exposure occurs during that 8-hour time period (see 29 CFR 1910.1000, Table Z-2). Health effects begin with prolonged exposures as low as 2 to 5 ppm – potentially resulting in nausea, tearing of the eyes, headaches, and loss of sleep. Generally, industry practice uses 10 ppm as an alarm set point to warn workers of the hazard, and to evacuate the area, and the NIOSH Recommended Exposure Limit is 10 ppm.

$H_2S$ sometimes can be detectable by its characteristic odor; however, the sense of smell cannot be relied upon to provide a warning of higher concentrations of the gas (i.e., greater than 100 ppm) because $H_2S$ rapidly eliminates the sense of smell (due to paralysis of the olfactory nerve). Longer exposures to lower concentrations also have a similar desensitizing effect on the sense of smell. Never rely on sense of smell for the presence of $H_2S$.

### 5.2 COMMON $H_2S$ SOURCES

The most common $H_2S$ sources during drilling activity are in the mud handling, rig floor, pits or during connection operations.

- Gases diffusing from recovered drilling samples taken.
- Gases that are "swabbed" up the drill string when a core, down-hole tool, or logging tool is recovered and escape when the drill string is opened at the rig floor.
- Gases that escape from down-hole or logging tools when opened in the laboratory after use.



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- Gases displaced when the inner core barrel is washed out.
- Decomposition of recovered $H_2S$ clathrates.
- Well blowout that releases gases up through the drill string or into the surrounding waters.
- Gases diffusing through the drilling fluids, on rig floor, pits, and other mud handling or transferring system.

In all these cases (except for clathrates and blowout situations), the source of $H_2S$ is small in volume or must pass through a small opening first (i.e., the open end of the drill string) before reaching a work area.

### 5.3 $H_2S$ HAZARD DETERMINATION

There are five $H_2S$ hazard conditions, excluding "normal operations" (see that attached **Table T1**).

The $H_2S$ hazard condition sign is set by the Company Man/PIC based on the concentration of $H_2S$ (in parts per million or "ppm") in air, the type of $H_2S$ source, the location of the detector (open air or confined space), and the relative distance of the detector from the $H_2S$ source.

To determine the $H_2S$ hazard action level **see "Table T1".** It is important to remember the following facts:

- $H_2S$ concentrations will diminish with distance from the source.
- Moving air will greatly reduce the concentration of H2S with distance from the source.
- Moving air can direct $H_2S$ away from the sensor.
- $H_2S$ is denser than air and will accumulate in unventilated rooms or in low lying areas, (e.g., in the well cellar, pits, between tanks; and ditches or valleys).

The following examples demonstrate why it is important to understand where and how $H_2S$ was detected before assigning a hazard classification.

- $H_2S$ has been swabbed up the drill pipe and released onto the drill floor when the pipe was opened to retrieve a core barrel.
- A fixed detector, mounted 10 ft away and downwind from the open drill pipe, measures an $H_2S$ level of 4 ppm (no alarm).
- On the core-receiving station, or at gassing point of drill pipe, $H_2S$ measures 100 ppm using a portable detector with the sampling tube.



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## 6.0 $H_2S$ DETECTORS AND ALARMS

**Table T2** is an example of typical sensor and alarm locations on a drilling pad. At the time of Operations, the Company Man/PIC and EHS Coordinator will identify site-specific locations based upon actual layout and prevailing wind direction. This table is provided for guidance *only* and may be modified by the Company Man and the on-site EHS Coordinator or as the situation and experience with the local $H_2S$ environment dictates.

### 6.1 FIXED-AREA DETECTION STATIONS

Fixed-area detection stations are mounted around the well site **(see "Table T2")** where $H_2S$ sources are present or in areas where $H_2S$ may accumulate. One $H_2S$ and one Lower Explosive Limit (LEL) sensor is attached to each detection station. The stations are mounted in open areas and continuously monitor for $H_2S$ and combustible gases in the work area atmosphere.

Alarm control panels are mounted in strategic locations to provide the workers, Company Man/PIC, and Rig or Frac Manager immediate notification of a hazardous conditions. Examples of areas to position control panels may include at or near the doghouse/rig floor and the Company Man trailer/Primary Muster location.

All fixed $H_2S$ sensors are set to detect a minimum of 10 ppm. Warning lights and siren units should be installed on the rig floor and the working pits. If $H_2S$ is present at concentrations at or above 10 ppm, a local audible and visual alarm will sound. At the same time, an audible and visual alarm will be triggered on the central alarm panel.

For detailed operating instructions and specifications, see the manufacturer's operator manual.

### 6.2 PERSONAL DETECTORS

$H_2S$ monitors (personal, portable or fixed) are to be utilized in THQA drilling, completion, well servicing, workover, and production operations where atmospheric concentrations of $H_2S$ could exceed 10 PPM.

Supervisors are responsible for assuring that $H_2S$ monitoring equipment is available to protect employees involved in $H_2S$ operations. The EHS Coordinator is responsible for recommending appropriate $H_2S$ monitoring equipment to be utilized in THQA operations.

THQA employees and contractor workers are responsible for utilizing $H_2S$ monitoring equipment provided in accordance with the Contractor Expectations Manual and $H_2S$ Program requirements and training received.

THQA will issue $H_2S$ monitors to its personnel working on location. Contractors are responsible to provide their own workers with monitors. If THQA assigns a monitor to workers of Contractors, the Contractor is responsible to ensure that the workers wears, utilizes and returns the monitors in proper worker condition. **<u>$H_2S$ Monitor is to be worn in the breathing zone (NOT on your boot or hard hat).</u>**



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EHS Coordinator, Company Man, Rig Manager, and Tool Pusher will be issued 4-gas monitors that can detect $H_2S$ as well as CO, O2, and LEL .

Attached to the Contingency Plan is the **Tug Hill – Multi-Gas Meter Alarm Card** providing ready reference gas concentration risk levels and appropriate response actions by the wearer of the gas monitor. These Multi-Gas Meter Alarm Cards are issued at the time of CEM Safety Orientation and/or on-site $H_2S$ awareness training.

Personal monitors are designed to alert the wearer when the $H_2S$ concentration level reaches 10 PPM or greater. If your monitor alarms, notify the Rig Manager or Tool Pusher, who will notify the Company Man and EHS Coordinator immediately.

THQA employees and contractors assigned $H_2S$ personal monitors must:

1. Wear personal monitors on the collar area outside of all clothing for the complete workday at THQA locations where atmospheric concentrations of $H_2S$ could exceed 10 PPM.
2. Check personal monitors daily or before each use to ensure that they are operating properly in accordance with the monitor manufacturer's recommendations. Monitors that do not perform properly in this "go/no-go" check are to be removed from service and repaired.
3. Calibrate personal monitors in accordance with monitor manufacturer's recommendations and procedures utilizing approved calibration kit.
4. Report any perceived malfunctions of the monitor and perform routine maintenance on personal monitors in accordance with monitor manufacturer's recommendations and procedures. All repairs are to be performed only by the manufacturer or an authorized distributor technician.
5. Store monitors in a clean dry place. Personal and portable monitors are to be carried in the interior of vehicles and not in toolboxes. Monitors are not to be left in direct sunlight or in extremes of heat or cold. Necessary precautions are to be taken with all types of monitors to ensure that the sensor head is protected, does not become clogged with dust or dirt and that it does not become saturated with water or petroleum products.
6. Not place monitors in high $H_2S$ concentration or high humidity untreated gas lines, sample ports or in the vapor space above tanks to check the alarm on the equipment. Such practice can cause irreparable damage to the monitor sensor. Use calibration gas to "bump" test a monitor.
7. Questions concerning personal monitor selection, operation, calibration, maintenance or repairs are to be directed to the EHS Coordinator.

Continuous reading portable monitors are to be used to:

1. To survey suspect areas
2. To find sources of leaks



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3. When lines, valves or vessels are opened
4. For confined space entry activities including maintenance and inspection

## 6.3 CONFINED SPACE

Confined spaces in field areas may include enclosures, oil and condensate tanks, gun barrels, heaters, separators, treaters, well cellars, excavated areas around flow lines (bell holes), open pits, and open produced water storage tanks.

Portable monitors are to be used in the following manner:

1. Prior to initiating work, the portable monitor is to be used to thoroughly check the complete work area.
2. Monitors are to be used with a probe so entry into the suspect area can be limited. The emphasis on monitoring must be on low lying areas where $H_2S$ is prone to concentrate.
3. If the suspect area must be entered to perform the initial check, then respiratory protection must be worn.
4. Once the initial check of the area has been completed, the portable monitor is to be placed in the immediate work area and used for the duration of the work task.
5. If the work task requires workers to be more dispersed, then additional portable monitors are to be utilized.
6. $H_2S$ can become isolated to small areas and the gas has been known to increase from a low concentration to a hazardous level within several feet.

When $H_2S$ levels are above 10 ppm, use a detector...don't assume! Always use a portable $H_2S$ detector to monitor $H_2S$ levels in a confined space. Low oxygen levels can be just as lethal as $H_2S$. In some cases, it is necessary to use both types of meters. $H_2S$ levels may be safe at the entrance to a confined area but can change quickly to lethal levels, depending on the source. $H_2S$ is denser than air and will settle into low areas. Do not enter a confined space without using a SCBA to rescue someone who has passed out.

For additional information, see the Confined Space Entry Program.



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## 7.0 RESPIRATORY PROTECTION

Respiratory protection equipment is to be provided for employees where atmospheric concentrations of $H_2S$ could exceed 10 PPM.

Local Supervisors are responsible for assuring that respiratory protection equipment is available for routine and emergency use to protect employees involved in $H_2S$ operations. Respiratory protection equipment is to be readily available to employees.

The EHS Coordinator is responsible for recommending appropriate respiratory protection to be used in THQA operations involving $H_2S$ and for conducting or coordinating respiratory protection training for employees.

Employees required to use respiratory protection equipment on a routine or emergency basis are to receive medical clearance and annual training to ensure the proper and safe use of such equipment. Additional information may be found in the Respiratory Protection Program.

### 7.1 RESPIRATOR SPECIFICATION REQUIREMENTS

Only National Institute for Occupational Safety and Health/Mine Safety Health Administration (NIOSH/MSHA) approved positive pressure self-contained breathing apparatus (SCBA) or positive pressure airline units with an emergency egress bottle with an air supply of at least five (5) minutes duration are to be provided and used. Canister-type gas masks or any other type of air purifying respirators shall not be used in $H_2S$ environments.

Breathing air in SCBAs and airline respirators shall meet the specifications for Grade D breathing air. Suppliers of compressed breathing air must furnish written documentation that air meets Grade D specification. A copy of this documentation must be kept on file at each location where breathing air is used.

### 7.2 RESPIRATOR MEDICAL CLEARANCE REQUIREMENTS

Employees must be physically able to utilize a SCBA or airline unit if they are to be assigned to a work location involving $H_2S$ operations. Employees who may be required to wear respiratory protection equipment on a routine or emergency basis will undergo a medical status evaluation. A THQA authorized physician shall determine if an employee is approved to wear a respirator.

### 7.3 RESPIRATOR TRAINING REQUIREMENTS

Employees expected to wear respirators for routine or emergency use are to receive annual training to ensure the proper and safe use of respirators.



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## 7.4 RESPIRATOR USE REQUIREMENTS

Suspected Exposure - Respiratory protection use is mandatory where atmospheric concentrations of $H_2S$ could exceed 10 PPM or where the concentration is unknown. Work tasks that may expose employees to unknown or suspected $H_2S$ atmospheres of 10 PPM or more include:

- For confined space work when the atmospheric concentration of $H_2S$ has not yet been determined and entry is required to perform the initial check.
- During emergency rescue where there is the slightest chance that the victim has been overcome by $H_2S$.
- When checking known or suspected leaks at THQA operated locations, facilities and pipelines involved in $H_2S$ service.
- When it is necessary to evacuate the work environment due to a sudden release of $H_2S$.
- When conducting initial $H_2S$ surveys when concentrations are unknown.

When atmospheric concentration of $H_2S$ exceeds 100 PPM (IDLH), the use of a standby person is required. Tank gauging and other operations requiring open thief hatches on tanks require a standby person when the concentration of $H_2S$ is 100 PPM or greater measured level with the thief hatch. The standby person is required at all times, including call outs, and must have positive pressure SCBA immediately available.



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# 8.0 OPERATING CONTROLS WHEN $H_2S$ IS SUSPECTED

## 8.1 SITE ACCESS CONTROL

During operations where the potential for $H_2S$ is suspected, access will be limited by the security guard positioned at the site entrance. Only those with the previously described $H_2S$ training will be allowed unattended entry.

Those individuals who have not been trained may be escorted by a trained individual at the discretion of the company man or EHS Coordinator.

## 8.2 RESPONSE EQUIPMENT

The following section details $H_2S$ safety equipment to be utilized at THQA drilling operations where atmospheric concentrations of $H_2S$ could exceed 10 ppm. Equipment is located and actively maintained onsite during operations where an $H_2S$ encounter is suspected. All personnel who may be expected to use this equipment must be "fit for duty". An authorized THQA representative will have the final authority to make the determination. Both portable and stationary equipment will be in use.

- Safety trailer with breathing air cascade and manifold system (Minimum 10 - 300 $ft^3$ cylinders/4 manifolds)
- Airline (NIOSH approved airline hose/sufficient footage for location setup and complement of personnel)
- Air-supplied airline respirators with emergency escape bottles (Minimum 8 NIOSH approved units)
- SCBA respirators (Minimum 5 NIOSH approved units with 30-minute air supply)
- Portable $H_2S$ monitor
- "$H_2S$ Warning" sign (Minimum 2)
- "$H_2S$ Condition" sign (Minimum 2)
- "Safety Briefing Area" sign (Minimum 2)
- Windsock (Minimum 2) and/or Streamers
- Sample gas (sufficient quantity for daily testing of sensors)
- First aid kit
- Resuscitator/spare cylinder
- Hand portable fire extinguisher (Minimum 20# ABC)
- Full-body harnesses/lifelines (Minimum 2)
- Portable combustible gas detector


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## 8.3 OPERATIONS

During normal drilling operations, $H_2S$ is typically first detected by odor (<1 ppm). When an $H_2S$ odor is detected, the company man should be notified immediately. After consultation with the operations manager, Director EH&S Affairs, and all personnel have been made aware, the manager determines whether or not an $H_2S$ hazard conditions exists.

During an $H_2S$ hazard condition of ALERT (Light is Yellow) or higher, all drilling operations are suspended until the pre-site $H_2S$ preparations are completed, monitoring, including $H_2S$ safety training, which can be given to each shift before they start work.

In addition, the company man can permit drilling operations to resume while fixed-station detectors are being installed, provided portable detectors are available for monitoring and $H_2S$ levels do not exceed 10 ppm when measured at the drill string or core.

## 8.4 GENERAL SAFETY PRACTICES FOR POTENTIAL $H_2S$

- At a minimum, a fixed detector must be installed on the rig floor and in several points of the mud handling system.
- Use fans to ventilate work areas. Fans can keep the $H_2S$ concentration low enough so that SCBAs are not required
- Always use the buddy system when working in potentially hazardous areas
- Always check PPE at the beginning of the work shift. Never assume that someone has left it in working order
- Do not let materials pile up around fixed $H_2S$ sensors
- While cleaning/steaming rig area, Do Not Steam Clean Sensors

## 8.5 POTENTIAL $H_2S$ POTENTIAL BLOWOUT

Although unlikely, a set of circumstances could occur that would cause an $H_2S$ discharge gas up through the drill string. The first sign that this situation is occurring would be backflow when the drill string is opened.

Although considered unlikely in the THQA operating area in West Virginia, this drill string $H_2S$ observation represents a potential to escalate into an $H_2S$ blowout. There are many situations other than a blowout that can cause backflow, but while drilling in an environment where $H_2S$ is present the following steps should be taken if backflow is detected unless otherwise instructed by the installation manager:

- The drill string is reconnected as quickly as possible.
- The safety technician checks atmosphere for $H_2S$.
- The safety technician notifies the driller, and manager will take charge of the situation.
- Safety technicians await instructions from the manager.



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The toxic hazards associated with $H_2S$ exposure are serious at well sites. Maintain strict diligence to prevent and control exposure. Post warning signs indicating the hazards associated with the release of $H_2S$ at any well site that has $H_2S$ present in the system at high concentrations.

## 9.0 $H_2S$ HAZARD ROLES AND RESPONSIBILITIES

Each person on location has a responsibility to work safely and make known any unsafe or hazard work condition; this includes hazards related to H2S exposure.

### 9.1.1 Tug Hill Company Man/PIC

- Understands the $H_2S$ guidelines and policies set forth in this document and ensures that all personnel observe the same;
- Informs the Tool-Pusher, Driller, EHS Coordinator, and additional personnel of the current $H_2S$ hazard condition;
- Responsible to restrict entry to pad in a Level III or Level IV Alarm condition; and
- May modify the policies in this document to fit the safety requirements of the situation.

### 9.1.2 Driller and Tool Pusher or Frac Supervisor

- Assists the Company Man in enforcing the policies set forth in this document;
- Ensures all Rig Personnel have training;
- Collaborates with EHS Coordinator and Company Man to conduct drills;
- Assigns an individual to monitor $H_2S$ levels on the core-receiving platform, drilling platform or in the core laboratory facility;
- Communications Alarm conditions and keeps staff informed of the $H_2S$ hazard situation;
- Keeps management informed of $H_2S$ hazard situation; and
- Is qualified to assist in all emergency procedures.

### 9.1.3 EHS Coordinator

- Knows and executes the $H_2S$ monitoring policies/guidelines set forth in this document;
- Monitors $H_2S$ detection system for functionality and coordinates repairs with contractor;
- Ensures that safety equipment supplied by 3rd party contractor is in good working order;
- Completes head count and accounts for personnel on location during muster events;
- Coordinates with Company Man and Driller to facility drills;
- Communicates with Tug Hill EH&S Director and WVDEP for reporting;



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- Keeps the on-site manager, tool-pusher, driller, and all on-site personnel, advised of the $H_2S$ situation in their work area, and provide guidance in the evacuation/rescue procedures;
- Ensures all personnel on location have had required $H_2S$ training;
- Ensures personal monitors/meters on location are accounted and calibrated;
- Serves as Safety Representative on location in the event of an incident; and
- Conducts Incident Reporting and Investigation.

9.1.4 <u>All Personnel</u>

All personnel working in the designated hazardous areas (rig floor, core-receiving platform) must:

- Be familiar with the procedures outlined in this document;
- Complete an $H_2S$ safety training course;
- Be responsible for their PPE including proper storage and accessibility;
- Responsible for your personal monitor condition and calibration;
- Be familiar with the location of all safety equipment in your respective work areas and be able to use it upon notice;
- Stay informed of the current $H_2S$ hazard condition; and
- Follow instructions set forth in this document or as provided by your supervisor.

## 9.2 THIRD-PARTY H2S MONITORING COMPANY

If conditions warrant, THQA may engage a 3rd party $H_2S$ monitoring and response Contractor to provide a 2-man crew during 24/7 operations, and a single man crew when daylight-hour operations only are being conducted. When operations are underway that require the use of respirators, this 3rd party monitoring company will be acting as $H_2S$ Safety Advisors and Emergency Response and will have the full authority of the on-site THQA Representative.

Respirators, sensors, alarms and personal $H_2S$ monitors will be periodically checked, calibrated, and recharged by the $H_2S$ monitoring contractor.



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# 10.0 RESPONSE TO HAZARDOUS CONCENTRATIONS

## 10.1 INITIAL RESPONSE TO $H_2S$ EMERGENCY CONDITION

**Unexpected $H_2S$ Release**

Regardless of the source, the emergency alarm will be audible and/or visual and will be detectable by all personnel on location. All personnel are advised to following these initial guidelines:

- DO NOT PANIC! Identify your best route of escape.
- If available, put on a 5-minute escape unit or Breathing Apparatus, Supplied Air Respirator; (hold your breath while evacuating if supplied air breathing equipment such as 5-minute escape units are not available).
- Rapidly evacuate the area containing the $H_2S$ and move upwind or cross wind if possible and evacuate anyone who may be affected by the gas to a safe area.
- Put on air breathing equipment before helping anyone overcome by $H_2S$.
- Assemble at Primary Muster Point or alternate upwind Muster Point and wait to receive instructions.
- Drilling/coring operations remain suspended until the source of $H_2S$ is located and the atmospheric level falls to a level <10 ppm.
- The buddy system is utilized for all personnel remaining in the potential danger area.

## 10.2 PROCEED TO THE PRIMARY OR SECONDARY MUSTER POINT

The Primary Muster Point is located at the Company Man Trailer. The Guard Shack on the Access Road to the Pad is the Secondary Muster Point.

Be cognizant of the wind direction. If the wind direction is towards the Primary Muster location and you are on the upwind side of the $H_2S$ release, use the 5-minute escape pack or SCBA to proceed to the Muster location. If you DO NOT have access to an escape pack or SCBA, do your best to communicate to someone who has a radio or to your supervisor of your location and evacuate the pad in the upwind direction.

Muster Areas will be monitored throughout the response. All personnel not assigned emergency duties will proceed to the safe-briefing area. Personnel must avoid entering areas designated as potential $H_2S$ danger areas as they proceed to the safe-briefing areas.

## 10.3 INCIDENT REPORTING AND ACTIVATION OF THE ERP

If dangerous levels of $H_2S$ are detected, report the incident as soon as it is safe to do so, pursuant the Tug Hill **Incident Response and Notification Procedure** and implement the procedures described in this $H_2S$ Contingency Plan and the Tug Hill ERP, which are provided in this WSSP and



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ICP binder. This plan specifies the roles and responsibilities of on-site personnel in case of emergency and addresses emergency notification of potentially affected residents and public emergency response personnel.

After initial assessment of the situation, if $H_2S$ gas is detected and confirmed at sustained concentrations above 10 ppm, the Tug Hill Operations management or the Director EH&S Affairs will notify the County EMA and the WVDEP Inspector. If the Director of EH&S Affairs cannot be reached, the EHS Coordinator or the Company Man will make the notification as soon as practicable.

If the situation is of immediate danger to life and health, Unfired Command/Incident Command ("UIC") will be established pursuant the Incident Command System (ICS) in the ERP.

UIC will assess and determine if evacuation is desired and the size of protective zone for local residents (e.g., 1,500 feet from center of pad – See Well Siting Exhibits in the WSSP).

If the agency directs, on-site Tug Hill personnel and Contractors will be engaged to notify all local potentially impacted residents of the incident by dispatching workers to each potentially affected residence. If the public emergency responder does not direct this notification to be made by the Operator, then the public response agency will be responsible for this notification.

Tug Hill commits it full cooperation and assistance in making notifications to residents and assisting to maintain the designated protective zone. Tug Hill resources include the workers onsite and other Operations personnel, as well as our Incident Command Structure, EHS Department personnel and contractors, and the Tug Hill Land Department Land Agents.

## 10.4 PROTECTION ZONES

In cooperation with the UIC, the On-Scene Incident Commander, or his designee, shall determine protective zones to limit the risk of exposure to workers, local responders, and residents surrounding the work area.

The Safety Zone Map and Parcel Owners listed is provided in the **SITE-SPECIFIC DATA** section of the WSSP and ICP binder for each location.

Life safety impacts to the environment, and property conservation are priorities. The Emergency Protection Zones based on the following information on the scene:

- Magnitude of the incident
- Wind Direction
- MSDS of applicable materials
- Current and forecasted weather conditions
- Topography and land conditions
- Other influences specific to the incident



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Once established, these zones will be maintained until a determination is made by the Emergency Coordinator to alter or discontinue them. Tug Hill will contact local residents and will post personnel on all roads within the zone to prevent entrance to the area until an all clear has been issued. The initial contact will be conducted by telephone and, for those that cannot be reached, a drive by will be initiated.

## 10.5 FIRST AID

If a person is overcome by $H_2S$ gas, immediate first aid treatment is vital. Degree of $H_2S$ poisoning and probability of respiratory failure will vary depending on the concentration of $H_2S$ gas, the duration of exposure, and the physiological and psychological condition of the individual.

The primary objective is managing first aid treatment of $H_2S$ exposure is to provide the person with fresh breathing air (oxygen), free of gas contamination.

The following steps are a basic guideline to follow in managing first aid treatment for a person overcome by $H_2S$ gas:

1. Once in a fresh breathing air area, provide mouth-to-mouth artificial respiration or mechanical oxygen resuscitation (only if properly trained). NOTE: Oxygen applied to a greasy face will burn where it is greasy.
2. Provide CPR (Cardiopulmonary Resuscitation) only if required and properly trained.
3. Once revived, treat for shock and do not leave unattended.
4. Transport to professional medical care at once. Although the person may seem to have recovered, do not rely on their sense or appearance – all victims of $H_2S$ gas poisoning shall receive professional care as soon as possible. It is important for persons working around $H_2S$ gas areas to have proper training (American Red Cross courses or American Heart Association courses or Medic First Aid) in mouth-to-mouth artificial respiration and CPR.

## 10.6 RESCUE

All emergency rescue attempts must be performed by personal trained and qualified personnel. Rescue attempts in an $H_2S$ gas release area requires the rescuer to don a positive pressure type SCBA or airline units with emergency egress bottle. Do not attempt rescue without the proper respiratory protection or the rescuer may become a victim.

1. Notify emergency response services and your supervisor.
2. Put on a SCBA before proceeding to assist anyone affected by the gas. Check pressure and don emergency respiratory protection equipment, making certain of a good seal on the face piece.
3. Put on a rescue harness with a minimum of 50 ft. of rescue line and obtain standby assistance before entering the area if the person is in a high-concentration area.



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4. Remove the individual from the suspected area to a safe location upwind and away from the source of $H_2S$ emissions.
5. Once removed from the area, open the individual's airway, check for breathing. Begin mouth-to-mouth artificial respiration if the individual is not breathing.
6. Check for pulse. Initiate CPR if circulation has stopped.
7. Treat for shock.
8. If emergency medical personnel cannot be summoned to the scene quickly, the individual should be taken to the nearest hospital.
9. Continue mouth-to-mouth artificial respiration or CPR during transport. Once started, CPR should be continued until the individual recovers or until turned over to emergency service personnel.

All individuals reacting to $H_2S$ exposure, which includes showing signs of severe persistent irritation, faintness, sluggishness, eye pain, convulsions, nausea, vomiting, confusion or unconsciousness, are to receive medical attention and remain under observation until released by a physician.

## 10.7 POST-INCIDENT FOLLOW-UP AND DOCUMENTATION

After the well and site are secured and it is safe to access the area, post-incident investigation of the conditions and circumstances leading up and during the incident is required. The time, date, weather conditions, Operational details, geologic formation, pressures recorded, personnel sign-in sheets, and information and logs regarding where, when and how the $H_2S$ release occurred are to be preserved and provided to the EHS Department. Logs of landowner and agency communications will also be required.

Personal medical information regarding injured parties is to be kept confidential and handled in a discrete and confidential manner and shared solely with the EHS Director and/or human resources of the employer.



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# Tables

## Table T1

## Hydrogen Sulfide Operating Conditions Hazard Action Levels

| $H_2S$ condition | Conc. ppm | Level Risk | Action |
|---|---|---|---|
| | Open air | | |
| **Normal operations** | No $H_2S$ potential | None/NA | None |
| **Watch/Green** | Potential $H_2S$ Odor | None/NA | Monitor/Be Alert |
| **Alert/Yellow** | 1–10 ppm | Low | Report<br>Use Caution<br>Inform All Personnel<br>Continuously Monitor for changes |
| **Danger/Red** | >10 ppm to 15 ppm | Low - Moderate | At 10 PPM company man will instruct the rig to pull up, start circulating and prepare to shut-in.<br>Report to Company Man and EHS Coordinator<br>Pair Up / Buddy System<br>Check Wind Direction<br>Notify All Personnel<br>Muster at Primary or Upwind Muster Pt.<br>Check Head Count and Names<br>EHS and Company Man Check Sensors Functions<br>Monitor for Changes in Concentration<br>EHS to Notify WVDEP Inspector |
| **Danger/Red** | 15-25 ppm | Moderate<br>OSHA STEL (15 min) is 20 ppm | **ALL ABOVE ACTIONS PLUS:**<br>Don 5 Minute Escape Pack<br>Shut the Air/Mud Pumps<br>Shut-in the Well<br>Evacuate Rig<br>Establish Red Zone |
| **Elevated Emergency** | >25 ppm | Extreme Danger | Evacuate all personnel to Primary Muster if concentration at Primary Muster Area is <10 ppm<br>Evacuate to Off-Site Muster at Security Shack if sustained conc. is >25 ppm at Primary Muster<br>Initiate Emergency Procedures<br>Guard to STOP all access<br>SCBA or Supplied Air Required to Enter Red Zone<br>If concentrations off pad >100 ppm, work with County OEM (EMA?)/ EMA to notify residents within 3,000 ft. |

**Table T2**

**Locations of Sensors, Alarms and Breathing Apparatus Equipment**

| **Sensor Locations**<br>**LEL and $H_2S$ Sensors are at Each Location** | **Sensor #**<br>**(To be shown on Site Plan)** | **Visible Flash or Audible Siren** |
|---|---|---|
| Rig Floor – Back of Draw-works | LEL – T-#<br>$H_2S$ – T-# | **Both** |
| Well Cellar/BOP – LEL and $H_2S$ on opposing I-Beams | LEL – T-#<br>$H_2S$ – T-# | **Both** |
| Shaker – (Prevailing Downwind Side) | LEL – T-#<br>$H_2S$ – T-# | **Both** |
| Backyard Near Mud Mix-off Half-Round (Downwind) | LEL – T-#<br>$H_2S$ – T-# | **Both** |
| Other? | LEL – T-#<br>$H_2S$ – T-# | |
| Other? | LEL – T-#<br>$H_2S$ – T-# | |
| Other? | LEL – T-#<br>$H_2S$ – T-# | |
| Other? | LEL – T-#<br>$H_2S$ – T-# | |
| | | |
| **Location of Self-Contained Breathing Apparatus (SCBA)** | **Escape Packs** | **SCBA** |
| 2 SCBA at Primary Muster Point | | **X** |
| 2 SCBA at Secondary Muster | | **X** |
| | | |
| **5-Minute Escape Packs** | | |
| Excavator – 1 Pack | **X** | |
| Shaker Catwalk – 2 Packs – One at Each End | **X** | |
| Rig Dog House – 2 Packs | **X** | |
| Rig Floor – 2 at Each Stairway – On-side and Off-side | **X** | |
| Hopper House – 1 Pack | **X** | |
| | | |

**Table T3**

**Breathing Apparatus Required before Opening Drill String**

| $H_2S$ hazard condition | Pit/Mud (handling area) | Rig floor crew | Driller (driller's shack) |
|---|---|---|---|
| Watch | None | None | No |
| Alert | In ready state | In ready state | In ready state |
| Danger | Yes | Yes | Yes |
| Emergency | Yes | Yes | Yes |

**Table T4**

**Health Effects of $H_2S$ Exposure**

| Concentration of $H_2S$ | | | Effect |
|---|---|---|---|
| (%) | (ppm) | (g/100 $ft^3$) | |
| 0.001 | 10 | 0.65 | Obvious and unpleasant odor; safe for 8 hr |
| 0.002 | 20 | 1.3 | Safe for 4 hr exposure |
| 0.01 | 100 | 6.48 | Kills sense of smell in 3–15 min; may sting eyes and throat |
| 0.02 | 200 | 12.96 | Kills sense of smell; stings eyes and throat |
| 0.05 | 500 | 32.96 | Dizziness; breathing ceases in minutes; need prompt artificial respiration |
| 0.07 | 700 | 45.26 | Unconscious quickly; death will result if not rescued promptly |
| 0.1 | 1000 | 64.8 | Unconscious immediately, followed by death within minutes |

**Tug Hill – Multi-Gas Meter Alarm Card**

| Tug Hill – Multi-Gas Meter Alarms | | | | |
|---|---|---|---|---|
| Sensors | Low Alarm | High Alarm | No Entry (Note: No Alarm) | Reference |
| $O_2$ | < 19.5 % | > 23.5 % | < 18.5 %<br>> 24.5 % | Fresh Air 20.9% |
| $H_2S$ | > 10 ppm | > 15 ppm | > 25 ppm | OSHA PEL 10 ppm[1] |
| LEL | > 10 % | > 20 % | > 50 % | |
| CO | > 35 ppm | > 100 ppm | > 200ppm | OSHA PEL 50 ppm[1] |
| **Low Risk** | **Medium Risk** | | **High Risk** | |
| [1]OSHA PEL Based on 8-Hour TWA | | | | |

| Tug Hill – Procedural Risk Actions | |
|---|---|
| Low Risk Actions | Notify Operator & Crew, Identify Source & Attempt to Control |
| CO > 35 ppm | When elevated CO is encountered, Continuously Monitor |
| H2S/LEL > 1 ppm | When H2S is encountered at this level, Continuously Monitor |
| Medium Risk Actions | Notify Operator & Crew, Identify Source & Attempt to Control, Prepare to evacuate. |
| O2 > 23.5% | Extremely Flammable Atmosphere, No Hot Work, Control or Evacuate |
| H2S > 10 ppm | Stop Work & Continue to Identify Source |
| H2S > 15 ppm | Evacuate After 5 Min if H2S Remains > 15 ppm & Uncontrollable |
| LEL > 10% | No Hot Work, Implement Intrinsically Safe Environment |
| LEL > 20% | Stop Work |
| CO > 100 ppm | Stop Work |
| High Risk Actions | Evacuate Immediately |
| O2 < 18.5% or<br>O2 > 24.5%<br>H2S > 25 ppm<br>LEL > 50%<br>CO > 200 ppm | Evacuate to muster point. Go to high ground that is upwind & watch for wind direction changes. Notify Management. No Re-entry.<br>*Note IDLH: H2S – 100 ppm; CO – 1200 ppm* |
| Confined Space | If Confined Space, Evacuate for Any Alarm; High or Low |

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# CONSTRUCTION

## SHELLENBERGER /

## JR CONSTRUCTION

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**CONSTRUCTION**

**Products stored on location**

**Tier II Determination**

| CAS # | Chemical | Max. on Location | Units | Specific Gravity | % by Weight | Gal | Pounds /gal | Total Pounds | Reportable Quantity | Reportable on Tier II | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 68476-34-6 | Diesel Fuel | 2,500 | gallons | 0.865 | 100% | 2,500 | 7.2 | 18,014 | 10,000 lbs | yes | 313 = NL; 311 = Acute and chronic health, fire hazard |
| NA | Hydraulic Fluid | 150 | gallons | | | | | | NA | no | |
| NA | 10w30 or 10w40 Oil | 55 | gallons | | | | | | NA | no | |
| NA | Grease | 10 | gallons | | | | | | NA | no | |

When there is a range, maximum quantity or percentage is used in calculation

NL = Not Listed

# Safety Data Sheet

**Material Name: Diesel Fuel, All Types**

**SDS No. 9909**
**US GHS**

**Synonyms:** Ultra Low Sulfur Diesel; Low Sulfur Diesel; No. 2 Diesel; Motor Vehicle Diesel Fuel; Non-Road Diesel Fuel; Locomotive/Marine Diesel Fuel

## * * * Section 1 - Product and Company Identification * * *

### Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

## * * * Section 2 - Hazards Identification * * *

### GHS Classification:

Flammable Liquids - Category 3
Skin Corrosion/Irritation – Category 2
Germ Cell Mutagenicity – Category 2
Carcinogenicity - Category 2
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)
Aspiration Hazard – Category 1
Hazardous to the Aquatic Environment, Acute Hazard – Category 3

### GHS LABEL ELEMENTS

### Symbol(s)

### Signal Word

DANGER

### Hazard Statements

Flammable liquid and vapor.
Causes skin irritation.
Suspected of causing genetic defects.
Suspected of causing cancer.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May be fatal if swallowed and enters airways.
Harmful to aquatic life.

### Precautionary Statements

**Prevention**

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.



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Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash hands and forearms thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing fume/mist/vapours/spray.

**Response**
In case of fire: Use water spray, fog or foam to extinguish.
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
If swallowed: Immediately call a poison center or doctor. Do NOT induce vomiting.
IF exposed or concerned: Get medical advice/attention.

**Storage**
Store in a well-ventilated place. Keep cool.
Keep container tightly closed.
Store locked up.

**Disposal**
Dispose of contents/container in accordance with local/regional/national/international regulations.

## * * * Section 3 - Composition / Information on Ingredients * * *

| CAS # | Component | Percent |
|---|---|---|
| 68476-34-6 | Fuels, diesel, no. 2 | 100 |
| 91-20-3 | Naphthalene | <0.1 |

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher.

## * * * Section 4 - First Aid Measures * * *

### First Aid: Eyes
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

### First Aid: Skin
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

### First Aid: Ingestion
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

### First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

## * * * Section 5 - Fire Fighting Measures * * *

### General Fire Hazards

See Section 9 for Flammability Properties.
Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

### Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

### Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, and other gaseous agents.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

### Unsuitable Extinguishing Media

None

### Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

## * * * Section 6 - Accidental Release Measures * * *

### Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

### Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

### Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.



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## Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

## Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

## Prevention of Secondary Hazards

None

# * * * Section 7 - Handling and Storage * * *

## Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

## Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

## Incompatibilities

Keep away from strong oxidizers.

# * * * Section 8 - Exposure Controls / Personal Protection * * *

## Component Exposure Limits

**Fuels, diesel, no. 2 (68476-34-6)**

ACGIH: 100 mg/m3 TWA (inhalable fraction and vapor, as total hydrocarbons, listed under Diesel fuel)
Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Diesel fuel)

**Naphthalene (91-20-3)**

| | |
|---|---|
| ACGIH: | 10 ppm TWA |
| | 15 ppm STEL |
| | Skin - potential significant contribution to overall exposure by the cutaneous route |
| OSHA: | 10 ppm TWA; 50 mg/m3 TWA |
| NIOSH: | 10 ppm TWA; 50 mg/m3 TWA |
| | 15 ppm STEL; 75 mg/m3 STEL |

## Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

## Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

## Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

## Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

## Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

# * * * Section 9 - Physical & Chemical Properties * * *

| | | | |
|---|---|---|---|
| **Appearance:** | Clear, straw-yellow. | **Odor:** | Mild, petroleum distillate odor |
| **Physical State:** | Liquid | **pH:** | ND |
| **Vapor Pressure:** | 0.009 psia @ 70 °F (21 °C) | **Vapor Density:** | >1.0 |
| **Boiling Point:** | 320 to 690 °F (160 to 366 °C) | **Melting Point:** | ND |
| **Solubility (H2O):** | Negligible | **Specific Gravity:** | 0.83-0.876 @ 60°F (16°C) |
| **Evaporation Rate:** | Slow; varies with conditions | **VOC:** | ND |
| **Percent Volatile:** | 100% | **Octanol/H2O Coeff.:** | ND |
| **Flash Point:** | >125 °F (>52 °C) minimum | **Flash Point Method:** | PMCC |
| **Upper Flammability Limit (UFL):** | 7.5 | **Lower Flammability Limit (LFL):** | 0.6 |
| **Burning Rate:** | ND | **Auto Ignition:** | 494°F (257°C) |

# * * * Section 10 - Chemical Stability & Reactivity Information * * *

## Chemical Stability

This is a stable material.

## Hazardous Reaction Potential

Will not occur.

## Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

## Incompatible Products

Keep away from strong oxidizers.

## Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

## * * * Section 11 - Toxicological Information * * *

## Acute Toxicity

### A: General Product Information

Harmful if swallowed.

### B: Component Analysis - LD50/LC50

**Naphthalene (91-20-3)**

Inhalation LC50 Rat >340 mg/m3 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

## Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

## Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

## Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

## Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

## Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

## Generative Cell Mutagenicity

This material has been positive in a mutagenicity study.

## Carcinogenicity

### A: General Product Information

Suspected of causing cancer.

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

### B: Component Carcinogenicity

**Fuels, diesel, no. 2 (68476-34-6)**

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Diesel fuel)

**Naphthalene (91-20-3)**

ACGIH: A4 - Not Classifiable as a Human Carcinogen
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

## Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

## Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

## Specified Target Organ General Toxicity: Repeated Exposure

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

## Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

# * * * Section 12 - Ecological Information * * *

## Ecotoxicity

### A: General Product Information

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

### B: Component Analysis - Ecotoxicity - Aquatic Toxicity

**Fuels, diesel, no. 2 (68476-34-6)**

| Test & Species | | Conditions |
|---|---|---|
| 96 Hr LC50 Pimephales promelas | 35 mg/L [flow-through] | |

**Naphthalene (91-20-3)**

| Test & Species | | Conditions |
|---|---|---|
| 96 Hr LC50 Pimephales promelas | 5.74-6.44 mg/L [flow-through] | |
| 96 Hr LC50 Oncorhynchus mykiss | 1.6 mg/L [flow-through] | |
| 96 Hr LC50 Oncorhynchus mykiss | 0.91-2.82 mg/L [static] | |
| 96 Hr LC50 Pimephales promelas | 1.99 mg/L [static] | |



04/14/2023

| | |
|---|---|
| 96 Hr LC50 Lepomis macrochirus | 31.0265 mg/L [static] |
| 72 Hr EC50 Skeletonema costatum | 0.4 mg/L |
| 48 Hr LC50 Daphnia magna | 2.16 mg/L |
| 48 Hr EC50 Daphnia magna | 1.96 mg/L [Flow through] |
| 48 Hr EC50 Daphnia magna | 1.09 - 3.4 mg/L [Static] |

## Persistence/Degradability

No information available.

## Bioaccumulation

No information available.

## Mobility in Soil

No information available.

## * * * Section 13 - Disposal Considerations * * *

## Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

## Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

## * * * Section 14 - Transportation Information * * *

## DOT Information

**Shipping Name:** Diesel Fuel

**NA #:** 1993 **Hazard Class:** 3 **Packing Group:** III

**Placard:**

## * * * Section 15 - Regulatory Information * * *

## Regulatory Information

**Component Analysis**

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

**Naphthalene (91-20-3)**

CERCLA: 100 lb final RQ; 45.4 kg final RQ

**SARA Section 311/312 – Hazard Classes**

| Acute Health | Chronic Health | Fire | Sudden Release of Pressure | Reactive |
|---|---|---|---|---|
| X | X | X | -- | -- |

**SARA SECTION 313 - SUPPLIER NOTIFICATION**

This product may contain listed chemicals below the de minimis levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right- To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

**State Regulations**

**Component Analysis - State**

The following components appear on one or more of the following state hazardous substances lists:

| Component | CAS | CA | MA | MN | NJ | PA | RI |
|---|---|---|---|---|---|---|---|
| Fuels, diesel, no. 2 | 68476-34-6 | No | No | No | Yes | No | No |
| Naphthalene | 91-20-3 | Yes | Yes | Yes | Yes | Yes | No |

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

**Component Analysis - WHMIS IDL**

No components are listed in the WHMIS IDL.

**Additional Regulatory Information**

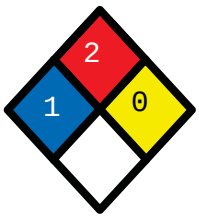
**Component Analysis - Inventory**

| Component | CAS # | TSCA | CAN | EEC |
|---|---|---|---|---|
| Fuels, diesel, no. 2 | 68476-34-6 | Yes | DSL | EINECS |
| Naphthalene | 91-20-3 | Yes | DSL | EINECS |

## * * * Section 16 - Other Information * * *

**NFPA® Hazard Rating**

| | |
|---|---|
| Health | 1 |
| Fire | 2 |
| Reactivity | 0 |




**HMIS® Hazard Rating**

| | | |
|---|---|---|
| Health | 1* | Slight |
| Fire | 2 | Moderate |
| Physical | 0 | Minimal |
| | | *Chronic |

## Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

## Literature References

None

## Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet

# DRILLING

## BAKER HUGHES

04/14/2023

**DRILLING**

**Baker Hughes Products stored on location**

**Tier II Determination**

| CAS # | Chemical | Max. on Location | Units | Specific Gravity | % by Weight | Gal | Pounds /gal | Total Pounds | Reportable Quantity | Reportable on Tier II | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Calcium Chloride** | 25,000 | pounds | | | | | | NA | no | CERCLA 313 = NL; TSCA exempt |
| 10043-52-4 | Calcium chloride, anhydrous | | | 2.20 | 90-100% | | | 25,000.0 | NA | no | CERCLA 313 = NL; TSCA exempt |
| | **Carbo-Gel II** | 2,500 | pounds | 1.70 | 100.00% | | | 2,500.0 | NA | no | NL |
| 14808-60-7 | Crystalline silica, quartz | | | | 5-10% | | | 250.0 | NA | no | CERCLA 313 = NL; TSCA exempt |
| | **Carbo-Tec** | 1,320 | gallons | 0.96 | 100% | | | | NA | no | CERCLA 313 = NL; TSCA exempt |
| 64742-47-8 | Distillates, (petroleum), hydrotreated light | | | 0.80 | 10-20% | 264 | 6.664 | 1,759.29 | NA | no | NL |
| | **LC-Lube Plus** | 4,000 | pounds | 2.2 | 100% | | | 4,000 | NA | no | CERCLA 313 = NL; TSCA exempt |
| 14808-60-7 | Crystalline silica, quartz | | | | 0.1-1% | | | 40 | NA | no | NL |
| | **Mil-Bar 410** | 40,000 | pounds | 4.1 | 100% | | | 40,000 | NA | no | CERCLA 313 = NL; TSCA exempt |
| 14808-60-7 | Crystalline silica, quartz | | | | 1-5% | | | 2,000 | NA | no | NL |
| | **Mil-Carb 25** | 10,000 | pounds | | | | | 10,000 | NA | no | CERCLA 313 = NL; TSCA exempt |
| 1317-65-3 | Calcium carbonate | | | | 90-100% | | | 10,000 | NA | no | NL |
| 14808-60-7 | Crystalline silica, quartz | | | | 1-5% | | | 500.0 | NA | no | NL |
| | **Mil-Carb TM** | 17,500 | pounds | | | | | | | no | CERCLA 313 = NL; TSCA exempt |
| 1317-65-3 | Calcium carbonate | | | | 90-100% | | | 17,500 | NA | no | NL |
| 14808-60-7 | Crystalline silica, quartz | | | | 1-5% | | | 875.0 | NA | no | NL |
| | **Mil-Clean** | 440 | gallons | 1.03 | 100% | 440 | 8.58 | 3,775.2 | NA | no | CERCLA 313 = NL; TSCA exempt |
| 111-76-2 | 2-Butoxyethanol | | | 0.9012 | 5-10% | | | | NA | no | 313 glycol ether; flammable; health hazard 2 |
| 68081-81-2 | Alkyl benzenesulfonate | | | | 5-10% | | | | NA | no | NL |
| proprietary | Sodium silicate | | | NA | 1-5% | | | | NA | no | NL |
| 57-13-6 | Urea | | | | 1-5% | | | | NA | no | NL |
| proprietary | Alkylaryl sulfonates | | | NA | 1-5% | | | | NA | no | NL |
| proprietary | Oxyalkylated alkylphenol | | | NA | 1-5% | | | | NA | no | NL |
| | **Mil-Lime** | 12,500 | pounds | 2.4 | 100% | | | 12,500 | 10,000 lbs | yes | 313 = NL; 311/312 = acute health hazard |
| 1305-62-0 | Calcium hydroxide | | | 2.24 | 95-100% | | | 12,500 | 10,000 lbs | yes | 313 = NL; 311/312 = acute health hazard |
| | **Mil-Sorb** | 2,500 | pounds | 1 | 100% | | | 2,500 | NA | no | CERCLA 313 = NL; TSCA exempt |
| 14808-60-7 | Crystalline silica, quartz | | | | 5-10% | | | 250 | NA | no | |
| | **Next-Base eC** | 16,800 | gallons | 0.78 | 100% | 16,800 | 6.5 | 109,156.3 | 10,000 lbs | yes | 313 = NL; 311/312 = acute health hazard |
| 848301-67-7 | Aliphatic hydrocarbons | | | NA | 80-85% | | | | 10,000 lbs | yes | NL |
| 112-40-3 | Dodecane | | | NA | 5-10% | | | | NA | no | NL |
| 629-59-4 | Tetradecane | | | NA | 5-10% | | | | NA | no | NL |
| 629-50-5 | Tridecane | | | NA | 1-5% | | | | NA | no | NL |
| 1120-21-4 | Undecane | | | NA | 1-5% | | | | NA | no | NL |
| 12002-43-6 | **Next-FLC -** Asphaltite | 4,000 | pounds | 1.08 | 90-100% | | | 4,000.0 | NA | no | CERCLA 313 = NL; stable |
| | **Next-Mul HT** | 880 | gallons | 0.92 | 100% | 880 | 7.66 | 6,744 | NA | no | CERCLA 313 = NL; TSCA exempt |
| 64742-46-7 | Distillates, (petroleum), hydrotreated middle | | | NA | 30-40% | NA | | | NA | no | NL |
| 111-76-2 | 2-butoxyethanol | | | 0.9012 | 1-5% | 44 | 7.51 | 330.44 | 10,000 lbs | no | 313 glycol ether; flammable; health hazard 2 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Omni-Cote** | 880 | gallons | 0.941 | 100% | 880 | 7.84 | 6,897.90 | NA | no | CERCLA 313 = NL; TSCA exempt |
| 70528-83-5 | Calcium bis(dodecylbenzenesulphonate), branched | | | NA | 20-30% | 264 | NA | | NA | no | NL: TSCA exempt |
| 26952-14-7 | Hexadecene | | | NA | 10-20% | 176 | NA | | NA | no | NL; TSCA exempt |
| 104-75-7 | 2-ethyl hexanol | | | NA | 5-10% | 88 | | | NA | no | NL |
| 27070-58-2 | Octadecene | | | NA | 5-10% | 88 | | | NA | no | NL; CDR, TSCA exempt |
| | **Product 2077** | 440 | gallons | 1.43 | 100% | 440 | 11.9119 | 5,241.24 | NA | no | CERCLA 313 = NL; 311/312 health hazard |
| proprietary | Polyphosphoric acid esters | | | NA | 30-60% | 264 | NA | NA | NA | no | |
| 7758-11-4 | Dipotassium Phosphate | | | 2.3 | 10-30% | 132 | 19.16 | 2,529.10 | NA | no | nonflammable, stable; chronic health effects = NA |
| | **Surf-Cote** | 220 | gallons | 0.98 | 100% | 220 | 8.1634 | 1,796 | 10,000 lbs | no | Flammable Category 3; OSHA hazard |
| 70528-83-5 | Calcium bis(dodecylbenzenesulphonate), branched | | | NA | 50-60% | 132 | | NA | NA | no | NL |
| 64742-94-5 | Naphtha (petroleum), heavy aromatic | | | 0.98 | 30-40% | 88 | 8.1634 | 718.38 | 10,000 lbs | no | Flammable; TSCA listed |
| 71-36-3 | N-butanol | | | 0.81 | 5-10% | 22 | 6.75 | 148.44 | 5,000 lbs | no | "313"; < 5,000 lbs |
| 91-20-3 | Naphthalene | | | 1.162 | 1-5% | 11 | 9.68 | 106.47 | 100 lbs | yes | "313"; > 100 lbs |
| | **X-Cide 102 Industrial Bactericide** | 80 | gallons | 1.07 | 100% | 80 | 8.91 | 713.0 | 10,000 lbs | no | 313 = NL; OSHA hazard, acute toxicity |
| 111-30-8 | Glutaraldehyde | | | 1.129 | 20-30% | 24 | 9.4 | 225.7 | 10,000 lbs | no | acute toxicity |

When there is a range, maximum quantity or percentage is used in calculation

NL = Not Listed

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : Calcium Chloride
**Product code** : 5008DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Salt.

**Print date** : 7/1/2015.
**Validation date** : 6/30/2015.
**Version** : 2

**Supplier's details** : Baker Hughes Oilfield Operations
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Warning
**Hazard statements** : Causes serious eye irritation.

**Precautionary statements**

**Prevention** : Wear eye or face protection. Wash hands thoroughly after handling.
**Response** : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.
**Storage** : Not applicable.
**Disposal** : Not applicable.

**Hazards not otherwise classified** : Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat.

# Section 3. Composition/information on ingredients

**Substance/mixture** : Substance

| Ingredient name | % | CAS number |
|---|---|---|
| Calcium chloride, anhydrous | 90 - 100 | 10043-52-4 |

# Section 4. First aid measures

## Description of necessary first aid measures

**Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

**Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

## Most important symptoms/effects, acute and delayed

### Potential acute health effects

**Eye contact** : Causes serious eye irritation.

**Inhalation** : Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.

**Skin contact** : No known significant effects or critical hazards.

**Ingestion** : Irritating to mouth, throat and stomach.

### Over-exposure signs/symptoms

**Eye contact** : pain or irritation,watering,redness

**Inhalation** : respiratory tract irritation,coughing

**Skin contact** : No specific data.

**Ingestion** : No specific data.

## Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

# Section 4. First aid measures

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

## Extinguishing media

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : No specific fire or explosion hazard.

**Hazardous thermal decomposition products** : halogenated compounds,metal oxide/oxides

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

# Section 6. Accidental release measures

## Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

## Methods and materials for containment and cleaning up

**Small spill** : Move containers from spill area. Avoid dust generation. Using a vacuum with HEPA filter will reduce dust dispersal. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing dust. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| No exposure limit value known. | | | | | | | | | | | |

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

## Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Hand protection** : Chemical-resistant gloves: neoprene or nitrile

**Skin protection** : Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection** : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: No personal respiratory protective equipment normally required.

## Section 9. Physical and chemical properties

**Appearance**

| | | |
|---|---|---|
| **Physical state** | : | Solid. [Powder or flakes.] |
| **Color** | : | White. |
| **Odor** | : | Odorless. |
| **Odor threshold** | : | Not available. |
| **pH** | : | 9 to 10.5 [Conc. (% w/w): 10%] |
| **Melting/freezing point** | : | 772°C (1421.6°F) |
| **Boiling point** | : | 1600°C (2912°F) |
| **Initial Boiling Point** | : | Not available. |
| **Flash point** | : | Closed cup: Not applicable. |
| **Burning time** | : | Not available. |
| **Burning rate** | : | Not available. |
| **Evaporation rate** | : | Not available. |
| **Flammability (solid, gas)** | : | Not available. |
| **Lower and upper explosive (flammable) limits** | : | Not available. |
| **Vapor pressure** | : | Not available. |
| **Vapor density** | : | Not available. |
| **Relative density** | : | 2.1 to 2.2 |
| **Density** | : | Not available. |
| **Solubility in water** | : | Not available. |
| **Partition coefficient: n-octanol/water** | : | Not available. |
| **Auto-ignition temperature** | : | Not available. |
| **Decomposition temperature** | : | Not available. |
| **Viscosity** | : | Not available. |
| **VOC** | : | Not available. |
| **Pour Point** | : | Not available. |

**Additional information**

Water-reactive

## Section 10. Stability and reactivity

| | | |
|---|---|---|
| **Reactivity** | : | No specific test data related to reactivity available for this product or its ingredients. |
| **Chemical stability** | : | The product is stable. |
| **Possibility of hazardous reactions** | : | Hazardous reactions or instability may occur under certain conditions of storage or use. |
| **Conditions to avoid** | : | No specific data. |
| **Incompatible materials** | : | Reactive or incompatible with the following materials: moisture. |
| **Hazardous decomposition products** | : | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |

# Section 11. Toxicological information

## Information on toxicological effects

### Acute toxicity

| Product/ingredient name | Result | Species | Dose | Exposure |
|---|---|---|---|---|
| Calcium chloride, anhydrous | LD50 Oral | Rat | 1 g/kg | - |

### Irritation/Corrosion

No applicable toxicity data

### Sensitization

No applicable toxicity data

### Mutagenicity

No applicable toxicity data

### Carcinogenicity

No applicable toxicity data

### Reproductive toxicity

No applicable toxicity data

### Teratogenicity

No applicable toxicity data

### Specific target organ toxicity (single exposure)

Not applicable.

### Specific target organ toxicity (repeated exposure)

Not applicable.

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

## Delayed and immediate effects and also chronic effects from short and long term exposure

### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

**General** : Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

## Numerical measures of toxicity

### Acute toxicity estimates

Not available.

## Section 11. Toxicological information

## Section 12. Ecological information

### Toxicity

| Product/ingredient name | Result | Species | Exposure |
|---|---|---|---|
| Calcium chloride, anhydrous | Acute EC50 3130000 µg/l Fresh water<br>Acute EC50 52000 µg/l Fresh water<br>Acute LC50 270 mg/l Marine water<br><br>Acute LC50 2110 mg/l Fresh water | Algae - Navicula seminulum<br>Daphnia - Daphnia magna<br>Crustaceans - Americamysis bahia<br>Fish - Pimephales promelas | 96 hours<br>48 hours<br>48 hours<br><br>96 hours |

### Persistence and degradability

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | - | - | - | - |
| **Transport hazard class(es)** | - | - | - | - |
| **Packing group** | - | - | - | - |
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | - | - |

## Section 14. Transport information

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not available.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.

**TSCA 12(b) annual export notification**: No products were found.

**United States inventory (TSCA 8b)**: All components are listed or exempted.

**Clean Water Act (CWA) 307**: No products were found.

**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Immediate (acute) health hazard

**SARA 313**

**Supplier notification** : No products were found.

**Canada**

**Canada (CEPA DSL):** : All components are listed or exempted.

## Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | | |
|---|---|---|
| Health | * | 1 |
| Flammability | | 0 |
| Physical hazards | | 1 |
| Personal protection | | E |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**

**History**

**Date of printing** : 7/1/2015.

04/14/2023

# Section 16. Other information

**Indicates information that has changed from previously issued version.**

**Notice to reader**

**NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes Drilling Fluids, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.**

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : CARBO-GEL™ II
**Product code** : 1845DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Viscosifier

**Print date** : 6/14/2016
**Validation date** : 6/14/2016
**Version** : 2

**Supplier's details** : Baker Hughes Oilfield Operations
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : COMBUSTIBLE DUSTS
CARCINOGENICITY - Category 1A
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (lungs) - Category 2

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Danger

**Hazard statements** : May form combustible dust concentrations in air.
May cause cancer.
May cause damage to organs through prolonged or repeated exposure. (lungs)

**Precautionary statements**

**Prevention** : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves: > 8 hours (breakthrough time): nitrile or neoprene. Wear eye or face protection. Wear protective clothing. Do not breathe dust or mist.

**Response** : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention.

**Storage** : Store locked up.

**Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.

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## Section 2. Hazards identification

**Supplemental label elements** : Keep container tightly closed. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Prevent dust accumulation.

**Hazards not otherwise classified** : Fine dust clouds may form explosive mixtures with air. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat.

## Section 3. Composition/information on ingredients

**Substance/mixture** : Substance

| Ingredient name | % | CAS number |
|---|---|---|
| Crystalline silica, quartz | 5 - 10 | 14808-60-7 |

## Section 4. First aid measures

### Description of necessary first aid measures

**Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

**Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Get medical attention.

**Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

**Eye contact** : Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.

**Inhalation** : Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.

**Skin contact** : No known significant effects or critical hazards.

**Ingestion** : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

**Eye contact** : irritation,redness

**Inhalation** : respiratory tract irritation,coughing

**Skin contact** : No specific data.

**Ingestion** : No specific data.

### Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

## Section 4. First aid measures

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**See toxicological information (Section 11)**

## Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : Do not use water jet.

**Specific hazards arising from the chemical** : Fine dust clouds may form explosive mixtures with air.

**Hazardous thermal decomposition products** : metal oxide/oxides

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

**Methods and materials for containment and cleaning up**

**Small spill** : Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

# Section 6. Accidental release measures

**Large spill** : Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

### Occupational exposure limits

| Ingredient name | Exposure limits |
|---|---|
| Crystalline silica, quartz | **OSHA PEL Z3 (United States, 2/2013).**<br>TWA: 250 MPPCF / (%SiO2+5) 8 hours. Form: Respirable<br>TWA: 10 MG/M3 / (%SiO2+2) 8 hours. Form: Respirable<br>**OSHA PEL 1989 (United States, 3/1989).**<br>TWA: 0.1 mg/m³, (as quartz) 8 hours. Form: Respirable dust<br>**ACGIH TLV (United States, 4/2014).**<br>TWA: 0.025 mg/m³ 8 hours. Form: Respirable fraction |

**Consult local authorities for acceptable exposure limits.**

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## Section 8. Exposure controls/personal protection

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**Individual protection measures**

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Hand protection** : Chemical-resistant gloves: nitrile or neoprene

**Skin protection** : Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection** : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: Wear a respirator conforming to EN140 with type A/P2 filter or better.

## Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Solid. [Powder.]

**Color** : Off-white.

**Odor** : Odorless.

**Odor threshold** : Not available.

**pH** : 7 [Conc. (% w/w): 1%]

**Melting/freezing point** : Not available.

**Boiling point** : Not available.

**Initial Boiling Point** : Not available.

**Flash point** : Closed cup: Not applicable.

**Burning time** : Not available.

**Burning rate** : Not available.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Not available.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : Not available.

**Vapor density** : Not available.

**Relative density** : 1.7 (20°C)

**Density** : Not available.

**Solubility in water** : Insoluble

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : Not available.

## Section 9. Physical and chemical properties

**Decomposition temperature** : Not available.

**Viscosity** : Not available.

**VOC** : Not available.

**Pour Point** : Not available.

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Prevent dust accumulation.

**Incompatible materials** : Not available.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

No applicable toxicity data

#### Irritation/Corrosion

No applicable toxicity data

#### Sensitization

No applicable toxicity data

#### Mutagenicity

No applicable toxicity data

#### Carcinogenicity

| Product/ingredient name | OSHA | IARC | NTP |
|---|---|---|---|
| Crystalline silica, quartz | - | 1 | Known to be a human carcinogen. |

#### Reproductive toxicity

No applicable toxicity data

#### Teratogenicity

No applicable toxicity data

#### Specific target organ toxicity (single exposure)

Not applicable.

#### Specific target organ toxicity (repeated exposure)

# Section 11. Toxicological information

| Name | Category | Route of exposure | Target organs |
|---|---|---|---|
| Crystalline silica, quartz | Category 1 | Inhalation | lungs |

**Aspiration hazard**

Not available.

**Information on the likely routes of exposure** : Not available.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

**Potential chronic health effects**

**General** : May cause damage to organs through prolonged or repeated exposure. Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

**Carcinogenicity** : May cause cancer. Risk of cancer depends on duration and level of exposure.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

Not available.

# Section 12. Ecological information

**Toxicity**

| Product/ingredient name | Result | Species | Exposure |
|---|---|---|---|
| CARBO-GEL™ II | Acute LC50 853.6 ppm Marine water<br>Chronic LOEL 78 ppm Marine water<br><br>Chronic NOEC 39 ppm Marine water | Crustaceans - Mysidopsis juniae<br>Echinodermata - Lytechinus variegatus<br>Echinodermata - Lytechinus variegatus | 96 hours<br>-<br><br>- |

**Persistence and degradability**

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | - | - | - | - |
| **Transport hazard class(es)** | - | - | - | - |
| **Packing group** | - | - | - | - |
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | - | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not available.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.

**TSCA 12(b) annual export notification**: No products were found.

**United States inventory (TSCA 8b)**: All components are listed or exempted.

**Clean Water Act (CWA) 307**: No products were found.

**Clean Water Act (CWA) 311**: No products were found.

**United States - Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) :**

| List name | Status | Ingredient name | Name on list | Conc. |
|---|---|---|---|---|
| None of the components are listed. | | | | |

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# Section 15. Regulatory information

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Fire hazard
Delayed (chronic) health hazard

**SARA 313**

**Supplier notification** : No products were found.

**Canada**

**Canada (CEPA DSL):** : All components are listed or exempted.

# Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | | |
|---|---|---|
| Health | * | 1 |
| Flammability | | 1 |
| Physical hazards | | 0 |
| Personal protection | | E |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**

**History**

**Date of printing** : 6/14/2016

**Notice to reader**

**NOTE: The information on this SDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This SDS was prepared and is to be used for this product. If the product is used as a component in another product, this SDS information may not be applicable.**

04/14/2023

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : CARBO-TEC™
**Product code** : 1210DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Emulsifier/ Wetting agent.

**Print date** : 9/2/2015.
**Validation date** : 9/2/2015.
**Version** : 1.02

**Supplier's details** : Baker Hughes Oilfield Operations
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : Not classified.

**GHS label elements**

**Signal word** : No signal word.
**Hazard statements** : No known significant effects or critical hazards.
**Precautionary statements**
**Prevention** : Not applicable.
**Response** : Not applicable.
**Storage** : Not applicable.
**Disposal** : Not applicable.
**Supplemental label elements** : Avoid contact with skin and clothing. Wash thoroughly after handling.

**Hazards not otherwise classified** : Prolonged or repeated contact may dry skin and cause irritation.

# Section 3. Composition/information on ingredients

**Substance/mixture** : Mixture

| Ingredient name | % | CAS number |
|---|---|---|
| Distillates, (petroleum), hydrotreated light | 10 - 20 | 64742-47-8 |

# Section 4. First aid measures

## Description of necessary first aid measures

**Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention.

**Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

**Skin contact** : Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

**Ingestion** : Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

## Most important symptoms/effects, acute and delayed

### Potential acute health effects

**Eye contact** : No known significant effects or critical hazards.

**Inhalation** : No known significant effects or critical hazards.

**Skin contact** : Defatting to the skin. May cause skin dryness and irritation.

**Ingestion** : No known significant effects or critical hazards.

### Over-exposure signs/symptoms

**Eye contact** : No specific data.

**Inhalation** : No specific data.

**Skin contact** : irritation,dryness,cracking

**Ingestion** : No specific data.

## Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training.

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

## Extinguishing media

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : In a fire or if heated, a pressure increase will occur and the container may burst.

04/14/2023

## Section 5. Fire-fighting measures

**Hazardous thermal decomposition products** : No specific data.

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

**Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Stop leak if without risk. Move containers from spill area. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8).

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ingredients:** | **List name** | **ppm** | **mg/m³** | **Other** | **ppm** | **mg/m³** | **Other** | **ppm** | **mg/m³** | **Other** | **Notations** |
| Distillates, (petroleum), hydrotreated light, as total hydrocarbon vapor | US ACGIH | - | 200 | - | - | - | - | - | - | - | [1] |

[1]Absorbed through skin.

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

## Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. Recommended: Chemical splash goggles.

**Hand protection** : Chemical-resistant gloves: Nitrile gloves.

**Skin protection** : Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: organic vapor (Type A) and particulate filter

# Section 9. Physical and chemical properties

## Appearance

**Physical state** : Liquid. [Viscous liquid.]

**Color** : Brown. [Dark]

**Odor** : Strong.

**Odor threshold** : Not available.

**pH** : Not available.

**Melting/freezing point** : Not available.

**Boiling point** : Not available.

**Initial Boiling Point** : Not available.

**Flash point** : Closed cup: >100°C (>212°F)

**Burning time** : Not applicable.

**Burning rate** : Not applicable.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Not available.

## Section 9. Physical and chemical properties

| | | |
|---|---|---|
| **Lower and upper explosive (flammable) limits** | : | Not available. |
| **Vapor pressure** | : | Not available. |
| **Vapor density** | : | Not available. |
| **Relative density** | : | 0.96 |
| **Density** | : | Not available. |
| **Solubility in water** | : | Not available. |
| **Partition coefficient: n-octanol/water** | : | Not available. |
| **Auto-ignition temperature** | : | Not available. |
| **Decomposition temperature** | : | Not available. |
| **Viscosity** | : | Dynamic: >97 cP |
| **VOC** | : | Not available. |
| **Pour Point** | : | Not available. |

## Section 10. Stability and reactivity

| | | |
|---|---|---|
| **Reactivity** | : | No specific test data related to reactivity available for this product or its ingredients. |
| **Chemical stability** | : | The product is stable. |
| **Possibility of hazardous reactions** | : | Under normal conditions of storage and use, hazardous reactions will not occur. |
| **Conditions to avoid** | : | No specific data. |
| **Incompatible materials** | : | Not available. |
| **Hazardous decomposition products** | : | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

No applicable toxicity data

#### Irritation/Corrosion

No applicable toxicity data

#### Sensitization

No applicable toxicity data

#### Mutagenicity

No applicable toxicity data

#### Carcinogenicity

No applicable toxicity data

#### Reproductive toxicity

No applicable toxicity data

#### Teratogenicity

# Section 11. Toxicological information

No applicable toxicity data

### Specific target organ toxicity (single exposure)

Not applicable.

### Specific target organ toxicity (repeated exposure)

Not applicable.

### Aspiration hazard

| Name | Result |
|---|---|
| Distillates, (petroleum), hydrotreated light | ASPIRATION HAZARD - Category 1 |

**Information on the likely routes of exposure** : Not available.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Potential chronic health effects

**General** : Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Not available.

# Section 12. Ecological information

### Toxicity

| Product/ingredient name | Result | Species | Exposure |
|---|---|---|---|
| Distillates, (petroleum), hydrotreated light | Acute LC50 2200 µg/l Fresh water | Fish - Lepomis macrochirus | 4 days |

### Persistence and degradability

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | - | - | - | - |
| **Transport hazard class(es)** | - | - | - | - |
| **Packing group** | - | - | - | - |
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | - | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not available.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.

**TSCA 12(b) annual export notification**: No products were found.

**United States inventory (TSCA 8b)**: All components are listed or exempted.

**Clean Water Act (CWA) 307**: No products were found.

**Clean Water Act (CWA) 311**: No products were found.

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## Section 15. Regulatory information

| | | |
|---|---|---|
| **Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** | : | Not listed |
| **SARA 302/304** | : | No products were found. |
| **SARA 311/312** | | |
| **Classification** | : | Immediate (acute) health hazard |
| **SARA 313** | | |
| **Supplier notification** | : | No products were found. |
| **Canada** | | |
| **Canada (CEPA DSL):** | : | All components are listed or exempted. |

## Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | | |
|---|---|---|
| **Health** | * | 1 |
| **Flammability** | | 0 |
| **Physical hazards** | | 0 |
| **Personal protection** | | D |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**

**History**

**Date of printing** : 9/2/2015.

**Indicates information that has changed from previously issued version.**

**Notice to reader**

**NOTE: The information on this SDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This SDS was prepared and is to be used for this product. If the product is used as a component in another product, this SDS information may not be applicable.**

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : LC-LUBE™ PLUS
**Product code** : 7533DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Fluid loss control and Lubricant.

**Print date** : 10/22/2014.
**Validation date** : 10/22/2014.
**Version** : 1

**Supplier's details** : Baker Hughes
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : CARCINOGENICITY: INHALATION - Category 1A

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Danger
**Hazard statements** : May cause cancer if inhaled.

**Precautionary statements**

**Prevention** : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required.

**Response** : IF exposed or concerned: Get medical attention.

**Storage** : Store locked up.

**Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazards not otherwise classified** : None known.

# Section 3. Composition/information on ingredients

**Substance/mixture** : Mixture

| Ingredient name | % | CAS number |
|---|---|---|
| Crystalline silica, quartz | 0.1 - 1 | 14808-60-7 |

# Section 4. First aid measures

## Description of necessary first aid measures

**Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

**Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

## Most important symptoms/effects, acute and delayed

### Potential acute health effects

**Eye contact** : No known significant effects or critical hazards.

**Inhalation** : No known significant effects or critical hazards.

**Skin contact** : No known significant effects or critical hazards.

**Ingestion** : No known significant effects or critical hazards.

### Over-exposure signs/symptoms

**Eye contact** : No specific data.

**Inhalation** : No specific data.

**Skin contact** : No specific data.

**Ingestion** : No specific data.

## Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

# Section 4. First aid measures

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : No specific fire or explosion hazard.

**Hazardous thermal decomposition products** : carbon dioxide,carbon monoxide

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

# Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

**Methods and materials for containment and cleaning up**

**Small spill** : Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| Crystalline silica, quartz | US ACGIH | - | 0.025 | - | - | - | - | - | - | - | [a] |
| Crystalline silica, quartz, as quartz | OSHA PEL 1989 | - | 0.1 | - | - | - | - | - | - | - | [b] |

**Form:** [a]Respirable fraction [b]Respirable dust

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

## Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Hand protection** : Chemical-resistant gloves: Nitrile. Neoprene gloves.

**Skin protection** : Wear long sleeves to prevent repeated or prolonged skin contact.

## Section 8. Exposure controls/personal protection

**Respiratory protection** : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: Use dust masks which mechanically filter and prevent inhalation of dust as needed.

## Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Solid. [Granules or Powder]

**Color** : Gray. to Black.

**Odor** : Odorless.

**Odor threshold** : Not available.

**pH** : Not applicable.

**Melting/freezing point** : Not available.

**Boiling point** : Not available.

**Initial Boiling Point** : Not available.

**Flash point** : Not available.

**Burning time** : Not available.

**Burning rate** : Not available.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Not available.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : Not available.

**Vapor density** : Not available.

**Relative density** : 1.9 to 2.2

**Density** : Not available.

**Solubility in water** : Insoluble

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : >500°C (>932°F)

**Decomposition temperature** : Not available.

**Viscosity** : Not available.

**VOC** : Not available.

**Pour Point** : Not available.

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : No specific data.

**Incompatible materials** : Not available.

# Section 10. Stability and reactivity

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

# Section 11. Toxicological information

## Information on toxicological effects

### Acute toxicity

No applicable toxicity data

### Irritation/Corrosion

No applicable toxicity data

### Sensitization

No applicable toxicity data

### Mutagenicity

No applicable toxicity data

### Carcinogenicity

| Product/ingredient name | OSHA | IARC | NTP |
|---|---|---|---|
| Crystalline silica, quartz | - | 1 | Known to be a human carcinogen. |

### Reproductive toxicity

No applicable toxicity data

### Teratogenicity

No applicable toxicity data

### Specific target organ toxicity (single exposure)

Not applicable.

### Specific target organ toxicity (repeated exposure)

| Name | Category | Route of exposure | Target organs |
|---|---|---|---|
| Crystalline silica, quartz | Category 1 | Inhalation | lungs |

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

## Delayed and immediate effects and also chronic effects from short and long term exposure

### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

**General** : No known significant effects or critical hazards.

**Carcinogenicity** : May cause cancer if inhaled. Risk of cancer depends on duration and level of exposure.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

## Section 11. Toxicological information

**Fertility effects** : No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

Not available.

## Section 12. Ecological information

**Toxicity**

No applicable toxicity data

**Persistence and degradability**

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | - | - | - | - |
| **Transport hazard class(es)** | - | - | - | - |
| **Packing group** | - | - | - | - |
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | - | - |

## Section 14. Transport information

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not available.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.
**TSCA 12(b) annual export notification**: No products were found.
**United States inventory (TSCA 8b)**: All components are listed or exempted.
**Clean Water Act (CWA) 307**: No products were found.
**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Delayed (chronic) health hazard

**SARA 313**

**Supplier notification** : No products were found.

**Canada**

**Canada (CEPA DSL):** : All components are listed or exempted.

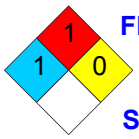
## Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | | |
|---|---|---|
| Health | * | 1 |
| Flammability | | 1 |
| Physical hazards | | 0 |
| Personal protection | | E |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**




Flammability
Health
Instability/Reactivity
Special

**History**

# Section 16. Other information

**Date of printing** : 10/22/2014.

**Indicates information that has changed from previously issued version.**

**Notice to reader**

**NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes Drilling Fluids, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.**

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : MIL-BAR™ 410
**Product code** : 4017DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Weighting Agent

**Print date** : 10/27/2015.
**Validation date** : 10/27/2015.
**Version** : 2

**Supplier's details** : Baker Hughes Oilfield Operations
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : CARCINOGENICITY: INHALATION - Category 1A
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE): INHALATION [lungs] - Category 2

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Danger

**Hazard statements** : May cause cancer if inhaled.
May cause damage to organs through prolonged or repeated exposure if inhaled. (lungs)

**Precautionary statements**

**Prevention** : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Do not breathe dust.

**Response** : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention.

**Storage** : Store locked up.

**Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazards not otherwise classified** : None known.

04/14/2023

# Section 3. Composition/information on ingredients

**Substance/mixture** : Mixture

| Ingredient name | % | CAS number |
|---|---|---|
| Crystalline silica, quartz | 1 - 5 | 14808-60-7 |

# Section 4. First aid measures

## Description of necessary first aid measures

**Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

**Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

## Most important symptoms/effects, acute and delayed

### Potential acute health effects

**Eye contact** : No known significant effects or critical hazards.

**Inhalation** : No known significant effects or critical hazards.

**Skin contact** : No known significant effects or critical hazards.

**Ingestion** : No known significant effects or critical hazards.

### Over-exposure signs/symptoms

**Eye contact** : No specific data.

**Inhalation** : No specific data.

**Skin contact** : No specific data.

**Ingestion** : No specific data.

## Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

# Section 4. First aid measures

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : No specific fire or explosion hazard.

**Hazardous thermal decomposition products** : sulfur oxides,metal oxide/oxides

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

# Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

**Methods and materials for containment and cleaning up**

**Small spill** : Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| Crystalline silica, quartz | US ACGIH | - | 0.025 | - | - | - | - | - | - | - | [a] |
| Crystalline silica, quartz, as quartz | OSHA PEL 1989 | - | 0.1 | - | - | - | - | - | - | - | [b] |

**Form:** [a]Respirable fraction [b]Respirable dust

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

## Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Hand protection** : Chemical-resistant gloves.

**Skin protection** : Wear long sleeves to prevent repeated or prolonged skin contact.

## Section 8. Exposure controls/personal protection

**Respiratory protection** : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Solid.

**Color** : Tan. to Brown.

**Odor** : Odorless.

**Odor threshold** : Not available.

**pH** : 7 [Conc. (% w/w): 2%]

**Melting/freezing point** : Not available.

**Boiling point** : Not available.

**Initial Boiling Point** : Not available.

**Flash point** : Closed cup: Not applicable.

**Burning time** : Not available.

**Burning rate** : Not available.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Not available.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : Not available.

**Vapor density** : Not available.

**Relative density** : 4.1

**Density** : Not available.

**Solubility in water** : Insoluble

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : Not available.

**Decomposition temperature** : Not available.

**Viscosity** : Not available.

**VOC** : Not available.

**Pour Point** : Not available.

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : No specific data.

**Incompatible materials** : Not available.

# Section 10. Stability and reactivity

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

# Section 11. Toxicological information

## Information on toxicological effects

### Acute toxicity

No applicable toxicity data

### Irritation/Corrosion

No applicable toxicity data

### Sensitization

No applicable toxicity data

### Mutagenicity

No applicable toxicity data

### Carcinogenicity

| Product/ingredient name | OSHA | IARC | NTP |
|---|---|---|---|
| Crystalline silica, quartz | - | 1 | Known to be a human carcinogen. |

### Reproductive toxicity

No applicable toxicity data

### Teratogenicity

No applicable toxicity data

### Specific target organ toxicity (single exposure)

Not applicable.

### Specific target organ toxicity (repeated exposure)

| Name | Category | Route of exposure | Target organs |
|---|---|---|---|
| Crystalline silica, quartz | Category 1 | Inhalation | lungs |

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

## Delayed and immediate effects and also chronic effects from short and long term exposure

### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

**General** : May cause damage to organs through prolonged or repeated exposure if inhaled.

**Carcinogenicity** : May cause cancer if inhaled. Risk of cancer depends on duration and level of exposure.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

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## Section 11. Toxicological information

**Fertility effects** : No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

Not available.

## Section 12. Ecological information

**Toxicity**

No applicable toxicity data

**Persistence and degradability**

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | - | - | - | - |
| **Transport hazard class(es)** | - | - | - | - |
| **Packing group** | - | - | - | - |
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | - | - |

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## Section 14. Transport information

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not available.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.
**TSCA 12(b) annual export notification**: No products were found.
**United States inventory (TSCA 8b)**: All components are listed or exempted.
**Clean Water Act (CWA) 307**: No products were found.
**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Delayed (chronic) health hazard

**SARA 313**

**Supplier notification** : No products were found.

**Canada**

**Canada (CEPA DSL):** : All components are listed or exempted.

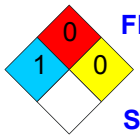
## Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | | |
|---|---|---|
| Health | * | 1 |
| Flammability | | 0 |
| Physical hazards | | 0 |
| Personal protection | | E |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**




Flammability
Health
Instability/Reactivity
Special

**History**

**Date of printing** : 10/27/2015.

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# Section 16. Other information

**Indicates information that has changed from previously issued version.**

**Notice to reader**

**NOTE: The information on this SDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This SDS was prepared and is to be used for this product. If the product is used as a component in another product, this SDS information may not be applicable.**

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : MIL-CARB™ 25

**Product code** : 7096DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Lost Circulation Material

**Print date** : 11/9/2015.

**Validation date** : 11/9/2015.

**Version** : 2

**Supplier's details** : Baker Hughes Oilfield Operations
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : CARCINOGENICITY: INHALATION - Category 1A
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE): INHALATION [lungs] - Category 2

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Danger

**Hazard statements** : May cause cancer if inhaled.
May cause damage to organs through prolonged or repeated exposure if inhaled. (lungs)

**Precautionary statements**

**Prevention** : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Do not breathe dust or mist.

**Response** : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention.

**Storage** : Store locked up.

**Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Supplemental label elements** : Avoid contact with skin and clothing. Wash thoroughly after handling.

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## Section 2. Hazards identification

**Hazards not otherwise classified** : Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat. Prolonged or repeated contact may dry skin and cause irritation.

## Section 3. Composition/information on ingredients

**Substance/mixture** : Substance

| Ingredient name | % | CAS number |
|---|---|---|
| Calcium carbonate | 90 - 100 | 1317-65-3 |
| Crystalline silica, quartz | 1 - 5 | 14808-60-7 |

## Section 4. First aid measures

### Description of necessary first aid measures

**Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

**Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact** : Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

**Eye contact** : Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.

**Inhalation** : Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.

**Skin contact** : Defatting to the skin. May cause skin dryness and irritation.

**Ingestion** : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

**Eye contact** : irritation,redness

**Inhalation** : respiratory tract irritation,coughing

**Skin contact** : irritation,dryness,cracking

**Ingestion** : No specific data.

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# Section 4. First aid measures

**Indication of immediate medical attention and special treatment needed, if necessary**

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : No specific fire or explosion hazard.

**Hazardous thermal decomposition products** : carbon dioxide,carbon monoxide,metal oxide/oxides

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

# Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

**Methods and materials for containment and cleaning up**

**Small spill** : Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

# Section 6. Accidental release measures

**Large spill** : Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe dust. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| Calcium carbonate | OSHA PEL | - | 5 | - | - | - | - | - | - | - | [a] |
| | OSHA PEL | - | 15 | - | - | - | - | - | - | - | [b] |
| | OSHA PEL 1989 | - | 5 | - | - | - | - | - | - | - | [a] |
| | OSHA PEL 1989 | - | 15 | - | - | - | - | - | - | - | [b] |
| Crystalline silica, quartz | US ACGIH | - | 0.025 | - | - | - | - | - | - | - | [a] |
| Crystalline silica, quartz, as quartz | OSHA PEL 1989 | - | 0.1 | - | - | - | - | - | - | - | [c] |

**Form:** [a]Respirable fraction [b]Total dust [c]Respirable dust

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

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# Section 8. Exposure controls/personal protection

**Individual protection measures**

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Hand protection** : Chemical-resistant gloves.

**Skin protection** : Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection** : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

# Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Solid. [Powder.]

**Color** : White.

**Odor** : Odorless.

**Odor threshold** : Not available.

**pH** : 8.4 to 10.2 [Conc. (% w/w): 5%]

**Melting/freezing point** : Not available.

**Boiling point** : Not available.

**Initial Boiling Point** : Not available.

**Flash point** : Not available.

**Burning time** : Not available.

**Burning rate** : Not available.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Not available.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : Not available.

**Vapor density** : Not available.

**Relative density** : Not available.

**Density** : Not available.

**Solubility in water** : Insoluble

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : Not available.

**Decomposition temperature** : Not available.

**Viscosity** : Not available.

**VOC** : Not available.

**Pour Point** : Not available.

# Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : No specific data.

**Incompatible materials** : Reactive or incompatible with the following materials: acids.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

# Section 11. Toxicological information

## Information on toxicological effects

### Acute toxicity

No applicable toxicity data

### Irritation/Corrosion

No applicable toxicity data

### Sensitization

No applicable toxicity data

### Mutagenicity

No applicable toxicity data

### Carcinogenicity

| Product/ingredient name | OSHA | IARC | NTP |
|---|---|---|---|
| Crystalline silica, quartz | - | 1 | Known to be a human carcinogen. |

### Reproductive toxicity

No applicable toxicity data

### Teratogenicity

No applicable toxicity data

### Specific target organ toxicity (single exposure)

Not applicable.

### Specific target organ toxicity (repeated exposure)

| Name | Category | Route of exposure | Target organs |
|---|---|---|---|
| Crystalline silica, quartz | Category 1 | Inhalation | lungs |

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

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# Section 11. Toxicological information

## Delayed and immediate effects and also chronic effects from short and long term exposure

### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

**General** : May cause damage to organs through prolonged or repeated exposure if inhaled. Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

**Carcinogenicity** : May cause cancer if inhaled. Risk of cancer depends on duration and level of exposure.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

## Numerical measures of toxicity

### Acute toxicity estimates

Not available.

# Section 12. Ecological information

## Toxicity

No applicable toxicity data

## Persistence and degradability

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

# Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | - | - | - | - |
| **Transport hazard class(es)** | - | - | - | - |
| **Packing group** | - | - | - | - |
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | - | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not available.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.
**TSCA 12(b) annual export notification**: No products were found.
**United States inventory (TSCA 8b)**: All components are listed or exempted.
**Clean Water Act (CWA) 307**: No products were found.
**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Immediate (acute) health hazard
Delayed (chronic) health hazard

**SARA 313**

**Supplier notification** : No products were found.

**Canada**

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## Section 15. Regulatory information

**Canada (CEPA DSL):** : At least one component is not listed in DSL but all such components are listed in NDSL.

## Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | | |
|---|---|---|
| **Health** | * | 1 |
| **Flammability** | | 0 |
| **Physical hazards** | | 0 |
| **Personal protection** | | E |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**

**History**

**Date of printing** : 11/9/2015.

**Indicates information that has changed from previously issued version.**

**Notice to reader**

**NOTE: The information on this SDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This SDS was prepared and is to be used for this product. If the product is used as a component in another product, this SDS information may not be applicable.**

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : MIL-CARB™
**Product code** : 6099DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Lost Circulation Material

**Print date** : 11/6/2015.
**Validation date** : 11/6/2015.
**Version** : 2

**Supplier's details** : Baker Hughes Oilfield Operations
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : CARCINOGENICITY: INHALATION - Category 1A
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE): INHALATION [lungs] - Category 2

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Danger

**Hazard statements** : May cause cancer if inhaled.
May cause damage to organs through prolonged or repeated exposure if inhaled. (lungs)

**Precautionary statements**

**Prevention** : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Do not breathe dust or mist.

**Response** : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention.

**Storage** : Store locked up.

**Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Supplemental label elements** : Avoid contact with skin and clothing. Wash thoroughly after handling.

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## Section 2. Hazards identification

**Hazards not otherwise classified** : Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat. Prolonged or repeated contact may dry skin and cause irritation.

## Section 3. Composition/information on ingredients

**Substance/mixture** : Substance

| Ingredient name | % | CAS number |
|---|---|---|
| Calcium carbonate | 90 - 100 | 1317-65-3 |
| Crystalline silica, quartz | 1 - 5 | 14808-60-7 |

## Section 4. First aid measures

### Description of necessary first aid measures

**Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

**Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact** : Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

**Eye contact** : Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.

**Inhalation** : Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.

**Skin contact** : Defatting to the skin. May cause skin dryness and irritation.

**Ingestion** : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

**Eye contact** : irritation,redness

**Inhalation** : respiratory tract irritation,coughing

**Skin contact** : irritation,dryness,cracking

**Ingestion** : No specific data.

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# Section 4. First aid measures

**Indication of immediate medical attention and special treatment needed, if necessary**

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : No specific fire or explosion hazard.

**Hazardous thermal decomposition products** : carbon dioxide,carbon monoxide,metal oxide/oxides

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

# Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

**Methods and materials for containment and cleaning up**

**Small spill** : Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

# Section 6. Accidental release measures

**Large spill** : Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe dust. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| Calcium carbonate | OSHA PEL | - | 5 | - | - | - | - | - | - | - | [a] |
| | OSHA PEL | - | 15 | - | - | - | - | - | - | - | [b] |
| | OSHA PEL 1989 | - | 5 | - | - | - | - | - | - | - | [a] |
| | OSHA PEL 1989 | - | 15 | - | - | - | - | - | - | - | [b] |
| Crystalline silica, quartz | US ACGIH | - | 0.025 | - | - | - | - | - | - | - | [a] |
| Crystalline silica, quartz, as quartz | OSHA PEL 1989 | - | 0.1 | - | - | - | - | - | - | - | [c] |

**Form:** [a]Respirable fraction [b]Total dust [c]Respirable dust

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

# Section 8. Exposure controls/personal protection

**Individual protection measures**

| | | |
|---|---|---|
| **Hygiene measures** | : | Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location. |
| **Eye/face protection** | : | Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. |
| **Hand protection** | : | Chemical-resistant gloves: Rubber gloves. |
| **Skin protection** | : | Wear long sleeves to prevent repeated or prolonged skin contact. |
| **Respiratory protection** | : | Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |

# Section 9. Physical and chemical properties

**Appearance**

| | | |
|---|---|---|
| **Physical state** | : | Solid. [Powder.] |
| **Color** | : | White. |
| **Odor** | : | Odorless. |
| **Odor threshold** | : | Not available. |
| **pH** | : | 8.5 to 10 [Conc. (% w/w): 5%] |
| **Melting/freezing point** | : | Not available. |
| **Boiling point** | : | Not available. |
| **Initial Boiling Point** | : | Not available. |
| **Flash point** | : | Closed cup: Not applicable. |
| **Burning time** | : | Not available. |
| **Burning rate** | : | Not available. |
| **Evaporation rate** | : | Not available. |
| **Flammability (solid, gas)** | : | Not available. |
| **Lower and upper explosive (flammable) limits** | : | Not available. |
| **Vapor pressure** | : | Not available. |
| **Vapor density** | : | Not available. |
| **Relative density** | : | 2.7 (20°C) |
| **Density** | : | Not available. |
| **Solubility in water** | : | Insoluble |
| **Partition coefficient: n-octanol/water** | : | Not available. |
| **Auto-ignition temperature** | : | Not available. |
| **Decomposition temperature** | : | >825°C (>1517°F) |
| **Viscosity** | : | Not available. |
| **VOC** | : | Not available. |
| **Pour Point** | : | Not available. |

# Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : No specific data.

**Incompatible materials** : Reactive or incompatible with the following materials: acids.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

# Section 11. Toxicological information

## Information on toxicological effects

### Acute toxicity

No applicable toxicity data

### Irritation/Corrosion

No applicable toxicity data

### Sensitization

No applicable toxicity data

### Mutagenicity

No applicable toxicity data

### Carcinogenicity

| Product/ingredient name | OSHA | IARC | NTP |
|---|---|---|---|
| Crystalline silica, quartz | - | 1 | Known to be a human carcinogen. |

### Reproductive toxicity

No applicable toxicity data

### Teratogenicity

No applicable toxicity data

### Specific target organ toxicity (single exposure)

Not applicable.

### Specific target organ toxicity (repeated exposure)

| Name | Category | Route of exposure | Target organs |
|---|---|---|---|
| Crystalline silica, quartz | Category 1 | Inhalation | lungs |

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

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# Section 11. Toxicological information

## Delayed and immediate effects and also chronic effects from short and long term exposure

### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

**General** : May cause damage to organs through prolonged or repeated exposure if inhaled. Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

**Carcinogenicity** : May cause cancer if inhaled. Risk of cancer depends on duration and level of exposure.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

## Numerical measures of toxicity

### Acute toxicity estimates

Not available.

# Section 12. Ecological information

## Toxicity

No applicable toxicity data

## Persistence and degradability

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

# Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | - | - | - | - |
| **Transport hazard class(es)** | - | - | - | - |
| **Packing group** | - | - | - | - |
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | - | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not available.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.
**TSCA 12(b) annual export notification**: No products were found.
**United States inventory (TSCA 8b)**: All components are listed or exempted.
**Clean Water Act (CWA) 307**: No products were found.
**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Immediate (acute) health hazard
Delayed (chronic) health hazard

**SARA 313**

**Supplier notification** : No products were found.

**Canada**

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## Section 15. Regulatory information

**Canada (CEPA DSL):** : At least one component is not listed in DSL but all such components are listed in NDSL.

## Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | | |
|---|---|---|
| **Health** | * | 1 |
| **Flammability** | | 0 |
| **Physical hazards** | | 0 |
| **Personal protection** | | E |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**

**History**

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# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : MIL-CLEAN™
**Product code** : 2761DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Detergents

**Print date** : 11/14/2014.
**Validation date** : 11/14/2014.
**Version** : 1

**Supplier's details** : Baker Hughes
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Warning

**Hazard statements** : Causes serious eye irritation.
Causes skin irritation.

**Precautionary statements**

**Prevention** : Wear protective gloves: > 8 hours (breakthrough time): Nitrile or Neoprene gloves.. Wear eye or face protection. Wash hands thoroughly after handling.

**Response** : IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

**Storage** : Not applicable.

**Disposal** : Not applicable.

## Section 2. Hazards identification

**Hazards not otherwise classified** : None known.

## Section 3. Composition/information on ingredients

**Substance/mixture** : Mixture

| Ingredient name | % | CAS number |
|---|---|---|
| 2-Butoxyethanol | 5 - 10 | 111-76-2 |
| Alkyl benzenesulfonate | 5 - 10 | 68081-81-2 |
| Sodium silicate | 1 - 5 | Trade secret. |
| Urea | 1 - 5 | 57-13-6 |
| Alkylaryl sulfonates | 1 - 5 | Trade secret. |
| Oxyalkylated alkylphenol | 1 - 5 | Trade secret. |

## Section 4. First aid measures

### Description of necessary first aid measures

**Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

**Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

**Eye contact** : Causes serious eye irritation.

**Inhalation** : Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

**Skin contact** : Causes skin irritation.

**Ingestion** : Irritating to mouth, throat and stomach.

#### Over-exposure signs/symptoms

**Eye contact** : pain or irritation,watering,redness

**Inhalation** : No specific data.

# Section 4. First aid measures

**Skin contact** : irritation,redness

**Ingestion** : No specific data.

**Indication of immediate medical attention and special treatment needed, if necessary**

**Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : In a fire or if heated, a pressure increase will occur and the container may burst.

**Hazardous thermal decomposition products** : carbon dioxide,carbon monoxide,nitrogen oxides,sulfur oxides,metal oxide/oxides

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

# Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

**Methods and materials for containment and cleaning up**

**Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

# Section 6. Accidental release measures

**Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

**If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.**

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from acids. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Separate from acids. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| 2-Butoxyethanol | US ACGIH | 20 | - | - | - | - | - | - | - | - | |
| | OSHA PEL | 50 | 240 | - | - | - | - | - | - | - | [1] |
| | OSHA PEL 1989 | 25 | 120 | - | - | - | - | - | - | - | [1] |

[1]Absorbed through skin.

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

## Individual protection measures

## Section 8. Exposure controls/personal protection

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Hand protection** : Chemical-resistant gloves: Nitrile or Neoprene gloves.

**Skin protection** : Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Liquid. [Clear.]

**Color** : Blue.

**Odor** : Mild. Sweet.

**Odor threshold** : Not available.

**pH** : 11 to 12 [Conc. (% w/w): 5%]

: 5% in water

**Melting/freezing point** : Not available.

**Boiling point** : Not available.

**Initial Boiling Point** : Not available.

**Flash point** : Closed cup: >93.4°C (>200.1°F) [PMCC]

**Burning time** : Not applicable.

**Burning rate** : Not applicable.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : 2.4 kPa (18.2 mm Hg) @ 21.1°C (Calculated Value for all Components.)

**Vapor density** : >1 [Air = 1]

**Relative density** : 1.03 (15.6°C)

**Density** : 8.58 (lbs/gal)

**Solubility in water** : Soluble

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : Not available.

**Decomposition temperature** : Not available.

**Viscosity** : Not available.

**VOC** : Not available.

**Pour Point** : Not available.

# Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : No specific data.

**Incompatible materials** : Reactive or incompatible with the following materials: oxidizing materials.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

# Section 11. Toxicological information

## Information on toxicological effects

### Acute toxicity

| Product/ingredient name | Result | Species | Dose | Exposure |
|---|---|---|---|---|
| 2-Butoxyethanol | LC50 Inhalation Gas. | Rat | 450 ppm | 4 hours |
| | LD50 Dermal | Guinea pig | >2000 mg/kg | - |
| | LD50 Dermal | Rabbit | 200 mg/kg | - |
| | LD50 Dermal | Rabbit | 99 mg/kg | - |
| | LD50 Oral | Guinea pig | 500 to 2000 mg/kg | - |
| | LD50 Oral | Rabbit | 320 mg/kg | - |
| Sodium silicate | LD50 Oral | Rat | 1153 mg/kg | - |
| Urea | LD50 Oral | Rat | 8471 mg/kg | - |
| Alkylaryl sulfonates | LD50 Oral | Rat | 1000 mg/kg | - |

### Irritation/Corrosion

No applicable toxicity data

### Sensitization

No applicable toxicity data

### Mutagenicity

No applicable toxicity data

### Carcinogenicity

| Product/ingredient name | OSHA | IARC | NTP |
|---|---|---|---|
| 2-Butoxyethanol | - | 3 | - |

### Reproductive toxicity

No applicable toxicity data

### Teratogenicity

No applicable toxicity data

### Specific target organ toxicity (single exposure)

# Section 11. Toxicological information

| Name | Category | Route of exposure | Target organs |
|---|---|---|---|
| Alkyl benzenesulfonate | Category 3 | Not applicable. | Respiratory tract irritation |
| Sodium silicate | Category 3 | Not applicable. | Respiratory tract irritation |

**Specific target organ toxicity (repeated exposure)**

Not applicable.

**Aspiration hazard**

Not available.

**Information on the likely routes of exposure** : Routes of entry anticipated: Dermal, Inhalation.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

**Potential chronic health effects**

**General** : No known significant effects or critical hazards.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

| Route | ATE value |
|---|---|
| Oral | 3651 mg/kg |
| Dermal | 16176.5 mg/kg |
| Inhalation (vapors) | 161.8 mg/l |

# Section 12. Ecological information

**Toxicity**

| Product/ingredient name | Result | Species | Exposure |
|---|---|---|---|
| 2-Butoxyethanol | Acute EC50 >1000 mg/l Fresh water | Daphnia - Daphnia magna | 48 hours |
| | Acute LC50 1000 mg/l Marine water | Crustaceans - Chaetogammarus marinus - Young | 48 hours |
| | Acute LC50 1250000 µg/l Marine water | Fish - Menidia beryllina | 96 hours |
| Sodium silicate | Acute EC50 33.53 mg/l Fresh water | Crustaceans - Ceriodaphnia dubia - Neonate | 48 hours |
| | Acute LC50 2320 ppm Fresh water | Fish - Gambusia affinis - Adult | 96 hours |
| | Chronic NOEC 160 mg/l Fresh water | Algae - Pseudokirchneriella subcapitata | 72 hours |



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## Section 12. Ecological information

| | | | |
|---|---|---|---|
| Urea | Acute EC50 3910000 µg/l Fresh water<br>Acute LC50 1000 mg/l Marine water<br>Acute LC50 22.5 ppt Fresh water | Daphnia - Daphnia magna - Neonate<br>Crustaceans - Chaetogammarus marinus - Young<br>Fish - Oreochromis mossambicus - Young | 48 hours<br>48 hours<br>96 hours |

**Persistence and degradability**

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | UN3266 | UN3266 | UN3266 | UN3266 |
| **UN proper shipping name** | CORROSIVE LIQUID, BASIC, INORGANIC, N. O.S. (Contains: Sodium silicate) | CORROSIVE LIQUID, BASIC, INORGANIC, N. O.S. (Contains: Sodium silicate) | CORROSIVE LIQUID, BASIC, INORGANIC, N. O.S. (Contains: Sodium silicate) | CORROSIVE LIQUID, BASIC, INORGANIC, N. O.S. (Contains: Sodium silicate) |
| **Transport hazard class(es)** | 8 | 8 | 8 | 8 |
| **Packing group** | III | III | III | III |
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | **Emergency schedules (EmS)**<br>F-A S-B | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

## Section 14. Transport information

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not available.

**North-America NAERG** : 154

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.
**TSCA 12(b) annual export notification**: No products were found.
**United States inventory (TSCA 8b)**: All components are listed or exempted.
**Clean Water Act (CWA) 307**: No products were found.
**Clean Water Act (CWA) 311**: sodium hydroxide

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Immediate (acute) health hazard

**SARA 313**

| | Product name | CAS number | % |
|---|---|---|---|
| Supplier notification | 2-Butoxyethanol | 111-76-2 | 5 - 10 |

**Canada**

**Canada (CEPA DSL):** : All components are listed or exempted.

## Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | | |
|---|---|---|
| Health | * | 3 |
| Flammability | | 1 |
| Physical hazards | | 0 |
| Personal protection | | H |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**

**History**

**Date of printing** : 11/14/2014.

**Indicates information that has changed from previously issued version.**

# Section 16. Other information

**Notice to reader**

**NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes Drilling Fluids, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.**

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : MIL-LIME™
**Product code** : 5025DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Alkalinity Control

**Print date** : 6/25/2014.
**Validation date** : 6/25/2014.
**Version** : 1.01

**Supplier's details** : Baker Hughes, Inc.
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] - Category 3

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Danger

**Hazard statements** : Causes serious eye damage.
Causes skin irritation.
May cause respiratory irritation.

**Precautionary statements**

**Prevention** : Wear protective gloves: > 8 hours (breakthrough time): nitrile or neoprene. Wear eye or face protection. Use only outdoors or in a well-ventilated area. Avoid breathing dust. Wash hands thoroughly after handling.

## Section 2. Hazards identification

**Response** : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

**Storage** : Store locked up.

**Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazards not otherwise classified** : None known.

## Section 3. Composition/information on ingredients

**Substance/mixture** : Substance

| Ingredient name | % | CAS number |
|---|---|---|
| Calcium hydroxide | 95 - 100 | 1305-62-0 |

## Section 4. First aid measures

### Description of necessary first aid measures

**Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

**Inhalation** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact** : Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

**Eye contact** : Causes serious eye damage.

## Section 4. First aid measures

**Inhalation** : May cause respiratory irritation.

**Skin contact** : Causes skin irritation.

**Ingestion** : May cause burns to mouth, throat and stomach.

**Over-exposure signs/symptoms**

**Eye contact** : pain,watering,redness

**Inhalation** : respiratory tract irritation,coughing

**Skin contact** : pain or irritation,redness,blistering may occur

**Ingestion** : stomach pains

**Indication of immediate medical attention and special treatment needed, if necessary**

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**See toxicological information (Section 11)**

## Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : No specific fire or explosion hazard.

**Hazardous thermal decomposition products** : metal oxide/oxides

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

# Section 6. Accidental release measures

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

## Methods and materials for containment and cleaning up

**Small spill** : Move containers from spill area. Avoid dust generation. Using a vacuum with HEPA filter will reduce dust dispersal. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| Calcium hydroxide | US ACGIH | - | 5 | - | - | - | - | - | - | - | |
| | OSHA PEL | - | 5 | - | - | - | - | - | - | - | [a] |
| | OSHA PEL | - | 15 | - | - | - | - | - | - | - | [b] |
| | OSHA PEL 1989 | - | 5 | - | - | - | - | - | - | - | |

**Form:** [a]Respirable fraction [b]Total dust

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

## Section 8. Exposure controls/personal protection

**Appropriate engineering controls** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

**Individual protection measures**

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

**Hand protection** : Chemical-resistant gloves: nitrile or neoprene

**Skin protection** : Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

**Respiratory protection** : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: Wear a respirator conforming to EN140 with Type A/P2 filter or better.

## Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Solid. [Crystalline solid.]

**Color** : White.

**Odor** : Odorless.

**Odor threshold** : Not available.

**pH** : 12.4 [Conc. (% w/w): 10%]

**Melting/freezing point** : 580°C (1076°F)

**Boiling point** : 2850°C (5162°F)

**Initial Boiling Point** : Not available.

**Flash point** : Not available.

**Burning time** : Not available.

**Burning rate** : Not available.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Not available.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : Not available.

**Vapor density** : Not available.

**Relative density** : 2.2 to 2.4

**Density** : Not available.

**Solubility in water** : Soluble

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : Not available.

**Decomposition temperature** : Not available.

**Viscosity** : Not available.

## Section 9. Physical and chemical properties

**VOC** : Not available.

**Pour Point** : Not available.

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : No specific data.

**Incompatible materials** : Not available.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

| Product/ingredient name | Result | Species | Dose | Exposure |
|---|---|---|---|---|
| Calcium hydroxide | LD50 Oral | Rat | 7340 mg/kg | - |

#### Irritation/Corrosion

No applicable toxicity data

#### Sensitization

No applicable toxicity data

#### Mutagenicity

No applicable toxicity data

#### Carcinogenicity

No applicable toxicity data

#### Reproductive toxicity

No applicable toxicity data

#### Teratogenicity

No applicable toxicity data

#### Specific target organ toxicity (single exposure)

| Name | Category | Route of exposure | Target organs |
|---|---|---|---|
| Calcium hydroxide | Category 3 | Not applicable. | Respiratory tract irritation |

#### Specific target organ toxicity (repeated exposure)

Not applicable.

#### Aspiration hazard

# Section 11. Toxicological information

Not available.

**Information on the likely routes of exposure** : Not available.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

**Potential chronic health effects**

**General** : No known significant effects or critical hazards.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

Not available.

# Section 12. Ecological information

**Toxicity**

| Product/ingredient name | Result | Species | Exposure |
|---|---|---|---|
| Calcium hydroxide | Acute LC50 33884.4 µg/l Fresh water | Fish - Clarias gariepinus - Fingerling | 96 hours |

**Persistence and degradability**

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

# Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains

## Section 13. Disposal considerations

and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | - | - | - | - |
| **Transport hazard class(es)** | - | - | - | - |
| **Packing group** | - | - | - | - |
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | - | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not applicable.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.
**TSCA 12(b) annual export notification**: No products were found.
**United States inventory (TSCA 8b)**: All components are listed or exempted.
**Clean Water Act (CWA) 307**: No products were found.
**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Immediate (acute) health hazard

**SARA 313**

**Supplier notification** : No products were found.

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# Section 15. Regulatory information

## Canada

**Canada (CEPA DSL):** : All components are listed or exempted.

# Section 16. Other information

## Hazardous Material Information System (U.S.A.)

| | | |
|---|---|---|
| **Health** | * | 2 |
| **Flammability** | | 0 |
| **Physical hazards** | | 0 |
| **Personal protection** | | J |

**The customer is responsible for determining the PPE code for this material.**

## National Fire Protection Association (U.S.A.)

## History

**Date of printing** : 6/25/2014.

**Indicates information that has changed from previously issued version.**

## Notice to reader

**NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes Drilling Fluids, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.**

## SECTION 1 : Identification of the substance/mixture and of the supplier

**Product name** : **Calcium Hydroxide,**

**Manufacturer/Supplier Trade name**:

**Manufacturer/Supplier Article number**: **S25225A**

**Recommended uses of the product and uses restrictions on use**:

**Manufacturer Details**:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

**Supplier Details**:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

**Emergency telephone number**:

Fisher Science Education Emergency Telephone No.: 800-535-5053

## SECTION 2 : Hazards identification

**Classification of the substance or mixture**:

**Irritant**
Skin irritation, category 2
Specific target organ toxicity following single exposure, category 3

**Corrosive**
Serious eye damage, category 1

Skin Irritation 2
Eye Damage 1
Specific Target Organ Toxicity, Single Exposure (respiratory) 3

**Signal word** :Danger

**Hazard statements**:
**Precautionary statements**:
If medical advice is needed, have product container or label at hand
Keep out of reach of children
Read label before use
Wash ... thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Avoid breathing dust/fume/gas/mist/vapours/spray
Use only outdoors or in a well-ventilated area
Do not eat, drink or smoke when using this product
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing
If eye irritation persists get medical advice/attention
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
IF ON SKIN: Wash with soap and water
If skin irritation occurs: Get medical advice/attention

Specific treatment (see ... on this label)
Store locked up
Store in a well ventilated place. Keep container tightly closed

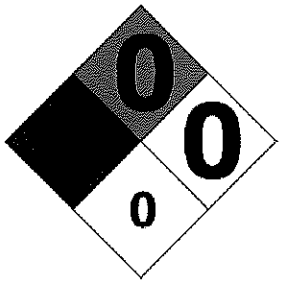
**Combustible Dust Hazard: :**
May form combustible dust concentrations in air (during processing).

**Other Non-GHS Classification**:

**WHMIS**

E

**NFPA/HMIS**




NFPA SCALE (0-4)

| | |
|---|---|
| **Health** | **3** |
| **Flammability** | **0** |
| **Physical Hazard** | **0** |
| **Personal Protection** | **X** |

HMIS RATINGS (0-4)

## SECTION 3 : Composition/information on ingredients

| **Ingredients:** | | |
|---|---|---|
| CAS 1305-62-0 | Calcium Hydroxide | >95 % |
| | | Percentages are by weight |

## SECTION 4 : First aid measures

**Description of first aid measures**

**After inhalation:** Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position.Seek medical advice if discomfort or irritation persists.If breathing difficult, give oxygen.

**After skin contact:** Wash affected area with soap and water. Rinse thoroughly. Seek medical attention if irritation, discomfort or vomiting persists.

**After eye contact:** Protect unexposed eye. Rinse/flush exposed eye(s) gently using water for 15-20 minutes. Remove contact lens(es) if able to do so during rinsing. Seek medical attention if irritation persists or if concerned.

**After swallowing:** Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Seek medical attention if irritation, discomfort or vomiting persists.

**Most important symptoms and effects, both acute and delayed:**

Skin, eye, and upper respiratory tract irritation. Irritation, Nausea,Headache, Shortness of breath.;

**Indication of any immediate medical attention and special treatment needed:**

If seeking medical attention, provide SDS document to physician.

## SECTION 5 : Firefighting measures

**Extinguishing media**

**Suitable extinguishing agents:** If in laboratory setting, follow laboratory fire suppression procedures. Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition

**For safety reasons unsuitable extinguishing agents:** Carbon Dioxide

**Special hazards arising from the substance or mixture:**

Combustion products may include carbon oxides or other toxic vapors.Thermal decomposition can lead to release of irritating gases and vapors.Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.Calcium Oxide.

**Advice for firefighters:**

**Protective equipment:** Use NIOSH-approved respiratory protection/breathing apparatus.

**Additional information (precautions):** Move product containers away from fire or keep cool with water spray as a protective measure, where feasible.Use spark-proof tools and explosion-proof equipment.

## SECTION 6 : Accidental release measures

**Personal precautions, protective equipment and emergency procedures:**

Wear protective equipment. Transfer to a disposal or recovery container.Use spark-proof tools and explosion-proof equipment.Use respiratory protective device against the effects of fumes/dust/aerosol. Keep unprotected persons away. Ensure adequate ventilation.Keep away from ignition sources. Protect from heat.Stop the spill, if possible. Contain spilled material by diking or using inert absorbent.

**Environmental precautions:**

Prevent from reaching drains, sewer or waterway. Collect contaminated soil for characterization per Section 13

**Methods and material for containment and cleaning up:**

If in a laboratory setting, follow Chemical Hygiene Plan procedures.Collect liquids using vacuum or by use of absorbents. Place into properly labeled containers for recovery or disposal. If necessary, use trained response staff/contractor.Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air).

**Reference to other sections:**

## SECTION 7 : Handling and storage

**Precautions for safe handling:**

Minimize dust generation and accumulation. Wash hands after handling. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Follow good hygiene procedures when handling chemical materials. Do not eat, drink, smoke, or use personal products when handling chemical substances. If in a laboratory setting, follow Chemical Hygiene Plan.Use only in well ventilated areas.Avoid generation of dust or fine particulate.Avoid contact with eyes, skin, and clothing.

**Conditions for safe storage, including any incompatibilities:**

Store in a cool location. Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame. Store away from foodstuffs. Store away from oxidizing agents.Store in cool, dry conditions in well sealed containers. Keep container tightly sealed.

## SECTION 8 : Exposure controls/personal protection

**Control Parameters:** 1305-62-0, Calcium hydroxide, NIOSH REL: TWA 5 mg/m3
1305-62-0, Calcium hydroxide, ACGIH TLV TWA 5 mg/m3
1305-62-0, Calcium hydroxide, OSHA PEL TWA: 15 mg/m3 (total dust)
1305-62-0, Calcium hydroxide, OSHA PEL TWA: 5 mg/m3 (respirable fraction)

**Appropriate Engineering controls:** Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use/handling.Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or dusts (total/respirable) below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above.Use under a fume hood. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen deficient environment.Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

**Respiratory protection:** Not required under normal conditions of use. Use suitable respiratory protective device when high concentrations are present. Use suitable respiratory protective device when aerosol or mist is formed. For spills, respiratory protection may be advisable.

**Protection of skin:** The glove material has to be impermeable and resistant to the product/ the substance/ the preparation being used/handled.Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

**Eye protection:** Safety glasses with side shields or goggles.

**General hygienic measures:** The usual precautionary measures are to be adhered to when handling chemicals. Keep away from food, beverages and feed sources. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Do not inhale gases/fumes/dust/mist/vapor/aerosols. Avoid contact with the eyes and skin.

## SECTION 9 : Physical and chemical properties

| | | | |
|---|---|---|---|
| **Appearance (physical state,color):** | Off - white solid | **Explosion limit lower:**<br>**Explosion limit upper:** | Not Determined<br>Not Determined |
| **Odor:** | Odorless | **Vapor pressure:** | Not Determined |
| **Odor threshold:** | Not Determined | **Vapor density:** | Not Determined |
| **pH-value:** | 12.4 saturated solution | **Relative density:** | 2.24 |
| **Melting/Freezing point:** | 580 C | **Solubilities:** | ND = Not Determined. N/A = Not Applicable. Slightlyt soluble in water. |

| | | | |
|---|---|---|---|
| **Boiling point/Boiling range**: | 2850C | **Partition coefficient (n-octanol/water)**: | Not Determined |
| **Flash point (closed cup)**: | Not Determined | **Auto/Self-ignition temperature**: | Not Determined |
| **Evaporation rate**: | Not Determined | **Decomposition temperature**: | Not Determined |
| **Flammability (solid,gaseous)**: | Not Determined | **Viscosity**: | a. Kinematic:Not Determined<br>b. Dynamic: Not Determined |
| **Density**: Not Determined | | | |

## SECTION 10 : Stability and reactivity

**Reactivity:**Nonreactive under normal conditions.
**Chemical stability:**No decomposition if used and stored according to specifications.
**Possible hazardous reactions:**None under normal processing
**Conditions to avoid:**Store away from oxidizing agents, strong acids or bases.Incompatible Materials.Dust generation.excess heat.
**Incompatible materials:**Metals, acids, bases, strong oxidizing and reducing agents.
**Hazardous decomposition products:**Carbon oxides (CO, CO2).Oxides of calcium.

## SECTION 11 : Toxicological information

| | | |
|---|---|---|
| **Acute Toxicity**: | | |
| **Oral**: | 7340 mg/kg | LD50 (rat) |
| **Chronic Toxicity**: No additional information. | | |
| **Corrosion Irritation**: No additional information. | | |
| **Sensitization**: | | No additional information. |
| **Single Target Organ (STOT)**: | | May cause respiratory irritation. |
| **Numerical Measures**: | | No additional information. |
| **Carcinogenicity**: | | No additional information. |
| **Mutagenicity**: | | No additional information. |
| **Reproductive Toxicity**: | | No additional information. |

## SECTION 12 : Ecological information

**Ecotoxicity Persistence and degradability**: Readily degradable in the environment.
**Bioaccumulative potential**:
**Mobility in soil**:
**Other adverse effects**:

## SECTION 13 : Disposal considerations

**Waste disposal recommendations**:

Product/containers must not be disposed together with household garbage. Do not allow product to reach sewage system or open water.It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Consult federal state/ provincial and local regulations regarding the proper disposal of waste material that may incorporate some amount of this product.

## SECTION 14 : Transport information

**UN-Number**

3262

**UN proper shipping name**

Corrosive solid, basic, inorganic, n.o.s.

**Transport hazard class(es)**

**Class:**
8 Corrosive substances

**Packing group**:III
**Environmental hazard**:
**Transport in bulk**:
**Special precautions for user**:

## SECTION 15 : Regulatory information

**United States (USA)**

**SARA Section 311/312 (Specific toxic chemical listings)**:

Acute

**SARA Section 313 (Specific toxic chemical listings)**:

None of the ingredients is listed

**RCRA (hazardous waste code)**:

None of the ingredients is listed

**TSCA (Toxic Substances Control Act)**:

All ingredients are listed.

**CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act)**:

None of the ingredients is listed

**Proposition 65 (California)**:

**Chemicals known to cause cancer**:

None of the ingredients is listed

**Chemicals known to cause reproductive toxicity for females**:

None of the ingredients is listed

**Chemicals known to cause reproductive toxicity for males**:

None of the ingredients is listed

**Chemicals known to cause developmental toxicity**:

None of the ingredients is listed

**Canada**

**Canadian Domestic Substances List (DSL)**:

All ingredients are listed.

**Canadian NPRI Ingredient Disclosure list (limit 0.1%)**:

None of the ingredients is listed

**Canadian NPRI Ingredient Disclosure list (limit 1%)**:

1305-62-0 Calcium hydroxide

## SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

**GHS Full Text Phrases**:

**Abbreviations and acronyms**:
IMDG: International Maritime Code for Dangerous Goods
PNEC: Predicted No-Effect Concentration (REACH)
CFR: Code of Federal Regulations (USA)
SARA: Superfund Amendments and Reauthorization Act (USA)
RCRA: Resource Conservation and Recovery Act (USA)
TSCA: Toxic Substances Control Act (USA)
NPRI: National Pollutant Release Inventory (Canada)
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)

**Effective date** : 12.14.2014
**Last updated** : 03.19.2015

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : MIL-SORB™
**Product code** : 7544DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Absorbent.

**Print date** : 6/5/2014.
**Validation date** : 6/5/2014.
**Version** : 1

**Supplier's details** : Baker Hughes, Inc.
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : CARCINOGENICITY: INHALATION - Category 1A
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE): INHALATION [lungs] - Category 2

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Danger

**Hazard statements** : May cause cancer if inhaled.
May cause damage to organs through prolonged or repeated exposure if inhaled. (lungs)

**Precautionary statements**

**General** : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

**Prevention** : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Do not breathe dust.

**Response** : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention.

**Storage** : Store locked up.

**Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.


04/14/2023

## Section 2. Hazards identification

**Hazards not otherwise classified** : None known.

## Section 3. Composition/information on ingredients

**Substance/mixture** : Mixture

| Ingredient name | % | CAS number |
|---|---|---|
| Crystalline silica, quartz | 5 - 10 | 14808-60-7 |

## Section 4. First aid measures

### Description of necessary first aid measures

**Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

**Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

**Eye contact** : No known significant effects or critical hazards.

**Inhalation** : No known significant effects or critical hazards.

**Skin contact** : No known significant effects or critical hazards.

**Ingestion** : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

**Eye contact** : No specific data.

**Inhalation** : No specific data.

**Skin contact** : No specific data.

**Ingestion** : No specific data.

### Indication of immediate medical attention and special treatment needed, if necessary

## Section 4. First aid measures

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**See toxicological information (Section 11)**

## Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : No specific fire or explosion hazard.

**Hazardous thermal decomposition products** : metal oxide/oxides

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

**Methods and materials for containment and cleaning up**

**Small spill** : Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

# Section 6. Accidental release measures

**Large spill** : Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| Crystalline silica, quartz | US ACGIH | - | 0.025 | - | - | - | - | - | - | - | [a] |
| Crystalline silica, quartz, as quartz | OSHA PEL 1989 | - | 0.1 | - | - | - | - | - | - | - | [b] |

**Form:** [a]Respirable fraction [b]Respirable dust

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

## Individual protection measures

## Section 8. Exposure controls/personal protection

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Hand protection** : Chemical-resistant gloves.

**Skin protection** : Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection** : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Solid.

**Color** : Tan.

**Odor** : Odorless.

**Odor threshold** : Not available.

**pH** : 8 to 9.5 [Conc. (% w/w): 10%]

**Melting/freezing point** : >1000°C (>1832°F)

**Boiling point** : Not available.

**Initial Boiling Point** : Not available.

**Flash point** : Closed cup: Not applicable.

**Burning time** : Not available.

**Burning rate** : Not available.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Not available.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : Not available.

**Vapor density** : Not available.

**Relative density** : 1

**Density** : Not available.

**Solubility in water** : Insoluble

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : Not available.

**Decomposition temperature** : Not available.

**Viscosity** : Not available.

**VOC** : Not available.

**Pour Point** : Not available.

# Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : No specific data.

**Incompatible materials** : Not available.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

# Section 11. Toxicological information

## Information on toxicological effects

### Acute toxicity

No applicable toxicity data

### Irritation/Corrosion

No applicable toxicity data

### Sensitization

No applicable toxicity data

### Mutagenicity

No applicable toxicity data

### Carcinogenicity

| Product/ingredient name | OSHA | IARC | NTP |
|---|---|---|---|
| Crystalline silica, quartz | - | 1 | Known to be a human carcinogen. |

### Reproductive toxicity

No applicable toxicity data

### Teratogenicity

No applicable toxicity data

### Specific target organ toxicity (single exposure)

Not applicable.

### Specific target organ toxicity (repeated exposure)

| Name | Category | Route of exposure | Target organs |
|---|---|---|---|
| Crystalline silica, quartz | Category 1 | Inhalation | lungs |

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

# Section 11. Toxicological information

## Delayed and immediate effects and also chronic effects from short and long term exposure

### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

**General** : May cause damage to organs through prolonged or repeated exposure if inhaled.

**Carcinogenicity** : May cause cancer if inhaled. Risk of cancer depends on duration and level of exposure.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

## Numerical measures of toxicity

### Acute toxicity estimates

Not available.

# Section 12. Ecological information

## Toxicity

No applicable toxicity data

## Persistence and degradability

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

# Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | Not available. | Not available. | Not available. | Not available. |
| **Transport hazard class(es)** | - | - | - | - |
| **Packing group** | - | - | - | - |
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | - | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not applicable.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.
**TSCA 12(b) annual export notification**: No products were found.
**United States inventory (TSCA 8b)**: All components are listed or exempted.
**Clean Water Act (CWA) 307**: No products were found.
**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Delayed (chronic) health hazard

**SARA 313**

**Supplier notification** : No products were found.

**Canada**

**Canada (CEPA DSL):** : All components are listed or exempted.

# Section 16. Other information

## Hazardous Material Information System (U.S.A.)

| | | |
|---|---|---|
| Health | * | 1 |
| Flammability | | 0 |
| Physical hazards | | 0 |
| Personal protection | | E |

**The customer is responsible for determining the PPE code for this material.**

## National Fire Protection Association (U.S.A.)

## History

**Date of printing** : 6/5/2014.

**Indicates information that has changed from previously issued version.**

## Notice to reader

**NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes Drilling Fluids, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.**

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : NEXT-BASE eC

**Product code** : 7271DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Synthetic Drilling Fluid Base

**Print date** : 6/10/2014.

**Validation date** : 6/10/2014.

**Version** : 1.01

**Supplier's details** : Baker Hughes, Inc.
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : ASPIRATION HAZARD - Category 1

Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 23.5%

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Danger

**Hazard statements** : May be fatal if swallowed and enters airways.

**Precautionary statements**

**General** : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

**Prevention** : Not applicable.

**Response** : IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.

**Storage** : Store locked up.

**Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Supplemental label elements** : Avoid contact with skin and clothing. Wash thoroughly after handling.



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## Section 2. Hazards identification

**Hazards not otherwise classified** : Prolonged or repeated contact may dry skin and cause irritation.

## Section 3. Composition/information on ingredients

**Substance/mixture** : Mixture

| Ingredient name | % | CAS number |
|---|---|---|
| Aliphatic hydrocarbons | 80 - 85 | 848301-67-7 |
| Dodecane | 5 - 10 | 112-40-3 |
| Tetradecane | 5 - 10 | 629-59-4 |
| Tridecane | 1 - 5 | 629-50-5 |
| Undecane | 1 - 5 | 1120-21-4 |

## Section 4. First aid measures

### Description of necessary first aid measures

**Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

**Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact** : Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

**Eye contact** : No known significant effects or critical hazards.

**Inhalation** : No known significant effects or critical hazards.

**Skin contact** : Defatting to the skin. May cause skin dryness and irritation.

**Ingestion** : May be fatal if swallowed and enters airways.

#### Over-exposure signs/symptoms

**Eye contact** : No specific data.

**Inhalation** : No specific data.

**Skin contact** : irritation,dryness,cracking

**Ingestion** : nausea or vomiting

# Section 4. First aid measures

**Indication of immediate medical attention and special treatment needed, if necessary**

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : In a fire or if heated, a pressure increase will occur and the container may burst.

**Hazardous thermal decomposition products** : carbon dioxide,carbon monoxide

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

# Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

**Methods and materials for containment and cleaning up**

**Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

# Section 6. Accidental release measures

**Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not swallow. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| No exposure limit value known. | | | | | | | | | | | |

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

## Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

## Section 8. Exposure controls/personal protection

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Hand protection** : Chemical-resistant gloves.

**Skin protection** : Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Liquid.

**Color** : Clear.

**Odor** : Odorless.

**Odor threshold** : Not available.

**pH** : Not available.

**Melting/freezing point** : Not available.

**Boiling point** : 200 to 320°C (392 to 608°F)

**Initial Boiling Point** : Not available.

**Flash point** : Closed cup: >85°C (>185°F) [Product does not sustain combustion.]

**Burning time** : Not applicable.

**Burning rate** : Not applicable.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Not available.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : Not available.

**Vapor density** : Not available.

**Relative density** : 0.78 (20°C)

**Density** : 6.33 to 6.43 (lbs/gal)

**Solubility in water** : Insoluble

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : 210°C (410°F)

**Decomposition temperature** : Not available.

**Viscosity** : Kinematic (40°C): 2.18 to 2.3 cSt

**VOC** : Not available.

**Pour Point** : -21°C (-5.8°F)

**Additional information**

Product does not sustain combustion.

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

## Section 10. Stability and reactivity

**Conditions to avoid** : No specific data.

**Incompatible materials** : Reactive or incompatible with the following materials: oxidizing materials.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

No applicable toxicity data

#### Irritation/Corrosion

No applicable toxicity data

#### Sensitization

No applicable toxicity data

#### Mutagenicity

No applicable toxicity data

#### Carcinogenicity

No applicable toxicity data

#### Reproductive toxicity

No applicable toxicity data

#### Teratogenicity

No applicable toxicity data

#### Specific target organ toxicity (single exposure)

Not applicable.

#### Specific target organ toxicity (repeated exposure)

Not applicable.

#### Aspiration hazard

| Name | Result |
|---|---|
| Aliphatic hydrocarbons | ASPIRATION HAZARD - Category 1 |
| Dodecane | ASPIRATION HAZARD - Category 1 |
| Tetradecane | ASPIRATION HAZARD - Category 1 |
| Tridecane | ASPIRATION HAZARD - Category 1 |
| Undecane | ASPIRATION HAZARD - Category 1 |

**Information on the likely routes of exposure** : Not available.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

## Section 11. Toxicological information

**Potential chronic health effects**

**General** : Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

Not available.

## Section 12. Ecological information

**Toxicity**

No applicable toxicity data

**Persistence and degradability**

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | - | - | - | - |
| | | | | |



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## Section 14. Transport information

| | | | | |
|---|---|---|---|---|
| **Transport hazard class(es)** | - | - | - | - |
| **Packing group** | - | - | - | - |
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | - | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not applicable.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.
**TSCA 12(b) annual export notification**: No products were found.
**United States inventory (TSCA 8b)**: All components are listed or exempted.
**Clean Water Act (CWA) 307**: No products were found.
**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Immediate (acute) health hazard

**SARA 313**

**Supplier notification** : No products were found.

**Canada**

**Canada (CEPA DSL):** : Not determined.

**Additional information**

## Section 15. Regulatory information

DO NOT USE THIS PRODUCT FOR DRILLING OPERATIONS IN THE U.S. GULF OF MEXICO INVOLVING MARINE DISCHARGE OF CUTTINGS CONTAINING THIS PRODUCT. IN GENERAL, DO NOT DISCHARGE THIS PRODUCT OR DRILL CUTTINGS CONTAINING THIS PRODUCT INTO ENVIRONMENTS THAT MAY BE OR MAY BECOME ANAEROBIC (ABSENT OF OXYGEN). Anaerobic conditions are likely to exist at the seafloor and within cuttings piles in certain conditions. Testing jointly by the Oil & Gas Industry and the US EPA indicates that this product does not biodegrade anaerobically.

LAND DRILLING AND ZERO DISCHARGE OPERATIONS

THIS PRODUCT SHOULD ONLY BE USED FOR LAND DRILLING OPERATIONS AND ZERO DISCHARGE OPERATIONS WHERE DRILL CUTTINGS ARE MANAGED VIA ACCEPTED CUTTINGS MANAGEMENT PRACTICES SUCH AS INJECTION, THERMAL TREATMENT, LAND FARMING, OR COMPOSTING. Similar to diesel cuttings, if drill cuttings containing this product are discharged to or placed in the environment, the use of best cuttings management practices should be used.

## Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | |
|---|---|
| **Health** | 1 |
| **Flammability** | 1 |
| **Physical hazards** | 0 |
| **Personal protection** | C |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**

**History**

**Date of printing** : 6/10/2014.

**Indicates information that has changed from previously issued version.**

**Notice to reader**

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**This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.**

# Safety Data Sheet

## 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1 Product Identifier

**Material Name** : **GTL Gas Oil**
**Product Code** : 002D1963
**REACH Registration No.** : 01-0000020119-75, 01-0000020118-77

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

**Product Use** : Gasoil blending component. Fuel for use in diesel powered engines. Fuel for use in domestic and commercial heating and lighting equipment.

**Product Use** Please refer to Ch16 and/or the annexes for the registered uses under REACH.

**Uses Advised Against** : This product must not be used in applications other than those recommended in Section 1, without first seeking the advice of the supplier.

### 1.3 Details of the supplier of the substance or mixture

**Manufacturer/Supplier** : **Shell UK Oil Products Limited**
Shell Centre
London
SE1 7NA
United Kingdom

**Telephone** : (+44) 08708500939
**Email Contact for MSDS** : If you have any enquiries about the content of this MSDS please email fuelSDS@shell.com

### 1.4 Emergency Telephone Number

: +44-(0) 151-350-4595

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of substance or mixture

| Regulation (EC) No 1272/2008 (CLP) | |
|---|---|
| **Hazard classes / Hazard categories** | **Hazard Statement** |
| Aspiration hazard, 1 | H304 |



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| | |
|---|---|
| | EUH066 |
| Flammable liquids, Category 3 | H226 |

| **67/548/EEC or 1999/45/EC** | |
|---|---|
| **Hazard Characteristics** | **R-phrase(s)** |
| Harmful. | R65; R66 |

Classification triggering components : Contains Distillates (Fischer - Tropsch), C8-26 - branched and linear.

**2.2 Label Elements**

**Labeling according to Regulation (EC) No 1272/2008**

**Symbol(s)** :

**CLP Hazard Statements** : PHYSICAL HAZARDS:
H226: Flammable liquid and vapor.

HEALTH HAZARDS:
H304: May be fatal if swallowed and enters airways.

EUH066: Repeated exposure may cause skin dryness or cracking.

ENVIRONMENTAL HAZARDS:
Not classified as environmental hazard according to CLP criteria.

**CLP Precautionary statements**
**Prevention** : P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P280: Wear protective gloves/protective clothing/eye protection/face protection.

**Response** : P301+P310: IF SWALLOWED: Immediately call a POISON



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CENTER or doctor/physician.
P331: Do NOT induce vomiting.

**Storage** : P403+P235: Store in a well-ventilated place. Keep cool.

**Disposal** : P501: Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

**Labeling according to Directive 1999/45/EC/67/548/EEC**

EC Symbols : Xn Harmful.

EC Classification : Harmful.
EC Risk Phrases : R65 Harmful: May cause lung damage if swallowed.
R66 Repeated exposure may cause skin dryness or cracking.
EC Safety Phrases : S2 Keep out of the reach of children.
S24 Avoid contact with skin.
S36/37 Wear suitable protective clothing and gloves.
S62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

**2.3 Other Hazards**

**Health Hazards** : Slightly irritating to respiratory system.
Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache and nausea.
Repeated exposure may cause skin dryness or cracking.

**Safety Hazards** : May ignite on surfaces at temperatures above auto-ignition temperature. Vapour in the headspace of tanks and containers may ignite and explode at temperatures exceeding auto-ignition temperature, where vapour concentrations are within the flammability range. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire.

**Other Information** : This product is intended for use in closed systems only.



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## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substance

**CAS No.** : 848301-67-7

### 3.2 Mixtures

**Preparation Description** : A complex combination of hydrocarbons obtained from a feedstock derived from the catalytic hydrogenation of carbon monoxide (the Fischer - Tropsch Process), optionally followed by one or more of the following processes: hydrotreatment, hydroisomerisation, hydrocracking. It consists predominantly of branched and linear aliphatic hydrocarons having carbon numbers in the range of C8 to C26 and boiling in the range of approximately 120C to 380C (248F to 716F).
Product is not a mixture according to regulation 1907/2006/EC.

**Hazardous Components**

**Classification of components according to Regulation (EC) No 1272/2008**

| Chemical Name | CAS No. | EINECS | REACH Registration No. | Conc. |
|---|---|---|---|---|
| Distillates (Fischer-Tropsch) C8-26 - Branched and Linear | 848301-67-7 | | 01-0000020118-77 | 99.00 - 100.00% |
| Distillates (Fischer-Tropsch) C8-26 - Branched and Linear | 848301-67-7 | | 01-0000020119-75 | 99.00 - 100.00% |

| Chemical Name | Hazard Class & Category | Hazard Statement |
|---|---|---|
| Distillates (Fischer-Tropsch) C8-26 - Branched and Linear | Flam. Liq., 3; Asp. Tox., 1; | H226; H304; EUH066; |
| Distillates (Fischer-Tropsch) C8-26 - Branched and Linear | Flam. Liq., 3; Asp. Tox., 1; | H226; H304; EUH066; |

**Classification of components according to 67/548/EEC**



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| Chemical Name | CAS No. | EINECS | REACH Registration No. | Symbol(s) | R-phrase(s) | Conc. |
|---|---|---|---|---|---|---|
| Distillates (Fischer-Tropsch) C8-26 - Branched and Linear | 848301-67-7 | | 01-0000020118-77 | Xn | R65; R66 | 99.00 - 100.00% |
| Distillates (Fischer-Tropsch) C8-26 - Branched and Linear | 848301-67-7 | | 01-0000020119-75 | Xn | R65; R66 | 99.00 - 100.00% |

**Additional Information** : Distillates (Fischer-Tropsch) C8-26 - Branched and Linear ELINCS Nr 481-740-5.

Refer to chapter 16 for full text of EC R-phrases.

## 4. FIRST AID MEASURES

### 4.1 Description of First Aid Measures

**Inhalation** : Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.

**Skin Contact** : Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.

**Eye Contact** : Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

**Ingestion** : If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing.

**4.2 Most important symptoms/effects, acute & delayed** : If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. The onset of respiratory symptoms may be delayed for several hours after exposure.



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| | | |
|---|---|---|
| | | Defatting dermatitis signs and symptoms may include a burning sensation and/or a dried/cracked appearance. |
| **4.3 Indication of immediate medical attention and special treatment needed** | : | Treat symptomatically. |

## 5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

| | | |
|---|---|---|
| **5.1 Extinguishing Media** | : | Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only. |
| **Unsuitable Extinguishing Media** | : | Do not use water in a jet. |
| **5.2 Special hazards arising from substance or mixture** | : | Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Unidentified organic and inorganic compounds. Carbon monoxide may be evolved if incomplete combustion occurs. Will float and can be reignited on surface water. Flammable vapours may be present even at temperatures below the flash point. |
| **5.3 Advice for fire-fighters** | : | Wear full protective clothing and self-contained breathing apparatus. |
| **Additional Advice** | : | Keep adjacent containers cool by spraying with water. |

## 6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal. Observe the relevant local and international regulations. Evacuate the area of all non-essential personnel. Ventilate contaminated area thoroughly.

| | | |
|---|---|---|
| **6.1 Personal Precautions, Protective Equipment and Emergency Procedures** | : | Do not breathe fumes, vapour. Do not operate electrical equipment. |
| **6.2 Environmental Precautions** | : | Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Use appropriate containment (of product and fire fighting water) to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure |



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electrical continuity by bonding and grounding (earthing) all equipment.

**6.3 Methods and Material for Containment and Clean Up** : For small liquid spills (< 1 drum), transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. Shovel into a suitable clearly marked container for disposal or reclamation in accordance with local regulations.

**Additional Advice** : Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities should be advised if significant spillages cannot be contained. Maritime spillages should be dealt with using a Shipboard Oil Pollution Emergency Plan (SOPEP), as required by MARPOL Annex 1 Regulation 26.

## 7. HANDLING AND STORAGE

**General Precautions** : Avoid breathing vapours or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. Air-dry contaminated clothing in a well-ventilated area before laundering. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Prevent spillages. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Never siphon by mouth. Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse. For comprehensive advice on handling, product transfer, storage and tank cleaning refer to the product supplier.
Maintenance and Fuelling Activities - Avoid inhalation of vapours and contact with skin.

**7.1 Precautions for Safe Handling** : Avoid inhaling vapour and/or mists. Avoid prolonged or repeated contact with skin. When using do not eat or drink.



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| | | |
|---|---|---|
| | | Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Earth all equipment. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Not expected to be a health hazard when used under normal conditions. The vapour is heavier than air, spreads along the ground and distant ignition is possible. |
| **7.2 Conditions for safe storage, including any incompatibilities** | : | Drum and small container storage: Drums should be stacked to a maximum of 3 high. Use properly labelled and closeable containers. Tank storage: Tanks must be specifically designed for use with this product. Bulk storage tanks should be diked (bunded). Locate tanks away from heat and other sources of ignition. Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat. The vapour is heavier than air. Beware of accumulation in pits and confined spaces.<br>Keep in a bunded area with a sealed (low permeability) floor, to provide containment against spillage. Prevent ingress of water. |
| **7.3 Specific End Uses** | : | Please refer to Ch16 and/or the annexes for the registered uses under REACH. |
| **Additional Information** | : | Exposure to this product should be reduced as low as reasonably practicable. Reference should be made to the Health and Safety Executive's publication "COSHH Essentials". Ensure that all local regulations regarding handling and storage facilities are followed. |
| **Product Transfer** | : | Avoid splash filling. Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Keep containers closed when not in use. Do not use compressed air for filling, discharging or handling. Contamination resulting from product transfer may give rise to light hydrocarbon vapour in the headspace of tanks that have previously contained gasoline. This vapour may explode if there is a source of ignition. Partly filled containers present a greater hazard than those that are full, therefore handling, transfer and sampling activities need special care. |
| **Recommended Materials** | : | For containers, or container linings use mild steel, stainless steel. Aluminium may also be used for applications where it does not present an unnecessary fire hazard. Examples of suitable materials are: high density polyethylene (HDPE) and Viton (FKM), which have been specifically tested for compatibility with this product. For container linings, use amine-adduct cured epoxy paint. For seals and gaskets use: |



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graphite, PTFE, Viton A, Viton B.

**Unsuitable Materials** : Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyisobutylene. However, some may be suitable for glove materials.

**Container Advice** : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

If the American Conference of Governmental Industrial Hygienists (ACGIH) value is provided on this document, it is provided for information only.

### 8.1 Control Parameters

**Occupational Exposure Limits**

None established.

**Additional Information** : In the absence of a national exposure limit, the American Conference of Governmental Industrial Hygienists (ACGIH) recommends the following values for Diesel Fuel: TWA - 100 mg/m3 Critical effects based on Skin and Irritation.

### 8.2 Exposure Controls

**General Information** : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Use sealed systems as far as possible. Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Local exhaust ventilation is recommended. Eye washes and showers for emergency use.

Do not ingest. If swallowed then seek immediate medical assistance.



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### Occupational Exposure Controls

| | | |
|---|---|---|
| **Personal Protective Equipment** | : | Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers. |
| **Eye Protection** | : | Chemical splash goggles (chemical monogoggles). Approved to EU Standard EN166. |
| **Hand Protection** | : | Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced.<br>Select gloves tested to a relevant standard (e.g. Europe EN374, US F739). When prolonged or frequent repeated contact occurs, Nitrile gloves may be suitable. (Breakthrough time of > 240 minutes.) For incidental contact/splash protection Neoprene, PVC gloves may be suitable. |
| **Body protection** | : | Chemical resistant gloves/gauntlets, boots, and apron (where risk of splashing). |
| **Respiratory Protection** | : | If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. All respiratory protection equipment and use must be in accordance with local regulations. |
| **Thermal Hazards** | : | Not applicable. |
| **Monitoring Methods** | : | Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. |

### Environmental Exposure Controls

| | | |
|---|---|---|
| **Environmental exposure control measures** | : | Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour. |



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**Consumer Exposure Controls**

| | | |
|---|---|---|
| **Exposure Control Measures for Consumers** | : | If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to EN374 and provide employee skin care programmes. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

| | | |
|---|---|---|
| Appearance | : | Colourless. Liquid. |
| Odour | : | Data not available. |
| pH | : | Not applicable. |
| Initial Boiling Point and Boiling Range | : | 150 - 380 °C / 302 - 716 °F |
| Melting / freezing point | : | Data not available |
| Flash point | : | Typical > 55 - 75 °C / > 131 - 167 °F |
| Upper / lower Flammability or Explosion limits | : | 0.5 - 5.0 %(V) |
| Auto-ignition temperature | : | ca. 210 °C / 410 °F |
| Vapour pressure | : | < 0.0054 kPa at 25 °C / 77 °F |
| Specific gravity | : | Data not available |
| Density | : | ca. 760 - 780 kg/m3 at 15 °C / 59 °F |
| Water solubility | : | Negligible. |
| Solubility in other solvents | : | Data not available |
| n-octanol/water partition coefficient (log Pow) | : | > 6.5 |
| Dynamic viscosity | : | Data not available |
| Kinematic viscosity | : | 3.5 - 3.8 mm2/s at 40 °C / 104 °F |
| Evaporation rate (nBuAc=1) | : | Data not available |
| Decomposition Temperature | : | Data not available |
| Flammability | : | Data not available |

### 9.2 Other Information

| | | |
|---|---|---|
| Other Information | : | Not applicable. |

## 10. STABILITY AND REACTIVITY

| | | |
|---|---|---|
| **10.1 Reactivity** | : | Stable under normal conditions of use. |
| **10.2 Chemical Stability** | : | Stable under normal conditions of use. |



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| | | |
|---|---|---|
| **10.3 Possibility of Hazardous Reactions** | : | Reacts with strong oxidising agents. |
| **10.4 Conditions to Avoid** | : | Avoid heat, sparks, open flames and other ignition sources. |
| **10.5 Incompatible Materials** | : | Strong oxidising agents. |
| **10.6 Hazardous Decomposition Products** | : | Hazardous decomposition products are not expected to form during normal storage.<br><br>Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases, including carbon monoxide, carbon dioxide and other organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation. |

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on Toxicological effects

| | | |
|---|---|---|
| **Basis for Assessment** | : | Information given is based on product data, a knowledge of the components and the toxicology of similar products. |
| **Likely Routes of Exposure** | : | Inhalation is the primary route of exposure although absorption may occur through skin contact or following accidental ingestion. |
| **Acute Oral Toxicity** | : | Low toxicity: LD50 > 5000 mg/kg , Rat |
| **Acute Dermal Toxicity** | : | Expected to be of low toxicity: LD50 >2000 mg/kg , Rabbit |
| **Acute Inhalation Toxicity** | : | Expected to be of low toxicity if inhaled. |
| **Skin Corrosion/Irritation** | : | Expected to be non-irritating to skin. |
| **Serious Eye Damage/Irritation** | : | Expected to be non-irritating to eyes. |
| **Respiratory Irritation** | : | Not expected to be a respiratory irritant. |
| **Respiratory or Skin Sensitisation** | : | Not expected to be a sensitiser. |
| **Aspiration Hazard** | : | Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal. |
| **Germ Cell Mutagenicity** | : | Not mutagenic. |
| **Carcinogenicity** | : | Not expected to be carcinogenic. |
| **Reproductive and Developmental Toxicity** | : | Does not impair fertility. Not a developmental toxicant. |
| **Specific target organ toxicity - single exposure** | : | High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death. |



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| | | |
|---|---|---|
| **Specific target organ toxicity - repeated exposure** | : | Repeated exposure may cause skin dryness or cracking. |

## 12. ECOLOGICAL INFORMATION

| | | |
|---|---|---|
| **Basis for Assessment** | : | Information given is based on product testing. |
| **12.1 Toxicity** | | |
| **Acute Toxicity** | : | (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). |
| **Fish** | : | Practically non toxic: LL/EL/IL50 > 100 mg/l |
| **Aquatic Invertebrates** | : | Practically non toxic: LL/EL/IL50 > 100 mg/l |
| **Algae** | : | Practically non toxic: LL/EL/IL50 > 100 mg/l |
| **Microorganisms** | : | Practically non toxic: LL/EL/IL50 > 100 mg/l |
| **Chronic Toxicity** | | |
| **Fish** | : | NOEC/NOEL > 100 mg/l |
| **Aquatic Invertebrates** | : | NOEC/NOEL expected to be > 10 - <= 100 mg/l |
| **12.2 Persistence and degradability** | : | Readily biodegradable. |
| **12.3 Bioaccumulative Potential** | : | Contains constituents with the potential to bioaccumulate. |
| **12.4 Mobility** | : | Floats on water. Partly evaporates from water or soil surfaces, but a significant proportion will remain after one day. Large volumes may penetrate soil and could contaminate groundwater. |
| **12.5 Result of the PBT and vPvB assessment** | : | The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB. |
| **12.6 Other Adverse Effects** | : | Films formed on water may affect oxygen transfer and damage organisms. |

## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste Treatment Methods

| | | |
|---|---|---|
| **Material Disposal** | : | Recover or recycle if possible. It is the responsibility of the |



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| | | |
|---|---|---|
| | | waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses. Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination. Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand. |
| **Container Disposal** | : | Send to drum recoverer or metal reclaimer. Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard if heated above the flash point. Do not puncture, cut or weld uncleaned drums. Do not pollute the soil, water or environment with the waste container. Comply with any local recovery or waste disposal regulations. |
| **Local Legislation** | : | EU Waste Disposal Code (EWC): 13 07 01 fuel oil and diesel. The number given to waste is associated with the appropriate usage. The user must decide if their particular use results in another waste code being assigned.<br>Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.<br>Hazardous Waste (England and Wales) Regulations 2005. |

## 14. TRANSPORT INFORMATION

**Land transport (ADR/RID):**
**ADR**

| | | |
|---|---|---|
| 14.1 UN No. | : | 1202 |
| 14.2 UN Proper Shipping Name | : | GAS OIL |
| 14.3 Transport Hazard Class | : | 3 |
| 14.4 Packing group | : | III |
| Danger label (primary risk) | : | 3 |
| 14.5 Environmental Hazard | : | No |
| 14.6 Special Precautions for user | : | Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport. |



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**RID**

| | | |
|---|---|---|
| 14.1 UN No. | : | 1202 |
| 14.2 UN Proper Shipping Name | : | GAS OIL |
| 14.3 Transport Hazard Class | : | 3 |
| 14.4 Packing group | : | III |
| Danger label (primary risk) | : | 3 |
| 14.5 Environmental Hazard | : | No |

**Inland waterways transport (ADN):**

| | | |
|---|---|---|
| 14.1 UN No. | : | 1202 |
| 14.2 UN Proper Shipping Name | : | GAS OIL |
| 14.3 Transport Hazard Class | : | 3 |
| 14.4 Packing group | : | III |
| Danger label (primary risk) | : | 3 |
| Danger label (subsidiary risk) | : | F |
| 14.5 Environmental Hazard | : | No |
| 14.6 Special Precautions for user | : | Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport. |

**Sea transport (IMDG Code):**

| | | |
|---|---|---|
| 14.1 UN No. | : | UN 1202 |
| 14.2 UN Proper Shipping Name | : | GAS OIL |
| 14.3 Transport Hazard Class | : | 3 |
| 14.4 Packing group | : | III |
| 14.5 Marine pollutant | : | No |
| 14.6 Special Precautions for user | : | Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport. |

**Air transport (IATA):**

| | | |
|---|---|---|
| 14.1 UN No. | : | 1202 |
| 14.2 UN Proper Shipping | : | Gas oil |



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| | | |
|---|---|---|
| Name | | |
| 14.3 Transport Hazard Class | : | 3 |
| 14.4 Packing group | : | III |
| 14.6 Special Precautions for user | : | Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport. |

**Sea (Annex II of MARPOL 73/78 and the IBC code)**

| | | |
|---|---|---|
| Pollution Category | : | Not applicable. |
| Ship Type | : | Not applicable. |
| Product Name | : | Not applicable. |
| Special Precaution | : | Not applicable. |
| **Additional Information** | **:** | MARPOL Annex 1 rules apply for bulk shipments by sea. For bulk shipping this product has been classified under Annex I (Groups 6-19 Gasoil). |

## 15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

**Other regulatory Information**

**Chemical Inventory Status**

| | | |
|---|---|---|
| EINECS | : | Listed. |
| TSCA | : | Listed. |
| JEX (JP) | : | Listed. |
| DSL | : | Listed. |
| AICS | : | Listed. |
| INV (CN) | : | Listed. |
| KECI (KR) | : | Listed. |
| PICCS (PH) | : | Listed. |
| NZIOC | : | Listed. |

| | | |
|---|---|---|
| Other Information | : | Environmental Protection Act 1990 (as amended). Health and Safety at Work Act 1974. Consumers Protection Act 1987. Control of Pollution Act 1974. Environmental Act 1995. |



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Factories Act 1961. Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations. Chemicals (Hazard Information and Packaging for Supply) Regulations 2002. Control of Substances Hazardous to Health Regulations 1994 (as amended). Road Traffic (Carriage of Dangerous Substances in Packages) Regulations. Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations. Road Traffic (Carriage of Dangerous Substances in Road Tankers in Tank Containers) Regulations. Road Traffic (Training of Drivers of Vehicles Carrying Dangerous Goods) Regulations. Reporting of Injuries, Diseases and Dangerous Occurrences Regulations. Health and Safety (First Aid) Regulations 1981. Personal Protective Equipment (EC Directive) Regulations 1992. Personal Protective Equipment at Work Regulations 1992.

**15.2 Chemical Safety Assessment** : A Chemical Safety Assessment was performed for this substance.

## 16. OTHER INFORMATION

**R-phrase(s)**

| | |
|---|---|
| R65 | Harmful: may cause lung damage if swallowed. |
| R66 | Repeated exposure may cause skin dryness or cracking. |

**CLP Hazard Statements**

| | |
|---|---|
| H226 | Flammable liquid and vapor. |
| H304 | May be fatal if swallowed and enters airways. |

**Identified Uses according to the Use Descriptor System**

**Uses - Worker**
Title : - Industrial
Formulation & (re)packing of substances and mixtures
Use as a fuel

**Uses - Worker**
Title : - Professional
Use as a fuel

**Uses - Consumer**
Title : - Consumer
Use as a fuel



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| | | |
|---|---|---|
| **Recommended Restrictions on Use (Advice Against)** | : | This product must not be used in applications other than those recommended in Section 1, without first seeking the advice of the supplier. |
| **Additional Information** | : | This document contains important information to ensure the safe storage, handling and use of this product. The information in this document should be brought to the attention of the person in your organisation responsible for advising on safety matters.<br>This product is classified as R65 (Harmful: may cause lung damage if swallowed) respectively H304 (May be fatal if swallowed and enters airways). The risk relates to potential for aspiration. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific hazard. An exposure scenario is not presented. This product is classified as R66 / EUH066 (Repeated exposure may cause skin dryness or cracking). The risk relates to the potential for repeated or prolonged dermal contact. The risk arising from contact is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific hazard and included within Chapter 8 of the SDS. An exposure scenario is not presented. |
| **Other Information** | | |
| **Further Information** | : | This product is intended for use in closed systems only. |
| **MSDS Distribution** | : | The information in this document should be made available to all who may handle the product. |
| **MSDS Version Number** | : | 2.1 |
| **MSDS Effective Date** | : | 01.11.2011 |
| **MSDS Revisions** | : | A vertical bar (\|) in the left margin indicates an amendment from the previous version. |
| **MSDS Regulation** | : | Regulation 1907/2006/EC |
| **Disclaimer** | : | This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. |



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**Safety Data Sheet**



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# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : NEXT-FLC™
**Product code** : 7780DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Fluid Loss Control Additive

**Print date** : 5/21/2015.
**Validation date** : 5/21/2015.
**Version** : 1

**Supplier's details** : Baker Hughes Oilfield Operations
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : COMBUSTIBLE DUSTS

**GHS label elements**

**Signal word** : Warning
**Hazard statements** : May form combustible dust concentrations in air.

**Precautionary statements**

**Prevention** : Not applicable.
**Response** : Not applicable.
**Storage** : Not applicable.
**Disposal** : Not applicable.

**Supplemental label elements** : Keep container tightly closed. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Prevent dust accumulation.

**Hazards not otherwise classified** : Fine dust clouds may form explosive mixtures with air. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat.

# Section 3. Composition/information on ingredients

**Substance/mixture** : Substance

| Ingredient name | % | CAS number |
|---|---|---|
| Asphaltite | 90 - 100 | 12002-43-6 |

# Section 4. First aid measures

## Description of necessary first aid measures

**Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention if irritation occurs.

**Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

## Most important symptoms/effects, acute and delayed

### Potential acute health effects

**Eye contact** : Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.

**Inhalation** : Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.

**Skin contact** : No known significant effects or critical hazards.

**Ingestion** : No known significant effects or critical hazards.

### Over-exposure signs/symptoms

**Eye contact** : irritation,redness

**Inhalation** : respiratory tract irritation,coughing

**Skin contact** : No specific data.

**Ingestion** : No specific data.

## Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

# Section 4. First aid measures

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

## Extinguishing media

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : Do not use water jet.

**Specific hazards arising from the chemical** : Fine dust clouds may form explosive mixtures with air.

**Hazardous thermal decomposition products** : No specific data.

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

# Section 6. Accidental release measures

## Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

## Methods and materials for containment and cleaning up

**Small spill** : Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Vacuum or sweep up material and place in a designated, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| No exposure limit value known. | | | | | | | | | | | |

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

## Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

## Section 8. Exposure controls/personal protection

**Hand protection** : Chemical-resistant gloves.

**Skin protection** : Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection** : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Solid. [Powder.]

**Color** : Black.

**Odor** : Odorless. to Slight

**Odor threshold** : Not available.

**pH** : Not available.

**Melting/freezing point** : Not available.

**Boiling point** : Not available.

**Initial Boiling Point** : Not available.

**Flash point** : Closed cup: 310°C (590°F)

**Burning time** : Not available.

**Burning rate** : Not available.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Not available.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : Not available.

**Vapor density** : Not available.

**Relative density** : 1.04 to 1.08

**Density** : Not available.

**Solubility in water** : Insoluble

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : 500°C (932°F)

**Decomposition temperature** : Not available.

**Viscosity** : Not available.

**VOC** : Not available.

**Pour Point** : Not available.

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

## Section 10. Stability and reactivity

**Conditions to avoid** : Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Prevent dust accumulation.

**Incompatible materials** : Reactive or incompatible with the following materials: oxidizing materials.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

No applicable toxicity data

#### Irritation/Corrosion

No applicable toxicity data

#### Sensitization

No applicable toxicity data

#### Mutagenicity

No applicable toxicity data

#### Carcinogenicity

No applicable toxicity data

#### Reproductive toxicity

No applicable toxicity data

#### Teratogenicity

No applicable toxicity data

#### Specific target organ toxicity (single exposure)

Not applicable.

#### Specific target organ toxicity (repeated exposure)

Not applicable.

#### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Potential chronic health effects

**General** : Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

## Section 11. Toxicological information

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

Not available.

## Section 12. Ecological information

**Toxicity**

No applicable toxicity data

**Persistence and degradability**

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | - | - | - | - |
| **Transport hazard class(es)** | - | - | - | - |
| **Packing group** | - | - | - | - |
| | | | | |

## Section 14. Transport information

| | | | | |
|---|---|---|---|---|
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | - | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not available.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.
**TSCA 12(b) annual export notification**: No products were found.
**United States inventory (TSCA 8b)**: All components are listed or exempted.
**Clean Water Act (CWA) 307**: No products were found.
**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Fire hazard

**SARA 313**

**Supplier notification** : No products were found.

**Canada**

**Canada (CEPA DSL):** : All components are listed or exempted.

## Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | |
|---|---|
| **Health** | 0 |
| **Flammability** | 1 |
| **Physical hazards** | 0 |
| **Personal protection** | E |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**

# Section 16. Other information

## History

**Date of printing** : 5/21/2015.

**Indicates information that has changed from previously issued version.**

## Notice to reader

**NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes Drilling Fluids, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.**

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : NEXT-MUL™ HT
**Product code** : 7115DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Emulsifier/Wetting Agent

**Print date** : 4/23/2015.
**Validation date** : 4/23/2015.
**Version** : 3.03

**Supplier's details** : Baker Hughes Oilfield Operations
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : FLAMMABLE LIQUIDS - Category 4
SKIN CORROSION/IRRITATION - Category 2
ASPIRATION HAZARD - Category 1
AQUATIC HAZARD (ACUTE) - Category 2
AQUATIC HAZARD (LONG-TERM) - Category 2

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Danger

**Hazard statements** : Combustible liquid.
Causes skin irritation.
May be fatal if swallowed and enters airways.
Toxic to aquatic life with long lasting effects.

**Precautionary statements**

**Prevention** : Wear protective gloves. Wear eye or face protection. Keep away from flames and hot surfaces. - No smoking. Avoid release to the environment. Wash hands thoroughly after handling.

## Section 2. Hazards identification

**Response** : Collect spillage. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation occurs: Get medical attention.

**Storage** : Store locked up. Store in a well-ventilated place. Keep cool.

**Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazards not otherwise classified** : None known.

## Section 3. Composition/information on ingredients

**Substance/mixture** : Mixture

| Ingredient name | % | CAS number |
|---|---|---|
| Distillates (petroleum), hydrotreated middle | 30 - 40 | 64742-46-7 |
| 2-butoxyethanol | 1 - 5 | 111-76-2 |

## Section 4. First aid measures

### Description of necessary first aid measures

**Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

**Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

**Eye contact** : Causes serious eye irritation.

**Inhalation** : No known significant effects or critical hazards.

**Skin contact** : Causes skin irritation.

**Ingestion** : May be fatal if swallowed and enters airways. Irritating to mouth, throat and stomach.

#### Over-exposure signs/symptoms

**Eye contact** : pain or irritation,watering,redness

# Section 4. First aid measures

**Inhalation** : No specific data.

**Skin contact** : irritation,redness

**Ingestion** : nausea or vomiting

**Indication of immediate medical attention and special treatment needed, if necessary**

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media** : Use dry chemical, $CO_2$, water spray (fog) or foam.

**Unsuitable extinguishing media** : Do not use water jet.

**Specific hazards arising from the chemical** : Combustible liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products** : carbon dioxide,carbon monoxide

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

# Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

# Section 6. Accidental release measures

## Methods and materials for containment and cleaning up

**Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

**If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.**

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not swallow. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| 2-butoxyethanol | US ACGIH | 20 | - | - | - | - | - | - | - | - | |
| | OSHA PEL | 50 | 240 | - | - | - | - | - | - | - | [1] |
| | OSHA PEL 1989 | 25 | 120 | - | - | - | - | - | - | - | [1] |

## Section 8. Exposure controls/personal protection

[1]Absorbed through skin.

**Consult local authorities for acceptable exposure limits.**
**Only components of this product with established exposure limits appear in the box above.**
**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**Individual protection measures**

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Hand protection** : Chemical-resistant gloves.

**Skin protection** : Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Liquid.

**Color** : Amber. [Dark]

**Odor** : Hydrocarbon. [Slight]

**Odor threshold** : Not available.

**pH** : Not available.

**Melting/freezing point** : Not available.

**Boiling point** : Not available.

**Initial Boiling Point** : Not available.

**Flash point** : Closed cup: 83°C (181.4°F) [PMCC]

**Burning time** : Not applicable.

**Burning rate** : Not applicable.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Not available.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : Not available.

**Vapor density** : Not available.

**Relative density** : 0.92 (20°C)

**Density** : Not available.

## Section 9. Physical and chemical properties

**Solubility in water** : Insoluble

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : Not available.

**Decomposition temperature** : Not available.

**Viscosity** : Not available.

**VOC** : Not available.

**Pour Point** : Not available.

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

**Incompatible materials** : Not available.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

| Product/ingredient name | Result | Species | Dose | Exposure |
|---|---|---|---|---|
| 2-butoxyethanol | LC50 Inhalation Gas.<br>LD50 Dermal<br>LD50 Oral | Rat<br>Rabbit - Male<br>Rat | 450 ppm<br>435 mg/kg<br>1746 mg/kg | 4 hours<br>-<br>- |

#### Irritation/Corrosion

No applicable toxicity data

#### Sensitization

No applicable toxicity data

#### Mutagenicity

No applicable toxicity data

#### Carcinogenicity

| Product/ingredient name | OSHA | IARC | NTP |
|---|---|---|---|
| 2-butoxyethanol | - | 3 | - |

#### Reproductive toxicity

No applicable toxicity data

#### Teratogenicity

No applicable toxicity data

# Section 11. Toxicological information

### Specific target organ toxicity (single exposure)

Not applicable.

### Specific target organ toxicity (repeated exposure)

Not applicable.

### Aspiration hazard

| Name | Result |
|---|---|
| Distillates (petroleum), hydrotreated middle | ASPIRATION HAZARD - Category 1 |

**Information on the likely routes of exposure** : Not available.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Potential chronic health effects

**General** : No known significant effects or critical hazards.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Not available.

# Section 12. Ecological information

### Toxicity

| Product/ingredient name | Result | Species | Exposure |
|---|---|---|---|
| 2-butoxyethanol | Acute LC50 1000 mg/l Marine water | Crustaceans - Chaetogammarus marinus - Young | 48 hours |

### Persistence and degradability

| Product/ingredient name | Test | Result | Dose | Inoculum |
|---|---|---|---|---|
| 2-butoxyethanol | - | 90.4 % - Readily - 28 days | - | - |

| Product/ingredient name | Aquatic half-life | Photolysis | Biodegradability |
|---|---|---|---|
| 2-butoxyethanol | - | - | Readily |

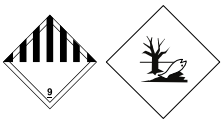
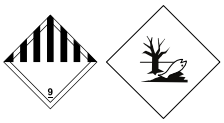
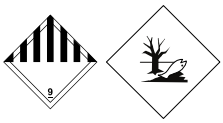
## Section 12. Ecological information

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | NA1993 | UN3082 | UN3082 | UN3082 |
| **UN proper shipping name** | COMBUSTIBLE LIQUID, N.O.S. (Contains: 2-butoxyethanol) | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Contains: Distillates (petroleum), hydrotreated middle) | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Contains: Distillates (petroleum), hydrotreated middle) | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Contains: Distillates (petroleum), hydrotreated middle) |
| **Transport hazard class(es)** | Combustible liquid. | 9  | 9  | 9  |
| **Packing group** | III | III | III | III |
| **Environmental hazards** | | Yes. | Yes. | Yes. |
| **Additional information** | This material is not regulated by DOT if transported in a packaging </= 119 gallons. | - | - | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

## Section 14. Transport information

**Marine pollutant** Distillates (petroleum), hydrotreated middle

**North-America NAERG** : 128

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.
**TSCA 12(b) annual export notification**: No products were found.
**United States inventory (TSCA 8b)**: All components are listed or exempted.
**Clean Water Act (CWA) 307**: No products were found.
**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Fire hazard
Immediate (acute) health hazard

**SARA 313**

| | Product name | CAS number | % |
|---|---|---|---|
| Supplier notification | 2-butoxyethanol | 111-76-2 | 1 - 5 |

**Canada**

**Canada (CEPA DSL):** : At least one component is not listed.

## Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | | |
|---|---|---|
| Health | * | 1 |
| Flammability | | 1 |
| Physical hazards | | 0 |
| Personal protection | | D |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**

**History**

**Date of printing** : 4/23/2015.

**Indicates information that has changed from previously issued version.**

**Notice to reader**

# Section 16. Other information

**NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes Drilling Fluids, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.**

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : OMNI-COTE™
**Product code** : 7193DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Emulsifier / Wetting agent.

**Print date** : 5/20/2015.
**Validation date** : 5/20/2015.
**Version** : 1

**Supplier's details** : Baker Hughes Oilfield Operations
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
AQUATIC HAZARD (LONG-TERM) - Category 3

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Danger

**Hazard statements** : Causes serious eye damage.
Causes skin irritation.
Harmful to aquatic life with long lasting effects.

**Precautionary statements**

**Prevention** : Wear protective gloves. Wear eye or face protection. Avoid release to the environment. Wash hands thoroughly after handling.

**Response** : IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

**Storage** : Not applicable.

## Section 2. Hazards identification

**Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Supplemental label elements** : Avoid contact with skin and clothing. Wash thoroughly after handling.

**Hazards not otherwise classified** : Prolonged or repeated contact may dry skin and cause irritation.

## Section 3. Composition/information on ingredients

**Substance/mixture** : Mixture

| Ingredient name | % | CAS number |
|---|---|---|
| calcium bis(dodecylbenzenesulphonate), branched | 20 - 30 | 70528-83-5 |
| Hexadecene | 10 - 20 | 26952-14-7 |
| 2-Ethyl hexanol | 5 - 10 | 104-76-7 |
| Octadecene | 5 - 10 | 27070-58-2 |

## Section 4. First aid measures

### Description of necessary first aid measures

**Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

**Inhalation** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact** : Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

**Eye contact** : Causes serious eye damage.

**Inhalation** : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.

# Section 4. First aid measures

**Skin contact** : Causes skin irritation. Defatting to the skin.

**Ingestion** : May cause burns to mouth, throat and stomach.

**Over-exposure signs/symptoms**

**Eye contact** : pain,watering,redness

**Inhalation** : No specific data.

**Skin contact** : pain or irritation,redness,dryness,cracking,blistering may occur

**Ingestion** : stomach pains

**Indication of immediate medical attention and special treatment needed, if necessary**

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products** : carbon dioxide,carbon monoxide,sulfur oxides,metal oxide/oxides

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

# Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

# Section 6. Accidental release measures

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

**Methods and materials for containment and cleaning up**

**Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

**Precautions for safe handling**

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

**Control parameters**

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| No exposure limit value known. | | | | | | | | | | | |

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

## Section 8. Exposure controls/personal protection

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

**Individual protection measures**

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

**Hand protection** : Chemical-resistant gloves.

**Skin protection** : Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

**Respiratory protection** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Liquid.

**Color** : Amber. [Dark]

**Odor** : Solvent.

**Odor threshold** : Not available.

**pH** : Not available.

**Melting/freezing point** : Not available.

**Boiling point** : Not available.

**Initial Boiling Point** : Not available.

**Flash point** : Closed cup: 100°C (212°F) [SFCC]

**Burning time** : Not applicable.

**Burning rate** : Not applicable.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Not available.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : Not available.

**Vapor density** : Not available.

**Relative density** : 0.935 to 0.941

**Density** : Not available.

**Solubility in water** : Not available.

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : Not available.

## Section 9. Physical and chemical properties

**Decomposition temperature** : Not available.

**Viscosity** : Dynamic (25°C): <1500 cP

**VOC** : Not available.

**Pour Point** : Not available.

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : No specific data.

**Incompatible materials** : Not available.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

| Product/ingredient name | Result | Species | Dose | Exposure |
|---|---|---|---|---|
| Hexadecene | LD50 Oral | Rat | >5050 mg/kg | - |
| 2-Ethyl hexanol | LD50 Dermal | Rat | >3000 mg/kg | - |
| | LD50 Oral | Rat | 3290 mg/kg | - |
| Octadecene | LD50 Oral | Rat | >5050 mg/kg | - |

#### Irritation/Corrosion

No applicable toxicity data

#### Sensitization

No applicable toxicity data

#### Mutagenicity

No applicable toxicity data

#### Carcinogenicity

No applicable toxicity data

#### Reproductive toxicity

No applicable toxicity data

#### Teratogenicity

No applicable toxicity data

#### Specific target organ toxicity (single exposure)

# Section 11. Toxicological information

| Name | Category | Route of exposure | Target organs |
|---|---|---|---|
| 2-Ethyl hexanol | Category 3 | Not applicable. | Respiratory tract irritation |

**Specific target organ toxicity (repeated exposure)**

Not applicable.

**Aspiration hazard**

| Name | Result |
|---|---|
| Hexadecene<br>Octadecene | ASPIRATION HAZARD - Category 1<br>ASPIRATION HAZARD - Category 1 |

**Information on the likely routes of exposure** : Not available.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

**Potential chronic health effects**

**General** : Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

| Route | ATE value |
|---|---|
| Oral<br>Inhalation (vapors) | 37600 mg/kg<br>125.7 mg/l |

# Section 12. Ecological information

**Toxicity**

| Product/ingredient name | Result | Species | Exposure |
|---|---|---|---|
| calcium bis (dodecylbenzenesulphonate), branched | Acute LC50 <10 mg/l | Fish | 96 hours |
| 2-Ethyl hexanol | Acute EC50 11.5 mg/l Fresh water<br>Acute EC50 39 mg/l Fresh water<br>Acute LC50 17.1 mg/l Fresh water | Algae<br>Daphnia<br>Fish | 72 hours<br>48 hours<br>96 hours |

## Section 12. Ecological information

**Persistence and degradability**

| Product/ingredient name | Test | Result | Dose | Inoculum |
|---|---|---|---|---|
| 2-Ethyl hexanol | - | >99 % - Readily - 28 days | - | - |

| Product/ingredient name | Aquatic half-life | Photolysis | Biodegradability |
|---|---|---|---|
| 2-Ethyl hexanol | - | - | Readily |

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | - | - | - | - |
| **Transport hazard class(es)** | - | - | - | - |
| **Packing group** | - | - | - | - |
| **Environmental hazards** | No. | No. | No. | No. |
| **Additional information** | - | - | - | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

## Section 14. Transport information

**Marine pollutant** Not available.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.
**TSCA 12(b) annual export notification**: No products were found.
**United States inventory (TSCA 8b)**: All components are listed or exempted.
**Clean Water Act (CWA) 307**: No products were found.
**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Immediate (acute) health hazard

**SARA 313**

**Supplier notification** : No products were found.

**Canada**

**Canada (CEPA DSL):** : At least one component is not listed.

## Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | |
|---|---|
| Health | 1 |
| Flammability | 1 |
| Physical hazards | 0 |
| Personal protection | G |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**

**History**

**Date of printing** : 5/20/2015.

**Indicates information that has changed from previously issued version.**

**Notice to reader**

**NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes Drilling Fluids, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or**

## Section 16. Other information

**disposal of this product.**

**This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.**

# SAFETY DATA SHEET

## Product 2077

## Section: 1. PRODUCT AND COMPANY IDENTIFICATION

| | | |
|---|---|---|
| Product name | : | Product 2077 |
| Other means of identification | : | Not applicable. |
| Recommended use | : | CORROSION INHIBITOR |
| Restrictions on use | : | Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits. |
| Company | : | Nalco Champion Company<br>7705 Highway 90-A<br>Sugar Land, Texas 77478<br>USA<br>TEL: (281) 263-7000 |
| Emergency telephone number | : | (800) 424-9300 (24 Hours) CHEMTREC |
| Issuing date | : | 01/16/2015 |

## Section: 2. HAZARDS IDENTIFICATION

**GHS Classification**

| | | |
|---|---|---|
| Eye irritation | : | Category 2B |

**GHS Label element**

| | | |
|---|---|---|
| Signal Word | : | Warning |
| Hazard Statements | : | Causes eye irritation. |
| Precautionary Statements | : | **Prevention:**<br>Wash skin thoroughly after handling.<br>**Response:**<br>IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/ attention. |
| **Other hazards** | : | None known. |

## Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

| Chemical Name | CAS-No. | Concentration: (%) |
|---|---|---|
| Polyphosphoric acid esters | Proprietary | 30 - 60 |
| Dipotassium Phosphate | 7758-11-4 | 10 - 30 |

## Section: 4. FIRST AID MEASURES

In case of eye contact : Rinse with plenty of water. Get medical attention if symptoms occur.



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| | | |
|---|---|---|
| In case of skin contact | : | Wash off with soap and plenty of water. Get medical attention if symptoms occur. |
| If swallowed | : | Rinse mouth. Get medical attention if symptoms occur. |
| If inhaled | : | Get medical attention if symptoms occur. |
| Protection of first-aiders | : | In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders.Use personal protective equipment as required. |
| Notes to physician | : | Treat symptomatically. |
| Most important symptoms and effects, both acute and delayed | : | See Section 11 for more detailed information on health effects and symptoms. |

## Section: 5. FIREFIGHTING MEASURES

| | | |
|---|---|---|
| Suitable extinguishing media | : | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| Unsuitable extinguishing media | : | None known. |
| Specific hazards during firefighting | : | Not flammable or combustible. |
| Hazardous combustion products | : | Carbon oxides Oxides of phosphorus metal oxides |
| Special protective equipment for firefighters | : | Use personal protective equipment. |
| Specific extinguishing methods | : | Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not breathe fumes. |

## Section: 6. ACCIDENTAL RELEASE MEASURES

| | | |
|---|---|---|
| Personal precautions, protective equipment and emergency procedures | : | Refer to protective measures listed in sections 7 and 8. |
| Environmental precautions | : | Do not allow contact with soil, surface or ground water. |
| Methods and materials for containment and cleaning up | : | Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Flush away traces with water. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. |

## Section: 7. HANDLING AND STORAGE

| | | |
|---|---|---|
| Advice on safe handling | : | Wash hands thoroughly after handling. Use only with adequate ventilation. |

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| | | |
|---|---|---|
| Conditions for safe storage | : | Keep container tightly closed. Store in suitable labeled containers. |
| Suitable material | : | Keep in properly labelled containers. |
| Unsuitable material | : | not determined |

## Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

| | | |
|---|---|---|
| Engineering measures | : | Good general ventilation should be sufficient to control worker exposure to airborne contaminants. |

**Personal protective equipment**

| | | |
|---|---|---|
| Eye protection | : | Safety glasses |
| Hand protection | : | Wear the following personal protective equipment:<br>Impervious butyl rubber gloves<br>Nitrile rubber<br>Neoprene gloves<br>Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. |
| Skin protection | : | Wear suitable protective clothing. |
| Respiratory protection | : | In the case of vapour formation use a respirator with an approved filter. |
| Hygiene measures | : | Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. |

## Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| Appearance | : | liquid |
| Colour | : | yellow |
| Odour | : | stinging |
| Flash point | : | > 100 °C<br>Method: Pensky-Martens closed cup |
| pH | : | 7.0 - 8.0, (undiluted) |
| Odour Threshold | : | no data available |
| Melting point/freezing point | : | pour point: -17.8 °C |
| Initial boiling point and boiling range | : | no data available |
| Evaporation rate | : | no data available |
| Flammability (solid, gas) | : | no data available |
| Upper explosion limit | : | no data available |

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| | | |
|---|---|---|
| Lower explosion limit | : | no data available |
| Vapour pressure | : | no data available |
| Relative vapour density | : | no data available |
| Relative density | : | 1.4011 - 1.4311 (15.6 °C) |
| Density | : | 1.3987 - 1.4287 g/cm3 |
| Water solubility | : | soluble |
| Solubility in other solvents | : | no data available |
| Partition coefficient: n-octanol/water | : | no data available |
| Auto-ignition temperature | : | no data available |
| Thermal decomposition temperature | : | no data available |
| Viscosity, dynamic | : | 5 - 25 mPa.s (23.9 °C) |
| Viscosity, kinematic | : | 6.9 mm2/s (40 °C) |
| VOC | : | no data available |

## Section: 10. STABILITY AND REACTIVITY

| | | |
|---|---|---|
| Chemical stability | : | Stable under normal conditions. |
| Possibility of hazardous reactions | : | No dangerous reaction known under conditions of normal use. |
| Conditions to avoid | : | None known. |
| Incompatible materials | : | no data available |
| Hazardous decomposition products | : | Carbon oxides |

## Section: 11. TOXICOLOGICAL INFORMATION

| | | |
|---|---|---|
| Information on likely routes of exposure | : | Inhalation, Eye contact, Skin contact |

**Potential Health Effects**

| | | |
|---|---|---|
| Eyes | : | Causes eye irritation. |
| Skin | : | Health injuries are not known or expected under normal use. |
| Ingestion | : | Health injuries are not known or expected under normal use. |
| Inhalation | : | Health injuries are not known or expected under normal use. |
| Chronic Exposure | : | Health injuries are not known or expected under normal use. |

**Experience with human exposure**

| | | |
|---|---|---|
| Eye contact | : | Redness, Irritation |
| Skin contact | : | No symptoms known or expected. |

| | | |
|---|---|---|
| Ingestion | : | No symptoms known or expected. |
| Inhalation | : | No symptoms known or expected. |

**Toxicity**

**Product**

| | | |
|---|---|---|
| Acute oral toxicity | : | no data available |
| Acute inhalation toxicity | : | no data available |
| Acute dermal toxicity | : | no data available |
| Skin corrosion/irritation | : | no data available |
| Serious eye damage/eye irritation | : | no data available |
| Respiratory or skin sensitization | : | no data available |
| Carcinogenicity | : | no data available |
| Reproductive effects | : | no data available |
| Germ cell mutagenicity | : | no data available |
| Teratogenicity | : | no data available |
| STOT - single exposure | : | no data available |
| STOT - repeated exposure | : | no data available |
| Aspiration toxicity | : | no data available |

**Components**

| | | |
|---|---|---|
| Acute oral toxicity | : | Dipotassium Phosphate<br>LD50 rat: > 2,000 mg/kg |

**Components**

| | | |
|---|---|---|
| Acute dermal toxicity | : | Dipotassium Phosphate<br>LD50 rat: > 2,000 mg/kg |

## Section: 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

| | | |
|---|---|---|
| Environmental Effects | : | This product has no known ecotoxicological effects. |

**Components**

| | | |
|---|---|---|
| Toxicity to fish | : | Dipotassium Phosphate<br>LC50 Fish: > 100 mg/l<br>Exposure time: 96 h |

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**Persistence and degradability**

no data available

**Mobility**

no data available

**Bioaccumulative potential**

no data available

**Other information**

no data available

## Section: 13. DISPOSAL CONSIDERATIONS

| | | |
|---|---|---|
| Disposal methods | : | Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility. |
| Disposal considerations | : | Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers. |

## Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

**Land transport (DOT)**

| | | |
|---|---|---|
| Proper shipping name | : | PRODUCT IS NOT REGULATED DURING TRANSPORTATION |

**Air transport (IATA)**

| | | |
|---|---|---|
| Proper shipping name | : | PRODUCT IS NOT REGULATED DURING TRANSPORTATION |

**Sea transport (IMDG/IMO)**

| | | |
|---|---|---|
| Proper shipping name | : | PRODUCT IS NOT REGULATED DURING TRANSPORTATION |

## Section: 15. REGULATORY INFORMATION

**EPCRA - Emergency Planning and Community Right-to-Know Act**

**CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 311/312 Hazards** : Acute Health Hazard

**SARA 302** : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**California Prop 65**
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS :

TOXIC SUBSTANCES CONTROL ACT (TSCA)
On TSCA Inventory

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)
This product contains one or several components listed in the Canadian NDSL.

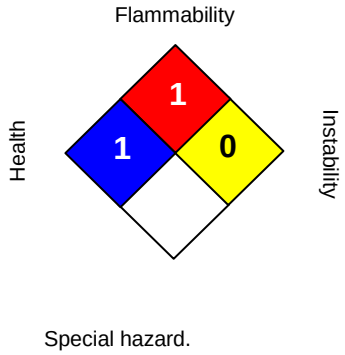
AUSTRALIA
Not in compliance with the inventory

CHINA
Not in compliance with the inventory

NEW ZEALAND
Not in compliance with the inventory

## Section: 16. OTHER INFORMATION

**NFPA:**




**HMIS III:**

| | |
|---|---|
| HEALTH | 1 |
| FLAMMABILITY | 1 |
| PHYSICAL HAZARD | 0 |

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date : 01/16/2015
Version Number : 1.0
Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

04/14/2023

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
For additional copies of an MSDS visit www.nalco.com and request access.

04/14/2023

# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : SURF-COTE™
**Product code** : 2049DF

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Wetting agent.

**Print date** : 6/9/2015.
**Validation date** : 6/9/2015.
**Version** : 2

**Supplier's details** : Baker Hughes Oilfield Operations
12645 W. Airport Blvd.
Sugar Land, TX 77478

**Emergency telephone number (with hours of operation)** : CHEMTREC 800-424-9300 (U.S. 24 hour)
(001)713-439-8900
CANUTEC 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : FLAMMABLE LIQUIDS - Category 3
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
CARCINOGENICITY - Category 2
AQUATIC HAZARD (ACUTE) - Category 3
AQUATIC HAZARD (LONG-TERM) - Category 2

Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 34.2%

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Danger

**Hazard statements** : Flammable liquid and vapor.
Causes serious eye damage.
Causes skin irritation.
Suspected of causing cancer.
Toxic to aquatic life with long lasting effects.

**Precautionary statements**

## Section 2. Hazards identification

**Prevention** : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Avoid release to the environment. Wash hands thoroughly after handling.

**Response** : Collect spillage. IF exposed or concerned: Get medical attention. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

**Storage** : Store locked up. Store in a well-ventilated place. Keep cool.

**Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Supplemental label elements** : Avoid contact with skin and clothing. Wash thoroughly after handling.

**Hazards not otherwise classified** : Prolonged or repeated contact may dry skin and cause irritation.

## Section 3. Composition/information on ingredients

**Substance/mixture** : Mixture

| Ingredient name | % | CAS number |
|---|---|---|
| calcium bis(dodecylbenzenesulphonate), branched | 50 - 60 | 70528-83-5 |
| Naphtha (petroleum), heavy aromatic | 30 - 40 | 64742-94-5 |
| N-butanol | 5 - 10 | 71-36-3 |
| Naphthalene | 1 - 5 | 91-20-3 |

## Section 4. First aid measures

### Description of necessary first aid measures

**Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

**Inhalation** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact** : Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

# Section 4. First aid measures

**Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

## Most important symptoms/effects, acute and delayed

### Potential acute health effects

**Eye contact** : Causes serious eye damage.

**Inhalation** : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.

**Skin contact** : Causes skin irritation. Defatting to the skin.

**Ingestion** : May cause burns to mouth, throat and stomach.

### Over-exposure signs/symptoms

**Eye contact** : pain,watering,redness

**Inhalation** : No specific data.

**Skin contact** : pain or irritation,redness,dryness,cracking,blistering may occur

**Ingestion** : stomach pains

## Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

## Extinguishing media

**Suitable extinguishing media** : Use dry chemical, $CO_2$, water spray (fog) or foam.

**Unsuitable extinguishing media** : Do not use water jet.

**Specific hazards arising from the chemical** : Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products** : carbon dioxide,carbon monoxide,sulfur oxides,metal oxide/oxides

# Section 5. Fire-fighting measures

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

# Section 6. Accidental release measures

## Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

## Methods and materials for containment and cleaning up

**Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

**If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.**

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue

# Section 7. Handling and storage

and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ingredients:** | **List name** | **ppm** | **mg/m³** | **Other** | **ppm** | **mg/m³** | **Other** | **ppm** | **mg/m³** | **Other** | **Notations** |
| N-butanol | US ACGIH | 20 | - | - | - | - | - | - | - | - | |
| | OSHA PEL | 100 | 300 | - | - | - | - | - | - | - | |
| | OSHA PEL 1989 | - | - | - | - | - | - | 50 | 150 | - | [1] |
| Naphthalene | US ACGIH | 10 | 52 | - | - | - | - | - | - | - | [1] |
| | OSHA PEL | 10 | 50 | - | - | - | - | - | - | - | |
| | OSHA PEL 1989 | 10 | 50 | - | 15 | 75 | - | - | - | - | |

[1]Absorbed through skin.

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

## Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

**Hand protection** : Chemical-resistant gloves.

**Skin protection** : Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

## Section 8. Exposure controls/personal protection

**Respiratory protection** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Liquid. [Clear. Colorless.]

**Color** : Amber.

**Odor** : Solvents

**Odor threshold** : Not available.

**pH** : 6 to 8

**Melting/freezing point** : Not available.

**Boiling point** : Not available.

**Initial Boiling Point** : Not available.

**Flash point** : Closed cup: 43°C (109.4°F) [PMCC]

**Burning time** : Not applicable.

**Burning rate** : Not applicable.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Not available.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : Not available.

**Vapor density** : Not available.

**Relative density** : 0.98

**Density** : 8.1 (lbs/gal)

**Solubility in water** : Insoluble

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : Not available.

**Decomposition temperature** : Not available.

**Viscosity** : Not available.

**VOC** : Not available.

**Pour Point** : Not available.

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

**Incompatible materials** : Reactive or incompatible with the following materials: oxidizing materials.

# Section 10. Stability and reactivity

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

# Section 11. Toxicological information

## Information on toxicological effects

### Acute toxicity

| Product/ingredient name | Result | Species | Dose | Exposure |
|---|---|---|---|---|
| N-butanol | LC50 Inhalation Vapor | Rat | 24000 mg/m³ | 4 hours |
| | LD50 Dermal | Rabbit | 3400 mg/kg | - |
| | LD50 Oral | Rat | 790 mg/kg | - |
| Naphthalene | LD50 Dermal | Rabbit | >20 g/kg | - |
| | LD50 Oral | Rat | 490 mg/kg | - |

### Irritation/Corrosion

No applicable toxicity data

### Sensitization

No applicable toxicity data

### Mutagenicity

No applicable toxicity data

### Carcinogenicity

| Product/ingredient name | OSHA | IARC | NTP |
|---|---|---|---|
| Naphthalene | - | 2B | Reasonably anticipated to be a human carcinogen. |

### Reproductive toxicity

No applicable toxicity data

### Teratogenicity

No applicable toxicity data

### Specific target organ toxicity (single exposure)

| Name | Category | Route of exposure | Target organs |
|---|---|---|---|
| N-butanol | Category 3 | Not applicable. | Respiratory tract irritation and Narcotic effects |

### Specific target organ toxicity (repeated exposure)

Not applicable.

### Aspiration hazard

| Name | Result |
|---|---|
| Naphtha (petroleum), heavy aromatic | ASPIRATION HAZARD - Category 1 |

**Information on the likely routes of exposure** : Not available.

## Delayed and immediate effects and also chronic effects from short and long term exposure

### Short term exposure

**Potential immediate effects** : Not available.

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# Section 11. Toxicological information

**Potential delayed effects** : Not available.

**Potential chronic health effects**

**General** : Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

**Carcinogenicity** : Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

| Route | ATE value |
|---|---|
| Oral | 4123.8 mg/kg |
| Dermal | 22666.7 mg/kg |

# Section 12. Ecological information

**Toxicity**

| Product/ingredient name | Result | Species | Exposure |
|---|---|---|---|
| calcium bis (dodecylbenzenesulphonate), branched | Acute LC50 <10 mg/l | Fish | 96 hours |
| N-butanol | Acute EC50 1983000 µg/l Fresh water | Daphnia - Daphnia magna | 48 hours |
| | Acute LC50 1730000 µg/l Fresh water | Fish - Pimephales promelas | 96 hours |
| Naphthalene | Acute EC50 1.6 ppm Fresh water | Daphnia - Daphnia magna | 48 hours |
| | Acute LC50 2350 µg/l Marine water | Crustaceans - Palaemonetes pugio | 48 hours |
| | Acute LC50 213 µg/l Fresh water | Fish - Melanotaenia fluviatilis - Larvae | 96 hours |
| | Chronic NOEC 0.67 ppm Fresh water | Fish - Oncorhynchus kisutch | 40 days |

**Persistence and degradability**

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

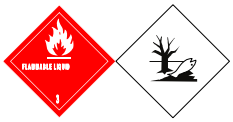
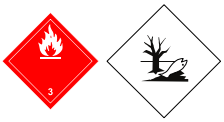
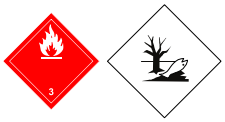
# Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been

## Section 13. Disposal considerations

cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | UN1993 | UN1993 | UN1993 | UN1993 |
| **UN proper shipping name** | FLAMMABLE LIQUID, N.O.S. (Contains: N-butanol, Naphtha (petroleum), heavy aromatic) | FLAMMABLE LIQUID, N.O.S. (Contains: N-butanol, Naphtha (petroleum), heavy aromatic) | FLAMMABLE LIQUID, N.O.S. (Contains: N-butanol, Naphtha (petroleum), heavy aromatic) | FLAMMABLE LIQUID, N.O.S. (Contains: N-butanol, Naphtha (petroleum), heavy aromatic) |
| **Transport hazard class(es)** | 3  | 3  | 3  | 3 |
| **Packing group** | III | III | III | III |
| **Environmental hazards** | Yes. | Yes. | Yes. | No. |
| **Additional information** | - | - | - | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** N-butanol, 6259 gal of this product.
Naphthalene, 728 gal of this product.

**Marine pollutant** calcium bis(dodecylbenzenesulphonate), branched

**North-America NAERG** : 128

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.

**TSCA 12(b) annual export notification**: No products were found.

**United States inventory (TSCA 8b)**: All components are listed or exempted.

**Clean Water Act (CWA) 307**: naphthalene

**Clean Water Act (CWA) 311**: naphthalene

## Section 15. Regulatory information

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Fire hazard
Immediate (acute) health hazard
Delayed (chronic) health hazard

**SARA 313**

| | Product name | CAS number | % |
|---|---|---|---|
| Supplier notification | N-butanol<br>Naphthalene | 71-36-3<br>91-20-3 | 5 - 10<br>1 - 5 |

**Canada**

**Canada (CEPA DSL):** : All components are listed or exempted.

## Section 16. Other information

**Hazardous Material Information System (U.S.A.)**

| | | |
|---|---|---|
| Health | * | 2 |
| Flammability | | 2 |
| Physical hazards | | 0 |
| Personal protection | | H |

**The customer is responsible for determining the PPE code for this material.**

**National Fire Protection Association (U.S.A.)**

**History**

**Date of printing** : 6/9/2015.

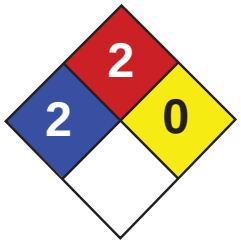
**Indicates information that has changed from previously issued version.**

**Notice to reader**

**NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes Drilling Fluids, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.**




| | |
|---|---|
| Health | 2 |
| Fire | 2 |
| Reactivity | 0 |
| Personal Protection | E |

# Material Safety Data Sheet
## Naphthalene MSDS

## Section 1: Chemical Product and Company Identification

**Product Name:** Naphthalene

**Catalog Codes:** SLN1789, SLN2401

**CAS#:** 91-20-3

**RTECS:** QJ0525000

**TSCA:** TSCA 8(b) inventory: Naphthalene

**CI#:** Not available.

**Synonym:**

**Chemical Name:** Not available.

**Chemical Formula:** C10H8

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:** 1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| Naphthalene | 91-20-3 | 100 |

**Toxicological Data on Ingredients:** Naphthalene: ORAL (LD50): Acute: 490 mg/kg [Rat]. 533 mg/kg [Mouse]. 1200 mg/kg [Guinea pig]. DERMAL (LD50): Acute: 20001 mg/kg [Rabbit]. VAPOR (LC50): Acute: 170 ppm 4 hour(s) [Rat].

## Section 3: Hazards Identification

**Potential Acute Health Effects:**
Very hazardous in case of ingestion. Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant, permeator). Severe over-exposure can result in death.

**Potential Chronic Health Effects:**
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Development toxin [POSSIBLE]. The substance is toxic to blood, kidneys, the nervous system, the reproductive system, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

## Section 4: First Aid Measures

**Eye Contact:**
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:** Not available.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:**
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion:**
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 567°C (1052.6°F)

**Flash Points:** CLOSED CUP: 88°C (190.4°F). OPEN CUP: 79°C (174.2°F).

**Flammable Limits:** LOWER: 0.9% UPPER: 5.9%

**Products of Combustion:** These products are carbon oxides (CO, CO2).

**Fire Hazards in Presence of Various Substances:** Not available.

**Explosion Hazards in Presence of Various Substances:**
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**
Flammable solid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Use appropriate tools to put the spilled solid in a convenient waste disposal container.

**Large Spill:**
Flammable solid. Stop leak if without risk. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**
Keep locked up Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Avoid contact with eyes Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

**Storage:**
Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. Keep container dry. Keep in a cool place.

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection:**
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
Israel: TWA: 10 (ppm) TWA: 10 STEL: 15 (ppm) from ACGIH (TLV) [1995] TWA: 52 STEL: 79 (mg/m3) from ACGIH [1995]
Australia: STEL: 15 (ppm) Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid. (Crystalline solid.)

**Odor:** Aromatic.

**Taste:** Not available.

**Molecular Weight:** 128.19 g/mole

**Color:** White.

**pH (1% soln/water):** Not available.

**Boiling Point:** 218°C (424.4°F)

**Melting Point:** 80.2°C (176.4°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 1.162 (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** 4.4 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.038 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:**
Partially dispersed in hot water, methanol, n-octanol. Very slightly dispersed in cold water. See solubility in methanol, n-octanol.

**Solubility:**
Partially soluble in methanol, n-octanol. Very slightly soluble in cold water, hot water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Highly reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** May attack some forms of rubber and plastic

**Polymerization:** No.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 490 mg/kg [Rat]. Acute dermal toxicity (LD50): 20001 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 170 ppm 4 hour(s) [Rat].

**Chronic Effects on Humans:**
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. DEVELOPMENTAL TOXICITY: Classified Development toxin [POSSIBLE]. The substance is toxic to blood, kidneys, the nervous system, the reproductive system, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, central nervous system (CNS).

**Other Toxic Effects on Humans:**
Very hazardous in case of ingestion. Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

## Section 12: Ecological Information

**Ecotoxicity:** Ecotoxicity in water (LC50): 305.2 ppm 96 hour(s) [Trout].

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:** CLASS 4.1: Flammable solid.

**Identification:** : Naphthalene, refined : UN1334 PG: III

**Special Provisions for Transport:** Marine Pollutant

## Section 15: Other Regulatory Information

**Federal and State Regulations:**
Rhode Island RTK hazardous substances: Naphthalene Pennsylvania RTK: Naphthalene Florida: Naphthalene Minnesota: Naphthalene Massachusetts RTK: Naphthalene TSCA 8(b) inventory: Naphthalene TSCA 8(a) PAIR: Naphthalene TSCA 8(d) H and S data reporting: Naphthalene: 06/01/87 SARA 313 toxic chemical notification and release reporting: Naphthalene: 1% CERCLA: Hazardous substances.: Naphthalene: 100 lbs. (45.36 kg)

**Other Regulations:**
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**
CLASS B-4: Flammable solid. CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

**DSCL (EEC):**
R36- Irritating to eyes. R40- Possible risks of irreversible effects. R48/22- Harmful: danger of serious damage to health by prolonged exposure if swallowed. R48/23- Toxic: danger of serious damage to health by prolonged exposure through inhalation. R63- Possible risk of harm to the unborn child.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 2

**Reactivity:** 0

**Personal Protection:** E

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 2

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/11/2005 01:30 PM

**Last Updated:** 05/21/2013 12:00 PM

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# SAFETY DATA SHEET

## Section 1. Identification

**Product name** : X-CIDE™ 102 INDUSTRIAL BACTERICIDE
™ a trademark of Baker Hughes Incorporated.

**Product code** : XC102

**Relevant identified uses of the substance or mixture and uses advised against**

**Identified uses** : Industrial Bactericide.

**Print date** : 3/24/2015.

**Validation date** : 3/24/2015.

**Version** : 2

**Supplier's details** : Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/SDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

**Emergency telephone number (with hours of operation)** : CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : ACUTE TOXICITY: ORAL - Category 4
ACUTE TOXICITY: INHALATION - Category 3
SKIN CORROSION/IRRITATION - Category 1B
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
RESPIRATORY SENSITIZATION - Category 1
SKIN SENSITIZATION - Category 1
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] - Category 3
AQUATIC HAZARD (ACUTE) - Category 2
AQUATIC HAZARD (LONG-TERM) - Category 3

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Danger

# Section 2. Hazards identification

**Hazard statements** : Toxic if inhaled.
Harmful if swallowed.
Causes severe skin burns and eye damage.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
May cause respiratory irritation.
Toxic to aquatic life.
Harmful to aquatic life with long lasting effects.

**Precautionary statements**

**Prevention** : Wear protective gloves: > 8 hours (breakthrough time): Nitrile or Neoprene gloves. PVC gloves. 4H gloves. Butyl rubber gloves.. Wear eye or face protection. Wear protective clothing. In case of inadequate ventilation wear respiratory protection. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Avoid breathing vapor. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

**Response** : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. If experiencing respiratory symptoms: Call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

**Storage** : Store locked up.

**Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazards not otherwise classified** : None known.

**Additional information**

Glutaraldehyde may stain skin and nails to brown or golden brown color.Glutaraldehyde can cause allergic contact dermatitis, asthma and rhinitis and may aggravate existing asthmatic conditions.

# Section 3. Composition/information on ingredients

**Substance/mixture** : Mixture

| Ingredient name | % | CAS number |
|---|---|---|
| Glutaraldehyde | 20 - 30 | 111-30-8 |

# Section 4. First aid measures

**Description of necessary first aid measures**

**Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

# Section 4. First aid measures

**Inhalation** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In the event of any complaints or symptoms, avoid further exposure.

**Skin contact** : Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

## Most important symptoms/effects, acute and delayed

### Potential acute health effects

**Eye contact** : Causes serious eye damage.

**Inhalation** : Toxic if inhaled. May cause respiratory irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

**Skin contact** : Causes severe burns. May cause an allergic skin reaction.

**Ingestion** : Harmful if swallowed. May cause burns to mouth, throat and stomach.

### Over-exposure signs/symptoms

**Eye contact** : pain,watering,redness

**Inhalation** : respiratory tract irritation,coughing,wheezing and breathing difficulties,asthma

**Skin contact** : pain or irritation,redness,blistering may occur

**Ingestion** : stomach pains

## Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

## Extinguishing media

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products** : carbon dioxide,carbon monoxide

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

# Section 6. Accidental release measures

## Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

## Methods and materials for containment and cleaning up

**Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

**If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.**

# Section 7. Handling and storage

## Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

# Section 8. Exposure controls/personal protection

## Control parameters

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingredients: | List name | ppm | mg/m³ | Other | ppm | mg/m³ | Other | ppm | mg/m³ | Other | Notations |
| Glutaraldehyde | US ACGIH<br>OSHA PEL 1989 | -<br>- | -<br>- | -<br>- | -<br>- | -<br>- | -<br>- | 0.05<br>0.2 | -<br>0.8 | -<br>- | [3] |

[3]Skin sensitization

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

**Appropriate engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

## Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

**Hand protection** : Chemical-resistant gloves: Nitrile or Neoprene gloves. PVC gloves. 4H gloves. Butyl rubber gloves.

## Section 8. Exposure controls/personal protection

**Skin protection** : Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

**Respiratory protection** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

**Appearance**

**Physical state** : Liquid.

**Color** : Colorless.

**Odor** : Fruity. Medicinal. [Strong]

**Odor threshold** : Not available.

**pH** : 3 to 4.5

: Neat - without dilution.

**Melting/freezing point** : Not available.

**Boiling point** : Not available.

**Initial Boiling Point** : Not available.

**Flash point** : Closed cup: >93.4°C (>200.1°F) [SFCC]

**Burning time** : Not applicable.

**Burning rate** : Not applicable.

**Evaporation rate** : Not available.

**Flammability (solid, gas)** : Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

**Lower and upper explosive (flammable) limits** : Not available.

**Vapor pressure** : 3.9 psig @ 54.4°C, 130 F (Reid)

**Vapor density** : >1 [Air = 1]

**Relative density** : 1.07 (15.6°C)

**Density** : 8.91 (lbs/gal)

**Solubility in water** : Soluble

**Partition coefficient: n-octanol/water** : Not available.

**Auto-ignition temperature** : Not available.

**Decomposition temperature** : Not available.

**Viscosity** : Dynamic (15.6°C): 4 cP

**VOC** : Not available.

**Pour Point** : -6.7°C (19.9°F)

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : No specific data.

# Section 10. Stability and reactivity

**Incompatible materials** : Reactive or incompatible with the following materials: oxidizing materials, acids and alkalis.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

# Section 11. Toxicological information

## Information on toxicological effects

### Acute toxicity

| Product/ingredient name | Result | Species | Dose | Exposure |
|---|---|---|---|---|
| Glutaraldehyde | LD50 Oral | Rat | 134 mg/kg | - |
| X-CIDE™ 102 INDUSTRIAL BACTERICIDE | LC50 Inhalation Dusts and mists | Rat | 0.8 mg/l | 4 hours |
| | LD50 Dermal | Rabbit | 13600 mg/kg | - |
| | LD50 Oral | Rat | 1990 mg/kg | - |

### Irritation/Corrosion

No applicable toxicity data

### Sensitization

No applicable toxicity data

### Mutagenicity

No applicable toxicity data

### Carcinogenicity

No applicable toxicity data

### Reproductive toxicity

No applicable toxicity data

### Teratogenicity

No applicable toxicity data

### Specific target organ toxicity (single exposure)

| Name | Category | Route of exposure | Target organs |
|---|---|---|---|
| Glutaraldehyde | Category 3 | Not applicable. | Respiratory tract irritation |

### Specific target organ toxicity (repeated exposure)

Not applicable.

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Routes of entry anticipated: Dermal, Inhalation.

## Delayed and immediate effects and also chronic effects from short and long term exposure

### Short term exposure

**Potential immediate effects** : Not available.

# Section 11. Toxicological information

**Potential delayed effects** : Not available.

**Potential chronic health effects**

**General** : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

| Route | ATE value |
|---|---|
| Inhalation (vapors) | 12 mg/l |

# Section 12. Ecological information

**Toxicity**

| Product/ingredient name | Result | Species | Exposure |
|---|---|---|---|
| Glutaraldehyde | Acute EC50 0.31 ppm Fresh water | Algae - Pseudokirchneriella subcapitata | 96 hours |
| | Acute EC50 0.75 ppm Fresh water | Daphnia - Daphnia magna | 48 hours |
| | Acute LC50 5.4 ppm Fresh water | Fish - Pimephales promelas | 96 hours |
| | Chronic NOEC 3.41 ppm | Fish - Oncorhynchus mykiss | 97 days |
| X-CIDE™ 102 INDUSTRIAL BACTERICIDE | EC50 1.8 mg/l | Algae | 96 hours |
| | LC50 43 mg/l | Daphnia | 48 hours |
| | LC50 33 mg/l | Fish | 96 hours |

**Persistence and degradability**

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

# Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

# Section 14. Transport information

| | DOT Classification | TDG Classification | IMDG | IATA |
|---|---|---|---|---|
| **UN number** | UN3265 | UN3265 | UN3265 | UN3265 |
| **UN proper shipping name** | CORROSIVE LIQUID, ACIDIC, ORGANIC, N. O.S. (Contains: Glutaraldehyde) | CORROSIVE LIQUID, ACIDIC, ORGANIC, N. O.S. (Contains: Glutaraldehyde) | CORROSIVE LIQUID, ACIDIC, ORGANIC, N. O.S. (Contains: Glutaraldehyde) | CORROSIVE LIQUID, ACIDIC, ORGANIC, N. O.S. (Contains: Glutaraldehyde) |
| **Transport hazard class(es)** | 8 | 8 | 8 | 8 |
| **Packing group** | III | III | III | III |
| **Environmental hazards** | Yes. | Yes. | Yes. | No. |
| **Additional information** | - | - | - | - |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Glutaraldehyde

**North-America NAERG** : 153

# Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 12(b) one-time export**: No products were found.
**TSCA 12(b) annual export notification**: No products were found.
**United States inventory (TSCA 8b)**: All components are listed or exempted.
**Clean Water Act (CWA) 307**: No products were found.
**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Immediate (acute) health hazard

**SARA 313**

**Supplier notification** : No products were found.

# Section 15. Regulatory information

## Canada

**Canada (CEPA DSL):** : All components are listed or exempted.

## Additional information

This product is subject to regulation under the US Federal Insecticide, Fungicide and Rodenticide ACT (FIFRA) and is therefore exempt from US Toxic Substance Control Act (TSCA) Inventory listing requirements.

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals.

Following is the hazard information as required on the pesticide label:

DANGER
Harmful or fatal if swallowed. Vapor harmful. Avoid breathing spray mist or vapors. Do not get on skin. Corrosive. Causes eye damage and skin irritations. Do not get in eyes or on clothing. Wear goggles or face shield and rubber gloves when handling. Avoid contamination of food.
This product is toxic to fish and wildlife.

# Section 16. Other information

## National Fire Protection Association (U.S.A.)

## History

**Date of printing** : 3/24/2015.

**Indicates information that has changed from previously issued version.**

## Notice to reader

**NOTE: The information on this SDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.**

**The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.**

**This SDS was prepared and is to be used for this product. If the product is used as a component in another product, this SDS information may not be applicable.**

# C&J ENERGY SERVICES

04/14/2023

**DRILLING**

**C&J Energy Services Products stored on location**

**Tier II Determination**

| CAS # | Chemical | Max. on Location | Units | Specific Gravity | % by Weight | Gal | Pounds /gal | Total Pounds | Reportable Quantity | Reportable on Tier II | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **CJ020 Bentonite** | 500 | pounds | | | | | 500.0 | NA | no | CERCLA, 313: NL |
| 1302-78-9 | Bentonite | | | 2.5 | ≤ 100.0% | | 20.825 | 500.0 | NA | no | CERCLA, 313: NL |
| 14808-60-7 | Silica / Crystalline, Quartz | | | | ≤ 7.0% | | | 35.0 | NA | no | CERCLA, 313: NL |
| | **CJ110 Calcium Chloride** | 2,115 | pounds | | | | | 2,115.0 | NA | no | CERCLA, 313: NL |
| 10043-52-4 | Calcium Chloride | | | 2.15 | ≤ 100.0% | | | 2,115.0 | NA | no | CERCLA, 313: NL |
| 7447-40-7 | Potassium Chloride | | | 1.987 | ≤ 1.0% | | | 21.15 | NA | no | CERCLA, 313: NL |
| 7647-14-5 | Sodium Chloride | | | 2.165 | ≤ 1.0% | | | 21.15 | NA | no | CERCLA, 313: NL |
| | **CJ600 - Super Flake** | 188 | pounds | | | | | 188.0 | NA | no | CERCLA, 313: NL |
| 9005-81-6 | Cellophane | | | 1.0 | 100.0% | | 8.331 | 188.0 | NA | no | CERCLA, 313: NL |
| | **CJ910 Class A Cement** | 70,500 | pounds | | | | | 70,500.0 | NA | no | CERCLA, 313: NL |
| 12168-85-3 | Tricalcium Silicate / Calcium oxide silicate | | | | ≤ 70.0% | | | 49,350.0 | NA | no | CERCLA, 313: NL |
| 10034-77-2 | Dicalcium Silicate / Silicic acid / calcium salt | | | | ≤ 60.0% | | | 42,300.0 | NA | no | CERCLA, 313: NL |
| 12068-35-8 | Aluminum Calcium Iron Oxide | | | | 5.0% | | | 3,525.0 | NA | no | CERCLA, 313: NL |
| 1317-65-3 | Limestone / calcium carbonate | | | | 5.0% | | | 3,525.0 | NA | no | CERCLA, 313: NL |
| 1309-48-4 | Magnesium Oxide | | | | 4.0% | | | 2,820.0 | NA | no | CERCLA, 313: NL |
| 1305-78-8 | Calcium Oxide | | | | 0.2% | | | 141 | NA | no | CERCLA, 313: NL |
| 14808-60-7 | Silica / Quartz / crystalized silicon dioxide | | | | 0.2% | | | 141.0 | NA | no | CERCLA, 313: NL |
| 57-50-1 | **Sugar / Sucrose** | 400 | pounds | 1.59 | 100.0% | | | 400.0 | NA | no | CERCLA, 313: NL |

When there is a range, maximum quantity or percentage is used in calculation

NL = Not Listed

C&J Energy Services

# SAFETY DATA SHEET

## 1. Identification

**Product identifier** CJ020

**Other means of identification**

**Synonyms** Bentonite

**Recommended use** Cement Additive.

**Recommended restrictions** Workers (and your customers or users in the case of resale) should be informed of the potential presence of respirable dust and respirable crystalline silica as well as their potential hazards. Appropriate training in the proper use and handling of this material should be provided as required under applicable regulations.

**Manufacturer/Importer/Supplier/Distributor information**

**Manufacturer**

| | | |
|---|---|---|
| **Company name** | C&J Energy Services | |
| **Address** | 3990 Rogerdale<br>Houston, TX 77042 | |
| **Telephone** | For Product Information call | (713) 325-6000 |
| **Website** | CJEnergy.com | |
| **E-mail** | Not available. | |
| **Emergency phone number** | For an Emergency call CHEMTREC | 1-800-424-9300 |

## 2. Hazard(s) identification

**Physical hazards** Not classified.

**Health hazards**

| | |
|---|---|
| Skin corrosion/irritation | Category 2 |
| Serious eye damage/eye irritation | Category 2 |
| Carcinogenicity | Category 1A |
| Specific target organ toxicity, single exposure | Category 3 respiratory tract irritation |
| Specific target organ toxicity, repeated exposure | Category 2 (lung) |

**Environmental hazards** Not classified.

**OSHA defined hazards** Not classified.

**Label elements**

**Signal word** Danger

**Hazard statement** Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. May cause cancer. May cause damage to organs (lung) through prolonged or repeated exposure.

**Precautionary statement**

**Prevention** Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear eye protection/face protection. Wear protective gloves/protective clothing/eye protection/face protection.

**Response** If on skin: Wash with plenty of water. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed or concerned: Get medical advice/attention. Call a poison center/doctor if you feel unwell. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash before reuse.

**Storage** Store in a well-ventilated place. Keep container tightly closed. Store locked up.

**Disposal** Dispose of contents/container in accordance with local/regional/national/international regulations.

| | |
|---|---|
| **Hazard(s) not otherwise classified (HNOC)** | None known. |
| **Supplemental information** | None. |

## 3. Composition/information on ingredients

**Mixtures**

| Chemical name | Common name and synonyms | CAS number | % |
|---|---|---|---|
| Bentonite | | 1302-78-9 | 60-100 |
| Silica - Crystalline, Quartz | | 14808-60-7 | 3-7 |

## 4. First-aid measures

| | |
|---|---|
| **Inhalation** | Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. |
| **Skin contact** | Remove contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse. |
| **Eye contact** | Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. |
| **Ingestion** | Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately. |
| **Most important symptoms/effects, acute and delayed** | Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Dusts may irritate the respiratory tract, skin and eyes. Coughing. Discomfort in the chest. Shortness of breath. Skin irritation. May cause redness and pain. Prolonged exposure may cause chronic effects. |
| **Indication of immediate medical attention and special treatment needed** | Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed. |
| **General information** | IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. |

## 5. Fire-fighting measures

| | |
|---|---|
| **Suitable extinguishing media** | Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2). |
| **Unsuitable extinguishing media** | Do not use water jet as an extinguisher, as this will spread the fire. |
| **Specific hazards arising from the chemical** | During fire, gases hazardous to health may be formed. |
| **Special protective equipment and precautions for firefighters** | Material can be slippery when wet. |
| **Fire fighting equipment/instructions** | Use water spray to cool unopened containers. |
| **Specific methods** | Use standard firefighting procedures and consider the hazards of other involved materials. |
| **General fire hazards** | No unusual fire or explosion hazards noted. |

## 6. Accidental release measures

| | |
|---|---|
| **Personal precautions, protective equipment and emergency procedures** | Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Material can be slippery when wet. Wear appropriate protective equipment and clothing during clean-up. Do not breathe dust. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS. |

**Methods and materials for containment and cleaning up**

Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). The product is immiscible with water and will spread on the water surface. Stop the flow of material, if this is without risk. Absorb in vermiculite, dry sand or earth and place into containers. Collect dust using a vacuum cleaner equipped with HEPA filter.

Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water.

Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

**Environmental precautions**

Avoid discharge into drains, water courses or onto the ground.

## 7. Handling and storage

**Precautions for safe handling**

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Do not breathe dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

**Conditions for safe storage, including any incompatibilities**

Store locked up. Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

## 8. Exposure controls/personal protection

**Occupational exposure limits**

**US. OSHA Table Z-3 (29 CFR 1910.1000)**

| Components | Type | Value | Form |
|---|---|---|---|
| Silica - Crystalline, Quartz (CAS 14808-60-7) | TWA | 0.3 mg/m3 | Total dust. |
| | | 0.1 mg/m3 | Respirable. |
| | | 2.4 mppcf | Respirable. |

**US. ACGIH Threshold Limit Values**

| Components | Type | Value | Form |
|---|---|---|---|
| Silica - Crystalline, Quartz (CAS 14808-60-7) | TWA | 0.025 mg/m3 | Respirable fraction. |

**US. NIOSH: Pocket Guide to Chemical Hazards**

| Components | Type | Value | Form |
|---|---|---|---|
| Silica - Crystalline, Quartz (CAS 14808-60-7) | TWA | 0.05 mg/m3 | Respirable dust. |

**Biological limit values**

No biological exposure limits noted for the ingredient(s).

**Exposure guidelines**

Occupational exposure to nuisance dust (total and respirable) and respirable crystalline silica should be monitored and controlled.

**Appropriate engineering controls**

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits. Eye wash facilities and emergency shower must be available when handling this product.

**Individual protection measures, such as personal protective equipment**

**Eye/face protection**

Chemical respirator with organic vapor cartridge, full facepiece, dust and mist filter.

**Skin protection**

**Hand protection**

Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

**Other**

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

| | |
|---|---|
| **Respiratory protection** | Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Chemical respirator with organic vapor cartridge, full facepiece, dust and mist filter. |
| **Thermal hazards** | Wear appropriate thermal protective clothing, when necessary. |
| **General hygiene considerations** | Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. |

## 9. Physical and chemical properties

| | |
|---|---|
| **Appearance** | |
| **Physical state** | Solid. |
| **Form** | Powder. |
| **Color** | Blue green to Grey. |
| **Odor** | Odorless. |
| **Odor threshold** | Not available. |
| **pH** | 8 - 10 (@5% aq. suspension). |
| **Melting point/freezing point** | Not available. |
| **Initial boiling point and boiling range** | Not available. |
| **Flash point** | Not available. |
| **Evaporation rate** | Not available. |
| **Flammability (solid, gas)** | Not available. |
| **Upper/lower flammability or explosive limits** | |
| **Flammability limit - lower (%)** | Not available. |
| **Flammability limit - upper (%)** | Not available. |
| **Explosive limit - lower (%)** | Not available. |
| **Explosive limit - upper (%)** | Not available. |
| **Vapor pressure** | Not available. |
| **Vapor density** | Not available. |
| **Relative density** | Not available. |
| **Solubility(ies)** | |
| **Solubility (water)** | Insoluble, forms colloidal suspension. |
| **Partition coefficient (n-octanol/water)** | Not available. |
| **Auto-ignition temperature** | Not available. |
| **Decomposition temperature** | Not available. |
| **Viscosity** | Not available. |
| **Other information** | |
| **Bulk density** | 55 - 68 lb/ft$^3$ @ 20C |
| **Density** | 2.45 - 2.55 |
| **Explosive properties** | Not explosive. |
| **Oxidizing properties** | Not oxidizing. |

## 10. Stability and reactivity

| | |
|---|---|
| **Reactivity** | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| **Chemical stability** | Material is stable under normal conditions. |
| **Possibility of hazardous reactions** | No dangerous reaction known under conditions of normal use. |
| **Conditions to avoid** | Contact with incompatible materials. |
| **Incompatible materials** | Strong oxidizing agents. |

| | |
|---|---|
| **Hazardous decomposition products** | No hazardous decomposition products are known. |

## 11. Toxicological information

**Information on likely routes of exposure**

| | |
|---|---|
| **Inhalation** | May cause damage to organs through prolonged or repeated exposure by inhalation. Dust may irritate respiratory system. |
| **Skin contact** | Causes skin irritation. |
| **Eye contact** | Causes serious eye irritation. |
| **Ingestion** | Expected to be a low ingestion hazard. |
| **Symptoms related to the physical, chemical and toxicological characteristics** | Severe eye irritation. Dusts may irritate the respiratory tract, skin and eyes. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Coughing. Discomfort in the chest. Shortness of breath. Skin irritation. May cause redness and pain. |

**Information on toxicological effects**

| | |
|---|---|
| **Acute toxicity** | May cause respiratory irritation. |
| **Skin corrosion/irritation** | Causes skin irritation. |
| **Serious eye damage/eye irritation** | Causes serious eye irritation. |
| **Respiratory or skin sensitization** | |
| **Respiratory sensitization** | Not a respiratory sensitizer. |
| **Skin sensitization** | This product is not expected to cause skin sensitization. |
| **Germ cell mutagenicity** | No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic. |
| **Carcinogenicity** | In 1997, IARC (the International Agency for Research on Cancer) concluded that crystalline silica inhaled from occupational sources can cause lung cancer in humans. However in making the overall evaluation, IARC noted that "carcinogenicity was not detected in all industrial circumstances studied. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." (IARC Monographs on the evaluation of the carcinogenic risks of chemicals to humans, Silica, silicates dust and organic fibres, 1997, Vol. 68, IARC, Lyon, France.) In June 2003, SCOEL (the EU Scientific Committee on Occupational Exposure Limits) concluded that the main effect in humans of the inhalation of respirable crystalline silica dust is silicosis. "There is sufficient information to conclude that the relative risk of lung cancer is increased in persons with silicosis (and, apparently, not in employees without silicosis exposed to silica dust in quarries and in the ceramic industry). Therefore, preventing the onset of silicosis will also reduce the cancer risk..." (SCOEL SUM Doc 94-final, June 2003) According to the current state of the art, worker protection against silicosis can be consistently assured by respecting the existing regulatory occupational exposure limits. May cause cancer. Occupational exposure to respirable dust and respirable crystalline silica should be monitored and controlled. |

**IARC Monographs. Overall Evaluation of Carcinogenicity**

Silica - Crystalline, Quartz (CAS 14808-60-7) 1 Carcinogenic to humans.

**OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

**US. National Toxicology Program (NTP) Report on Carcinogens**

Silica - Crystalline, Quartz (CAS 14808-60-7) Known To Be Human Carcinogen.

| | |
|---|---|
| **Reproductive toxicity** | This product is not expected to cause reproductive or developmental effects. |
| **Specific target organ toxicity - single exposure** | May cause respiratory irritation. |
| **Specific target organ toxicity - repeated exposure** | May cause damage to organs (lung) through prolonged or repeated exposure. |
| **Aspiration hazard** | Not an aspiration hazard. |
| **Chronic effects** | May cause damage to organs through prolonged or repeated exposure. Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects. |

## 12. Ecological information

| | |
|---|---|
| **Ecotoxicity** | The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. |

| Components | | Species | Test Results |
|---|---|---|---|
| Bentonite (CAS 1302-78-9) | | | |
| **Aquatic** | | | |
| Fish | LC50 | Rainbow trout,donaldson trout (Oncorhynchus mykiss) | 19000 mg/l, 96 hours |

* Estimates for product may be based on additional component data not shown.

**Persistence and degradability** No data is available on the degradability of this product.

**Bioaccumulative potential** No data available.

**Mobility in soil** No data available.

**Other adverse effects** Not available.

## 13. Disposal considerations

**Disposal instructions** Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

**Local disposal regulations** Dispose in accordance with all applicable regulations.

**Hazardous waste code** The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

**Waste from residues / unused products** Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

**Contaminated packaging** Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

## 14. Transport information

**DOT**

Not regulated as dangerous goods.

**IATA**

Not regulated as dangerous goods.

**IMDG**

Not regulated as dangerous goods.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not applicable.

## 15. Regulatory information

**US federal regulations** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

Not regulated.

**CERCLA Hazardous Substance List (40 CFR 302.4)**

Not listed.

**SARA 304 Emergency release notification**

Not regulated.

**OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories** Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

**SARA 302 Extremely hazardous substance**

Not listed.

**SARA 311/312 Hazardous chemical** Yes

**SARA 313 (TRI reporting)**

Not regulated.

**Other federal regulations**

**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Not regulated.

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)**

Not regulated.

**Safe Drinking Water Act (SDWA)** Not regulated.

**US state regulations**

**US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)**

Not listed.

**US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))**

Silica - Crystalline, Quartz (CAS 14808-60-7)

**US. Massachusetts RTK - Substance List**

Silica - Crystalline, Quartz (CAS 14808-60-7)

**US. New Jersey Worker and Community Right-to-Know Act**

Silica - Crystalline, Quartz (CAS 14808-60-7)

**US. Pennsylvania Worker and Community Right-to-Know Law**

Silica - Crystalline, Quartz (CAS 14808-60-7)

**US. Rhode Island RTK**

Not regulated.

**US. California Proposition 65**

WARNING: This product contains a chemical known to the State of California to cause cancer.

**US - California Proposition 65 - CRT: Listed date/Carcinogenic substance**

Silica - Crystalline, Quartz (CAS 14808-60-7) Listed: October 1, 1988

**International Inventories**

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|---|---|---|
| Australia | Australian Inventory of Chemical Substances (AICS) | Yes |
| Canada | Domestic Substances List (DSL) | Yes |
| Canada | Non-Domestic Substances List (NDSL) | No |
| China | Inventory of Existing Chemical Substances in China (IECSC) | Yes |
| Europe | European Inventory of Existing Commercial Chemical Substances (EINECS) | Yes |
| Europe | European List of Notified Chemical Substances (ELINCS) | No |
| Japan | Inventory of Existing and New Chemical Substances (ENCS) | No |
| Korea | Existing Chemicals List (ECL) | Yes |
| New Zealand | New Zealand Inventory | Yes |
| Philippines | Philippine Inventory of Chemicals and Chemical Substances (PICCS) | Yes |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | Yes |

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

## 16. Other information, including date of preparation or last revision

| | |
|---|---|
| **Issue date** | 08-05-2015 |
| **Version #** | 01 |



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C&J Energy Services

# SAFETY DATA SHEET

## 1. Identification

**Product identifier** CJ110

Other means of identification

**Synonyms** Calcium Chloride (CaCl2)

**Recommended use** Cement Accelorator

**Recommended restrictions** None known.

**Manufacturer/Importer/Supplier/Distributor information**

**Manufacturer**

| | | |
|---|---|---|
| **Company name** | C&J Energy Services | |
| **Address** | 3990 Rogerdale<br>Houston, TX 77042 | |
| **Telephone** | For Product Information call | (713) 325-6000 |
| **Website** | CJEnergy.com | |
| **E-mail** | Not available. | |
| **Emergency phone number** | For an Emergency call CHEMTREC | 1-800-424-9300 |

## 2. Hazard(s) identification

| | | |
|---|---|---|
| **Physical hazards** | Not classified. | |
| **Health hazards** | Acute toxicity, oral | Category 4 |
| | Serious eye damage/eye irritation | Category 2 |
| **Environmental hazards** | Hazardous to the aquatic environment, acute hazard | Category 3 |
| | Hazardous to the aquatic environment, long-term hazard | Category 3 |
| **OSHA defined hazards** | Not classified. | |

**Label elements**

**Signal word** Warning

**Hazard statement** Harmful if swallowed. Causes serious eye irritation. Harmful to aquatic life. Harmful to aquatic life with long lasting effects.

**Precautionary statement**

**Prevention** Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Avoid release to the environment. Wear eye protection/face protection.

**Response** If swallowed: Call a poison center/doctor if you feel unwell. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Rinse mouth. If eye irritation persists: Get medical advice/attention.

**Storage** Store away from incompatible materials.

**Disposal** Dispose of contents/container in accordance with local/regional/national/international regulations.

**Hazard(s) not otherwise classified (HNOC)** None known.

**Supplemental information** None.

## 3. Composition/information on ingredients

**Mixtures**



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| Chemical name | Common name and synonyms | CAS number | % |
|---|---|---|---|
| Calcium Chloride | | 10043-52-4 | 90 - 100 |
| Potassium Chloride | | 7447-40-7 | <1 |
| Sodium Chloride | | 7647-14-5 | <1 |

## 4. First-aid measures

| | |
|---|---|
| Inhalation | Move to fresh air. Call a physician if symptoms develop or persist. |
| Skin contact | Rinse skin with water/shower. Get medical attention if irritation develops and persists. |
| Eye contact | Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. |
| **Ingestion** | Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell. |
| **Most important symptoms/effects, acute and delayed** | Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Dusts may irritate the respiratory tract, skin and eyes. |
| **Indication of immediate medical attention and special treatment needed** | Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed. |
| **General information** | Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. |

## 5. Fire-fighting measures

| | |
|---|---|
| **Suitable extinguishing media** | Use fire-extinguishing media appropriate for surrounding materials. |
| **Unsuitable extinguishing media** | Do not use water jet as an extinguisher, as this will spread the fire. |
| **Specific hazards arising from the chemical** | Heat is generated when product mixes with water. |
| **Special protective equipment and precautions for firefighters** | As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. |
| **Fire fighting equipment/instructions** | Use water spray to cool unopened containers. |
| Specific methods | Use standard firefighting procedures and consider the hazards of other involved materials. |
| General fire hazards | No unusual fire or explosion hazards noted. |

## 6. Accidental release measures

| | |
|---|---|
| **Personal precautions, protective equipment and emergency procedures** | Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS. |
| **Methods and materials for containment and cleaning up** | Stop the flow of material, if this is without risk. Absorb in vermiculite, dry sand or earth and place into containers. Collect dust using a vacuum cleaner equipped with HEPA filter. Shovel the material into waste container. Avoid the generation of dusts during clean-up. Prevent product from entering drains. Following product recovery, flush area with water.<br><br>Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.<br><br>Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS. |
| **Environmental precautions** | Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. Inform appropriate managerial or supervisory personnel of all environmental releases. |



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## 7. Handling and storage

| | |
|---|---|
| Precautions for safe handling | Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Avoid contact with eyes. Do not taste or swallow. When using, do not eat, drink or smoke. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices. |
| Conditions for safe storage, including any incompatibilities | Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS). |

## 8. Exposure controls/personal protection

| | |
|---|---|
| Occupational exposure limits | No exposure limits noted for ingredient(s). |
| Biological limit values | No biological exposure limits noted for the ingredient(s). |
| Appropriate engineering controls | Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits. Provide eyewash station. |
| **Individual protection measures, such as personal protective equipment** | |
| Eye/face protection | Face shield is recommended. Wear safety glasses with side shields (or goggles). |
| Skin protection | |
| Hand protection | Wear appropriate chemical resistant gloves. |
| Other | Wear suitable protective clothing. |
| Respiratory protection | Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. |
| Thermal hazards | Wear appropriate thermal protective clothing, when necessary. |
| General hygiene considerations | Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. |

## 9. Physical and chemical properties

| | |
|---|---|
| **Appearance** | |
| Physical state | Solid. |
| Form | Powder. Flakes. Pellets. Granular. |
| Color | White |
| Odor | Odorless. |
| Odor threshold | Not available. |
| pH | Not available. |
| Melting point/freezing point | Not available. |
| Initial boiling point and boiling range | Not available. |
| Flash point | Not available. |
| Evaporation rate | Not available. |
| Flammability (solid, gas) | Not available. |
| **Upper/lower flammability or explosive limits** | |
| Flammability limit - lower (%) | Not available. |
| Flammability limit - upper (%) | Not available. |
| Explosive limit - lower (%) | Not available. |
| Explosive limit - upper (%) | Not available. |
| Vapor pressure | 0.00001 hPa estimated |
| Vapor density | Not available. |
| Relative density | Not available. |



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| | |
|---|---|
| Solubility(ies) | |
| **Solubility (water)** | 40 % |
| **Partition coefficient (n-octanol/water)** | Not available. |
| **Auto-ignition temperature** | Not available. |
| **Decomposition temperature** | Not available. |
| **Viscosity** | Not available. |
| Other information | |
| **Explosive properties** | Not explosive. |
| **Molecular formula** | Ca-Cl2 |
| **Oxidizing properties** | Not oxidizing. |
| **Specific gravity** | 2.26 - 2.51 |
| **Wetted zone** | – |

## 10. Stability and reactivity

| | |
|---|---|
| **Reactivity** | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| **Chemical stability** | Material is stable under normal conditions. |
| **Possibility of hazardous reactions** | No dangerous reaction known under conditions of normal use. |
| **Conditions to avoid** | Contact with incompatible materials. Moisture. |
| **Incompatible materials** | Amphoteric metals. Inorganic acids. Metals. |
| **Hazardous decomposition products** | No hazardous decomposition products are known. |

## 11. Toxicological information

**Information on likely routes of exposure**

| | |
|---|---|
| **Inhalation** | Dust may irritate respiratory system. |
| **Skin contact** | Dust or powder may irritate the skin. |
| **Eye contact** | Causes serious eye irritation. |
| **Ingestion** | Harmful if swallowed. |
| **Symptoms related to the physical, chemical and toxicological characteristics** | Severe eye irritation. Dusts may irritate the respiratory tract, skin and eyes. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. |

**Information on toxicological effects**

**Acute toxicity** Harmful if swallowed.

| Components | Species | Test Results |
|---|---|---|
| Calcium Chloride (CAS 10043-52-4) | | |
| **Acute** | | |
| **Oral** | | |
| LD50 | Rat | 1000 mg/kg |
| Potassium Chloride (CAS 7447-40-7) | | |
| **Acute** | | |
| **Oral** | | |
| LD50 | Guinea pig | 2500 mg/kg |
| | Mouse | 383 mg/kg |
| | Rat | 2600 mg/kg |
| Sodium Chloride (CAS 7647-14-5) | | |
| **Acute** | | |
| **Oral** | | |
| LD50 | Mouse | 4000 mg/kg |
| | Rat | 3000 mg/kg |

**Skin corrosion/irritation** Prolonged skin contact may cause temporary irritation.



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| | |
|---|---|
| Serious eye damage/eye irritation | Causes serious eye irritation. |
| Respiratory or skin sensitization | |
| Respiratory sensitization | Not a respiratory sensitizer. |
| Skin sensitization | This product is not expected to cause skin sensitization. |
| Germ cell mutagenicity | No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic. |
| Carcinogenicity | This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. |

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

| | |
|---|---|
| **Reproductive toxicity** | This product is not expected to cause reproductive or developmental effects. |
| **Specific target organ toxicity - single exposure** | Not classified. |
| **Specific target organ toxicity - repeated exposure** | Not classified. |
| **Aspiration hazard** | Not an aspiration hazard. |

## 12. Ecological information

**Ecotoxicity** Harmful to aquatic life with long lasting effects.

| Components | | Species | Test Results |
|---|---|---|---|
| Calcium Chloride (CAS 10043-52-4) | | | |
| **Aquatic** | | | |
| Crustacea | EC50 | Water flea (Daphnia magna) | 52 mg/l, 48 hours |
| Fish | LC50 | Fathead minnow (Pimephales promelas) | 3930 - 5360 mg/l, 96 hours |
| Potassium Chloride (CAS 7447-40-7) | | | |
| **Aquatic** | | | |
| Crustacea | EC50 | Water flea (Daphnia magna) | 83 mg/l, 48 hours |
| Fish | LC50 | Western mosquitofish (Gambusia affinis) | 435 mg/l, 96 hours |
| Sodium Chloride (CAS 7647-14-5) | | | |
| **Aquatic** | | | |
| Crustacea | EC50 | Water flea (Daphnia magna) | 340.7 - 469.2 mg/l, 48 hours |
| Fish | LC50 | Fathead minnow (Pimephales promelas) | 6020 - 7070 mg/l, 96 hours |

| | |
|---|---|
| **Persistence and degradability** | No data is available on the degradability of this product. |
| **Bioaccumulative potential** | No data available. |
| **Mobility in soil** | No data available. |
| **Other adverse effects** | Not available. |

## 13. Disposal considerations

| | |
|---|---|
| **Disposal instructions** | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations. |
| **Local disposal regulations** | Dispose in accordance with all applicable regulations. |
| **Hazardous waste code** | The waste code should be assigned in discussion between the user, the producer and the waste disposal company. |
| **Waste from residues / unused products** | Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). |
| **Contaminated packaging** | Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. |

## 14. Transport information

**DOT**

Not regulated as dangerous goods.



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IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not applicable

## 15. Regulatory information

**US federal regulations** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

Not regulated.

**CERCLA Hazardous Substance List (40 CFR 302.4)**

Not listed.

**SARA 304 Emergency release notification**

Not regulated.

**OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories**
Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

**SARA 302 Extremely hazardous substance**

Not listed.

**SARA 311/312 Hazardous chemical** No

**SARA 313 (TRI reporting)**

Not regulated.

**Other federal regulations**

**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Not regulated.

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)**

Not regulated.

**Safe Drinking Water Act (SDWA)** Not regulated.

**US state regulations**

**US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)**

Not listed.

**US. Massachusetts RTK - Substance List**

Not regulated.

**US. New Jersey Worker and Community Right-to-Know Act**

Not listed.

**US. Pennsylvania Worker and Community Right-to-Know Law**

Not listed.

**US. Rhode Island RTK**

Not regulated.

**US. California Proposition 65**

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|---|---|---|
| Australia | Australian Inventory of Chemical Substances (AICS) | Yes |
| Canada | Domestic Substances List (DSL) | Yes |
| Canada | Non-Domestic Substances List (NDSL) | No |
| China | Inventory of Existing Chemical Substances in China (IECSC) | Yes |
| Europe | European Inventory of Existing Commercial Chemical Substances (EINECS) | Yes |
| Europe | European List of Notified Chemical Substances (ELINCS) | No |
| Japan | Inventory of Existing and New Chemical Substances (ENCS) | Yes |
| Korea | Existing Chemicals List (ECL) | Yes |
| New Zealand | New Zealand Inventory | Yes |
| Philippines | Philippine Inventory of Chemicals and Chemical Substances (PICCS) | Yes |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | Yes |

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

## 16. Other information, including date of preparation or last revision

**Issue date** 08-04-2015

**Version #** 01

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C&J Energy Services

# SAFETY DATA SHEET

## 1. Identification

| | |
|---|---|
| Product identifier | CJ600 |
| **Other means of identification** | |
| **Product code** | Super Flake |
| **Synonyms** | Flake LCM |
| **Recommended use** | Fluid loss, light weight, lost circulation, FR, Pre-flush |
| **Recommended restrictions** | None known. |

**Manufacturer/Importer/Supplier/Distributor information**

**Manufacturer**

| | | |
|---|---|---|
| **Company name** | C&J Energy Services | |
| **Address** | 3990 Rogerdale<br>Houston, TX 77042 | |
| **Telephone** | For Product Information call | (713) 325-6000 |
| **Website** | CJEnergy.com | |
| **E-mail** | Not available. | |
| **Emergency phone number** | For an Emergency call CHEMTREC | 1-800-424-9300 |

## 2. Hazard(s) identification

| | |
|---|---|
| **Physical hazards** | Not classified. |
| **Health hazards** | Not classified. |
| **Environmental hazards** | Not classified. |
| **OSHA defined hazards** | Combustible dust |
| **Label elements** | |
| **Hazard symbol** | None. |
| **Signal word** | Warning |
| **Hazard statement** | May form combustible dust concentrations in air. |
| **Precautionary statement** | |
| **Prevention** | Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Prevent dust accumulation to minimize explosion hazard. Observe good industrial hygiene practices. |
| **Response** | Take off contaminated clothing and wash before reuse. In case of fire: Use appropriate media to extinguish. |
| **Storage** | Store away from incompatible materials. |
| **Disposal** | Dispose of waste and residues in accordance with local authority requirements. |
| **Hazard(s) not otherwise classified (HNOC)** | None known. |
| **Supplemental information** | None. |

## 3. Composition/information on ingredients

**Mixtures**

| Chemical name | Common name and synonyms | CAS number | % |
|---|---|---|---|
| Cellophane | | 9005-81-6 | 100 |

## 4. First-aid measures

| | |
|---|---|
| **Inhalation** | If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist. |
| **Skin contact** | Rinse skin with water/shower. Get medical attention if irritation develops and persists. |



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| | |
|---|---|
| Eye contact | Do not rub eyes. Rinse with water. Get medical attention if irritation develops and persists. |
| Ingestion | Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately. |
| Most important symptoms/effects, acute and delayed | Dusts may irritate the respiratory tract, skin and eyes. |
| Indication of immediate medical attention and special treatment needed | Treat symptomatically. |
| General information | Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. |

## 5. Fire-fighting measures

| | |
|---|---|
| Suitable extinguishing media | Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2). Apply extinguishing media carefully to avoid creating airborne dust. |
| Unsuitable extinguishing media | Do not use water jet as an extinguisher, as this will spread the fire. |
| Specific hazards arising from the chemical | Explosion hazard: Avoid generating dust; fine dust dispersed in air in sufficient concentrations and in the presence of an ignition source is a potential dust explosion hazard. During fire, gases hazardous to health may be formed. |
| Special protective equipment and precautions for firefighters | Self-contained breathing apparatus and full protective clothing must be worn in case of fire. |
| Fire fighting equipment/instructions | In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. |
| Specific methods | Use standard firefighting procedures and consider the hazards of other involved materials. |
| General fire hazards | May form combustible dust concentrations in air. |

## 6. Accidental release measures

| | |
|---|---|
| Personal precautions, protective equipment and emergency procedures | Use only non-sparking tools. Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Wear appropriate protective equipment and clothing during clean-up. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS. |
| Methods and materials for containment and cleaning up | Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Stop the flow of material, if this is without risk.<br><br>Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water.<br><br>Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal.<br><br>Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS. |
| Environmental precautions | Avoid discharge into drains, water courses or onto the ground. |

## 7. Handling and storage

| | |
|---|---|
| Precautions for safe handling | Minimize dust generation and accumulation. Avoid significant deposits of material, especially on horizontal surfaces, which may become airborne and form combustible dust clouds and may contribute to secondary explosions. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Explosion-proof general and local exhaust ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Use care in handling/storage. |
| Conditions for safe storage, including any incompatibilities | Keep containers tightly closed in a dry, cool and well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS). |

## 8. Exposure controls/personal protection

| | |
|---|---|
| Occupational exposure limits | No exposure limits noted for ingredient(s). |
| Biological limit values | No biological exposure limits noted for the ingredient(s). |

| | |
|---|---|
| Appropriate engineering controls | Explosion-proof general and local exhaust ventilation. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. |

**Individual protection measures, such as personal protective equipment**

| | |
|---|---|
| **Eye/face protection** | Wear safety glasses with side shields (or goggles). |
| Skin protection | |
| Hand protection | Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier. |
| **Other** | Wear suitable protective clothing. |
| **Respiratory protection** | If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. |
| **Thermal hazards** | Wear appropriate thermal protective clothing, when necessary. |
| **General hygiene considerations** | When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. |

## 9. Physical and chemical properties

| | |
|---|---|
| **Appearance** | |
| **Physical state** | Solid. |
| **Form** | Solid. Flakes. |
| **Color** | Clear. Colorless. White. Brown. |
| **Odor** | Odorless. |
| **Odor threshold** | Not available. |
| **pH** | Not available. |
| **Melting point/freezing point** | Not available. |
| **Initial boiling point and boiling range** | Not available. |
| **Flash point** | > 212.0 °F (> 100.0 °C) |
| **Evaporation rate** | Not available. |
| **Flammability (solid, gas)** | Combustible Solid. |
| **Upper/lower flammability or explosive limits** | |
| **Flammability limit - lower (%)** | Not available. |
| **Flammability limit - upper (%)** | Not available. |
| **Explosive limit - lower (%)** | Not available. |
| **Explosive limit - upper (%)** | Not available. |
| **Vapor pressure** | Not available. |
| **Vapor density** | Not available. |
| **Relative density** | Not available. |
| **Solubility(ies)** | |
| **Solubility (water)** | Insoluble |
| **Partition coefficient (n-octanol/water)** | Not available. |
| **Auto-ignition temperature** | Not available. |
| **Decomposition temperature** | Not available. |
| **Viscosity** | Not available. |
| **Other information** | |
| **Density** | 1.00 g/cm3 |
| **Oxidizing properties** | Not oxidizing. |
| **Specific gravity** | 1 |


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## 10. Stability and reactivity

| | |
|---|---|
| **Reactivity** | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| **Chemical stability** | Material is stable under normal conditions. |
| **Possibility of hazardous reactions** | No dangerous reaction known under conditions of normal use. |
| **Conditions to avoid** | Keep away from heat, sparks and open flame. Minimize dust generation and accumulation. Contact with incompatible materials. |
| **Incompatible materials** | Strong oxidizing agents. |
| **Hazardous decomposition products** | Carbon oxides. |

## 11. Toxicological information

**Information on likely routes of exposure**

| | |
|---|---|
| **Inhalation** | No adverse effects due to inhalation are expected. |
| **Skin contact** | No adverse effects due to skin contact are expected. |
| **Eye contact** | Direct contact with eyes may cause temporary irritation. |
| **Ingestion** | Expected to be a low ingestion hazard. |
| **Symptoms related to the physical, chemical and toxicological characteristics** | Dusts may irritate the respiratory tract, skin and eyes. |

**Information on toxicological effects**

| | |
|---|---|
| **Acute toxicity** | Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes. |
| **Skin corrosion/irritation** | Prolonged skin contact may cause temporary irritation. |
| **Serious eye damage/eye irritation** | Direct contact with eyes may cause temporary irritation. |
| **Respiratory or skin sensitization** | |
| **Respiratory sensitization** | Not a respiratory sensitizer. |
| **Skin sensitization** | This product is not expected to cause skin sensitization. |
| **Germ cell mutagenicity** | No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic. |
| **Carcinogenicity** | This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. |

**IARC Monographs. Overall Evaluation of Carcinogenicity**

Not available.

**OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

**US. National Toxicology Program (NTP) Report on Carcinogens**

Not available.

| | |
|---|---|
| **Reproductive toxicity** | This product is not expected to cause reproductive or developmental effects. |
| **Specific target organ toxicity - single exposure** | Not classified. |
| **Specific target organ toxicity - repeated exposure** | Not classified. |
| **Aspiration hazard** | Not an aspiration hazard. |

## 12. Ecological information

| | |
|---|---|
| **Ecotoxicity** | The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. |
| **Persistence and degradability** | No data is available on the degradability of this product. |
| **Bioaccumulative potential** | No data available. |
| **Mobility in soil** | No data available. |
| **Other adverse effects** | Not available. |

## 13. Disposal considerations

| | |
|---|---|
| **Disposal instructions** | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations. |
| **Local disposal regulations** | Dispose in accordance with all applicable regulations. |
| **Hazardous waste code** | The waste code should be assigned in discussion between the user, the producer and the waste disposal company. |
| **Waste from residues / unused products** | Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see Disposal instructions). |
| **Contaminated packaging** | Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. |

## 14. Transport information

**DOT**

Not regulated as dangerous goods.

**IATA**

Not regulated as dangerous goods.

**IMDG**

Not regulated as dangerous goods.

| | |
|---|---|
| **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** | Not applicable. |

## 15. Regulatory information

| | |
|---|---|
| **US federal regulations** | This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.<br>One or more components are not listed on TSCA. |

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

Not regulated.

**CERCLA Hazardous Substance List (40 CFR 302.4)**

Not listed.

**SARA 304 Emergency release notification**

Not regulated.

**OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

| | |
|---|---|
| **Hazard categories** | Immediate Hazard - No<br>Delayed Hazard - No<br>Fire Hazard - Yes<br>Pressure Hazard - No<br>Reactivity Hazard - No |

**SARA 302 Extremely hazardous substance**

Not listed.

| | |
|---|---|
| **SARA 311/312 Hazardous chemical** | Yes |

**SARA 313 (TRI reporting)**

Not regulated.

**Other federal regulations**

**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Not regulated.

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)**

Not regulated.

| | |
|---|---|
| **Safe Drinking Water Act (SDWA)** | Not regulated. |



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US state regulations

**US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)**

Not listed.

**US. Massachusetts RTK - Substance List**

Not regulated.

**US. New Jersey Worker and Community Right-to-Know Act**

Not listed.

**US. Pennsylvania Worker and Community Right-to-Know Law**

Not listed.

**US. Rhode Island RTK**

Not regulated.

**US. California Proposition 65**

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

**International Inventories**

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|---|---|---|
| Australia | Australian Inventory of Chemical Substances (AICS) | No |
| Canada | Domestic Substances List (DSL) | No |
| Canada | Non-Domestic Substances List (NDSL) | No |
| China | Inventory of Existing Chemical Substances in China (IECSC) | No |
| Europe | European Inventory of Existing Commercial Chemical Substances (EINECS) | No |
| Europe | European List of Notified Chemical Substances (ELINCS) | No |
| Japan | Inventory of Existing and New Chemical Substances (ENCS) | No |
| Korea | Existing Chemicals List (ECL) | No |
| New Zealand | New Zealand Inventory | Yes |
| Philippines | Philippine Inventory of Chemicals and Chemical Substances (PICCS) | No |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | Yes |

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

## 16. Other information, including date of preparation or last revision

| | |
|---|---|
| **Issue date** | 08-14-2015 |
| **Version #** | 01 |
| **Further information** | Refer to NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, for safe handling. |
| **Disclaimer** | The data supplied herein is for use only in connection with occupational safety and health. The information provided in this Safety Data Sheet is believed to be correct as of the date issued. Updates to this information may be obtained by contacting C&J Energy Services. C&J Energy Services MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE. This information is not meant to be an all-inclusive document on worldwide hazard communication regulations. Each user of the material described herein must evaluate the conditions of use and design, many of which will be solely within the user's knowledge and control, and the appropriate protective actions, including proper notification and training of employees, necessary to prevent employee exposures, property damage or release to the environment. The information in the sheet was written based on the best knowledge and experience currently available. |



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C&J Energy Services

# SAFETY DATA SHEET

## 1. Identification

| | |
|---|---|
| **Product identifier** | CJ910 |
| **Other means of identification** | |
| **Synonyms** | Class A Cement |
| **Recommended use** | Cement |
| **Recommended restrictions** | Workers (and your customers or users in the case of resale) should be informed of the potential presence of respirable dust and respirable crystalline silica as well as their potential hazards. Appropriate training in the proper use and handling of this material should be provided as required under applicable regulations. |

**Manufacturer/Importer/Supplier/Distributor information**

**Manufacturer**

| | | |
|---|---|---|
| **Company name** | C&J Energy Services | |
| **Address** | 3990 Rogerdale<br>Houston, TX 77042 | |
| **Telephone** | For Product Information call | (713) 325-6000 |
| **Website** | CJEnergy.com | |
| **E-mail** | Not available. | |
| **Emergency phone number** | For an Emergency call CHEMTREC | 1-800-424-9300 |

## 2. Hazard(s) identification

| | | |
|---|---|---|
| **Physical hazards** | Not classified. | |
| **Health hazards** | Skin corrosion/irritation | Category 2 |
| | Serious eye damage/eye irritation | Category 1 |
| | Carcinogenicity | Category 1A |
| | Specific target organ toxicity, repeated exposure | Category 2 |
| **Environmental hazards** | Not classified. | |
| **OSHA defined hazards** | Not classified. | |

**Label elements**

| | |
|---|---|
| **Signal word** | Danger |
| **Hazard statement** | Causes skin irritation. Causes serious eye damage. May cause cancer. May cause damage to organs through prolonged or repeated exposure. |
| **Precautionary statement** | |
| **Prevention** | Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe mist or vapor. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. |
| **Response** | If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. If on skin: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. If exposed or concerned: Call a poison center/doctor. |
| **Storage** | Store locked up. |
| **Disposal** | Dispose of contents/container in accordance with local/regional/national/international regulations. |
| **Hazard(s) not otherwise classified (HNOC)** | None known. |
| **Supplemental information** | None. |


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## 3. Composition/information on ingredients

**Mixtures**

| Chemical name | Common name and synonyms | CAS number | % |
|---|---|---|---|
| Tricalcium Silicate | | 12168-85-3 | 40-70 |
| Dicalcium Silicate | | 10034-77-2 | 30-60 |
| Aluminum Calcium Iron Oxide | | 12068-35-8 | 5 |
| Limestone | | 1317-65-3 | 5 |
| Magnesium Oxide | | 1309-48-4 | 4 |
| Calcium Oxide | | 1305-78-8 | 0.2 |
| Silica - Crystalline, Quartz | | 14808-60-7 | 0.2 |

## 4. First-aid measures

**Inhalation**
If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.

**Skin contact**
Remove contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

**Eye contact**
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

**Ingestion**
Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately.

**Most important symptoms/effects, acute and delayed**
Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Skin irritation. May cause redness and pain. Prolonged exposure may cause chronic effects.

**Indication of immediate medical attention and special treatment needed**
Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

**General information**
IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

## 5. Fire-fighting measures

**Suitable extinguishing media**
Water fog. Foam. Dry chemical powder. Carbon dioxide ($CO_2$).

**Unsuitable extinguishing media**
Do not use water jet as an extinguisher, as this will spread the fire.

**Specific hazards arising from the chemical**
During fire, gases hazardous to health may be formed.

**Special protective equipment and precautions for firefighters**
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**Fire fighting equipment/instructions**
Move containers from fire area if you can do so without risk.

**Specific methods**
Use standard firefighting procedures and consider the hazards of other involved materials.

**General fire hazards**
No unusual fire or explosion hazards noted.

## 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

**Methods and materials for containment and cleaning up**
Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

**Environmental precautions**
Avoid discharge into drains, water courses or onto the ground.


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## 7. Handling and storage

**Precautions for safe handling**

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Provide adequate ventilation. Do not breathe mist or vapor. Do not get this material in contact with eyes. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

**Conditions for safe storage, including any incompatibilities**

Store locked up. Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

## 8. Exposure controls/personal protection

**Occupational exposure limits**

**US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

| Components | Type | Value | Form |
|---|---|---|---|
| Calcium Oxide (CAS 1305-78-8) | PEL | 5 mg/m3 | |
| Limestone (CAS 1317-65-3) | PEL | 5 mg/m3 | Respirable fraction. |
| | | 15 mg/m3 | Total dust. |
| Magnesium Oxide (CAS 1309-48-4) | PEL | 15 mg/m3 | Total particulate. |

**US. OSHA Table Z-3 (29 CFR 1910.1000)**

| Components | Type | Value | Form |
|---|---|---|---|
| Silica - Crystalline, Quartz (CAS 14808-60-7) | TWA | 0.3 mg/m3 | Total dust. |
| | | 0.1 mg/m3 | Respirable. |
| | | 2.4 mppcf | Respirable. |

**US. ACGIH Threshold Limit Values**

| Components | Type | Value | Form |
|---|---|---|---|
| Aluminum Calcium Iron Oxide (CAS 12068-35-8) | TWA | 1 mg/m3 | Respirable fraction. |
| Calcium Oxide (CAS 1305-78-8) | TWA | 2 mg/m3 | |
| Magnesium Oxide (CAS 1309-48-4) | TWA | 10 mg/m3 | Inhalable fraction. |
| Silica - Crystalline, Quartz (CAS 14808-60-7) | TWA | 0.025 mg/m3 | Respirable fraction. |

**US. NIOSH: Pocket Guide to Chemical Hazards**

| Components | Type | Value | Form |
|---|---|---|---|
| Calcium Oxide (CAS 1305-78-8) | TWA | 2 mg/m3 | |
| Limestone (CAS 1317-65-3) | TWA | 5 mg/m3 | Respirable. |
| | | 10 mg/m3 | Total |
| Silica - Crystalline, Quartz (CAS 14808-60-7) | TWA | 0.05 mg/m3 | Respirable dust. |

**Biological limit values**

No biological exposure limits noted for the ingredient(s).

**Appropriate engineering controls**

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

**Individual protection measures, such as personal protective equipment**

**Eye/face protection**

Chemical respirator with organic vapor cartridge and full facepiece.

**Skin protection**

**Hand protection**

Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

**Other**

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

**Respiratory protection**

Chemical respirator with organic vapor cartridge and full facepiece.

**Thermal hazards**

Wear appropriate thermal protective clothing, when necessary.


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| | |
|---|---|
| **General hygiene considerations** | Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. |

## 9. Physical and chemical properties

| | |
|---|---|
| **Appearance** | |
| **Physical state** | Solid. |
| **Form** | Powder. |
| **Color** | Grey |
| **Odor** | Odorless. |
| **Odor threshold** | Not available. |
| **pH** | Not available. |
| **Melting point/freezing point** | Not available. |
| **Initial boiling point and boiling range** | Not available. |
| **Flash point** | Not available. |
| **Evaporation rate** | Not available. |
| **Flammability (solid, gas)** | Not applicable. |
| **Upper/lower flammability or explosive limits** | |
| **Flammability limit - lower (%)** | Not available. |
| **Flammability limit - upper (%)** | Not available. |
| **Explosive limit - lower (%)** | Not available. |
| **Explosive limit - upper (%)** | Not available. |
| **Vapor pressure** | Not available. |
| **Vapor density** | Not available. |
| **Relative density** | Not available. |
| **Solubility(ies)** | |
| **Solubility (water)** | 0.1 - 1 |
| **Partition coefficient (n-octanol/water)** | Not available. |
| **Auto-ignition temperature** | Not available. |
| **Decomposition temperature** | Not available. |
| **Viscosity** | Not available. |
| **Other information** | |
| **Explosive properties** | Not explosive. |
| **Oxidizing properties** | Not oxidizing. |
| **pH in aqueous solution** | 12 - 13 |
| **Specific gravity** | 3.15 - 3.2 |

## 10. Stability and reactivity

| | |
|---|---|
| **Reactivity** | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| **Chemical stability** | Material is stable under normal conditions. |
| **Possibility of hazardous reactions** | No dangerous reaction known under conditions of normal use. |
| **Conditions to avoid** | Contact with incompatible materials. |
| **Incompatible materials** | Acids. Fluorine. |
| **Hazardous decomposition products** | No hazardous decomposition products are known. |

## 11. Toxicological information

**Information on likely routes of exposure**

| | |
|---|---|
| **Inhalation** | May cause damage to organs through prolonged or repeated exposure by inhalation. |


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| | |
|---|---|
| **Skin contact** | Causes skin irritation. |
| **Eye contact** | Causes serious eye damage. |
| **Ingestion** | May be harmful if swallowed. Ingestion may cause severe irritation of the mouth, the esophagus and the gastrointestinal tract. |
| **Symptoms related to the physical, chemical and toxicological characteristics** | Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Skin irritation. May cause redness and pain. |

**Information on toxicological effects**

| | |
|---|---|
| **Acute toxicity** | May be harmful if swallowed. |
| **Skin corrosion/irritation** | Causes skin irritation. |
| **Serious eye damage/eye irritation** | Causes serious eye damage. |
| **Respiratory or skin sensitization** | |
| **Respiratory sensitization** | Not a respiratory sensitizer. |
| **Skin sensitization** | This product is not expected to cause skin sensitization. |
| **Germ cell mutagenicity** | No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic. |
| **Carcinogenicity** | May cause cancer. |

**IARC Monographs. Overall Evaluation of Carcinogenicity**

Silica - Crystalline, Quartz (CAS 14808-60-7) 1 Carcinogenic to humans.

**OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

**US. National Toxicology Program (NTP) Report on Carcinogens**

Silica - Crystalline, Quartz (CAS 14808-60-7) Known To Be Human Carcinogen.

| | |
|---|---|
| **Reproductive toxicity** | This product is not expected to cause reproductive or developmental effects. |
| **Specific target organ toxicity - single exposure** | Not classified. |
| **Specific target organ toxicity - repeated exposure** | May cause damage to organs (lung) through prolonged or repeated exposure. |
| **Aspiration hazard** | Not an aspiration hazard. |
| **Chronic effects** | May cause damage to organs through prolonged or repeated exposure. Prolonged exposure may cause chronic effects. |

## 12. Ecological information

| | |
|---|---|
| **Ecotoxicity** | The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. |
| **Persistence and degradability** | No data is available on the degradability of this product. |
| **Bioaccumulative potential** | No data available. |
| **Mobility in soil** | No data available. |
| **Other adverse effects** | Not available. |

## 13. Disposal considerations

| | |
|---|---|
| **Disposal instructions** | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations. |
| **Local disposal regulations** | Dispose in accordance with all applicable regulations. |
| **Hazardous waste code** | The waste code should be assigned in discussion between the user, the producer and the waste disposal company. |
| **Waste from residues / unused products** | Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). |
| **Contaminated packaging** | Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. |


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## 14. Transport information

**DOT**

Not regulated as dangerous goods.

**IATA**

Not regulated as dangerous goods.

**IMDG**

Not regulated as dangerous goods.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not established.

## 15. Regulatory information

**US federal regulations** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
One or more components are not listed on TSCA.

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

Not regulated.

**CERCLA Hazardous Substance List (40 CFR 302.4)**

Not listed.

**SARA 304 Emergency release notification**

Not regulated.

**OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories**
Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

**SARA 302 Extremely hazardous substance**

Not listed.

**SARA 311/312 Hazardous chemical** Yes

**SARA 313 (TRI reporting)**

Not regulated.

**Other federal regulations**

**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Not regulated.

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)**

Not regulated.

**Safe Drinking Water Act (SDWA)** Not regulated.

**US state regulations**

**US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)**

Not listed.

**US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))**

Silica - Crystalline, Quartz (CAS 14808-60-7)

**US. Massachusetts RTK - Substance List**

Calcium Oxide (CAS 1305-78-8)
Limestone (CAS 1317-65-3)
Magnesium Oxide (CAS 1309-48-4)
Silica - Crystalline, Quartz (CAS 14808-60-7)

**US. New Jersey Worker and Community Right-to-Know Act**

Calcium Oxide (CAS 1305-78-8)
Limestone (CAS 1317-65-3)
Magnesium Oxide (CAS 1309-48-4)

Silica - Crystalline, Quartz (CAS 14808-60-7)

**US. Pennsylvania Worker and Community Right-to-Know Law**

Calcium Oxide (CAS 1305-78-8)
Limestone (CAS 1317-65-3)
Magnesium Oxide (CAS 1309-48-4)
Silica - Crystalline, Quartz (CAS 14808-60-7)

**US. Rhode Island RTK**

Not regulated.

**US. California Proposition 65**

WARNING: This product contains a chemical known to the State of California to cause cancer.

**US - California Proposition 65 - CRT: Listed date/Carcinogenic substance**

Silica - Crystalline, Quartz (CAS 14808-60-7) Listed: October 1, 1988

**International Inventories**

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|---|---|---|
| Australia | Australian Inventory of Chemical Substances (AICS) | No |
| Canada | Domestic Substances List (DSL) | No |
| Canada | Non-Domestic Substances List (NDSL) | No |
| China | Inventory of Existing Chemical Substances in China (IECSC) | No |
| Europe | European Inventory of Existing Commercial Chemical Substances (EINECS) | No |
| Europe | European List of Notified Chemical Substances (ELINCS) | No |
| Japan | Inventory of Existing and New Chemical Substances (ENCS) | No |
| Korea | Existing Chemicals List (ECL) | No |
| New Zealand | New Zealand Inventory | No |
| Philippines | Philippine Inventory of Chemicals and Chemical Substances (PICCS) | No |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | No |

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

## 16. Other information, including date of preparation or last revision

**Issue date** 08-07-2015

**Revision date** 08-07-2015

**Version #** 02

**Disclaimer** The data supplied herein is for use only in connection with occupational safety and health. The information provided in this Safety Data Sheet is believed to be correct as of the date issued. Updates to this information may be obtained by contacting C&J Energy Services. C&J Energy Services MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE. This information is not meant to be an all-inclusive document on worldwide hazard communication regulations. Each user of the material described herein must evaluate the conditions of use and design, many of which will be solely within the user's knowledge and control, and the appropriate protective actions, including proper notification and training of employees, necessary to prevent employee exposures, property damage or release to the environment. The information in the sheet was written based on the best knowledge and experience currently available.

**Revision information** Hazard(s) identification: Prevention
Hazard(s) identification: Response


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C&J Energy Services

## I. Chemical Product and Company Identification

| | |
|---|---|
| Product Name: | Sugar |
| Identification #: | 25-350-0003 |
| Product Use/Class: | Special Additive |
| Supplier: | Nabors Completion and Production Services<br>515 W. Greens Road, Suite 1100, Houston, TX 77067 |
| Supplier Tracking Code: | 1902 |
| Emergency Contact: | CHEMTREC: 1-800-424-9300<br>Customer # CCN647759 |
| Prepared By: | LZ |
| Date Prepared: | 06/26/2013 |

## II. Composition/Information on Ingredients

| | |
|---|---|
| Chemical Name: | Sucrose |
| CAS Number: | 57-50-1 |
| Percent by Mass Less Than: | 100% |
| Exposure Limits | |
| Threshold Limit Value - Time Weighted Average: | 10 mg/m3, 3 mg/m3 (Respirable) |
| Threshold Limit Value - Short Term Exposure Limit: | NI |
| Permissible Exposure Limit - Time Weighted Average: | 15 mg/m3 (Total Dust), 5 mg/m3 (Respirable Dust) |
| Permissible Exposure Limit - Ceiling: | NI |
| Company Threshold Limit - Time Weighted Average: | NI |
| Skin: | NI |

## III. Hazardous Identification

Emergency Overview: WARNING! MAY FORM COMBUSTIBLE DUST CONCENTRATIONS IN AIR

Explosion: This material is friable and can create small dust particles during any handling, processing, and transfer operations. This material can form explosible dust/air suspensions that are ignitable under some conditions. Dust accumulations should be avoided to prevent secondary dust explosions.

Fire: Sugar is a combustible material and could contribute to a fire, once started and, therefore, normal fire prevention practices should be followed.

| | |
|---|---|
| Eye Contact: | NI |
| Skin Contact: | Prolonged contact may cause skin sensitization or inflammation (reddening, scaling, or itching). |
| Inhalation: | Prolonged exposure to nuisance dust could result in temporary, reversible respiratory irritation. |
| Ingestion: | No Information |
| Chronic Harards: | No other effects have been reported in humans.<br>This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP. |



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| Primary Route(s) of Entry: | ■ Skin Contact | ☐ Eye Contact | ■ Ingestion |
|---|---|---|---|
| | ☐ Skin Absorbtion | ■ Inhalation | |

## IV. First Aid Measures

| | |
|---|---|
| Eye Contact: | Wash the affected area with large amounts of water for at least 15 minutes and obtain medical attention. |
| Skin Contact: | Wash the affected area with large amounts of water for 15 minutes. |
| Inhalation: | If a person inhales a large amount of sugar dust, move the exposed person to fresh air. Get medical attention. |
| Ingestion: | If swallowed in large amounts and the person is conscious, immediately give large amounts water. Get medical attention. |

## V. Fire Fighting Measures

| | |
|---|---|
| Flash Point: | NA |
| Auto Ignition Temperature: | 350-370 degree C |
| Lower Explosive Temp.: | NA |
| Upper Explosive Temp.: | NA |
| Extinguishing Media: | Suitable Extinguishing Media: Class A stored-pressure wet-water or water-mist extinguishers or extinguishing media that are appropriate for the surrounding fire and materials.<br><br>Unsuitable Extinguishing Media: Avoid use of pressurized dry-chemical extinguishers on powdered materials to prevent dust suspensions and dust explosion hazards. Hose streams should be used with great care to avoid creating dust clouds. Fog nozzles should be used. |
| Unusual Fire and Explosive Harards: | This material can form explosible dust/air suspensions that are ignitable under some conditions. Dust accumulations should be avoided to prevent secondary dust explosions. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source, is a potential dust explosion hazard. Refer to NFPA 61 for procedures regarding fire and explosion hazards relating to sugar dust. |
| Special Fire Fighting Procedures: | As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent) and full protective gear. |

## VI. Accidental Release Measures

| | |
|---|---|
| Steps to be Taken in Case Material is Released or Spilled: | Methods for Clean-Up: Airborne sugar dust may form explosible dust clouds and dust accumulations should be avoided to prevent secondary dust explosions. Sugar dust can accumulate on floors, equipment, and overhead structural members and can become airborne, and accordingly must be removed concurrently with operations. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Non-sparking tools should be used. Sugar dust should not be allowed to accumulate in quantities that when suspended could create an atmosphere above the Minimum Explosible Concentration (MEC) of 50 to 60 g/m3. Spills should be cleaned up and dust accumulations should be removed promptly. Surfaces should be cleaned in a manner that minimizes the generation of dust clouds. Refer to NFPA 61 for procedures regarding fire and explosion hazards relating to sugar dust. |

## VII. Handling and Storage



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Handling: Airborne sugar dust may form explosible dust clouds. To minimize dust generation and accumulation, spills should be cleaned up, and, dust accumulations should be removed promptly.

Provide adequate (local exhaust) ventilation to prevent the spread of dust clouds. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.

Ensure that electrical equipment meets the Class II, Group G classification for sugar-handling areas, particularly where dusts having average particle sizes less than 400 microns could be released or could accumulate.

Employ effective housekeeping practices and exhaust ventilation, electrostatic grounding of all metal equipment and operators, management of electrical devices, maintenance of mechanical equipment (e.g. mills, rotary valves, screw feeders, conveyors, and elevators), and explosion protection and isolation provisions in accord with accepted engineering practices in any process capable of generating dust.

Storage: Avoid all potential ignition sources including smoking, open flames, static electricity and sparks in areas where airborne sugar dust may be possible.

## *VIII. Exposure Controls/Personal Protection*

| | |
|---|---|
| Engineering Controls: | Establish and maintain good housekeeping practices. Follow dust control practices outlined in NFPA 61, "Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities." Accumulated dust on floors, structural members, and other surfaces should be removed concurrently with operations.<br><br>It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area. Use only appropriately classified electrical equipment and appropriately rated powered industrial trucks. |
| Respiratory Protection: | Local exhaust ventilation or other site specific engineering controls are recommended if visible dust emissions are present. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details. If dusty conditions exist, wear appropriate respiratory protection based on industrial hygiene exposure monitoring assessment until engineering controls reduce dust concentrations to an acceptable level. If the exposure limit is exceeded and engineering controls are not feasible, a half face elastomeric respirator (with NIOSH type N95 filters or better) or NIOSH approved disposable particulate respirator (filtering facepiece or dust mask) may be worn for up to ten times the exposure limit. A full-face elastomeric respirator (with NIOSH type N100 filters) may be worn up to 50 times the exposure limit. If oil particles are present or suspected to be present, use a NIOSH type R100 or P100 filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. If employees are required to wear respirators, they should be included in a written respirator program, trained in the use of respirators, medically qualified to wear respirators, and fit-tested to ensure proper fit of the respirator worn. |
| Skin Protection: | Protective clothing and gloves are not required for ordinary operations but may be desirable from a sanitation aspect. |
| Eye Protection: | Eye protection is recommended to avoid eye irritation. |
| Other Protective Equipment: | Emergency eyewash stations and deluge showers should be available in the work area. |
| Hygenic Practices: | Where dusty conditions are unavoidable, flame-resistant, antistatic outer clothing and conductive shoes should be worn and used. |

## IX. Physical and Chemical Properties

| | | | |
|---|---|---|---|
| Boiling Point: | Melting Point: 365°F (185°C) | Vapor Density: | NI |
| Odor: | odorless | Odor Threshold: | NI |
| Appearance: | hygroscopic, dry, white crystals with a sweet taste | Evaporation Rate: | NI |
| Solubility in H20: | 200 gm per 100 ml @ 20°C | Specific Gravity: | 1.59 |
| Freeze Point: | NI | pH at 50.0%: | NI |
| Vapor Pressure: | NI | Viscosity: | NI |
| Physical State: | NI | | |
| Coefficient of Water Oil Distribution: | NI | | |

## X. Stability and Reactivity

| | |
|---|---|
| Conditions to Avoid: | Keep away from heat, sparks and flames. |
| Incompatability: | Strong oxidizers, such as potassium permanganate, potassium chlorate, potassium nitrate, potassium perchlorate, and nitric acid. Strongly hydrophilic liquids such as sulfuric acid can release carbon monoxide upon contact with sugar. Carbon dioxide, flammable aldehyde, and carbon monoxide may form when heated to decomposition, or heated with strong, concentrated alkalis. This reaction is exothermic. |
| Hazardous Decomposition Products: | Thermal decomposition, at temperatures in excess of 365°F, may release flammable gases and acrid fumes and smoke, including aldehydes, carbon monoxide, carbon dioxide, and steam. If confined, the decomposition gases can exert considerable pressure. |
| Hazardous Polymization: | Will not occur under normal conditions. |
| Stability: | Stable under normal temperatures and pressures. |

## XI. Toxicological Properties

| | |
|---|---|
| Toxicological Properties: | No product information is available. |
| Oral: | Oral LD50 = 29.7 g/kg (rat) |
| Dermal: | No product information is available. |
| Inhalation: | No product information is available. |

## XII. Ecological Information

| | |
|---|---|
| Ecological Properties: | No product information is available. |
| Ecotoxicity: | No product information is available. |
| Chemical Fate Information: | No product information is available. |

## XIII. Disposal Consideration

| | |
|---|---|
| Disposal Method: | Dispose of spilled material using "Current Good Manufacturing Practices" as permitted by federal, state and local regulations or return to manufacturer for total reprocessing. |
| RCRA Status: | No product information is available. |

## XIV. Transportation Information

| | |
|---|---|
| DOT Proper Shipping Name: | Not DOT Regulated |
| DOT Technical Name: | |
| DOT Hazard Class: | |
| DOT Hazard Subclass: | |
| DOT UN/NA Number: | |
| Packing Group: | |
| Resp. Guide Page: | |

## XV. Regulatory Information

| | |
|---|---|
| OSHA: | No OSHA information listed. |
| TSCA Status: | All components of this product are listed on the Toxic Substance Control Act Inventory or are excluded from the listing requirements. |
| CERCLA SARA: | No Information |
| SARA Section 313 Required Reporting: | |

## XVI. Other Information

| | | | | |
|---|---|---|---|---|
| Other Information: | NA = Not applicable | ND = Not Determined | NI = No Information | NE = Not Established |
| MSDS Updated: | 6/26/2013 | | | |
| MSDS Printed: | 7/20/2017 | | | |

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04/14/2023

# NABORS DRILLING USA, LP

04/14/2023

**DRILLING**

**Nabors Drilling USA, LP Products stored on location**

**Tier II Determination**

| CAS # | Chemical | Max. on Location | Units | Specific Gravity | % by Weight | Gal | Pounds /gal | Total Pounds | Reportable Quantity | Reportable on Tier II | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Silver-Brite Aluminum Paint** | 10 | gallons | 1.09 | 100.00% | 10 | 9.08 | 90.8 | 10,000 lbs | no | < 10,000 lbs |
| 64742-88-7 | Mineral Spirits | | | 0.79 | NA | | | | NA | no | NL |
| 100-41-4 | Ethylbenzene | | | 0.867 | 3.0% | 0.3 | 7.2 | 2.2 | 1,000 lbs | no | CERCLA 1,000, "313"; < 1.000 lbs |
| 1330-20-7 | Xylene | | | 0.864 | 14.0% | 1.4 | 7.2 | 10.1 | 100 lbs | no | CERCLA 100, "313," U239; < 100 lbs |
| 64742-95-6 | Light Aromatic Hydrocarbons | | | | NA | | | | NA | no | NL |
| 98-82-8 | Cumene | | | 0.8618 | 1.0% | 0.1 | 7.2 | 0.7 | 5,000 lbs | no | CERCLA 5,000, "313", U055; < 5,000 lbs |
| 108-67-8 | 1,3,5-Trimethylbenzene | | | | NA | | | | NA | no | |
| 95-63-6 | 1,2,4-Trimethylbenzene | | | 0.88 | 12.0% | 1.2 | 7.3 | 8.8 | 10,000 lbs | no | "313"; < 10,000 lbs |
| | **Industrial Enamel** | 10 | gallons | 1.02 | 100.0% | 10 | 8.5 | 84.9 | 10,000 lbs | no | Paint - Anchor Gray; < 10,000 lbs |
| 64742-88-7 | Mineral Spirits | | | 0.79 | NA | | | | NA | no | NL |
| 64742-88-7 | Mineral Spirits 140-Flash | | | 0.79 | NA | | | | NA | no | NL |
| 100-41-4 | Ethylbenzene | | | 0.867 | 0.3% | 0.03 | 7.2 | 0.2 | 1,000 lbs | no | CERCLA 1,000; < 10,000 lbs |
| 1330-20-7 | Xylene | | | 0.864 | 2.0% | 0.2 | 7.2 | 1.4 | 100 lbs | no | CERCLA 100, "313", RCRA U239; < 100 lbs |
| 14807-96-6 | Talc | | | NA | NA | | | | NA | no | NL |
| 13463-67-7 | Titanium Dioxide | | | 4.26 | NA | | | | NA | no | RCRA K178 |
| | **B54AS10 Industrial Enamel** | 10 | gallons | 1.02 | 100.0% | 1.2 | 8.5 | 84.9 | 10,000 lbs | no | Paint - Hi-Lite Gray; < 10,000 lbs |
| 64742-88-7 | Mineral Spirits | | | 0.79 | NA | | | | NA | no | NL |
| 64742-88-7 | Mineral Spirits 140-Flash | | | 0.79 | NA | | | | NA | no | NL |
| 100-41-4 | Ethylbenzene | | | 0.867 | 0.3% | 0.03 | 7.2 | 0.2 | 1,000 lbs | no | CERCLA 1,000 |
| 1330-20-7 | Xylene | | | 0.864 | 2.0% | 0.2 | 7.2 | 1.4 | 100 lbs | no | CERCLA 100, "313", RCRA U239 |
| 14807-96-6 | Talc | | | NA | NA | | | | NA | no | NL |
| 13463-67-7 | Titanium Dioxide | | | 4.26 | NA | | | | NA | no | RCRA K178 |
| | **B54LS14 Industrial Enamel** | 10 | gallons | 1.0 | 100.0% | 10 | 8.33 | 83.3 | 10,000 lbs | no | Paint - Nabors Blue; < 10,000 lbs |
| 64742-88-7 | Mineral Spirits | | | 0.79 | NA | | | | NA | no | NL |
| 64742-88-7 | Mineral Spirits 140-Flash | | | 0.79 | NA | | | | NA | no | NL |
| 100-41-4 | Ethylbenzene | | | 0.867 | 0.3% | 0.03 | 7.2 | 0.2 | 1,000 lbs | no | CERCLA 1,000 |
| 1330-20-7 | Xylene | | | 0.864 | 2.0% | 0.2 | 7.2 | 1.4 | 100 lbs | no | CERCLA 100, "313", RCRA U239 |
| 108-65-5 | 1-Methoxy-2-Propanol Acetate | | | NA | NA | | | | NA | no | NL |
| 14807-96-6 | Talc | | | NA | NA | | | | NA | no | NL |
| 13463-67-7 | Titanium Dioxide | | | 4.26 | NA | | | | NA | no | RCRA K178 |
| | **Spatz M-150** | 10 | gallons | 0.97 | 100.0% | 10 | 8.1 | 80.801 | 10,000 lbs | no | Paint - Enamel Black; < 10,000 |
| 64742-88-7 | Mineral Spirits | | | 0.79 | NA | | | | NA | no | NL |
| 64742-88-7 | Mineral Spirits 140-Flash | | | 0.79 | NA | | | | NA | no | NL |
| 100-41-4 | Ethylbenzene | | | 0.867 | 0.3% | 0.03 | 7.2 | 0.2 | 1,000 lbs | no | CERCLA 1,000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1330-20-7 | Xylene | | | 0.864 | 2.0% | 0.2 | 7.2 | 1.4 | 100 lbs | no | CERCLA 100, "313", U239 |
| 136-52-7 | Cobalt 2 Ethylhexanoate | | | NA | 0.1% | | | | NA | no | NL |
| 471-34-1 | Calcium Carbonate | | | NA | NA | | | | NA | no | NL |
| 1333-89-4 | Carbon Black | | | NA | NA | | | | NA | no | NL |
| | **Spatz M-150** | 10 | gallons | 1.06 | 100.0% | 10 | 8.8 | 88.3 | 10,000 lbs | no | Paint - Enamel Pure White |
| 64742-88-7 | Mineral Spirits | | | 0.79 | NA | | | | NA | no | NL |
| 64742-88-7 | Mineral Spirits 140-Flash | | | 0.79 | NA | | | | NA | no | NL |
| 100-41-4 | Ethylbenzene | | | 0.867 | 0.3% | 0.03 | 7.2 | 0.2 | 1,000 lbs | no | CERCLA 1,000 |
| 1330-20-7 | Xylene | | | 0.864 | 2.0% | 0.2 | 7.2 | 1.4 | 100 lbs | no | CERCLA 100, "313", U239 |
| 13463-67-7 | Titanium Dioxide | | | 4.26 | NA | | | | NA | no | K178 |
| | **Spatz M-150 HS Equipment** | 10 | gallons | 1.04 | 100.0% | 10 | 8.6 | 86.6 | 10,000 lbs | no | Paint - Enamel Safety Yellow |
| 64742-88-7 | Mineral Spirits | | | 0.79 | NA | | | | NA | no | NL |
| 64742-88-7 | Mineral Spirits 140-Flash | | | 0.79 | NA | | | | NA | no | NL |
| 100-41-4 | Ethylbenzene | | | 0.867 | 0.3% | 0.03 | 7.2 | 0.2 | 1,000 lbs | no | CERCLA 1,000 |
| 1330-20-7 | Xylene | | | 0.864 | 2.0% | 0.2 | 7.2 | 1.4 | 100 lbs | no | CERCLA 100, "313", U239 |
| 13463-67-7 | Titanium Dioxide | | | 4.26 | NA | | | | NA | no | K178 |
| | **Spatz M-150 HS Equipment** | 10 | gallons | 1 | 100.0% | 10 | 8.3 | 83.3 | 10,000 lbs | no | Paint - Enamel Safety Red |
| 64742-88-7 | Mineral Spirits | | | 0.79 | NA | | | | NA | no | NL |
| 64742-88-7 | Mineral Spirits 140-Flash | | | 0.79 | NA | | | | NA | no | NL |
| 100-41-4 | Ethylbenzene | | | 0.867 | 0.3% | 0.03 | 7.2 | 0.2 | 1,000 lbs | no | CERCLA 1,000 |
| 1330-20-7 | Xylene | | | 0.864 | 2.0% | 0.2 | 7.2 | 1.4 | 100 lbs | no | CERCLA 100, "313", U239 |
| 471-34-1 | Calcium Carbonate | | | NA | NA | | | | NA | no | NL |
| 13463-67-7 | Titanium Dioxide | | | 4.26 | NA | | | | NA | no | K178 |
| | **Krylon BBQ & Stove Paint *** | 12 | pounds | 0.76 | 100.0% | | | 12 | 10,000 lbs | no | Aluminum |
| 74-98-6 | Propane | | | 0.504 | NA | | | NA | NA | no | NL |
| 64742-88-7 | Mineral Spirits | | | 0.79 | NA | | | NA | NA | no | NL |
| 100-41-4 | Ethylbenzene | | | 0.867 | 2.0% | | | 0.24 | 1,000 lbs | no | CERCLA 1,000 |
| 1330-20-7 | Xylene | | | 0.864 | 12.0% | | 7.2 | 1.44 | 100 lbs | no | CERCLA 100, "313", U239 |
| 67-64-1 | Acetone | | | NA | NA | | | NA | 5,000 lbs | no | CERCLA 5,000 |
| | **Krylon OSHA Colors** | 12 | pounds | 0.79 | 100.0% | | | 12 | 10,000 lbs | no | Paint - Safety Green |
| 74-98-6 | Propane | | | 0.504 | NA | | | NA | NA | no | NL |
| 106-97-8 | Butane | | | | NA | | | NA | NA | no | NL |
| 100-41-4 | Ethylbenzene | | | 0.867 | 2.0% | | | 0.24 | 1,000 lbs | no | CERCLA 1,000 |
| 1330-20-7 | Xylene | | | 0.864 | 9.0% | | 7.2 | 1.08 | 100 lbs | no | CERCLA 100, "313", U239 |
| 67-64-1 | Acetone | | | NA | NA | | | NA | 5,000 lbs | no | CERCLA 5,000 |
| 78-93-3 | Methyl Ethyl Ketone | | | 0.805 | 7.0% | | | 0.84 | 5,000 lbs | no | CERCLA 5,000, U159 |
| 108-10-1 | Methyl Isobutyl Ketone | | | 0.8 | 3.0% | | | 0.36 | 5,000 lbs | no | CERCLA 5,000, "313", U161 |
| 108-65-6 | 1-Methoxy-2-Propanol Acetate | | | NA | NA | | | NA | NA | no | NL |
| | **Krylon OSHA Colors** | 12 | pounds | 0.77 | 100.0% | | | 12 | 10,000 lbs | no | Paint - Safety Red |
| 74-98-6 | Propane | | | NA | NA | | | NA | NA | no | NL |
| 106-97-8 | Butane | | | NA | NA | | | NA | NA | no | NL |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100-41-4 | Ethylbenzene | | | 0.867 | 2.0% | | | 0.24 | 1,000 lbs | no | CERCLA 1,000 |
| 1330-20-7 | Xylene | | | 0.864 | 9.0% | | 7.2 | 1.08 | 100 lbs | no | CERCLA 100, "313", U239 |
| 67-64-1 | Acetone | | | NA | NA | | | NA | 5,000 lbs | no | CERCLA 5,000 |
| 78-93-3 | Methyl Ethyl Ketone | | | 0.805 | 7.0% | | | 0.84 | 5,000 lbs | no | CERCLA 5,000, U159 |
| 108-10-1 | Methyl Isobutyl Ketone | | | 0.8 | 3.0% | | | 0.36 | 5,000 lbs | no | CERCLA 5,000, "313", U161 |
| 108-65-6 | 1-Methoxy-2-Propanol Acetate | | | NA | NA | | | NA | NA | no | NL |
| | **Krylon OSHA Colors** | 12 | pounds | 0.78 | 100.0% | | | 12 | 10,000 lbs | no | Paint - Safety Yellow |
| 74-98-6 | Propane | | | NA | NA | | | NA | NA | no | NL |
| 106-97-8 | Butane | | | NA | NA | | | NA | NA | no | NL |
| 100-41-4 | Ethylbenzene | | | 0.867 | 1.0% | | | 0.12 | 1,000 lbs | no | CERCLA 1,000 |
| 1330-20-7 | Xylene | | | 0.864 | 7.0% | | 7.2 | 0.84 | 100 lbs | no | CERCLA 100, "313", U239 |
| 71-36-3 | 1-Butanol | | | NA | 1.0% | | | 0.12 | 5,000 lbs | no | CERCLA 5,000, "313", U031 |
| 67-64-1 | Acetone | | | NA | NA | | | NA | 5,000 lbs | no | CERCLA 5,000 |
| 78-93-3 | Methyl Ethyl Ketone | | | 0.805 | 9.0% | | | 1.08 | 5,000 lbs | no | CERCLA 5,000, U159 |
| 108-10-1 | Methyl Isobutyl Ketone | | | 0.8 | 5.0% | | | 0.60 | 5,000 lbs | no | CERCLA 5,000, "313", U161 |
| 108-65-6 | 1-Methoxy-2-Propanol Acetate | | | NA | NA | | | NA | NA | no | |
| 13463-67-7 | Titanium Dioxide | | | 4.26 | NA | | | NA | NA | no | K178 |
| | **Kem Kromik Metal Primer** | 10 | gallons | 1.51 | 100.0% | 10 | 12.6 | 125.8 | 10,000 lbs | no | Paint - Brown |
| 108-88-3 | Toluene | | | 0.8636 | 5.0% | 0.5 | 7.2 | 3.6 | 1,000 lbs | no | CERCLA 1,000, "313", RCRA U22O |
| 100-41-4 | Ethylbenzene | | | 0.867 | 2.0% | 0.2 | 7.2 | 0.2 | 1,000 lbs | no | CERCLA 1,000 |
| 1330-20-7 | Xylene | | | 0.864 | 10.0% | 1.0 | 7.2 | 1.4 | 100 lbs | no | CERCLA 100, "313", U239 |
| 64742-95-6 | Light Aromatic Hydrocarbons | | | NA | NA | NA | NA | NA | NA | no | NL |
| 108-67-8 | 1,3,5-Trimethylbenzene | | | NA | NA | NA | NA | NA | NA | no | NL |
| 95-63-6 | 1,2,4-Trimethylbenzene | | | 0.88 | 4.0% | 0.4 | 7.3 | 2.9 | 10,000 lbs | no | "313" |
| 14808-60-7 | Quartz | | | NA | NA | NA | NA | NA | NA | no | NL |
| 14807-96-6 | Talc | | | NA | NA | NA | NA | NA | NA | no | NL |
| 471-34-1 | Calcium Carbonate | | | NA | NA | NA | NA | NA | NA | no | NL |
| | | | | | | Total pounds for all paint = 856.7 | | | 10,000 lbs | no | < 10,000 lbs |
| | | | | | | Total pounds for Xylene = 25.74 | | | 100 lbs | no | < 100 lbs |
| 64742-88-7 | **Mineral Spirits** | 5 | gallons | 0.79 | 100.0% | 5 | 6.6 | 32.9 | 10,000 lbs | no | NL |
| | **D322-Rigwash** | 100 | gallons | 0.3 | 100.0% | 100 | 2.499 | 249.9 | NA | no | detergent, no hazardous ingredients |
| | **Dawn Professional** | 3 | gallons | 1 | 100.0% | 3 | 8.3 | 24.7 | NA | no | Dish detergent |
| 68585-47-7 | Alcohol Sulfates, Sodium Salt | | | 0.48 | 13.0% | 0.39 | 4.0 | 1.6 | NA | no | NL |
| 68585-34-2 | Alcohol Ethyxysulfate, Sodium Salt | | | NA | 10.0% | 0.3 | NA | NA | NA | no | NL |
| 70592-80-2 | Amines, C10-16-Alkyldimethyl, N-Oxides | | | NA | 5.0% | 0.15 | NA | NA | NA | no | NL |
| 64-17-5 | Ethanol | | | 0.0785 | 5.0% | 0.15 | 6.539 | 0.98 | NA | no | not on List of Lists, OSHA, DOT or NIOSH |
| | **Formula 409** | 5 | gallons | 1 | 100.0% | 5 | 8.3 | 41.65 | NA | no | Clorox commercial disinfectant |
| 68424-85-1 | n-Alkyl Dimethylbenzyl Ammonium Chloride | | | NA | 0.6% | 0.03 | NA | NA | NA | no | NL |
| 1569-01-3 | n-Propoxypropanol | | | NA | 2.0% | 0.1 | NA | NA | NA | no | NL |
| 141-43-5 | Monoethanolamine | | | NA | 1.5% | 0.075 | NA | NA | NA | no | NL |
| | **Pro 409 Antibacterial** | 3 | gallons | 1.01 | 100.0% | 3 | 8.4 | 25.2 | NA | no | Cleaner |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 68424-85-1 | Alkyl Dimethylbenzyl Ammonium Chloride | | | NA | 3.0% | NA | NA | NA | NA | no | NL |
| 111-76-2 | Ethylene Glycol Monobutyl Ether | | | 0.9012 | 8.0% | 0.24 | 7.5 | NA | NA | no | NL |
| 584-08-7 | Potassium Carbonate | | | NA | 3.0% | 0.09 | NA | NA | NA | no | NL |
| | **Pine Sol Cleaner** | 3 | gallons | NA | | | | | | | |
| 8002-09-3 | Pine oil | | | NA | 20.0% | 0.6 | NA | NA | NA | no | NL |
| 67-63-0 | Isopropyl Alcohol | | | 0.786 | 7.0% | 0.21 | 6.5 | 1.4 | NA | no | "313" |
| 66455-15-0 | Alkyl Alcohol Ethoxylates | | | NA | 6.0% | 0.18 | NA | NA | NA | no | NL |
| | **Pine Sol Original Multi-Surface** | 3 | gallons | 1 | 100.0% | 3 | 8.33 | 24.99 | NA | no | Cleaner |
| 8002-09-3 | Pine oil | | | NA | 7.0% | NA | NA | NA | NA | no | NL |
| 66455-15-0 | Alkyl Alcohol Ethoxylates | | | NA | 5.0% | NA | NA | NA | NA | no | NL |
| 68608-26-4 | Sodium Petroleum Sulfonate | | | NA | 5.0% | NA | NA | NA | NA | no | NL |
| 79-14-1 | Glycolic Acid | | | NA | 5.0% | NA | NA | NA | NA | no | NL |
| 67-63-0 | Isopropyl Alcohol | | | 0.786 | 1.5% | 0.045 | NA | NA | NA | no | "313" |
| | **Pure Bright Germicidal Bleach** | 5 | gallons | 1.09 | 100.0% | 5 | 9.1 | 45.4 | NA | no | NL |
| 7681-52-9 | Sodium Hypochlorite | | | 1.2 | 6-9% | 0.45 | 9.9 | 4.5 | NA | no | NL |
| 1310-73-2 | Sodium Hydroxide | | | NA | < 1.0% | 0.05 | NA | NA | 1,000 lbs | no | CERCLA 1,000 |
| | **Simple Green Cleaner/Degreaser** | 3 | gallons | 1.0257 | 100.0% | 3 | 8.5 | 25.6 | NA | no | Cleaner |
| 111-76-2 | 2-butoxyethanol / Butyl Cellosolve | | | 0.912 | ≤ 6.0% | 0.18 | 7.6 | 1.37 | NA | no | NL |
| | **Windex Powerized Formula** | 2 | gallons | 0.99 | 100.0% | 2.0 | 8.25 | 16.5 | NA | no | Cleaner |
| 1336-21-6 | Ammonium Hydroxide | | | 0.9 | 0.5-1.5% | 0.03 | 7.5 | 0.2 | 1,000 lbs | no | CERCLA 1,000, "X" |
| 111-76-2 | 2-Butoxyethanol | | | 0.9012 | 1-5% | 7.5 | 7.5 | 56.4 | NA | no | NL |
| 7732-18-5 | Water | | | 1 | < 90% | 1.8 | 8.33 | 14.99 | NA | no | NL |
| | **2-26 Multi-Purpose Precision Lubricant** | 12 | pounds | 0.81 | 100.0% | | | 12 | NA | no | NL |
| 64742-47-8 | Petroleum Distillate | | | 0.8 | 60-70% | | 6.664 | 8.4 | NA | no | NL |
| NA | Inhibited Paraffinic Oil | | | | 25-30% | | | 3.6 | NA | no | NL |
| 124-38-9 | Carbon Dioxide | | | 1.52 | ≤ 10% | | 12.6616 | 0.12 | NA | no | NL |
| 10192-30-0 | **Ammonium Bisulfite** | 42 | gallons | 1.38 | 60.0% | 25.2 | 11.5 | 289.7 | 5,000 lbs | no | < 5,000 lbs |
| 10043-52-4 | **Calcium Chloride** | 2,500 | pounds | 2.2 | ≤ 100% | | | 2,500 | NA | no | NL |
| Propietary | **Chemplex 710 /** Fumed Silica | 280 | gallons | 0.97 | ≤ 10% | 28 | 8.1 | 226 | NA | no | NL |
| | **Dow Corning 700 Industrial Grade** | 5 | pounds | 1.024 | 100.0% | | | 5 | NA | no | Silicone sealant |
| 4253-34-3 | Methyltriacetoxysilane | | | | 5.0% | | | 0.25 | NA | no | NL |
| 17689-77-9 | Ethyltriacetoxysilane | | | | 5.0% | | | 0.25 | NA | no | NL |
| | **Formula 151** | 31.5 | gallons | 1.3 | 100.0% | 31.5 | 10.83 | 341.11 | NA | no | NL |
| 1310-73-2 | Sodium Hydroxide | | | 2.1 | < 5% | 1.57 | 17.5 | 27.5 | 1,000 lbs | no | CERCLA 1,000 |
| 100-37-8 | Diethylaminoethanol | | | NA | 2.0% | NA | NA | NA | NA | no | NL |
| | **Great Stuff Pro** | 18 | pounds | NA | NA | NA | NA | NA | NA | no | HC foam sealant; 24 (12-ounce) cans |
| 101-68-8 | 4,4'-Methylenediphenyl Diisocyanate | | | 1.19 | 13.0% | | | 2.34 | 5,000 lbs | no | CERCLA 5,000, "X" |
| 63449-39-8 | Paraffin waxes and Hydrocarbon waxes, chlorinated | | | NA | 10.0% | | | 1.8 | NA | no | NL |
| 9016-87-9 | Diphenylmethane Diisocyanate, isomers & homologues | | | NA | 7.0% | | | 1.26 | NA | no | "313", "#" |
| | **HRP** | 9 | pounds | 0.99 | 100.0% | | | 9 | NA | no | 12 (12-ounce cans) |
| NA | Polyamide | | | NA | ≤ 60.0% | | | 5.4 | NA | no | NL |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 143-22-6 | Triethylene glycol monobutyl ether | | | NA | ≤ 60.0% | | | 5.4 | NA | no | NL |
| 108-32-7 | Propylene carbonate | | | NA | 5.0% | | | 0.45 | NA | no | NL |
| | **Kopr-Kote Bulk & Aerosol** | 3 | pounds | NA | | | | 3 | NA | no | NL |
| 64742-57-0 | Petroleum Oil | | | NA | ≤ 60.0% | | | 1.8 | NA | no | NL |
| 8298-05-49 | Non-hazardous Blend | | | NA | ≤ 60.0% | | | 1.8 | NA | no | NL |
| 7440-50-8 | Metallic Copper | | | 8.94 | ≤ 20.0% | | | 5.364 | 5,000 lbs | no | CERCLA 5,000, "313" |
| 64742-89-8 | Petroleum Solvent (aerosol) | | | NA | ≤ 10.0% | | | 0.3 | NA | no | NL |
| 6847-68-57 | Hydrocarbon Propellant (aerosol) | | | NA | ≤ 25.0% | | | 0.75 | NA | no | NL |
| | **Kov'R-Kote** | 2 | pounds | 1.22 | 100.0% | | | 2 | NL | no | NL |
| 64742-52-5 | Petroleum Oil | | | | ≤ 100.0% | | | 2 | NL | no | NL |
| 8298-05-49 | Nonhazardous Blend | | | | ≤ 60.0% | | | 1.2 | NL | no | NL |
| | **Lectra Clean Aerosol** | 12 | pounds | 1.46 | 100.0% | | | 12 | NL | no | NL |
| 79-01-6 | Trichloroethylene | | | 1.4649 | ≤ 95.0% | | | 11.4 | 100 lbs | no | CERCLA 100, "313", U228 |
| 106-88-7 | 1,2 Butylene Oxide | | | 0.826 | ≤ 10.0% | | | 1.2 | 100 lbs | no | CERCLA 100, "313" |
| 124-38-9 | Carbon Dioxide | | | 1.52 | ≤ 10.0% | | 12.6616 | 1.2 | NL | no | NL |
| 1897-45-6 | **Mar-T126 /** Tetrachloroisophthalonitrile | 9 | pounds | 1.8 | 0.2% | | | 9 | 10,000 lbs | no | 12 (12-ounce) cans; "X" |
| 67-56-1 | **MC-122 /** Methyl Alcohol | 42 | gallons | 0.791 | 100.0% | 42 | 6.6 | 276.7 | 5,000 lbs | no | CERCLA 5,000, "313" U514 |
| | **Marvel Mystery Oil** | 1 | case | | | | | | NL | no | NL |
| 64742-63-8 | Petroleum Lubricating Oil | | | | ≤ 75.0% | | | | NL | no | NL |
| 8052-41-3 | Mineral Spirits | | | | ≤ 30.0% | | | | NL | no | NL |
| | **Mystik JT-6 Multi-Purpose Grease** | 15 | pounds | | | | | 15 | 10,000 lbs | no | NL |
| various | Highly refined petroleum lubricant oils | | | NL | ≤ 100.0% | | | 15 | NA | no | NL |
| 3159-62-4 | Calcium, 12-hydroxy stearate | | | | ≤ 13.0% | | | 1.95 | NA | no | NL |
| Proprietary | Zinc and zinc compounds | | | | ≤ 1.0% | | | 0.15 | NA | no | NL |
| Proprietary | Antimony and antimony compounds | | | | ≤ 1.0% | | | 0.15 | NA | no | NL |
| | **Pyroil Prem Starting FL SFP-11** | 8.25 | pounds | 1 | 100.0% | | | 8.25 | 10,000 lbs | no | NL |
| 142-82-5 | Heptane | | | 0.69 | ≤ 59.0% | | | 4.86 | NA | no | NL |
| 60-29-7 | Ethyl Ether | | | | ≤ 36.0% | | | 2.97 | 100 lbs | no | CERCLA 100 |
| 124-38-9 | Carbon Dioxide | | | 1.52 | ≤ 13.0% | | 12.6616 | 1.07 | NA | no | NL |
| 110-54-3 | Hexane, n-Hexane | | | 0.659 | 6.0% | | | 0.495 | 5,000 lbs | no | CERCLA 5,000, "X" |
| | **Rain-X De-Icer** | 5 | gallons | NA | 100.0% | 5 | NA | NA | NA | no | NL |
| 7732-18-5 | Water | | | NA | ≤ 90.0% | NA | NA | NA | NA | no | NL |
| 67-56-1 | Methyl Alcohol | | | 0.791 | ≤ 40.0% | 2 | 6.6 | 13.2 | 5,000 lbs | no | CERCLA 5,000, U154 |
| 3734-33-6 | Bitrex | | | NA | ≤ 1.0% | NA | NA | NA | NA | no | NL |
| | **Shadow Mountain Bottled Water** | | | | | | | | NA | no | NL |
| | **Shell Rotella T 15-W-40 (CJ-4)** | < 1 | gallon | NA | 100.0% | | | | NA | no | NL |
| NA | Highly refined mineral oils & additives | | | NA | NA | | | | NA | no | NL |
| NA | DMSO-extract | | | NA | ≤ 3.0% | | | | NA | no | NL |
| | **Shell Tellus ® T Oil 15** | 3 | gallons | NA | 100.0% | | | | NA | no | NL |
| 64742-53-6 | Severely Hydrotreated Light Naphthenic Distillate | | | NA | ≤ 65.0% | | | | NA | no | NL |
| 64742-46-7 | Solvent Refined, Hydrotreated Middle Distillate | | | NA | ≤ 35.0% | | | | NA | no | NL |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 64742-54-7 | Solvent Refined, Hydrotreated Heavy Paraffinic Distillate | | | NA | ≤ 5.0% | | | | NA | no | NL |
| Mixture | Additive Package | | | NA | ≤ 5.0% | | | | NA | no | NL |
| | **WD-40** | 10 | pounds | | 100.0% | | | 10 | NA | no | NL |
| 8052-41-3 | Aliphatic Petroleum Distillates | | | | ≤ 50.0% | | | 5 | NA | no | NL |
| 64742-65-0 | Petroleum Base Oil | | | 0.87 | ≤ 35.0% | | | 3.5 | NA | no | NL |
| 64742-47-8 | LVP Hydrocarbon Fluid | | | 0.8 | ≤ 18.0% | | 6.664 | 1.8 | NA | no | |
| NA | Non-hazardous ingredients | | | | ≤ 10.0% | | | 1 | NA | no | |
| | **WD-40 Aerosol** | 10 | pounds | | 100.0% | | | 10 | NA | no | |
| 64742-47-8 | Alphatic Hydrocarbon | | | 0.8 | ≤ 50.0% | | 6.664 | 5 | NA | no | |
| 64742-58-1 | Petroleum Base Oil | | | | ≤ 25.0% | | | 2.5 | NA | no | |
| 64742-47-8 | LVP Aliphatic Hydrocarbon | | | 0.8 | ≤ 18.0% | | 6.664 | 1.8 | NA | no | |
| 124-38-9 | Carbon Dioxide | | | 1.52 | ≤ 3.0% | | 12.6616 | 0.3 | NA | no | |
| Mixture | Non-Hazardous Incredients | | | | ≤ 10.0% | | | 1 | NA | no | |
| 68476-30-2 | **Marathon No. 2 Ultra Low Sulfur** | 3,500 | gallons | 0.871 | 100.0% | 3,500 | 7.3 | 25,394.0 | 10,000 lbs | yes | > 10,000 lbs |
| Mixture | Saturated Hydrocarbons | | | NA | ≤ 80.0% | NA | NA | NA | NA | no | NL |
| Mixture | Aromatic Hydrocarbons | | | NA | ≤ 25.0% | NA | NA | NA | NA | no | NL |
| Mixture | Unsaturated Hydrocarbons | | | NA | ≤ 6.0% | NA | NA | NA | NA | no | NL |
| 91-20-3 | Naphthalene | | | 1.162 | ≤ 0.5% | 17.5 | 9.7 | 169.7 | 100 lbs | yes | RCRA U165; "313" |
| NA | **Torqueless** | NA | | | | | | | NA | no | |

* 1 can = 16 ounces

When there is a range, maximum quantity or percentage is used in calculation

NL = Not Listed

"313" = Subject to reporting under Section 313 & 6607

# MATERIAL SAFETY DATA SHEET

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

B59S8

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 2 |
| Reactivity | 1 |

PRODUCT NAME

SILVER-BRITE* Aluminum Paint, Hi-Heat Silicone Alkyd

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION

15-AUG-03

INFORMATION TELEPHONE NO.
(216) 566-2902

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 10 | 64742-88-7 | Mineral Spirits | | | | |
| | | ACGIH TLV | 100 | ppm | | 2 mm |
| | | OSHA PEL | 100 | ppm | | |
| 3 | 100-41-4 | Ethylbenzene | | | | |
| | | ACGIH TLV | 100 | ppm | | 7.1 mm |
| | | ACGIH TLV | 125 | ppm | STEL | |
| | | OSHA PEL | 100 | ppm | | |
| | | OSHA PEL | 125 | ppm | STEL | |
| 14 | 1330-20-7 | Xylene | | | | |
| | | ACGIH TLV | 100 | ppm | | 5.9 mm |
| | | ACGIH TLV | 150 | ppm | STEL | |
| | | OSHA PEL | 100 | ppm | | |
| | | OSHA PEL | 150 | ppm | STEL | |
| 10 | 64742-95-6 | Light Aromatic Hydrocarbons | | | | |
| | | ACGIH TLV | Not Available | | | 3.8 mm |
| | | OSHA PEL | Not Available | | | |
| 1 | 98-82-8 | Cumene | | | | |
| | | ACGIH TLV | 50 | ppm | | 10 mm |
| | | OSHA PEL | 50 | ppm | | |
| 8 | 108-67-8 | 1,3,5-Trimethylbenzene | | | | |
| | | ACGIH TLV | 25 | ppm | | 2 mm |
| | | OSHA PEL | 25 | ppm | | |
| 12 | 95-63-6 | 1,2,4-Trimethylbenzene | | | | |
| | | ACGIH TLV | 25 | ppm | | 2.03 mm |
| | | OSHA PEL | 25 | ppm | | |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

Continued on page 2

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EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

## Section 5 -- FIRE FIGHTING MEASURES

| FLASH POINT | LEL | UEL |
|---|---|---|
| 103 F PMCC | 0.7 | 7.0 |

FLAMMABILITY CLASSIFICATION

Combustible, Flash above 99 and below 200 F

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

Continued on page 3

## Section 7 -- HANDLING AND STORAGE

AGE CATEGORY

DOL Storage Class II

RECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are COMBUSTIBLE. Keep away from heat and open flame. Consult NFPA Code. Use approved Bonding and Grounding procedures. Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Continued on page 4

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| PRODUCT WEIGHT | 9.04 lb/gal | 1082 g/l |
| SPECIFIC GRAVITY | 1.09 | |
| BOILING POINT | 277 - 395 F | 136 - 201 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 74 % | |
| EVAPORATION RATE | Slower than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

| | | |
|---|---|---|
| 5.20 lb/gal | 623 g/l | Less Water and Federally Exempt Solvents |
| 5.20 lb/gal | 623 g/l | Emitted VOC |

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

Contamination with Water, Acids, or Alkalis can cause evolution of hydrogen, which may result in dangerously increased pressures in closed containers.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

## Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and reproductive systems.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

Continued on page 5

| CAS No. | Ingredient Name | | | | |
|---|---|---|---|---|---|
| 742-88-7 | Mineral Spirits | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 100-41-4 | Ethylbenzene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 3500 mg/kg |
| 1330-20-7 | Xylene | | | | |
| | | LC50 | RAT | 4HR | 5000 ppm |
| | | LD50 | RAT | | 4300 mg/kg |
| 64742-95-6 | Light Aromatic Hydrocarbons | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 98-82-8 | Cumene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 1400 mg/kg |
| 108-67-8 | 1,3,5-Trimethylbenzene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 95-63-6 | 1,2,4-Trimethylbenzene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |

## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

Continued on page 6

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 100-41-4 | Ethylbenzene | 3 | |
| 1330-20-7 | Xylene | 14 | |
| 98-82-8 | Cumene | 1 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | 12 | |

ALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of alifornia to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, n the TSCA Inventory.

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria f the CPR and the MSDS contains all of the information required by the PR.

The above information pertains to this product as currently formulated, nd is based on the information available at this time. Addition of educers or other additives to this product may substantially alter the omposition and hazards of the product. Since conditions of use are utside our control, we make no warranties, express or implied, and assume liability in connection with any use of this information.

04/14/2023

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# MATERIAL SAFETY DATA SHEET

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

B54AJ1001

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 3 |
| Reactivity | 0 |

PRODUCT NAME

Industrial Enamel - VOC Complying, Anchor Gray

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
02-JAN-04

INFORMATION TELEPHONE NO.
(216) 566-2902

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 19 | 64742-88-7 | Mineral Spirits | | | | |
| | | | ACGIH TLV | 100 | ppm | 2 mm |
| | | | OSHA PEL | 100 | ppm | |
| 18 | 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | | ACGIH TLV | 100 | ppm | 0.5 mm |
| | | | OSHA PEL | 100 | ppm | |
| C.4 | 100-41-4 | Ethylbenzene | | | | |
| | | | ACGIH TLV | 100 | ppm | 7.1 mm |
| | | | ACGIH TLV | 125 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 125 | ppm STEL | |
| 2 | 1330-20-7 | Xylene | | | | |
| | | | ACGIH TLV | 100 | ppm | 5.9 mm |
| | | | ACGIH TLV | 150 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 150 | ppm STEL | |
| 5 | 14807-96-6 | Talc | | | | |
| | | | ACGIH TLV | 2 | mg/m3 as Resp. Dust | |
| | | | OSHA PEL | 2 | mg/m3 as Resp. Dust | |
| 9 | 13463-67-7 | Titanium Dioxide | | | | |
| | | | ACGIH TLV | 10 | mg/m3 as Dust | |
| | | | OSHA PEL | 10 | mg/m3 Total Dust | |
| | | | OSHA PEL | 5 | mg/m3 Respirable Fraction | |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

Continued on page 2

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EFFECTS OF OVEREXPOSURE

EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
INGESTION: Do not induce vomiting. Get medical attention immediately.

## Section 5 -- FIRE FIGHTING MEASURES

| FLASH POINT | LEL | UEL |
|---|---|---|
| 87 F PMCC | 0.9 | 7.0 |

FLAMMABILITY CLASSIFICATION

RED LABEL -- Flammable, Flash below 100 F

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat.
Application to hot surfaces requires special precautions.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

Continued on page 3

04/14/2023

## Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

OL Storage Class IC

CAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are FLAMMABLE. Keep away from heat, sparks, and open flame. During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Continued on page 4

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| PRODUCT WEIGHT | 8.44 lb/gal | 1011 g/l |
| SPECIFIC GRAVITY | 1.02 | |
| BOILING POINT | 281 - 416 F | 138 - 213 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 52 % | |
| EVAPORATION RATE | Slower than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

| | | |
|---|---|---|
| 3.39 lb/gal | 407 g/l | Less Water and Federally Exempt Solvents |
| 3.39 lb/gal | 407 g/l | Emitted VOC |

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

## Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in oratory animals. Lifetime inhalation exposure of rats and mice to high ylbenzene concentrations resulted in increases in certain types of cer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

Continued on page 5

| CAS No. | Ingredient Name | | | | |
|---|---|---|---|---|---|
| 64742-88-7 | Mineral Spirits | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 100-41-4 | Ethylbenzene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 3500 mg/kg |
| 1330-20-7 | Xylene | | | | |
| | | LC50 | RAT | 4HR | 5000 ppm |
| | | LD50 | RAT | | 4300 mg/kg |
| 14807-96-6 | Talc | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 13463-67-7 | Titanium Dioxide | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |

## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 100-41-4 | Ethylbenzene | 0.3 | |
| 1330-20-7 | Xylene | 2 | |

CALIFORNIA PROPOSITION 65
WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Continued on page 6

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, the TSCA Inventory.

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

# MATERIAL SAFETY DATA SHEET

B54AS10
04 00

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

B54AS10

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 2 |
| Reactivity | 0 |

PRODUCT NAME
Industrial Enamel, Hi-Lite Gray

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
30-JAN-04

INFORMATION TELEPHONE NO.
(216) 566-2902

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 18 | 64742-88-7 | Mineral Spirits | | | | |
| | | | ACGIH TLV | 100 | ppm | 2 mm |
| | | | OSHA PEL | 100 | ppm | |
| 18 | 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | | ACGIH TLV | 100 | ppm | 0.5 mm |
| | | | OSHA PEL | 100 | ppm | |
| 0.4 | 100-41-4 | Ethylbenzene | | | | |
| | | | ACGIH TLV | 100 | ppm | 7.1 mm |
| | | | ACGIH TLV | 125 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 125 | ppm STEL | |
| 2 | 1330-20-7 | Xylene | | | | |
| | | | ACGIH TLV | 100 | ppm | 5.9 mm |
| | | | ACGIH TLV | 150 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 150 | ppm STEL | |
| 5 | 14807-96-6 | Talc | | | | |
| | | | ACGIH TLV | 2 | mg/m3 as Resp. Dust | |
| | | | OSHA PEL | 2 | mg/m3 as Resp. Dust | |
| 8 | 13463-67-7 | Titanium Dioxide | | | | |
| | | | ACGIH TLV | 10 | mg/m3 as Dust | |
| | | | OSHA PEL | 10 | mg/m3 Total Dust | |
| | | | OSHA PEL | 5 | mg/m3 Respirable Fraction | |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE
INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

Continued on page 2

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EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

## Section 5 -- FIRE FIGHTING MEASURES

| FLASH POINT | LEL | UEL |
|---|---|---|
| 112 F PMCC | 0.9 | 7.0 |

FLAMMABILITY CLASSIFICATION

Combustible, Flash above 99 and below 200 F

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

Continued on page 3

## Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

DOL Storage Class II

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are COMBUSTIBLE. Keep away from heat and open flame.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Continued on page 4

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| PRODUCT WEIGHT | 8.45 lb/gal | 1012 g/l |
| SPECIFIC GRAVITY | 1.02 | |
| BOILING POINT | 281 - 416 F | 138 - 213 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 52 % | |
| EVAPORATION RATE | Slower than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

| | | |
|---|---|---|
| 3.38 lb/gal | 405 g/l | Less Water and Federally Exempt Solvents |
| 3.38 lb/gal | 405 g/l | Emitted VOC |

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

## Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

Continued on page 5

| CAS No. | Ingredient Name | | | | |
|---|---|---|---|---|---|
| 64742-88-7 | Mineral Spirits | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 100-41-4 | Ethylbenzene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 3500 mg/kg |
| 1330-20-7 | Xylene | | | | |
| | | LC50 | RAT | 4HR | 5000 ppm |
| | | LD50 | RAT | | 4300 mg/kg |
| 14807-96-6 | Talc | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 13463-67-7 | Titanium Dioxide | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |

## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 100-41-4 | Ethylbenzene | 0.3 | |
| 1330-20-7 | Xylene | 2 | |

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Continued on page 6

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

04/14/2023

# MATERIAL SAFETY DATA SHEET

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

B54LS14

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 2 |
| Reactivity | 0 |

PRODUCT NAME

Industrial Enamel, Nabors Blue

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION

17-OCT-03

INFORMATION TELEPHONE NO.
(216) 566-2902

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 16 | 64742-88-7 | Mineral Spirits | | | | |
| | | | ACGIH TLV | 100 | ppm | |
| | | | OSHA PEL | 100 | ppm | 2 mm |
| 20 | 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | | ACGIH TLV | 100 | ppm | |
| | | | OSHA PEL | 100 | ppm | 0.5 mm |
| 0.4 | 100-41-4 | Ethylbenzene | | | | |
| | | | ACGIH TLV | 100 | ppm | |
| | | | ACGIH TLV | 125 | ppm STEL | 7.1 mm |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 125 | ppm STEL | |
| 2 | 1330-20-7 | Xylene | | | | |
| | | | ACGIH TLV | 100 | ppm | |
| | | | ACGIH TLV | 150 | ppm STEL | 5.9 mm |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 150 | ppm STEL | |
| 1 | 108-65-6 | 1-Methoxy-2-Propanol Acetate | | | | |
| | | | ACGIH TLV | Not Available | | |
| | | | OSHA PEL | Not Available | | 1.8 mm |
| 6 | 14807-96-6 | Talc | | | | |
| | | | ACGIH TLV | 2 | mg/m3 as Resp. Dust | |
| | | | OSHA PEL | 2 | mg/m3 as Resp. Dust | |
| 3 | 13463-67-7 | Titanium Dioxide | | | | |
| | | | ACGIH TLV | 10 | mg/m3 as Dust | |
| | | | OSHA PEL | 10 | mg/m3 Total Dust | |
| | | | OSHA PEL | 5 | mg/m3 Respirable Fraction | |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

Continued on page 2

04/14/2023

EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

## Section 5 -- FIRE FIGHTING MEASURES

| FLASH POINT | LEL | UEL |
|---|---|---|
| 112 F PMCC | 0.9 | 13.1 |

FLAMMABILITY CLASSIFICATION

Combustible, Flash above 99 and below 200 F

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

Continued on page 3

## Section 7 -- HANDLING AND STORAGE

AGE CATEGORY
OL Storage Class II

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Contents are COMBUSTIBLE. Keep away from heat and open flame.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE
Use only with adequate ventilation.
Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.
Wash hands after using.
This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION
If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.
When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION
Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

inued on page 4

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| RODUCT WEIGHT | 8.28 lb/gal | 992 g/l |
| SPECIFIC GRAVITY | 1.00 | |
| BOILING POINT | 281 - 416 F | 138 - 213 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 51 % | |
| EVAPORATION RATE | Slower than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

| | | |
|---|---|---|
| 3.35 lb/gal | 401 g/l | Less Water and Federally Exempt Solvents |
| 3.35 lb/gal | 401 g/l | Emitted VOC |

## Section 10 -- STABILITY AND REACTIVITY

TABILITY -- Stable

CONDITIONS TO AVOID

None known.

NCOMPATIBILITY

None known.

AZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

AZARDOUS POLYMERIZATION

Will not occur

## Section 11 -- TOXICOLOGICAL INFORMATION

NIC HEALTH HAZARDS

thylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in aboratory animals. Lifetime inhalation exposure of rats and mice to high thylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. hese effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Prolonged overexposure to solvent ingredients in Section 2 may cause dverse effects to the liver, urinary, blood forming and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung ancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents ith permanent brain and nervous system damage.

OXICOLOGY DATA

inued on page 5

| CAS No. | Ingredient Name | | | | |
|---|---|---|---|---|---|
| 742-88-7 | Mineral Spirits | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 100-41-4 | Ethylbenzene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 3500 mg/kg |
| 1330-20-7 | Xylene | | | | |
| | | LC50 | RAT | 4HR | 5000 ppm |
| | | LD50 | RAT | | 4300 mg/kg |
| 108-65-6 | 1-Methoxy-2-Propanol Acetate | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 8500 mg/kg |
| 14807-96-6 | Talc | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 13463 67-7 | Titanium Dioxide | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |

## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 100-41-4 | Ethylbenzene | 0.3 | |
| 1330-20-7 | Xylene | 2 | |

inued on page 6

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume liability in connection with any use of this information.

# MATERIAL SAFETY DATA SHEET

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

SZ11B100

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 2 |
| Reactivity | 0 |

PRODUCT NAME
SPATZ M-150 HS Equipment Enamel, Black

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
19-OCT-03

INFORMATION TELEPHONE NO.
(216) 566-2902

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 15 | 64742-88-7 | Mineral Spirits | | | | |
| | | | ACGIH TLV | 100 | ppm | 2 mm |
| | | | OSHA PEL | 100 | ppm | |
| 21 | 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | | ACGIH TLV | 100 | ppm | 0.5 mm |
| | | | OSHA PEL | 100 | ppm | |
| 0.4 | 100-41-4 | Ethylbenzene | | | | |
| | | | ACGIH TLV | 100 | ppm | 7.1 mm |
| | | | ACGIH TLV | 125 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 125 | ppm STEL | |
| 2 | 1330-20-7 | Xylene | | | | |
| | | | ACGIH TLV | 100 | ppm | 5.9 mm |
| | | | ACGIH TLV | 150 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 150 | ppm STEL | |
| 0.1 | 136-52-7 | Cobalt 2-Ethylhexanoate | | | | |
| | | | ACGIH TLV | Not Available | | |
| | | | OSHA PEL | Not Available | | |
| 6 | 471-34-1 | Calcium Carbonate | | | | |
| | | | ACGIH TLV | 10 | mg/m3 as Dust | |
| | | | OSHA PEL | 15 | mg/m3 Total Dust | |
| | | | OSHA PEL | 5 | mg/m3 Respirable Fraction | |
| 2 | 1333-86-4 | Carbon Black | | | | |
| | | | ACGIH TLV | 3.5 | mg/m3 | |
| | | | OSHA PEL | 3.5 | mg/m3 | |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE
INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

Continued on page 2

EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

## Section 5 -- FIRE FIGHTING MEASURES

| FLASH POINT | LEL | UEL |
|---|---|---|
| 112 F PMCC | 0.9 | 7.0 |

FLAMMABILITY CLASSIFICATION

Combustible, Flash above 99 and below 200 F

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

Continued on page 3

## Section 7 -- HANDLING AND STORAGE

RAGE CATEGORY

OL Storage Class II

RECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are COMBUSTIBLE. Keep away from heat and open flame. Consult NFPA Code. Use approved Bonding and Grounding procedures. Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

RECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels nly during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH LV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

ESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by tilation, wear a properly fitted organic vapor/particulate respirator oved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator pproved by NIOSH/MSHA for dust which may be generated from this product, nderlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

YE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

inued on page 4

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| PRODUCT WEIGHT | 8.08 lb/gal | 968 g/l |
| SPECIFIC GRAVITY | 0.97 | |
| BOILING POINT | 281 - 416 F | 138 - 213 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 49 % | |
| EVAPORATION RATE | Slower than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

| | | |
|---|---|---|
| 3.19 lb/gal | 383 g/l | Less Water and Federally Exempt Solvents |
| 3.19 lb/gal | 383 g/l | Emitted VOC |

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

## Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Carbon Black is classified by IARC as possibly carcinogenic to humans (group 2B) based on experimental animal data, however, there is insufficient evidence in humans for its carcinogenicity.

Cobalt and cobalt compounds are classified by IARC as possibly carcinogenic to humans (group 2B) based on experimental animal data, however, there is inadequate evidence in humans for its carcinogenicity.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and reproductive systems.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

Continued on page 5

| CAS No. | Ingredient Name | | | | | |
|---|---|---|---|---|---|---|
| :742-88-7 | Mineral Spirits | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 64742-88-7 | Mineral Spirits 140-Flash | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 100-41-4 | Ethylbenzene | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | 3500 | mg/kg |
| 1330-20-7 | Xylene | | | | | |
| | | LC50 | RAT | 4HR | 5000 | ppm |
| | | LD50 | RAT | | 4300 | mg/kg |
| 136-52-7 | Cobalt 2-Ethylhexanoate | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 471-34-1 | Calcium Carbonate | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 1333-86-4 | Carbon Black | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |

## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container. ispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

:inued on page 6

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 100-41-4 | Ethylbenzene | 0.3 | |
| 330-20-7 | Xylene | 2 | |
| | Cobalt Compound | 0.1 | 0.02 |

ALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of alifornia to cause cancer and birth defects or other reproductive harm.

SCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, n the TSCA Inventory.

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria f the Canadian Controlled Products Regulations (CPR) and the MSDS contains ll of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of educers or other additives to this product may substantially alter the omposition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume liability in connection with any use of this information.

04/14/2023

# MATERIAL SAFETY DATA SHEET

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

SZ11W101

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 2 |
| Reactivity | 0 |

PRODUCT NAME

SPATZ M-150 HS Equipment Enamel, Pure White

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION

17-AUG-03

INFORMATION TELEPHONE NO.
(216) 566-2902

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 21 | 64742-88-7 | Mineral Spirits | | | | |
| | | | ACGIH TLV | 100 | ppm | 2 mm |
| | | | OSHA PEL | 100 | ppm | |
| 14 | 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | | ACGIH TLV | 100 | ppm | 0.5 mm |
| | | | OSHA PEL | 100 | ppm | |
| 0.3 | 100-41-4 | Ethylbenzene | | | | |
| | | | ACGIH TLV | 100 | ppm | 7.1 mm |
| | | | ACGIH TLV | 125 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 125 | ppm STEL | |
| 2 | 1330-20-7 | Xylene | | | | |
| | | | ACGIH TLV | 100 | ppm | 5.9 mm |
| | | | ACGIH TLV | 150 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 150 | ppm STEL | |
| 11 | 13463-67-7 | Titanium Dioxide | | | | |
| | | | ACGIH TLV | 10 | mg/m3 as Dust | |
| | | | OSHA PEL | 10 | mg/m3 Total Dust | |
| | | | OSHA PEL | 5 | mg/m3 Respirable Fraction | |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

Continued on page 2

04/14/2023

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of ssive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive kin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

| | |
|---|---|
| EYES: | Flush eyes with large amounts of water for 15 minutes. Get medical attention. |
| SKIN: | Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use. |
| INHALATION: | If affected, remove from exposure. Restore breathing. Keep warm and quiet. |
| INGESTION: | Do not induce vomiting. Get medical attention immediately. |

## Section 5 -- FIRE FIGHTING MEASURES

| FLASH POINT | LEL | UEL |
|---|---|---|
| 112 F PMCC | 0.9 | 7.0 |

FLAMMABILITY CLASSIFICATION

Combustible, Flash above 99 and below 200 F

EXTINGUISHING MEDIA

arbon Dioxide, Dry Chemical, Foam

UAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

inued on page 3

## Section 7 -- HANDLING AND STORAGE

AGE CATEGORY

DOL Storage Class II

RECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are COMBUSTIBLE. Keep away from heat and open flame. Consult NFPA Code. Use approved Bonding and Grounding procedures. Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Continued on page 4

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| PRODUCT WEIGHT | 8.85 lb/gal | 1059 g/l |
| SPECIFIC GRAVITY | 1.06 | |
| BOILING POINT | 281 - 416 F | 138 - 213 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 52 % | |
| EVAPORATION RATE | Slower than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

| | | |
|---|---|---|
| 3.38 lb/gal | 405 g/l | Less Water and Federally Exempt Solvents |
| 3.38 lb/gal | 405 g/l | Emitted VOC |

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

## Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

Continued on page 5

| CAS No. | Ingredient Name | | | | |
|---|---|---|---|---|---|
| 742-88-7 | Mineral Spirits | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 100-41-4 | Ethylbenzene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 3500 mg/kg |
| 1330-20-7 | Xylene | | | | |
| | | LC50 | RAT | 4HR | 5000 ppm |
| | | LD50 | RAT | | 4300 mg/kg |
| 13463-67-7 | Titanium Dioxide | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |

## Section 12 -- ECOLOGICAL INFORMATION

COTOXICOLOGICAL INFORMATION
No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource onservation and Recovery Act (RCRA) 40 CFR 261.
aste must be tested for ignitability to determine the applicable EPA rdous waste numbers.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local egulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 100-41-4 | Ethylbenzene | 0.3 | |
| 1330-20-7 | Xylene | 2 | |

ALIFORNIA PROPOSITION 65
WARNING: This product contains chemicals known to the State of alifornia to cause cancer and birth defects or other reproductive harm.
SCA CERTIFICATION
All chemicals in this product are listed, or are exempt from listing, n the TSCA Inventory.

inued on page 6

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume liability in connection with any use of this information.

Z11Y100
06 00

# MATERIAL SAFETY DATA SHEET

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

SZ11Y100

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 2 |
| Reactivity | 0 |

PRODUCT NAME

SPATZ M-150 HS Equipment Enamel, Safety Yellow

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION

31 OCT-03

INFORMATION TELEPHONE NO.
(216) 566-2902

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 16 | 64742-88-7 | Mineral Spirits | | | | |
| | | | ACGIH TLV | 100 | ppm | |
| | | | OSHA PEL | 100 | ppm | 2 mm |
| 20 | 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | | ACGIH TLV | 100 | ppm | |
| | | | OSHA PEL | 100 | ppm | 0.5 mm |
| 0.4 | 100-41-4 | Ethylbenzene | | | | |
| | | | ACGIH TLV | 100 | ppm | |
| | | | ACGIH TLV | 125 | ppm STEL | 7.1 mm |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 125 | ppm STEL | |
| 2 | 1330-20-7 | Xylene | | | | |
| | | | ACGIH TLV | 100 | ppm | |
| | | | ACGIH TLV | 150 | ppm STEL | 5.9 mm |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 150 | ppm STEL | |
| 13 | 13463-67-7 | Titanium Dioxide | | | | |
| | | | ACGIH TLV | 10 | mg/m3 as Dust | |
| | | | OSHA PEL | 10 | mg/m3 Total Dust | |
| | | | OSHA PEL | 5 | mg/m3 Respirable Fraction | |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

Continued on page 2

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SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of ssive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive kin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.

CANCER INFORMATION
For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

## Section 5 -- FIRE FIGHTING MEASURES

| FLASH POINT | LEL | UEL |
|---|---|---|
| 105 F PMCC | 0.9 | 7.0 |

FLAMMABILITY CLASSIFICATION
Combustible, Flash above 99 and below 200 F

EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam

SUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode when exposed to extreme heat.
Application to hot surfaces requires special precautions.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain edical attention.

SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus hould be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent ressure build-up and possible autoignition or explosion when exposed to extreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

TEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

inued on page 3

## Section 7 -- HANDLING AND STORAGE

AGE CATEGORY
OL Storage Class II
ECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Contents are COMBUSTIBLE. Keep away from heat and open flame.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE
Use only with adequate ventilation.
Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.
Wash hands after using.
This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).
VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.
RESPIRATORY PROTECTION
If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.
When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.
PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section 2.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.
OTHER PRECAUTIONS
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

inued on page 4

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| RODUCT WEIGHT | 8.68 lb/gal | 1040 g/l |
| SPECIFIC GRAVITY | 1.04 | |
| BOILING POINT | 281 - 416 F | 138 - 213 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 52 % | |
| EVAPORATION RATE | Slower than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

| | | |
|---|---|---|
| 3.45 lb/gal | 413 g/l | Less Water and Federally Exempt Solvents |
| 3.45 lb/gal | 413 g/l | Emitted VOC |

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

## Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

Continued on page 5

| CAS No. | Ingredient Name | | | | |
|---|---|---|---|---|---|
| 742-88-7 | Mineral Spirits | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 100-41-4 | Ethylbenzene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 3500 mg/kg |
| 1330-20-7 | Xylene | | | | |
| | | LC50 | RAT | 4HR | 5000 ppm |
| | | LD50 | RAT | | 4300 mg/kg |
| 13463-67-7 | Titanium Dioxide | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |

## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Waste must be tested for ignitability to determine the applicable EPA ardous waste numbers.
Incinerate in approved facility. Do not incinerate closed container. ispose of in accordance with Federal, State/Provincial, and Local egulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 100-41-4 | Ethylbenzene | 0.3 | |
| 1330-20-7 | Xylene | 2 | |

CALIFORNIA PROPOSITION 65
WARNING: This product contains chemicals known to the State of alifornia to cause cancer and birth defects or other reproductive harm.
TSCA CERTIFICATION
All chemicals in this product are listed, or are exempt from listing, n the TSCA Inventory.

inued on page 6

## Section 16 — OTHER INFORMATION

This product has been classified in accordance with the hazard criteria the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume liability in connection with any use of this information.

04/14/2023

# MATERIAL SAFETY DATA SHEET

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

SZ11R100

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 2 |
| Reactivity | 0 |

PRODUCT NAME

SPATZ M-150 HS Equipment Enamel, Safety Red

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION

19-OCT-03

INFORMATION TELEPHONE NO.
(216) 566-2902

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 14 | 64742-88-7 | Mineral Spirits | | | | |
| | | | ACGIH TLV | 100 | ppm | |
| | | | OSHA PEL | 100 | ppm | 2 mm |
| 22 | 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | | ACGIH TLV | 100 | ppm | |
| | | | OSHA PEL | 100 | ppm | 0.5 mm |
| 0.4 | 100-41-4 | Ethylbenzene | | | | |
| | | | ACGIH TLV | 100 | ppm | |
| | | | ACGIH TLV | 125 | ppm STEL | 7.1 mm |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 125 | ppm STEL | |
| 2 | 1330-20-7 | Xylene | | | | |
| | | | ACGIH TLV | 100 | ppm | |
| | | | ACGIH TLV | 150 | ppm STEL | 5.9 mm |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 150 | ppm STEL | |
| 5 | 471-34-1 | Calcium Carbonate | | | | |
| | | | ACGIH TLV | 10 | mg/m3 as Dust | |
| | | | OSHA PEL | 15 | mg/m3 Total Dust | |
| | | | OSHA PEL | 5 | mg/m3 Respirable Fraction | |
| 3 | 13463-67-7 | Titanium Dioxide | | | | |
| | | | ACGIH TLV | 10 | mg/m3 as Dust | |
| | | | OSHA PEL | 10 | mg/m3 Total Dust | |
| | | | OSHA PEL | 5 | mg/m3 Respirable Fraction | |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

Continued on page 2

EFFECTS OF OVEREXPOSURE

EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
INGESTION: Do not induce vomiting. Get medical attention immediately.

## Section 5 -- FIRE FIGHTING MEASURES

| FLASH POINT | LEL | UEL |
|---|---|---|
| 101 F PMCC | 0.9 | 7.0 |

FLAMMABILITY CLASSIFICATION

Combustible, Flash above 99 and below 200 F

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat.
Application to hot surfaces requires special precautions.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

Continued on page 3

## Section 7 -- HANDLING AND STORAGE

AGE CATEGORY

OOL Storage Class II

RECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are COMBUSTIBLE. Keep away from heat and open flame. Consult NFPA Code. Use approved Bonding and Grounding procedures. Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

RECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2. When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

inued on page 4

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| PRODUCT WEIGHT | 8.27 lb/gal | 991 g/l |
| SPECIFIC GRAVITY | 1.00 | |
| BOILING POINT | 281 - 416 F | 138 - 213 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 51 % | |
| EVAPORATION RATE | Slower than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |
| VOLATILE ORGANIC COMPOUNDS (VOC Theoretical) | | |
| 3.34 lb/gal 400 g/l | Less Water and Federally Exempt Solvents | |
| 3.34 lb/gal 400 g/l | Emitted VOC | |

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

## Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

Continued on page 5

| CAS No. | Ingredient Name | | | | |
|---|---|---|---|---|---|
| 742-88-7 | Mineral Spirits | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 64742-88-7 | Mineral Spirits 140-Flash | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 100-41-4 | Ethylbenzene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 3500 mg/kg |
| 1330-20-7 | Xylene | | | | |
| | | LC50 | RAT | 4HR | 5000 ppm |
| | | LD50 | RAT | | 4300 mg/kg |
| 471-34-1 | Calcium Carbonate | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 13463-67-7 | Titanium Dioxide | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |

## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

E DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local Regulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 100-41-4 | Ethylbenzene | 0.3 | |
| 1330-20-7 | Xylene | 2 | |

CALIFORNIA PROPOSITION 65
WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Continued on page 6

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, the TSCA Inventory.

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume liability in connection with any use of this information.

1407
01 00

# MATERIAL SAFETY DATA SHEET

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

1407

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 4 |
| Reactivity | 1 |

PRODUCT NAME
KRYLON* BBQ & Stove Paint, Aluminum

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
KRYLON Products Group
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
14-OCT-03

INFORMATION TELEPHONE NO.
(800) 832-2541

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 18 | 74-98-6 | Propane | | | | |
| | | | ACGIH TLV | 2500 | ppm | 760 mm |
| | | | OSHA PEL | 1000 | ppm | |
| 1 | 64742-88-7 | Mineral Spirits | | | | |
| | | | ACGIH TLV | 100 | ppm | 2 mm |
| | | | OSHA PEL | 100 | ppm | |
| 2 | 100-41-4 | Ethylbenzene | | | | |
| | | | ACGIH TLV | 100 | ppm | 7.1 mm |
| | | | ACGIH TLV | 125 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 125 | ppm STEL | |
| 12 | 1330-20-7 | Xylene | | | | |
| | | | ACGIH TLV | 100 | ppm | 5.9 mm |
| | | | ACGIH TLV | 150 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 150 | ppm STEL | |
| 57 | 67-64-1 | Acetone | | | | |
| | | | ACGIH TLV | 500 | ppm | 180 mm |
| | | | ACGIH TLV | 750 | ppm STEL | |
| | | | OSHA PEL | 1000 | ppm | |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE
INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE
EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

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SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

| | |
|---|---|
| EYES: | Flush eyes with large amounts of water for 15 minutes. Get medical attention. |
| SKIN: | Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use. |
| INHALATION: | If affected, remove from exposure. Restore breathing. Keep warm and quiet. |
| INGESTION: | Do not induce vomiting. Get medical attention immediately. |

## Section 5 -- FIRE FIGHTING MEASURES

| FLASH POINT | LEL | UEL |
|---|---|---|
| Propellant < 0 F | 1.0 | 12.8 |

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

## Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

Not Available

Continued on page 3

04/14/2023

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Continued on page 4

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| PRODUCT WEIGHT | 6.31 lb/gal | 755 g/l |
| SPECIFIC GRAVITY | 0.76 | |
| BOILING POINT | <0 - 395 F | <-18 - 201 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 95 % | |
| EVAPORATION RATE | Faster than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |
| pH | 7.0 | |

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)
Volatile Weight 33.92 % Less Water and Federally Exempt Solvents

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable
CONDITIONS TO AVOID
None known.
INCOMPATIBILITY
None known.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide
HAZARDOUS POLYMERIZATION
Will not occur

## Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and reproductive systems.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

Continued on page 5

| CAS No. | Ingredient Name | | | | |
|---|---|---|---|---|---|
| 74-98-6 | Propane | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 64742-88-7 | Mineral Spirits | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 100-41-4 | Ethylbenzene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 3500 mg/kg |
| 1330-20-7 | Xylene | | | | |
| | | LC50 | RAT | 4HR | 5000 ppm |
| | | LD50 | RAT | | 4300 mg/kg |
| 67-64-1 | Acetone | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 5800 mg/kg |

## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.
Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 100-41-4 | Ethylbenzene | 2 | |
| 1330-20-7 | Xylene | 12 | |

CALIFORNIA PROPOSITION 65
WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
TSCA CERTIFICATION
All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Continued on page 6

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

2012
01 00

# MATERIAL SAFETY DATA SHEET

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

2012

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 4 |
| Reactivity | 0 |

PRODUCT NAME
KRYLON* OSHA Colors, Safety Green

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
KRYLON Products Group
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
14-OCT-03

INFORMATION TELEPHONE NO.
(800) 832-2541

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 14 | 74-98-6 | Propane | | | | |
| | | | ACGIH TLV | 2500 | ppm | 760 mm |
| | | | OSHA PEL | 1000 | ppm | |
| 6 | 106-97-8 | Butane | | | | |
| | | | ACGIH TLV | 800 | ppm | 760 mm |
| | | | OSHA PEL | 800 | ppm | |
| 2 | 100-41-4 | Ethylbenzene | | | | |
| | | | ACGIH TLV | 100 | ppm | 7.1 mm |
| | | | ACGIH TLV | 125 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 125 | ppm STEL | |
| 9 | 1330-20-7 | Xylene | | | | |
| | | | ACGIH TLV | 100 | ppm | 5.9 mm |
| | | | ACGIH TLV | 150 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 150 | ppm STEL | |
| 36 | 67-64-1 | Acetone | | | | |
| | | | ACGIH TLV | 500 | ppm | 180 mm |
| | | | ACGIH TLV | 750 | ppm STEL | |
| | | | OSHA PEL | 1000 | ppm | |
| 7 | 78-93-3 | Methyl Ethyl Ketone | | | | |
| | | | ACGIH TLV | 200 | ppm | 70 mm |
| | | | ACGIH TLV | 300 | ppm STEL | |
| | | | OSHA PEL | 200 | ppm | |
| | | | OSHA PEL | 300 | ppm STEL | |
| 3 | 108-10-1 | Methyl Isobutyl Ketone | | | | |
| | | | ACGIH TLV | 50 | ppm | 16 mm |
| | | | ACGIH TLV | 75 | ppm STEL | |
| | | | OSHA PEL | 50 | ppm | |
| | | | OSHA PEL | 75 | ppm STEL | |
| 7 | 108-65-6 | 1-Methoxy-2-Propanol Acetate | | | | |
| | | | ACGIH TLV | Not Available | | 1.8 mm |
| | | | OSHA PEL | Not Available | | |

Continued on page 2

04/14/2023

| | | | | | |
|---|---|---|---|---|---|
| 1 | 7727-43-7 | Barium Sulfate | | | |
| | | ACGIH TLV | 10 | mg/m3 | as Dust |
| | | OSHA PEL | 10 | mg/m3 | Total Dust |
| | | OSHA PEL | 5 | mg/m3 | Respirable Fraction |
| 3 | 13463-67-7 | Titanium Dioxide | | | |
| | | ACGIH TLV | 10 | mg/m3 | as Dust |
| | | OSHA PEL | 10 | mg/m3 | Total Dust |
| | | OSHA PEL | 5 | mg/m3 | Respirable Fraction |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE
INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE
EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.

CANCER INFORMATION
For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
INGESTION: Do not induce vomiting. Get medical attention immediately.

## Section 5 -- FIRE FIGHTING MEASURES

| FLASH POINT | LEL | UEL |
|---|---|---|
| Propellant < 0 F | 1.0 | 13.1 |

EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS
Containers may explode when exposed to extreme heat.
Application to hot surfaces requires special precautions.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

Continued on page 3

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

## Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

Not Available

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

Continued on page 4

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| PRODUCT WEIGHT | 6.54 lb/gal | 784 g/l |
| SPECIFIC GRAVITY | 0.79 | |
| BOILING POINT | <0 - 302 F | <-18 - 150 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 91 % | |
| EVAPORATION RATE | Faster than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |
| pH | 7.0 | |

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

Volatile Weight 48.24 % Less Water and Federally Exempt Solvents

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

Continued on page 5

## Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Methyl Ethyl Ketone may increase the nervous system effects of other solvents.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary, blood forming and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

| CAS No. | Ingredient Name | | | | |
|---|---|---|---|---|---|
| 74-98-6 | Propane | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 106-97-8 | Butane | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 100-41-4 | Ethylbenzene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 3500 mg/kg |
| 1330-20-7 | Xylene | | | | |
| | | LC50 | RAT | 4HR | 5000 ppm |
| | | LD50 | RAT | | 4300 mg/kg |
| 67-64-1 | Acetone | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 5800 mg/kg |
| 78-93-3 | Methyl Ethyl Ketone | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 2740 mg/kg |
| 108-10-1 | Methyl Isobutyl Ketone | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 2080 mg/kg |
| 108-65-6 | 1-Methoxy-2-Propanol Acetate | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 8500 mg/kg |
| 7727-43-7 | Barium Sulfate | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 13463-67-7 | Titanium Dioxide | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |

Continued on page 6

## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 100-41-4 | Ethylbenzene | 2 | |
| 1330-20-7 | Xylene | 9 | |
| 78-93-3 | Methyl Ethyl Ketone | 7 | |
| 108-10-1 | Methyl Isobutyl Ketone | 3 | |

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

# MATERIAL SAFETY DATA SHEET

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

2116

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 4 |
| Reactivity | 0 |

PRODUCT NAME
KRYLON* OSHA Colors, Safety Red

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
KRYLON Products Group
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
14-OCT-03

INFORMATION TELEPHONE NO.
(800) 832-2541

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 14 | 74-98-6 | Propane | | | | |
| | | | ACGIH TLV | 2500 | ppm | 760 mm |
| | | | OSHA PEL | 1000 | ppm | |
| 6 | 106-97-8 | Butane | | | | |
| | | | ACGIH TLV | 800 | ppm | 760 mm |
| | | | OSHA PEL | 800 | ppm | |
| 1 | 100-41-4 | Ethylbenzene | | | | |
| | | | ACGIH TLV | 100 | ppm | 7.1 mm |
| | | | ACGIH TLV | 125 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 125 | ppm STEL | |
| 8 | 1330-20-7 | Xylene | | | | |
| | | | ACGIH TLV | 100 | ppm | 5.9 mm |
| | | | ACGIH TLV | 150 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 150 | ppm STEL | |
| 39 | 67-64-1 | Acetone | | | | |
| | | | ACGIH TLV | 500 | ppm | 180 mm |
| | | | ACGIH TLV | 750 | ppm STEL | |
| | | | OSHA PEL | 1000 | ppm | |
| 8 | 78-93-3 | Methyl Ethyl Ketone | | | | |
| | | | ACGIH TLV | 200 | ppm | 70 mm |
| | | | ACGIH TLV | 300 | ppm STEL | |
| | | | OSHA PEL | 200 | ppm | |
| | | | OSHA PEL | 300 | ppm STEL | |
| 4 | 108-10-1 | Methyl Isobutyl Ketone | | | | |
| | | | ACGIH TLV | 50 | ppm | 16 mm |
| | | | ACGIH TLV | 75 | ppm STEL | |
| | | | OSHA PEL | 50 | ppm | |
| | | | OSHA PEL | 75 | ppm STEL | |
| 7 | 108-65-6 | 1-Methoxy-2-Propanol Acetate | | | | |
| | | | ACGIH TLV | Not Available | | 1.8 mm |
| | | | OSHA PEL | Not Available | | |

Continued on page 2

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## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE
INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE
EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.

CANCER INFORMATION
For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
INGESTION: Do not induce vomiting. Get medical attention immediately.

## Section 5 -- FIRE FIGHTING MEASURES

| FLASH POINT | LEL | UEL |
|---|---|---|
| Propellant < 0 F | 1.0 | 13.1 |

EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS
Containers may explode when exposed to extreme heat.
Application to hot surfaces requires special precautions.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Continued on page 3

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

## Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

Not Available

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

Continued on page 4

PROTECTIVE GLOVES

None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| PRODUCT WEIGHT | 6.36 lb/gal | 762 g/l |
| SPECIFIC GRAVITY | 0.77 | |
| BOILING POINT | <0 - 302 F | <-18 - 150 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 92 % | |
| EVAPORATION RATE | Faster than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |
| pH | 7.0 | |

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

Volatile Weight 49.04 % Less Water and Federally Exempt Solvents

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

## Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Methyl Ethyl Ketone may increase the nervous system effects of other solvents.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary, blood forming and reproductive systems.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Continued on page 5

TOXICOLOGY DATA

| CAS No. | Ingredient Name | | | | |
|---|---|---|---|---|---|
| 74-98-6 | Propane | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 106-97-8 | Butane | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |
| 100-41-4 | Ethylbenzene | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 3500 mg/kg |
| 1330-20-7 | Xylene | | | | |
| | | LC50 | RAT | 4HR | 5000 ppm |
| | | LD50 | RAT | | 4300 mg/kg |
| 67-64-1 | Acetone | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 5800 mg/kg |
| 78-93-3 | Methyl Ethyl Ketone | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 2740 mg/kg |
| 108-10-1 | Methyl Isobutyl Ketone | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 2080 mg/kg |
| 108-65-6 | 1-Methoxy-2-Propanol Acetate | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | 8500 mg/kg |

## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

Continued on page 6

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 100-41-4 | Ethylbenzene | 1 | |
| 1330-20-7 | Xylene | 8 | |
| 78-93-3 | Methyl Ethyl Ketone | 8 | |
| 108-10-1 | Methyl Isobutyl Ketone | 4 | |

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

1813
01 00

# MATERIAL SAFETY DATA SHEET

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

1813

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 4 |
| Reactivity | 0 |

PRODUCT NAME
KRYLON* OSHA Colors, Safety Yellow

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
KRYLON Products Group
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
02-DEC-03

INFORMATION TELEPHONE NO.
(800) 832-2541

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 14 | 74-98-6 | Propane | | | | |
| | | | ACGIH TLV | 2500 | ppm | 760 mm |
| | | | OSHA PEL | 1000 | ppm | |
| 6 | 106-97-8 | Butane | | | | |
| | | | ACGIH TLV | 800 | ppm | 760 mm |
| | | | OSHA PEL | 800 | ppm | |
| 1 | 100-41-4 | Ethylbenzene | | | | |
| | | | ACGIH TLV | 100 | ppm | 7.1 mm |
| | | | ACGIH TLV | 125 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 125 | ppm STEL | |
| 7 | 1330-20-7 | Xylene | | | | |
| | | | ACGIH TLV | 100 | ppm | 5.9 mm |
| | | | ACGIH TLV | 150 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 150 | ppm STEL | |
| 1 | 71-36-3 | 1-Butanol | | | | |
| | | | ACGIH TLV | 20 | ppm (skin) | 5.5 mm |
| | | | OSHA PEL | 50 | ppm (skin) CEILING | |
| 35 | 67-64-1 | Acetone | | | | |
| | | | ACGIH TLV | 500 | ppm | 180 mm |
| | | | ACGIH TLV | 750 | ppm STEL | |
| | | | OSHA PEL | 1000 | ppm | |
| 9 | 78-93-3 | Methyl Ethyl Ketone | | | | |
| | | | ACGIH TLV | 200 | ppm | 70 mm |
| | | | ACGIH TLV | 300 | ppm STEL | |
| | | | OSHA PEL | 200 | ppm | |
| | | | OSHA PEL | 300 | ppm STEL | |
| 5 | 108-10-1 | Methyl Isobutyl Ketone | | | | |
| | | | ACGIH TLV | 50 | ppm | 16 mm |
| | | | ACGIH TLV | 75 | ppm STEL | |
| | | | OSHA PEL | 50 | ppm | |
| | | | OSHA PEL | 75 | ppm STEL | |

Continued on page 2

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| | | | | | |
|---|---|---|---|---|---|
| 7 | 108-65-6 | 1-Methoxy-2-Propanol Acetate | | | |
| | | ACGIH TLV | Not Available | | 1.8 mm |
| | | OSHA PEL | Not Available | | |
| 2 | 13463-67-7 | Titanium Dioxide | | | |
| | | ACGIH TLV | 10 | mg/m3 as Dust | |
| | | OSHA PEL | 10 | mg/m3 Total Dust | |
| | | OSHA PEL | 5 | mg/m3 Respirable Fraction | |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.

EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

## Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT

| | LEL | UEL |
|---|---|---|
| Propellant < 0 F | 1.0 | 13.1 |

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

Continued on page 3

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

## Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

Not Available

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.
Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.
Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

Continued on page 4

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| PRODUCT WEIGHT | 6.47 lb/gal | 775 g/l |
| SPECIFIC GRAVITY | 0.78 | |
| BOILING POINT | <0 - 302 F | <-18 - 150 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 91 % | |
| EVAPORATION RATE | Faster than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |
| pH | 7.0 | |

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)
Volatile Weight 50.54 % Less Water and Federally Exempt Solvents

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

Continued on page 5

## Section 11 -- TOXICOLOGICAL INFORMATION

### CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Methyl Ethyl Ketone may increase the nervous system effects of other solvents.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary, blood forming and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

### TOXICOLOGY DATA

| CAS No. | Ingredient Name | | | | | |
|---|---|---|---|---|---|---|
| 74-98-6 | Propane | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 106-97-8 | Butane | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 100-41-4 | Ethylbenzene | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | 3500 | mg/kg |
| 1330-20-7 | Xylene | | | | | |
| | | LC50 | RAT | 4HR | 5000 | ppm |
| | | LD50 | RAT | | 4300 | mg/kg |
| 71-36-3 | 1-Butanol | | | | | |
| | | LC50 | RAT | 4HR | 8000 | ppm |
| | | LD50 | RAT | | 790 | mg/kg |
| 67-64-1 | Acetone | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | 5800 | mg/kg |
| 78-93-3 | Methyl Ethyl Ketone | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | 2740 | mg/kg |
| 108-10-1 | Methyl Isobutyl Ketone | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | 2080 | mg/kg |
| 108-65-6 | 1-Methoxy-2-Propanol Acetate | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | 8500 | mg/kg |
| 13463-67-7 | Titanium Dioxide | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |

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## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 100-41-4 | Ethylbenzene | 1 | |
| 1330-20-7 | Xylene | 7 | |
| 71-36-3 | 1-Butanol | 1 | |
| 78-93-3 | Methyl Ethyl Ketone | 9 | |
| 108-10-1 | Methyl Isobutyl Ketone | 5 | |

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

B50NZ6
00

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

B50NZ6

HMIS CODES

| | |
|---|---|
| Health | 2* |
| Flammability | 3 |
| Reactivity | 0 |

PRODUCT NAME

KEM KROMIK* Metal Primer (VOC Complying), Brown

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
15-AUG-03

INFORMATION TELEPHONE NO.
(216) 566-2902

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|---|
| 5 | 108-88-3 | Toluene | | | | |
| | | | ACGIH TLV | 50 | ppm (skin) | 22 mm |
| | | | OSHA PEL | 100 | ppm (skin) | |
| | | | OSHA PEL | 150 | ppm (skin) STEL | |
| 2 | 100-41-4 | Ethylbenzene | | | | |
| | | | ACGIH TLV | 100 | ppm | 7.1 mm |
| | | | ACGIH TLV | 125 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 125 | ppm STEL | |
| [illegible] | 1330-20-7 | Xylene | | | | |
| | | | ACGIH TLV | 100 | ppm | 5.9 mm |
| | | | ACGIH TLV | 150 | ppm STEL | |
| | | | OSHA PEL | 100 | ppm | |
| | | | OSHA PEL | 150 | ppm STEL | |
| 2 | 64742-95-6 | Light Aromatic Hydrocarbons | | | | |
| | | | ACGIH TLV | Not Available | | 3.8 mm |
| | | | OSHA PEL | Not Available | | |
| 2 | 108-67-8 | 1,3,5-Trimethylbenzene | | | | |
| | | | ACGIH TLV | 25 | ppm | 2 mm |
| | | | OSHA PEL | 25 | ppm | |
| 4 | 95-63-6 | 1,2,4-Trimethylbenzene | | | | |
| | | | ACGIH TLV | 25 | ppm | 2.03 mm |
| | | | OSHA PEL | 25 | ppm | |
| 0.2 | 14808-60-7 | Quartz | | | | |
| | | | ACGIH TLV | 0.05 | mg/m3 as Resp. Dust | |
| | | | OSHA PEL | 0.1 | mg/m3 as Resp. Dust | |
| 3 | 14807-96-6 | Talc | | | | |
| | | | ACGIH TLV | 2 | mg/m3 as Resp. Dust | |
| | | | OSHA PEL | 2 | mg/m3 as Resp. Dust | |
| 38 | 471-34-1 | Calcium Carbonate | | | | |
| | | | ACGIH TLV | 10 | mg/m3 as Dust | |
| | | | OSHA PEL | 15 | mg/m3 Total Dust | |
| | | | OSHA PEL | 5 | mg/m3 Respirable Fraction | |

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| | | | | | |
|---|---|---|---|---|---|
| 2 | 13463-67-7 | Titanium Dioxide | | | |
| | | ACGIH TLV | 10 | mg/m3 | as Dust |
| | | OSHA PEL | 10 | mg/m3 | Total Dust |
| | | OSHA PEL | 5 | mg/m3 | Respirable Fraction |
| 0.1 | 1333-86-4 | Carbon Black | | | |
| | | ACGIH TLV | 3.5 | mg/m3 | |
| | | OSHA PEL | 3.5 | mg/m3 | |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE
INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.
EFFECTS OF OVEREXPOSURE
EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.
SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.
CANCER INFORMATION
For complete discussion of toxicology data refer to Section 11.

## Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
INGESTION: Do not induce vomiting. Get medical attention immediately.

## Section 5 -- FIRE FIGHTING MEASURES

| FLASH POINT | LEL | UEL |
|---|---|---|
| 80 F PMCC | 0.7 | 7.0 |

FLAMMABILITY CLASSIFICATION
RED LABEL -- Flammable, Flash below 100 F
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode when exposed to extreme heat.
Application to hot surfaces requires special precautions.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

Continued on page 3

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus ld be used.

ater spray may be ineffective. If water is used, fog nozzles are eferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to xtreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

## Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

DOL Storage Class IC

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, lectric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Keep container closed when not in use. Transfer only to approved ontainers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

AUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates listed "as Dust" in Section 2) which may be present at hazardous levels nly during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH LV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. efer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by entilation, wear a properly fitted organic vapor/particulate respirator pproved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator pproved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

ROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

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EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| PRODUCT WEIGHT | 12.53 lb/gal | 1501 g/l |
| SPECIFIC GRAVITY | 1.51 | |
| BOILING POINT | 222 - 360 F | 105 - 182 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 46 % | |
| EVAPORATION RATE | Slower than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |
| VOLATILE ORGANIC COMPOUNDS | (VOC Theoretical) | |
| 3.38 lb/gal 405 g/l | Less Water and Federally Exempt Solvents | |
| 3.38 lb/gal 405 g/l | Emitted VOC | |

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

In fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

Continued on page 5

## Section 11 -- TOXICOLOGICAL INFORMATION

### NIC HEALTH HAZARDS

thylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Carbon Black is classified by IARC as possibly carcinogenic to humans (group 2B) based on experimental animal data, however, there is insufficient evidence in humans for its carcinogenicity.

Crystalline Silica (Quartz, Cristobalite) is listed by IARC and NTP. Long term exposure to high levels of silica dust, which can occur only when sanding or abrading the dry film, may cause lung damage (silicosis) and possibly cancer.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary, cardiovascular and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

### OXICOLOGY DATA

inued on page 6

| CAS No. | Ingredient Name | | | | | |
|---|---|---|---|---|---|---|
| 108-88-3 | Toluene | | | | | |
| | | LC50 | RAT | 4HR | 4000 | ppm |
| | | LD50 | RAT | | 5000 | mg/kg |
| 100-41-4 | Ethylbenzene | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | 3500 | mg/kg |
| 1330-20-7 | Xylene | | | | | |
| | | LC50 | RAT | 4HR | 5000 | ppm |
| | | LD50 | RAT | | 4300 | mg/kg |
| 64742-95-6 | Light Aromatic Hydrocarbons | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 108-67-8 | 1,3,5-Trimethylbenzene | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 95-63-6 | 1,2,4-Trimethylbenzene | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 14808-60-7 | Quartz | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 14807-96-6 | Talc | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 471-34-1 | Calcium Carbonate | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 463-67-7 | Titanium Dioxide | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |
| 1333-86-4 | Carbon Black | | | | | |
| | | LC50 | RAT | 4HR | Not Available | |
| | | LD50 | RAT | | Not Available | |

## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

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## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|
| 108-88-3 | Toluene | 5 | |
| 100-41-4 | Ethylbenzene | 2 | |
| 1330-20-7 | Xylene | 10 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | 4 | |

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume liability in connection with any use of this information.

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# MATERIAL SAFETY DATA SHEET

## Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER
154-2331

HMIS CODES

| | |
|---|---|
| Health | 2 |
| Flammability | 2 |
| Reactivity | 0 |

PRODUCT NAME
Mineral Spirits

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
20-AUG-03

INFORMATION TELEPHONE NO.
(216) 566-2902

## Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| % by WT | CAS No. | INGREDIENT | | UNITS | VAPOR PRESSURE |
|---|---|---|---|---|---|
| 100 | 64742-88-7 | Mineral Spirits | | | |
| | | ACGIH TLV | 100 | ppm | 2 mm |
| | | OSHA PEL | 100 | ppm | |

## Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE
INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE
EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.

CANCER INFORMATION
For complete discussion of toxicology data refer to Section 11.

Continued on page 2

## Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

## Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT
100 F TCC

| LEL | UEL |
|---|---|
| 1.0 | 6.0 |

FLAMMABILITY CLASSIFICATION
Combustible, Flash above 99 and below 200 F

EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode when exposed to extreme heat.
Application to hot surfaces requires special precautions.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

## Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

## Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY
DOL Storage Class II

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Contents are COMBUSTIBLE. Keep away from heat and open flame.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

Continued on page 3

## Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

AUTIONS TO BE TAKEN IN USE
Jse only with adequate ventilation.
Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.
Wash hands after using.

VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION
If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

YE PROTECTION
Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

## Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| PRODUCT WEIGHT | 6.35 lb/gal | 760 g/l |
| SPECIFIC GRAVITY | 0.76 | |
| BOILING POINT | 300 - 395 F | 148 - 201 C |
| MELTING POINT | Not Available | |
| VOLATILE VOLUME | 100 % | |
| EVAPORATION RATE | Slower than ether | |
| VAPOR DENSITY | Heavier than air | |
| SOLUBILITY IN WATER | N.A. | |
| VOLATILE ORGANIC COMPOUNDS (VOC Theoretical) | | |
| 6.35 lb/gal 760 g/l | Less Water and Federally Exempt Solvents | |
| 6.35 lb/gal 760 g/l | Emitted VOC | |

## Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID
None known.

INCOMPATIBILITY
None known.

HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION
Will not occur

Continued on page 4

## Section 11 -- TOXICOLOGICAL INFORMATION

NIC HEALTH HAZARDS

No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver and urinary systems.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

OXICOLOGY DATA

| CAS No. | Ingredient Name | | | | |
|---|---|---|---|---|---|
| 64742-88-7 | Mineral Spirits | | | | |
| | | LC50 | RAT | 4HR | Not Available |
| | | LD50 | RAT | | Not Available |

## Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

## Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container.

pose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

## Section 14 -- TRANSPORT INFORMATION

No data available.

## Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

| CAS No. | CHEMICAL/COMPOUND | % by WT | % Element |
|---|---|---|---|

No ingredients in this product are subject to SARA 313 (40 CFR 372.65C) Supplier Notification.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, n the TSCA Inventory.

inued on page 5

## Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume liability in connection with any use of this information.

PATCO
827

# SAFETY DATA SHEET
FOR

D322 - Rigwash

Date Prepared 8/1/91

CAP CITY PRODUCTS COMPANY
125 SANFORD AVE.
KEARNY, NJ 07032

PHONE: (201)955-2929

Chemical Name:
Chemical Family: Detergents
Trade Name:
Reg. Number: NA
C.A.S. #: NA
ECOIN # : NA

## 1. HAZARDOUS INGREDIENTS

NONE

Solvents:

## 2. PHYSICAL DATA

| | |
|---|---|
| Evaporation Rate: | 2.0 to 6.0 |
| Percent Volatile: | NA |
| Boiling Point (@760mm Hg): | NA |
| Vapor Pressure (mmHg.): | NA |
| Vapor Density (Air=1): | NA |
| Specific Gravity ($H_2O$=1) | Density = 0.10 to 0.30 g/cm$^3$ |
| Solubility in Water: | Complete |
| Appearance and Odor | White free flowing powder with clear odor |

## 3. FIRE AND EXPLOSION HAZARD DATA

| | |
|---|---|
| Flash Point (°F) COC - A.O.C.S. | NA |
| Extinguishing Media: | Non-Flamable |
| Special Fire Fighting Procedures: | |
| Unusual Fire and Explosion Hazards: | |

## 4. HEALTH HAZARD DATA

| | |
|---|---|
| Threshold Limit Value | Not determined |
| Effects of Overexposure | May irritate eyes |

Emergency and First Air Procedures:

Skin - Rinse with water.
Eyes - Flush with water. Call Physician
Ingestion - Drink milk. Do not induce vomitting
Call Physician

04/14/2023

**Eye Protection:**

Safety glasses when handling leakers.

**Other Protective Clothing or Equipment:**

None



04/14/2023

Sent by: OKLA RIG & SUPPLY 9186825936; 07/23/98 8:48; Jetfax #486;Page 6/20

Procter&Gamble Professional®

# MATERIAL SAFETY DATA SHEET

## 1. Product and Company Identification

| | |
|---|---|
| Material name | Dawn Professional Dish Detergent |
| Product Code | 95121663 |
| Version # | 01 |
| Revision date | 05-02-2012 |
| Manufacturer Address | Procter & Gamble Professional<br>2 P&G Plaza<br>Cincinnati<br>Ohio<br>45202<br>US |
| P&G Telephone Number: | 1-800-332-7787 |
| Emergency 24-hr Telephone #: | CHEMTREC 1-800-424-9300 |

## 2. Hazards Identification

**Potential health effects**

| | |
|---|---|
| Routes of exposure | Inhalation. Ingestion. Skin contact. Eye contact. |
| Eyes | Health injuries are not known or expected under normal use. Accidental exposure will cause a mild but transient irritation. |
| Skin | Health injuries are not known or expected under normal use. May cause transient irritation. Prolonged or repeated contact may be drying to skin. |
| Inhalation | Health injuries are not known or expected under normal use. |
| Ingestion | Health injuries are not known or expected under normal use. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. |
| Potential environmental effects | Considering the limited amount applied during use and the size of the container, the risk of adverse effects is considered small. |

## 3. Composition / Information on Ingredients

| Components | CAS # | Percent |
|---|---|---|
| ALCOHOL SULFATES, SODIUM SALT | 68585-47-7 | 7-13 |
| ALCOHOL ETHOXYSULFATE, SODIUM SALT | 68585-34-2 | 5-10 |
| AMINES, C10-16-ALKYLDIMETHYL, N-OXIDES | 70592-80-2 | 1-5 |
| ETHANOL | 64-17-5 | 1-5 |

## 4. First Aid Measures

**First aid procedures**

| | |
|---|---|
| Eye contact | After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Get medical attention if irritation develops and persists. |
| Skin contact | Rinse with water if prolonged contact occurs. Get medical attention if irritation develops and persists. |
| Inhalation | Move to fresh air. |
| Ingestion | Drink 1 or 2 glasses of water. If ingestion of a large amount does occur, call a poison control center immediately. |

## 5. Fire Fighting Measures

| | |
|---|---|
| **Environmental precautions** | Prevent further leakage or spillage if safe to do so. |
| **Extinguishing media** | |
| **Suitable extinguishing media** | Water. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2). |
| **Protection of firefighters** | |
| **Specific hazards arising from the chemical** | This product will not support sustained combustion when in contact with open flame above the indicated flash point. |
| **Protective equipment and precautions for firefighters** | Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. |

## 6. Accidental Release Measures

| | |
|---|---|
| **Personal precautions** | Keep unnecessary personnel away. Wear suitable protective clothing. |
| **Environmental precautions** | Prevent further leakage or spillage if safe to do so. |
| **Clean-up methods and materials and containment measures** | In case of spills, beware of slippery floors and surfaces. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water. |

## 7. Handling and Storage

| | |
|---|---|
| **Handling** | Use personal protective equipment as required. Keep container closed when not in use. Never return spills in original containers for re-use. Keep out of reach of children. |
| **Storage** | Store in a cool and well-ventilated place. Keep from freezing. |

## 8. Exposure Controls / Personal Protection

**Occupational exposure limits**

**US. ACGIH Threshold Limit Values**

| Components | Type | Value |
|---|---|---|
| ETHANOL (64-17-5) | STEL | 1000 ppm |

**US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

| Components | Type | Value |
|---|---|---|
| ETHANOL (64-17-5) | PEL | 1000 ppm<br>1900 mg/m3 |

| | |
|---|---|
| **Engineering controls** | Provide adequate ventilation. |
| **Personal protective equipment** | |
| **Eye / face protection** | Not normally needed. |
| **Skin protection** | Not normally needed. For prolonged or repeated skin contact use suitable protective gloves. Recommended gloves include rubber or neoprene. |
| **Respiratory protection** | Not normally needed. |
| **General hygiene considerations** | Handle in accordance with good industrial hygiene and safety practice. |

## 9. Physical & Chemical Properties

| | |
|---|---|
| **Color** | Dark blue or Yellow |
| **Odor** | Scented |
| **Odor threshold** | Not available. |
| **Physical state** | Liquid. |
| **pH** | 8.7 - 9.3 |
| **Melting point** | Not available. |
| **Freezing point** | 30 °F (-1.1 °C) |
| **Boiling point** | Not available. |

| | |
|---|---|
| **Flash point** | 115 - 135 °F (46.1 - 57.2 °C) Does not sustain combustion. |
| **Evaporation rate** | Not available. |
| **Vapor pressure** | Not available. |
| **Specific gravity** | 1 |
| **Solubility (water)** | Not available. |
| **Partition coefficient (n-octanol/water)** | Not available |
| **VOC** | 5.1514 % estimated |
| **Percent volatile** | 62.975016 % estimated |

## 10. Chemical Stability & Reactivity Information

| | |
|---|---|
| **Chemical stability** | This is a stable material. |
| **Conditions to avoid** | Keep away from heat, sparks and open flame. |
| **Hazardous decomposition products** | No hazardous decomposition products are known. |
| **Hazardous polymerization** | Will not occur. |

## 11. Toxicological Information

**Toxicological data**

| Components | Test Results |
|---|---|
| ETHANOL (64-17-5) | Acute Inhalation LC50 Mouse: 0.039 mg/l 4 Hours<br>Acute Inhalation LC50 Rat: 20000 mg/l 10 Hours<br>Acute Oral LD50 Dog: 5.5 g/kg<br>Acute Oral LD50 Guinea pig: 5.6 g/kg<br>Acute Oral LD50 Mouse: 3450 mg/kg<br>Acute Oral LD50 Rat: 7060 mg/kg<br>Acute Oral LD50 Rat: 6.2 g/kg<br>Acute Other LD50 Mouse: 933 mg/kg<br>Acute Other LD50 Rat: 1440 mg/kg |
| ALCOHOL ETHOXYSULFATE, SODIUM SALT (68585-34-2) | Acute Oral Rat: 1.85 g/kg |
| ALCOHOL SULFATES, SODIUM SALT (68585-47-7) | Acute Oral LD50 Rat: >= 2000 mg/kg |
| AMINES, C10-16-ALKYLDIMETHYL, N-OXIDES (70592-80-2) | Acute Oral LD50 Rat: 1330 mg/kg |

| | |
|---|---|
| **Sensitization** | Not available. |
| **Local effects** | Contact may irritate or burn eyes. |
| **Chronic effects** | Hazardous by OSHA criteria. Hazardous by WHMIS criteria. |
| **Skin corrosion/irritation** | Not available. |

## 12. Ecological Information

| | |
|---|---|
| **Environmental effects** | Based on ecotoxicity and fate data for the individual ingredients in this specific formulation, and for related consumer household cleaning products formulations, this product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment at relevant environmental concentrations. This product is intended for dispersive use and should not be disposed of directly into the environment. |

## 13. Disposal Considerations

| | |
|---|---|
| **Waste codes** | Not regulated. Product is an aqueous solution that contains less than 24% alcohol. |
| **Disposal instructions** | This product, in its present state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4 (b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations. |

## 14. Transport Information

**DOT**

Not regulated as dangerous goods.

**IMDG**

Not regulated as dangerous goods.

**IATA**

Not regulated as dangerous goods.

## 15. Regulatory Information

**US federal regulations** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**CERCLA (Superfund) reportable quantity**

ETHANOL: 100

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

| | |
|---|---|
| **Hazard categories** | Immediate Hazard - Yes<br>Delayed Hazard - Yes<br>Fire Hazard - Yes<br>Pressure Hazard - No<br>Reactivity Hazard - No |
| **Section 302 extremely hazardous substance** | No |
| **Section 311 hazardous chemical** | Yes |

**State regulations**

**ILLRTK**

Contains no Illinois Right To Know toxic substances.

**US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance**

| | |
|---|---|
| ETHANOL (CAS 64-17-5) | ALCOHOLIC BEVERAGES, WHEN ASSOCIATED WITH ALCOHOL ABUSE<br>ETHANOL IN ALCOHOLIC BEVERAGES<br>ETHYL ALCOHOL IN ALCOHOLIC BEVERAGES |

**US - California Proposition 65 - CRT: Listed date/Carcinogenic substance**

| | |
|---|---|
| ETHANOL (CAS 64-17-5) | ALCOHOLIC BEVERAGES, WHEN ASSOCIATED WITH ALCOHOL ABUSE<br>ETHANOL IN ALCOHOLIC BEVERAGES |

**US - Connecticut Hazardous Material Survey: Listed substance**

| | |
|---|---|
| ETHANOL (CAS 64-17-5) | LISTED |

**US - Illinois Chemical Safety Act: Listed substance**

| | |
|---|---|
| RCRA HAZARDOUS WASTE NO. D001 (CAS 64-17-5) | RCRA HAZARDOUS WASTE NO. D001<br>UNLISTED HAZARDOUS WASTES CHARACTERISTIC OF IGNITABILITY |

**US - Massachusetts RTK - Substance: Listed substance**

| | |
|---|---|
| ETHANOL (CAS 64-17-5) | LISTED |

**US - New Jersey Community RTK (EHS Survey): Listed substance**

**US - New Jersey RTK - Hazardous substance**

**US - New Jersey RTK - Special Hazard: Listed substance**

| | |
|---|---|
| ETHANOL (CAS 64-17-5) | ETHYL ALCOHOL SPEC_HAZAROUS |

**US - New Jersey RTK - Substances: Listed substance**

| | |
|---|---|
| ETHANOL (CAS 64-17-5) | ETHYL ALCOHOL LISTED |

**US - Pennsylvania RTK - Hazardous Substances: Listed substance**

| | |
|---|---|
| ETHANOL (CAS 64-17-5) | LISTED |

**US - Rhode Island RTK - Hazardous Substances: Listed substance**

ETHANOL (CAS 64-17-5) LISTED

**Canadian regulations**

All ingredients are CEPA approved for import to Canada by Procter & Gamble. This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

**Inventory Status**

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|---|---|---|
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | Yes |

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

## 16. Other Information

**HMIS® ratings**

Health: 2
Flammability: 2
Physical hazard: 0

**NFPA ratings**

Health: 2
Flammability: 2
Instability: 0
Special hazards:

**Disclaimer**

This MSDS is intended to provide a brief summary of our knowledge and guidance regarding the use of this material. The information contained here has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company's knowledge. It is not meant to be an all-inclusive document on worldwide hazard communication regulations.

This information is offered in good faith. Each user of this material needs to evaluate the conditions of use and design the appropriate protective mechanisms to prevent employee exposures, property damage or release to the environment. Procter & Gamble assumes no responsibility for injury to the recipient or third persons, or for any damage to any property resulting from misuse of the product.

**Clorox Professional Products Company**
1221 Broadway
Oakland, CA 94612
Tel. (510) 271-7000

# Material Safety Data Sheet

**I Product:** CLOROX COMMERCIAL SOLUTIONS® FORMULA 409® CLEANER DEGREASER DISINFECTANT

**Description:** CLEAR, COLORED LIQUID WITH A CITRUS/FLORAL ODOR

| Other Designations | Distributor | Emergency Telephone Nos. |
|---|---|---|
| EPA Reg. No. 67619-10 | Clorox Professional Products Company<br>1221 Broadway<br>Oakland, CA 94612 | For Medical Emergencies call:<br>(800) 446-1014<br>For Transportation Emergencies Chemtrec<br>(800) 424-9300 |

## II Health Hazard Data

CAUTION: EYE IRRITANT. Avoid eye and prolonged skin contact. Do not ingest.

FIRST AID:

EYE CONTACT: Immediately flush eyes with plenty of water. If irritation persists, see a doctor.

SKIN CONTACT: Wash with water. Seek medical attention if irritation develops or persists.

INGESTION: Drink a glassful of water. Call a physician. Do not induce vomiting. Do not give anything by mouth to an unconscious or convulsing person.

INHALATION: If breathing problems develop remove to fresh air. Seek medical attention if respiratory irritation develops or breathing becomes difficult.

KEEP OUT OF REACH OF CHILDREN

## III Hazardous Ingredients

| Ingredients | Concentration | Worker Exposure Limit |
|---|---|---|
| n-Alkyl (C12-16) Dimethylbenzyl Ammonium Chloride CAS #68424-85-1 | 0.3-0.6% | None Established |
| n-Propoxypropanol CAS # 1569-01-3 | 0.5 - 2% | None Established |
| Monoethanolamine CAS #141-43-5 | 0.5 – 1.5% | 3 ppm - TLV-TWA[a]<br>3 ppm - PEL[b]<br>6 ppm - TLV-STEL[c] |

[a]TLV-TWA = ACGIH Threshold Limit Value - Time Weighted Average

[b]PEL = OSHA Permissible Exposure Limit - Time Weighted Average

[c]TLV-STEL = ACGIH Threshold Limit Value - Short Term Exposure Limit

None of the materials in this product are on the IARC, OSHA, or NTP carcinogen lists.

## IV Special Protection and Precautions

Hygienic Practices: Wash hands after direct contact. Do not wear product-contaminated clothing for prolonged periods.

Engineering Controls: Use general ventilation to minimize exposure to product vapor or mist.

Personal Protective Equipment: Wear safety glasses. Wear gloves for repeated or prolonged skin contact.

## V Transportation and Regulatory Data

DOT/IATA/IMDG: Not restricted.

EPA - SARA Title III/CERCLA:
This product is not reportable under Sections 311/312 or 313; and contains no chemicals which are regulated under Section 304/CERCLA.

TSCA Status: All components of this product are on the TSCA Inventory.

## VI Spill Procedures/Waste Disposal

Spill Procedures: Absorb and containerize. Wash residual down to sanitary sewer. Contact the sanitary treatment facility in advance to assure ability to process washed-down material.

Waste Disposal: Dispose of in accordance with all applicable federal, state, and local regulations.

## VII Reactivity Data

Stable under normal use and storage conditions.

## VIII Fire and Explosion Data

Flash Point: >200 F

Fire Extinguishing Agents: Foam, Dry Chemical, Water, $CO_2$

## IX Physical Data

pH ..... 10.5
Solubility in Water ..... complete
Specific Gravity ($H_2O$=1) ..... ~1.0

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DATA SUPPLIED IS FOR USE ONLY IN CONNECTION WITH OCCUPATIONAL SAFETY AND HEALTH DATE PREPARED 6/06

04/14/2023

720872

# The Clorox Company
1221 Broadway
Oakland, California 94621
Tel. (510) 271-7000

# Material Safety Data Sheet

**I Product:** PRO 409 ANTIBACTERIAL

**Description:** Clear Green Liquid

| Other Designations | Distributed by | Emergency Telephone No. |
|---|---|---|
| EPA Registration Number 5813-55 | Clorox Sales Company<br>1221 Broadway<br>Oakland, CA 94612 | For Medical Emergencies call:<br>Rocky Mountain Poison Center<br>(800) 446-1014<br>For Transportation Emergencies Chemtrec<br>(800) 424-9300 |

## II Health Hazard Data

Eye irritant. Direct or prolonged skin contact may result in irritation. Avoid contact with food.

Overexposure to this product may cause the Worker Exposure Limit of 2-butoxyethanol to be exceeded. 2-butoxyethanol has been shown to cause red blood cell hemolysis in laboratory animals and secondary injury to the kidney and liver. However, humans apear to be resistant to this effect.

No know medical conditions are know to be aggravated by exposure to this product.

FIRST AID:

EYES: Flush eyes with water for at least 15 minutes. Call physician if irritation occurs.

SKIN CONTACT: Rinse skin with water. If irritation develops contact a physician.

INGESTION: Drink a glassful of water to dilute. Call a physician.

INHALATION: Remove from area to fresh air. Seek medical attention if respiratory irritation develops or if breathing becomes difficult.

## III Hazardous Ingredients

| Ingredients | Concentration | Worker Exposure Limit |
|---|---|---|
| Alkyl ($C_{12}$ 40%; $C_{14}$ 50% $C_{16}$ 10%) dimethyl benzyl ammonium chloride CAS #68424-85-1 | 0.3% | Not Established |
| Ethylene Glycol Monobutyl Ether CAS #111-76-2 | 3-8% | 25 ppm TLV-TWA<br>25 ppm PEL |
| Potassium carbonate CAS#584-08-7 | 1-3% | Not Established |

Note that 2-butoxyethanol can be absorbed through the skin and may contribute to overall exposure.

None of the ingredients in this product is on the IARC, NTP or OSHA carcinogen lists.

TLV-TWA - Threshold Limit Value - Time Weighted Average.
Source: ACGIH 1995-1996.
PEL - Permissible Exposure Limit. Source: OSHA

## IV Special Protection and Precautions

The following recommendations are given for production facilities and for other conditions and situations where there is increased potential for accidental, large-scale, or prolonged exposure:

Hygienic Practices: Wash hands after direct contact.

Engineering Controls: Use general ventilation to minimize exposure to mist.

Work Practices: Wear safety glasses and gloves. Do not inhale vapor or mist.

## V Transportation and Regulatory Data

DOT: Not restricted per 49 CFR 173.120(a)(3) and Appendix H.

IMO: Not restricted per IMDG Code Page 0016 Paragraph 5.1.3.1.1

IATA: Not restricted per IATA D.G.R. Sections 3.3.1.2 and 3.3.5

TSCA Status: All components of this product are on the TSCA Inventory.

EPA - SARA Title III/CERCLA: Bottled product is not reportable under Sections 311/312; contains no chemicals regulated under Section 313; and contains glycol ethers < 8% which is regulated under Section 304/CERCLA.

## VI Spill or Leak Procedures

Spill Procedures: Absorb and containerize. Wash residual down to sanitary sewer. Contact the sanitary treatment facility in advance to assure ability to process washed-down material.

Waste Disposal: Dispose of in accordance with all applicable federal, state, and local regulations.

## VII Reactivity Data

Stable under normal use and storage conditions.

## VIII Fire and Explosion Data

Flash Point: 128°F

Fire Extinguishing Agents: , Dry Chemical, carbon dioxide ($CO_2$), foam, or water spray.

## IX Physical Data

pH.....11.3
Specific Gravity.....1.01 @ 25C
Solubility in Water.....Soluble

PROANTI

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DATE PREPARED 7/98

DATA SUPPLIED IS FOR USE ONLY IN CONNECTION WITH OCCUPATIONAL SAFETY AND HEALTH

04/14/2023

720868

The Clorox Company
1221 Broadway
Oakland, CA 94612
Tel. (510) 271-7000

# Material Safety Data Sheet

**Product:** PINE-SOL® BRAND CLEANER

**Description:** CLEAR AMBER LIQUID WITH CHARACTERISTIC PINE ODOR

| Other Designations | Distributor | Emergency Telephone Nos. |
|---|---|---|
| | Clorox Sales Company<br>1221 Broadway<br>Oakland, CA 94612 | For Medical Emergencies call:<br>(800) 446-1014<br>For Transportation Emergencies Chemtrac<br>(800) 424-9300 |

## II Health Hazard Data

Eye irritant. May cause skin irritation. Avoid contact with food.
No medical conditions are known to be aggravated by exposure to this product.

FIRST AID:
EYE CONTACT: Immediately rinse eyes with water for 15 minutes. If irritation persists, call a physician.
INGESTION: DO NOT INDUCE VOMITING. Drink a glass/of water. Immediately call a physician.
SKIN CONTACT: Remove contaminated clothing. Wash skin with water. If irritation persists, call a physician.
INHALATION: Remove to fresh air. If breathing problems develop, call a physician.

## III Hazardous Ingredients

| Ingredient | Concentration | Worker Exposure Limit |
|---|---|---|
| Pine oil<br>CAS # 8002-09-3 | 10 - 20% | Not established. |
| Isopropyl alcohol<br>CAS # 67-63-0 | 4 - 7% | 400 ppm - TLV-TWA*<br>400 ppm - PEL*<br>500 ppm - TLV-STEL* |
| Alkyl alcohol ethoxylates<br>CAS # 68439-15-0 | 2 - 6% | Not established. |

*TLV-TWA = ACGIH Threshold Limit Value - Time Weighted Average
*PEL-TWA = OSHA Permissible Exposure Limit - Time Weighted Average
*TLV-STEL = ACGIH Threshold Limit Value - Short Term Exposure Limit
None of the materials in this product are on the IARC, OSHA, or NTP carcinogen lists.

## IV Special Protection and Precautions

Hygienic Practices: Wash hands after direct contact. Do not wear product-contaminated clothing for prolonged periods.

Engineering Controls: Use local exhaust to minimize exposure to product mist.

Personal Protective Equipment: Wear safety glasses. Wear gloves if there is the potential for repeated or prolonged skin contact.

## V Transportation and Regulatory Data

DOT: Not restricted.
DOT Proper Shipping Name: n/a.
IMO Proper Shipping Name: Dangerous goods in limited quantities of Class 3.3.
IATA Proper Shipping Name: Flammable liquid, Class 3, PGIII.
TSCA Inventory/Canadian Domestic Substances List Status:
All components of this product are listed.
EPA - SARA Title III/CERCLA: Packaged product is not reportable under Sections 311/312. This product contains no chemicals regulated under Section 313 and contains sodium dodecylbenzenesulfonate (CAS #25155-30-0, <4%), ammonium hydroxide (CAS #1336-21-6, <1%), benzoic acid (CAS #65-85-0, <1%) and glycol ethers (<1%) which are regulated under Section 304/CERCLA.

## VI Spill Procedures/Waste Disposal

Spill Procedures: Absorb and containerize. Wash residual down to sanitary sewer. Contact the sanitary treatment facility in advance to assure ability to process washed-down material.

Waste Disposal: Dispose of in accordance with all applicable federal, state, and local regulations.

## VII Reactivity Data

Stable under normal use and storage conditions.

## VIII Fire and Explosion Data

Flash Point: 105°F (Setaflash closed cup)
Fire Extinguishing Agents: Dry chemical, carbon dioxide ($CO_2$), foam or water spray.

## IX Physical Data

| | |
|---|---|
| pH | 3.0 - 4.0 |
| Specific gravity | ~1.0 |
| Solubility in water | Soluble |

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DATE PREPARED 10/00
04/14/2023

**The Clorox Company**
1221 Broadway
Oakland, CA 94612
Tel. (510) 271-7000

# Material Safety Data Sheet

**I Product:** ORIGINAL PINE-SOL® MULTI-SURFACE CLEANER

**Description:** CLEAR, AMBER, SLIGHTLY VISCOUS LIQUID WITH A CHARACTERISTIC PINE ODOR

| Other Designations | Distributor | Emergency Telephone Nos. |
|---|---|---|
| EPA Reg. No. 5813-101 | The Clorox Sales Company<br>1221 Broadway<br>Oakland, CA 94612 | For Medical Emergencies, call 1-800-446-1014.<br>For Transportation Emergencies, call 1-800-424-9300 (Chemtrec). |

## II Health Hazard Data

Causes moderate eye irritation.

No medical conditions are known to be aggravated by exposure to this product.

FIRST AID:

EYE CONTACT: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing eye. If irritation persists, call a doctor.

SKIN CONTACT: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. If irritation develops, call a doctor.

INGESTION: Call a poison control center or doctor immediately for treatment advice. Have person sip a glassful of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If breathing is affected, call a doctor.

## III Hazardous Ingredients

| Ingredient | Concentration | Worker Exposure Limit |
|---|---|---|
| Pine oil<br>CAS # 8002-09-3 | 3 - 7% | Not established. |
| Alkyl alcohol ethoxylates<br>CAS # 66455-15-0 | 1 - 5% | Not established. |
| Sodium petroleum sulfonate<br>CAS # 68608-26-4 | 1 - 5% | Not established. |
| Glycolic acid<br>CAS # 79-14-1 | 1 - 5% | Not established. |
| Isopropyl alcohol<br>CAS #67-63-0 | 0.5 - 1.5% | 200 ppm - TLV-TWA[a]<br>400 ppm - PEL[b]<br>400 ppm - TLV-STEL[c] |

[a]TLV-TWA = ACGIH Threshold Limit Value - Time Weighted Average

[b]PEL = OSHA Permissible Exposure Limit - Time Weighted Average

[c]TLV-STEL = ACGIH Threshold Limit Value - Short Term Exposure Limit

None of the materials in this product are on the IARC, OSHA, or NTP carcinogen lists.

## IV Special Protection and Precautions

Hygienic Practices: Wash thoroughly with soap and water after handling. Remove and wash contaminated clothing before reuse.

Engineering Controls: Use general ventilation or local exhaust to minimize exposure to vapor or mist.

Personal Protective Equipment: Wear safety glasses. Wear rubber or neoprene gloves if there is the potential for repeated or prolonged skin contact. In situations where exposure limits may be exceeded, a NIOSH-approved respirator is advised.

## V Transportation and Regulatory Data

DOT: Not restricted per 49 CFR 173.120(a)(3) and Appendix H.

IMDG: Not restricted per IMDG Code Page 0016 Paragraph 5.1.3.1.1.

IATA: Not restricted per IATA D.G.R. Sections 3.3.1.2 and 3.3.5.

EPA - SARA Title III/CERCLA: This product is regulated under Sections 311/312. This product contains no chemicals that are regulated under Section 313 or under Section 304/CERCLA.

## VI Spill Procedures/Waste Disposal

Spill Procedures: Absorb and containerize. Wash residual down to sanitary sewer. Contact the sanitary treatment facility in advance to assure ability to process washed-down material.

Waste Disposal: Dispose of in accordance with all applicable federal, state, and local regulations.

## VII Reactivity Data

Stable under normal use and storage conditions.

Do not use or mix with bleach-containing products or other household cleaners.

## VIII Fire and Explosion Data

Flash Point: 59°C (closed cup).

Fire Extinguishing Agents: Dry chemical, carbon dioxide ($CO_2$), foam, or water spray.

## IX Physical Data

pH ..... ~ 2
Specific gravity ..... ~1.0
Solubility in water ..... Appreciable
Viscosity ..... ~10 cP

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DATE PREPARED 10/2011
04/14/2023

KIK CUSTOM PRODUCTS

*Material Safety Data Sheet*

# Pure Bright Germicidal Bleach

## SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

| | |
|---|---|
| Product Name | 8.25% Sodium Hypochlorite |
| Reference Number | H12-023 (EPA Reg. No. 70271-24) |
| Company | KIK International Inc.<br>33 MacIntosh Blvd.<br>Concord, Ontario L4K 4L5<br>T: 905-660-0444 |
| 24 Hour Emergency Contact | 1-800-255-3924 |
| Prepared By | Product Development KIK Classic Division |
| Revised Date | 01-31-12 Revision: New |

## SECTION 2: HAZARD IDENTIFICATION

**General Advice:** DANGER! CORROSIVE.
May cause severe burns or damage to eyes.
May cause severe skin burns or irritation.
Harmful if swallowed.
Vapor or mist may irritate.
If irritation occurs see a doctor immediately. Keep out of reach of children and pets.

**Routes of Exposure:** Eyes, Skin, Inhalation, Ingestion
**Potential Health Effects:**
**Eyes:** Vapor or mist can be irritation, causing redness. Concentrated vapor, mist or splashed liquid can cause severe irritation, burns or even permanent blindness.
**Skin:** Contact may produce severe irritation or corrosive skin damage, depending upon length of contact. Under normal consumer use conditions the likelihood of any adverse health effects are low.
**Inhalation:** Vapor or mist can cause irritation to nose, throat and upper respiratory tract. Symptoms include: coughing, choking. Severe exposure can result in pulmonary edema and corrosion of tissues in the nose and throat.
**Ingestion:** Causes severe burns of the mouth, esophagus, and stomach, with consequent pain, nausea, vomiting, diarrhea, circulatory collapse.
**Target organs:** Eyes. Skin.
**Chronic effects:** Not known.



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# Pure Bright Germicidal Bleach

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

| *Chemical Name* | *Concentration %* | *CAS No.* | *Worker Exposure Limit* |
|---|---|---|---|
| Sodium Hypochlorite | 6% - 9% | 7681-52-9 | 5800 mg/kg / >10500 |
| Sodium Hydroxide | <1.00% | 7647-01-0 | Not Established |

## SECTION 4: FIRST AID MEASURES

**Eyes:** Flush eyes immediately with lukewarm water for at least 20 minutes. Remove contact lenses after first 5 minutes. Forcibly hold eyelids apart to ensure complete irrigation of eye tissue. See doctor immediately.

**Skin:** Remove contaminated clothing. Immediately wash the skin with copious amount of lukewarm water for at least 20 - 30 minutes. See doctor immediately.

**Inhalation:** Move to fresh air immediately and restore breathing. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. See doctor immediately.

**Ingestion: DO NOT INDUCE VOMITING UNLESS DIRECTED TO DO SO BY MEDICAL PERSONNEL!** Rinse mouth out with water. Drink 1 or 2 glasses of water, if swallowing is possible. Do not give anything by mouth to a convulsing or unconscious person. See a doctor immediately.

## SECTION 5: FIRE FIGHTING MEASURES

This product is neither flammable nor explosive.

Suitable extinguishing media : Treat for surrounding material.

Protective equipment for fire-fighters : As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

# Pure Bright Germicidal Bleach

## SECTION 6: ACCIDENTAL RELEASE MEASURES

Always contained all type of spills. Be sure to wear protective equipment (see Section 8)

**Leak and Spill Procedure:** Rinse with water, mop up, dispose of in accordance with local, state/provincial and federal regulations.

**Large Spills:** Large spills should be contained, and if not recoverable, then diluted with water. Use a water rinse for final clean-up.

## SECTION 7: HANDLING AND STORAGE

**Handling:** Use only as directed. Avoid any contact with eyes, skin and clothing. When using, do not eat or drink.

**Storage:** Store in a cool, dry and well-ventilated area. Always keep the container closed when not in use. KEEP OUT OF REACH OF CHILDREN AND PETS.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### Household Setting

**Eyes Protection** – No special requirements under normal use conditions.

**Hand Protection** – Use gloves for prolonged exposure.

**Footwear** – No special requirements under normal use conditions.

**Respiratory protection** – Not normally required.

### Industrial Setting

**Eyes Protection** – Wear splash-resistant, full-face shield chemical goggles.

**Hand Protection** – Use suitable gloves.

**Footwear** – Impervious boots of chemically resistant material should be worn at all times.

**Respiratory protection** – If ventilation is not sufficient to prevent vapor build up, use appropriate NIOSH/MSHA respiratory protection.



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# Pure Bright Germicidal Bleach

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| Form | : Liquid |
| Appearance | : Clear |
| Color | : Slightly yellow |
| Odor | : Bleach |
| pH | : 12.0 – 13.0 |
| Specific Gravity | : 1.09 minimum (water = 1) |
| Viscosity | : Water thin |
| Water Solubility | : Complete |
| Boiling Point | : 212°F (100°C) |
| Melting Point | : no data available |
| Freezing point | : no date available |

## SECTION 10: STABILITY AND REACTIVITY

**Chemical Stability:** Stable under normal use and storage conditions.
**Conditions to avoid:** Temperature above 40°C, sunlight and metals.
**Materials to avoid:** Acids, ammonia, urea, metals and oxidizers.
**Reactivity:** Releases Chlorine gas if mixed with ammonia.

## SECTION 11: TOXICOLOGICAL INFORMATION

**Acute Oral Toxicity**: Will cause membrane irritation, pain and inflammation to digestive tract.

**Acute dermal toxicity**: Will cause moderate irritation to skin and severe irritation and pain to eyes.

| | |
|---|---|
| **Chronic toxicity** | : None known. |
| **Carcinogenic Effects** and ACGIH | : Not considered to be carcinogenic by IARC, NTP |
| **Mutagenic Effects** | : None Known |
| **Reproductive Toxicity** | : None Known |

# Pure Bright Germicidal Bleach

## SECTION 12: ECOLOGICAL INFORMATION

**Ecotoxicity effects** : Not Available

## SECTION 13: DISPOSAL CONSIDERATIONS

Reclaim or dispose in accordance with federal, provincial and local regulations.

## SECTION 14: TRANSPORTATION INFORMATION

**U.S. DOT and Canadian TDG land Transportation**
Class 8: Corrosive material
UN Number: 1791
Proper Shipping name: Sodium Hypochlorite Solution
Packaging group: III
Marine pollutant: No

**IMDG Sea Transport**
Class 8: Corrosive material
UN Number: 1791
Proper Shipping name: Sodium Hypochlorite Solution
Packaging group: III
Marine pollutant: No

## SECTION 15: REGULATORY INFORMATION

**TSCA/DSL Status**: All components in this product are on the U.S. TSCA and Canadian DSL.

**WHMIS (Canada):** Class C: Oxidizing Material
**Class D, Div.** 2, Toxic Liquid, Skin Sensitizer



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# Pure Bright Germicidal Bleach

## SECTION 16: OTHER INFORMATION

**HMIS Ratings**

| | |
|---|---|
| Health | : 2 |
| Flammability | : 0 |
| Reactivity | : 2 |

**NFPA Ratings**

| | |
|---|---|
| Health | : 2 |
| Flammability | : 0 |
| Reactivity | : 2 |

| | |
|---|---|
| Created By: Mitul Bhandari | Date: 1/31/2012 |
| Approved By: Eden Mercado | Date: 1/31/2012 |

***** Preliminary MSDS. Subject to change *****

As the handling and use of this product are beyond our control, no warranty, expressed or implied is made concerning this product. The information contained here is offered only as a guide and is not intended to be all-inclusive in the manner and conditions of use and handling. The user assumes all risks of use or handling whether or not in accordance with any directions or suggestions of the manufacturer. Manufacturer shall not be liable to purchaser or any other person for loss or damages directly or indirectly arising from the use of our product.



04/14/2023

720890

# MATERIAL SAFETY DATA SHEET: SIMPLE GREEN®

## I. PRODUCT & COMPANY INFORMATION

**PRODUCT NAME:** SIMPLE GREEN® CLEANER / DEGREASER / DEODORIZER



**COMPANY NAME:** SUNSHINE MAKERS, INC.
15922 Pacific Coast Highway
Huntington Harbour, CA 92649 USA
Telephone: 800-228-0709 • 562-795-6000
Fax: 562-592-3034
Website: www.simplegreen.com

Version No. 1007
Issue Date: January, 2002

For 24-hour emergency, call Chem-Tel, Inc.: 800-255-3924

**USE OF PRODUCT:** An all purpose cleaner and degreaser used undiluted or diluted in water for direct, spray, and dip tank procedures.

## II. INGREDIENT INFORMATION

The only ingredient of Simple Green® with established exposure limits is undiluted 2-butoxyethanol (<6%) (Butyl Cellosolve; CAS No. 111-76-2): the OSHA PEL and ACGIH TLV is 25 ppm (skin). Note, however, that Butyl Cellosolve is only one of the raw material ingredients that undergo processing and dilution during the manufacture of Simple Green®. Upon completion of the manufacturing process, Simple Green® does not possess the occupational health risks associated with exposure to undiluted Butyl Cellosolve. Verification of this is contained in the independent test results detailed under "Toxicological Information" on Page 3 of this MSDS.

The Butyl Cellosolve in Simple Green® is part of a chemical category (glycol ethers) regulated by the Emergency Planning and Community Right-to-Know Act (SARA, Title III, section 313); therefore, a reporting requirement exists. Based upon chemical analysis, Simple Green® contains no known EPA priority pollutants, heavy metals, or chemicals listed under RCRA, CERCLA, or CWA. Analysis by TCLP (Toxicity Characteristic Leaching Procedure) according to RCRA revealed no toxic organic or inorganic constituents.

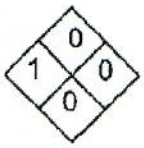
All components of Simple Green® are listed on the TSCA Chemical Substance Inventory.

## III. HAZARDS IDENTIFICATION

UN Number: Not required
Dangerous Goods Class: Nonhazardous

Hazard Rating (NFPA/HMIS)

Health = 1* Reactivity = 0
Fire = 0 Special = 0




Rating Scale

0 = minimal 1 = slight
2 = moderate 3 = serious
4 = severe

*Mild eye irritant, non-mutagenic and non-carcinogenic. **None of the ingredients in Simple Green® are regulated or listed as potential cancer agents by Federal OSHA, NTP, or IARC.**

## IV. FIRST AID MEASURES

***SYMPTOMS OF OVEREXPOSURE AND FIRST AID TREATMENT***

Eye contact: Reddening may develop. Immediately rinse the eye with large quantities of cool water; continue 10-15 minutes or until the material has been removed; be sure to remove contact lenses, if present, and to lift upper and lower lids during rinsing. Get medical attention if irritation persists.

Skin contact: Minimal effects, if any; rinse skin with water, rinse shoes and launder clothing before reuse. Reversible reddening may occur in some dermal-sensitive users; thoroughly rinse area and get medical attention if reaction persists.

Swallowing: Essentially non-toxic. Give several glasses of water to dilute; do not induce vomiting. If stomach upset occurs, consult physician.

Inhalation: Non-toxic. Exposures to concentrate-mist may cause mild irritation of nasal passages or throat; remove to fresh air. Get medical attention if irritation persists.

## V. FIRE FIGHTING MEASURES

Simple Green® is stable, not flammable, and will not burn.

| | |
|---|---|
| Flash Point/Auto-Ignition: | Not flammable. |
| Flammability Limits: | Not flammable. |
| Extinguishing Media: | Not flammable/nonexplosive. No special procedures required. |
| Special Fire Fighting Procedures: | None required. |

## VI. ACCIDENTAL RELEASE MEASURES

Recover usable material by convenient method; residual may be removed by wipe or wet mop. If necessary, unrecoverable material may be washed to drain with large quantities of water.

## VII. HANDLING, STORAGE & TRANSPORT INFORMATION

No special precautions are required. **This product is non-hazardous for storage and transport according to the U.S. Department of Transportation Regulations.** Simple Green® requires no special labeling or placarding to meet U.S. Department of Transportation requirements.

UN Number: Not required Dangerous Goods Class: Non-hazardous

## VIII. EXPOSURE CONTROLS

**Exposure Limits:** The Simple Green® formulation presents no health hazards to the user when used according to label directions for its intended purposes. Mild skin and eye irritation is possible (please see Eye contact and Skin contact in Section IV.).

**Ventilation:** No special ventilation is required during use.

**Human Health Effects or Risks from Exposure:** Adverse effects on human health are not expected from Simple Green®, based upon twenty years of use without reported adverse health incidence in diverse population groups, including extensive use by inmates of U.S. Federal prisons in cleaning operations.

Simple Green® is a mild eye irritant; mucous membranes may become irritated by concentrate-mist.

Simple Green® is not likely to irritate the skin in the majority of users. Repeated daily application to the skin without rinsing, or continuous contact of Simple Green® on the skin may lead to temporary, but reversible, irritation.

**Medical Conditions Aggravated by Exposure:** No aggravation of existing medical conditions is expected; dermal sensitive users may react to dermal contact by Simple Green®.

## IX. PERSONAL PROTECTION

| | |
|---|---|
| Precautionary Measures: | No special requirements under normal use conditions. |
| **Eye Protection:** | **Caution, including reasonable eye protection, should always be used to avoid eye contact where splashing may occur.** |
| Skin Protection: | No special precautions required; rinse completely from skin after contact. |
| Respiratory Protection: | No special precautions required. |
| Work and Hygienic Practices: | No special requirements. Wash or rinse hands before touching eyes or contact lenses. |

## X. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance/odor:** Translucent green liquid with characteristic sassafras odor.

| | | | |
|---|---|---|---|
| **Specific Gravity:** | 1.0257 | **Vapor Pressure:** | 17 mm Hg @ 20 °C; 22 mm Hg @ 25 °C |
| **pH of concentrate:** | 9.5 | **Vapor Density:** | 1.3 (air = 1) |
| **Evaporation:** | >1 (butyl acetate = 1) | **Density:** | 8.5 lbs./gallon |
| **Boiling Point:** | 110 °C (231 °F) | | |

**Freezing Point:** -9 °C (16 °F) If product freezes, it will reconstitute without loss of efficacy when brought back to room temperature and agitated.

**VOC Composite Partial Pressure:** 0.006 mm Hg @ 20 °C

**Volatile Organic Compounds (VOCs):** 7.96 g/L per ASTM Method 3960-90. Per California AQMD's VOC test method, product must be diluted at least 2 parts of water to 1 part Simple Green® in order to meet SCAQMD Rule 1171 & Rule 1122 and BAAQMD Regulation 8-16 VOC requirements for solvent cleaning operations.

**Water Solubility:** Completely soluble in water. The higher salt concentrations in marine ecosystems will lead to complexes with Simple Green® that may become visible at ratios above one part Simple Green® to 99 parts seawater.

**Ash Content:** At 600 °F: 1.86% by weight.

**Nutrient Content:** Nitrogen: <1.0% by weight (fusion and qualitative test for ammonia).
Phosphorus: 0.3% by formula.
Sulfur: 0.6% by weight (barium chloride precipitation method).

**Detection:** Simple Green® has a characteristic sassafras odor that is not indicative of any hazardous situation.

## XI. STABILITY AND REACTIVITY INFORMATION

Nonreactive. Simple Green® is stable, even under fire conditions, and will not react with water or oxidizers. Hazardous polymerization will not occur.

## XII. TOXICOLOGICAL INFORMATION

**Nonhuman Toxicity**

**Acute Mortality Studies:**

Oral $LD_{50}$ (rat): >5.0 g/kg body weight // Dermal $LD_{50}$ (rabbit): >2.0 g/kg body weight

**Dermal Irritation:** Only mild, but reversible, irritation was found in a standard 72-hr test on rabbits. A value of 0.2 (non-irritating) was found on a scale of 8.

**Eye Irritation:** With or without rinsing with water, the irritation scores in rabbits at 24 hours did not exceed 15 (mild irritant) on a scale of 110.

**Subchronic dermal effects:** No adverse effects, except reversible dermal irritation, were found in rabbits exposed to Simple Green® (up to 2.0 g/kg/day for 13 weeks) applied to the skin of 25 males and 25 females. Only female body weight gain was affected. Detailed microscopic examination of all major tissues showed no adverse changes.

**Fertility Assessment by Continuous Breeding:** The Simple Green® formulation had no adverse effect on fertility and reproduction in CD-1 mice with continuous administration for 18 weeks, and had no adverse effect on the reproductive performance of their offspring.

## XIII. BIODEGRADABILITY AND ENVIRONMENTAL TOXICITY INFORMATION

**Biodegradability:**
Simple Green® is readily decomposed by naturally occurring microorganisms. The biological oxygen demand (BOD), as a percentage of the chemical oxygen demand (COD), after 4, 7, and 11 days was 56%, 60%, and 70%, respectively. Per OECD Closed Bottle Test, Simple Green® meets OECD and EPA recommendations for ready biodegradability.
In a standard biodegradation test with soils from three different countries, Butyl Cellosolve reached 50% degradation in 6 to 23 days, depending upon soil type, and exceeded the rate of degradation for glucose which was used as a control for comparison.

**Environmental Toxicity Information:**
Simple Green® is considered practically non-toxic per EPA's aquatic toxicity scale. Simple Green® is non-lethal to any of the marine and estuarine test animals listed in the following table at concentrations below 200 mg/L (0.02%). This table shows the Simple Green® concentrations that are likely to be lethal to 50% of the exposed organisms.

| | $LC_{50}$ in mg/L (ppm) | |
|---|---|---|
| | 48-hour | 96-hour |
| Marine Fish: | | |
| Mud minnow *(Fundulus heteroclitus)* | 1690 | 1574 |
| Whitebait *(Galaxias maculatus)* | 210 | 210 |
| Marine/Estuarine Invertebrates: | | |
| Brine Shrimp *(Artemia salina)* | 610 | 399 |
| Grass Shrimp *(Palaemonetes pugio)* | 270 | 220 |
| Green-lipped Mussel *(Perna canaliculus)* | 220 | 220 |
| Mud Snail *(Potamopyrgus estuarinus)* | 410 | 350 |

## XIV. DISPOSAL CONSIDERATIONS

Simple Green® is fully water soluble and biodegradable and will not harm sewage-treatment microorganisms if disposal by sewer or drain is necessary. Dispose of in accordance with all applicable local, state, and federal laws.

## XV. OTHER INFORMATION

Containers: Simple Green® residues can be completely removed by rinsing with water; the container may be recycled or applied to other uses.

Electrical Wiring Compatibility: Polyimide insulated wiring is not affected by exposure to Simple Green®. After immersion in Simple Green® for 14 days at 74°F, the 61 cm piece of polyimide insulated wire passed a one minute dielectric proof test at 2500 volts (ASTM D-149).

Contact Point: Sunshine Makers, Inc., Research and Development Division: 562-795-6000.

***** NOTICE *****

All information appearing herein is based upon data obtained by the manufacturer and recognized technical sources. Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of this information, Sunshine Makers, Inc. or its distributors extends no warranties, makes no representations and assumes no responsibility as to the suitability of such information for application to purchaser's intended purposes or for consequences of its use.

720758

90135

MATERIAL SAFETY DATA SHEET

 MSDS # 126011001

# WINDEX POWERIZED FORMULA (READY TO USE)

Date Issued: 29Sep1998 Supersedes: 18Jun1997

Drackett Professional
A Division of
S.C. Johnson Commercial Markets, Inc.
8310 16th Street
Sturtevant, Wisconsin 53177-0902
Phone: (800) 725-6737
Emergency Phone: (800) 851-7145

| HAZARD RATING | HMIS | HAZARD | NFPA |
|---|---|---|---|
| 4-Very High | 0 | Health | 0 |
| 3-High | 0 | Flammability | 0 |
| 2-Moderate | 0 | Reactivity | 0 |
| 1-Slight | | Special | |
| 0-Insignificant | | | |

## SECTION 1 - PRODUCT IDENTIFICATION

PRODUCT NAME..... WINDEX POWERIZED FORMULA (READY TO USE)
REASON FOR CHANGE..... Section 2. Section 6. Section 13. Section 14.
PRODUCT USE..... Industrial/Institutional: Cleaning product.

## SECTION 2 - INGREDIENT INFORMATION

| INGREDIENT | WEIGHT% | EXPOSURE LIMIT/TOXICITY |
|---|---|---|
| [PA NJ MA] Ammonium Hydroxide (less than 30%.. active) (CAS# 1336-21-6) | 0.5-1.5 | 25 ppm ACGIH/OSHA TWA , 35 ppm ACGIH/OSHA STEL LD50: 350 mg/kg (oral-rat) |
| [PA NJ MA SARA] 2-Butoxyethanol..... (CAS# 111-76-2) | 1-5 | 25 ppm ACGIH/OSHA TWA (SKIN) LD50: 560-3,000 mg/kg (oral-rat) LC50: 500 ppm (inhalation-rat) 4 hrs. |
| Water (CAS# 7732-18-5)..... ..... | >90.0 | NOT ESTABLISHED |

## SECTION 3 - HEALTH HAZARDS IDENTIFICATION (Also See Section 11)

ROUTE(S) OF ENTRY..... Eye contact.
EFFECTS OF ACUTE EXPOSURE:
EYE..... May cause: Sensation of irritation.
SKIN..... None known.
INHALATION..... May cause: Irritation to nose, throat and respiratory tract.
INGESTION..... May cause: Irritation to mucous membranes.
MEDICAL CONDITIONS..... None known.
GENERALLY RECOGNIZED
AS BEING AGGRAVATED
BY EXPOSURE

## SECTION 4 - FIRST AID MEASURES

EYE CONTACT..... Rinse with plenty of water.
SKIN CONTACT..... Rinse with plenty of water.
INHALATION..... Remove to fresh air.
INGESTION..... No special requirements.

## SECTION 5 - FIRE AND EXPLOSION INFORMATION

FLASH POINT..... > 200°F (> 93°C) (TCC)
FLAMMABLE LIMITS..... Not available.
AUTOIGNITION..... Not available.
TEMPERATURE
EXTINGUISHING MEDIA.... Foam. CO2. Dry chemical. Water fog.
SPECIAL FIREFIGHTING... Normal fire fighting procedure may be used.
PROCEDURES
UNUSUAL FIRE AND..... No special hazards known.
EXPLOSION HAZARDS

MATERIAL SAFETY DATA SHEET



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# WINDEX POWERIZED FORMULA (READY TO USE)

Date Issued: 29Sep1998 Supersedes: 18Jun1997

## SECTION 10 - STABILITY AND REACTIVITY (continued)

| | |
|---|---|
| HAZARDOUS DECOMPOSITION PRODUCTS | When exposed to fire: Produces normal products of combustion. |
| HAZARDOUS POLYMERIZATION | Will not occur. |
| HAZARDOUS POLYMERIZATION - CONDITIONS TO AVOID | None known. |

## SECTION 11 - TOXICOLOGY INFORMATION (Also See Section 3)

| | |
|---|---|
| LD50 (ACUTE ORAL TOX) | Estimated to be greater than 5000 mg/kg (rato). |
| LD50 (ACUTE DERMAL TOX) | Not available. |
| LC50 (ACUTE INHALATION. TOX) | Not available. |
| EFFECTS OF CHRONIC EXPOSURE | None known. |
| SENSITIZATION | None known. |
| CARCINOGENICITY | None known. |
| REPRODUCTIVE TOXICITY | None known. |
| TERATOGENICITY | None known. |
| MUTAGENICITY | None known. |

## SECTION 12 - ECOLOGICAL INFORMATION

| | |
|---|---|
| ENVIRONMENTAL DATA | Not applicable. |

## SECTION 13 - DISPOSAL CONSIDERATIONS

| | |
|---|---|
| WASTE DISPOSAL INFORMATION | No special method. Observe all applicable Federal/ Provincial/ State regulations and Local/ Municipal ordinances regarding disposal of non-hazardous materials. |

## SECTION 14 - TRANSPORTATION INFORMATION

| | |
|---|---|
| US DOT INFORMATION | Non Regulated. |
| CANADIAN SHIPPING NAME | WINDEX POWERIZED FORMULA (READY TO USE) |
| TDG CLASSIFICATION | Not applicable. |
| PIN/NIP | Not applicable. |
| PACKING GROUP | Not applicable. |
| EXEMPTION NAME | Not Applicable. |

## SECTION 15 - REGULATORY INFORMATION

| | |
|---|---|
| WHMIS CLASSIFICATION | Non-regulated. |

All ingredients of this product are listed or are excluded from listing on the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

All ingredients in this product comply with the New Substances Notification requirements under the Canadian Environmental Protection Act (CEPA).

This product is not subject to the reporting requirements under California's Proposition 65. These ingredients from Section 2 are subject to the following reporting requirements:

MATERIAL SAFETY DATA SHEET



# WINDEX POWERIZED FORMULA (READY TO USE)

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## SECTION 6 - PREVENTIVE RELEASE MEASURES

| | |
|---|---|
| STEPS TO BE TAKEN IN... CASE MATERIAL IS RELEASED OR SPILLED | Absorb with fullex's earth or other inert materials. Sweep or scrape up and containerize. Do not let spilled or leaking material enter watercourse. Contains ammonia. |

## SECTION 7 - HANDLING AND STORAGE

| | |
|---|---|
| PRECAUTIONARY..... INFORMATION | Use as directed. |
| OTHER HANDLING AND..... STORAGE CONDITIONS | Store in a cool, dry place with adequate ventilation. Keep from freezing. |

## SECTION 8 - SPECIAL PROTECTION INFORMATION

| | |
|---|---|
| RESPIRATORY PROTECTION. | No special requirements under normal use conditions. |
| VENTILATION..... | General room ventilation adequate. |
| PROTECTIVE GLOVES..... | No special requirements under normal use conditions. |
| EYE PROTECTION..... | No special requirements under normal use conditions. |
| OTHER PROTECTIVE..... MEASURES | Not applicable. |

## SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| COLOR..... | Clear, Blue. |
| PRODUCT STATE..... | Liquid. |
| ODOR..... | Mild, Ammonia. |
| pH..... | 10.2-11.2 |
| ODOR THRESHOLD..... | Not available. |
| SOLUBILITY IN WATER.... | Complete. |
| SPECIFIC GRAVITY..... (H2O=1) | 0.99 |
| VISCOSITY..... | Not available |
| VAPOR DENSITY (AIR=1).. | > 1 |
| EVAPORATION RATE (BUTYL ACETATE=1) | < 1 |
| VAPOR PRESSURE (mm HG). | Not available. |
| BOILING POINT..... | 212°F (100°C) |
| FREEZING POINT..... | 32°F (0°C) |
| COEFFICIENT OF..... WATER/OIL | Not available. |
| PERCENT VOLATILE BY.... VOLUME (%) | Not available. |
| VOLATILE ORGANIC..... COMPOUND (VOC) | Glycol Ether. |
| THEORETICAL VOC..... (LB/GAL) | Not available. |

## SECTION 10 - STABILITY AND REACTIVITY

| | |
|---|---|
| STABILITY..... | Stable. |
| STABILITY - CONDITIONS. TO AVOID | No special requirements. |
| INCOMPATIBILITY..... | None known. |

MATERIAL SAFETY DATA SHEET

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# WINDEX POWERIZED FORMULA (READY TO USE)

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## SECTION 15 - REGULATORY INFORMATION (continued)

PA - The Pennsylvania Hazardous Substance List

NJ - The New Jersey Right to Know Hazardous Substance List
MA - The Massachusetts Hazardous Substance List
SARA - The Superfund Amendments and Reauthorization Act of 1986 Title III, Section 313 and 40 CFR Part 372

## SECTION 16 - OTHER INFORMATION

ADDITIONAL INFORMATION. Use as directed.
EPA REGISTRATION #..... Not applicable.

## PREPARATION INFORMATION

PREPARED BY..... Manufacturer's Technical Support Department. Refer to page 1 (Manufacturer) for contact information.

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PRINT DATE: 22Mar1999

# MATERIAL SAFETY DATA SHEET

## Section 1: Product & Company Identification

**Product Name:** **2-26 ® Multi Purpose Precision Lubricant** - Aerosol
**Product Number (s): 02004, 02005, 02024, 82005**

Manufactured By: CRC Industries, Inc. (215) 674-4300
885 Louis Drive, Warminster, PA 18974
24-Hour Emergency Information: CHEMTREC (800) 424-9300

---

## Section 2: Composition/Information on Ingredients

| Component | CAS NUMBER | ACGIH TLV | OSHA PEL | OTHER LIMITS | % |
|---|---|---|---|---|---|
| Petroleum Distillate | 64742-47-8 | NE | 400 ppm | NE | 60-70 |
| Inhibited Paraffinic Oil | Mixture | 5 mg/m3 | 5 mg/m3 | (mist) | 25-30 |
| Carbon Dioxide | 124-38-9 | 5000 ppm | 10000 ppm | NE | < 10 |

---

## Section 3: Hazards Identification

Emergency Overview

Appearance & Odor: Amber liquid, pleasant odor.

Danger: Flammable. Harmful or Fatal if Swallowed. Contents Under Pressure.

Potential Health Effects:

Inhalation: Headaches, nausea, dizziness and breathing problems.
Eyes: Irritation
Skin: Dryness
Ingestion: NA

Carcinogenicity: OSHA: No IARC: No NTP: No
Chronic Overexposure: Dermatitis.
Medical Conditions Aggravated by Exposure: NA

---

## Section 4: First Aid Measures

Inhalation: Remove to fresh air. Give artificial respiration if necessary.

Eyes: Flush with large amounts of water for 15 minutes.

Skin: Remove contaminated clothing and wash area with soap and water.

Ingestion: Call a physician. Do not induce vomiting.

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## Section 5: Fire-Fighting Measures

| | | | | | |
|---|---|---|---|---|---|
| Flashpoint: | 195°F | Method: | TCC | LEL: ND | UEL: ND |
| Extinguishing Media: | | $CO_2$, dry chemical and foam | | | |
| Hazardous Combustion Products: | | $CO_2$ and carbon monoxide (fire) | | | |
| Fire-fighting Instructions: | | Remove containers from fire area if possible. Use self-contained breathing apparatus for fire fighting. Aerosol cans may explode if heated above 120°F. | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| NFPA: | Health: | 1 | Flammability: | 2 | Reactivity: | 0 | |
| HMIS: | Health: | 1 | Flammability: | 2 | Reactivity: | 0 | PPE: B |

## Section 6: Accidental Release Measures

Spill/Leak Procedures: Usually not a problem with aerosols. Area should be ventilated. Absorbent should be used to pick up excess material. All used and unused product should be disposed of in accordance with federal, state and local regulations.

## Section 7: Handling and Storage

Handling Procedures: Store in a cool, dry area. Aerosol cans must be maintained below 120°F to prevent cans from exploding.

Aerosol Level: III

## Section 8: Exposure Controls/Personal Protection

Engineering Controls: Adequate to prevent accumulation of vapors. Use mechanical means if necessary to maintain levels below the exposure limits. If working in a confined space, follow applicable OSHA regulations.

Respiratory: Use NIOSH/MSHA compliant respirators or self-contained breathing apparatus above exposure limits. Follow OSHA regulations 29 CFR 1910.134.

Protective Clothing/Equipment: Wear chemically protective gloves and safety glasses. Use a splash apron and boots if splashing occurs.

## Section 9: Physical & Chemical Properties

| | | | |
|---|---|---|---|
| Physical State: | Liquid | Appearance & Odor: | Amber liquid, pleasant odor |
| Specific Gravity: | 0.8127 | Boiling Point: | 424°F (initial) |
| Freezing Point: | ND | Vapor Pressure: | 0.23 mm |
| Evaporation Rate: | slow .01 (toluene=1) | Vapor Density (air = 1) | > air |
| pH: | NA | Solubility: | Negligible in water |

| | | | | | |
|---|---|---|---|---|---|
| Volatile Organic Compounds %: | 0.1 | g/L: | 1 | lbs./gal: | 0.01 |

## Section 10: Stability and Reactivity

| | | |
|---|---|---|
| Stability: | Stable | Hazardous Polymerization: No |
| Chemical Incompatibilities: | Strong oxidizers. | |
| Materials to Avoid: | Strong oxidizers. | |



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Hazardous Decomposition Products: None

## Section 11: Toxicological Information

Long-term toxicological studies have not been conducted for this product. See Section 3 of this MSDS for acute symptoms of overexposure and carcinogenicity information.

## Section 12: Ecological Information

Ecotoxicity: No data available.
Environmental Fate: No data available for biodegradation.

## Section 13: Disposal Considerations

Disposal: This material if discarded may be hazardous waste under U.S. EPA RCRA regulations. All disposal activities must comply with federal, state and local regulations. Contact your local or state environmental agency for specific rules. Do not dump into sewers, on the ground or into any body of water.

## Section 14: Transportation Information

| | | | | | |
|---|---|---|---|---|---|
| Shipping Name: | Consumer Commodity | | | | |
| Hazard Class: | ORM-D | UN Number: | NA | Packing Group: | NA |
| Label: | NA | Placard: | NA | | |
| Special Provisions: | NA | | | | |

## Section 15: Regulatory Information

| | | | | |
|---|---|---|---|---|
| TSCA: | All components are either listed under TSCA or are exempt. | | | |
| SARA Title III: | Section 311/312: | Acute/Pressure | Section 313*: | None |
| CERCLA/Superfund (RQ): | | NA | | |
| Extremely Hazardous Substances: | | No | | |
| California Prop 65: | | This product contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm. | | |

* See section 2 for percentage

## Section 16: Additional Information

| | | | |
|---|---|---|---|
| Prepared By: | Adam M. Selisker | Date: | November 15, 2002 |
| Technical Information: | (800) 521-3168 | CRC #: | 591 |

This information is accurate to the best of CRC Industries' knowledge or obtained from sources believed by CRC to be accurate. Before using any product, read all warnings and directions on the label.

| | | | |
|---|---|---|---|
| CAS: | Chemical Abstract Service | NA: | Not Applicable |
| ppm: | Parts per Million | ND: | Not Determined |
| TCC: | Tag Closed Cup | NE: | Not Established |
| LEL: | Lower Explosive Limit | g/L: | grams per Liter |
| UEL: | Upper Explosive Limit | lbs./gal: | pounds per gallon |
| PPE: | Personal Protection Equipment | RQ: | Reportable Quantity |
| COC: | Cleveland Closed Cup | | |



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MATERIAL SAFETY DATA SHEET

TRADE NAME: AMMONIUM BISULFITE

PRODUCT NAME: AMMONIUM BISULFITE, 60 % SOLUTION
SYNONYMS: AMMONIUM HYDROGEN SULFITE SOLUTION
CHEMICAL NAME: AMMONIUM BISULFITE SOLUTION
CHEMICAL FAMILY: BISULFITE

DOT SHIPPING INFORMATION: BISULFITES, AQUEOUS, 8, UN 2693, PG III RQ=5000 lbs

## 1. HAZARDOUS INGREDIENTS:

This material contains no ingredients which are known by Thatcher Company to be hazardous unless listed below

| HAZARDOUS MATERIAL | CAS NUMBER | W/W% | EXPOSURE LIMITS IN AIR |
|---|---|---|---|
| AMMONIUM BISULFITE | 10192-30-0 | | None Known |

The specific identity of some ingredients may be withheld for confidential business purposes. However, all known potential health effects from exposure to these ingredients are being addressed.

## 2. HEALTH HAZARD DATA:

**CARCINOGENIC LISTING:**

NTP: No ingredients listed in this section.
LARC MONOGRAPHS: No ingredients listed in this sections.
OSHA 29 CFR 1910: No ingredients listed in this section.

**ENTRY ROUTES & EFFECTS OF OVEREXPOSURE:**

CONTACT: Can cause irritation and burns to skin and eyes.
INGESTION: Can cause irritation and burns to the gastrointestinal tract.

## 3. HEALTH HAZARD DATA (Cont'd):

**STATEMENT OF PRACTICAL TREATMENT:**

Contact: Flush exposed area thoroughly with water. For eyes, flush with cool water for at least 15 minutes and obtain prompt medical attention.
Ingestion: If conscious, give several glasses of water or milk and call a physician immediately. Do not induce vomiting.



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## 4. FIRE AND EXPLOSION DATA:

FLASH POINT:
Nonflammable
FLAMMABLE LIMITS:
LEL: N/A UEL: N/A
EXTINGUISHING MEDIA:
USE ANY.
SPECIAL FIRE-FIGHTING PROCEDURES:
NONE
UNUSUAL FIRE AND EXPLOSION HAZARDS:
NONE

## 5. SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION:
NONE REQUIRED.
VENTILATION:
MAINTAIN ADEQUATE VENTILATION.
EYE PROTECTION:
CHEMICAL SPLASH GOGGLES.
OTHER PROTECTIVE EQUIPMENT:
AS NEEDED TO PREVENT CONTACT WITH THE LIQUID.

## 6. SPECIAL PRECAUTIONS:

HANDLING AND STORAGE PRECAUTIONS:
Do not let the product come in contact with skin or eyes. Do not take internally.

## 7. PHYSICAL DATA:

BOILING POINT: Unknown
VAPOR PRESSURE(mm-hg): Essentially water
VAPOR DENSITY:(air=1): Essentially water.
SOLUBILITY IN WATER: Complete
SPECIFIC GRAVITY: 1.38
%VOLATILE, BY VOLUME: abt 30%
EVAPORATION RATE: Unknown
APPEARANCE AND ODOR: Clear, pale yellow solution with sulfur dioxide odor.



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## 8. REACTIVITY DATA:

STABILITY:
Stable.
HAZARDOUS POLYMERIZATION:
Will not occur.
CONDITIONS OR MATERIALS TO AVOID:
Avoid contact with acids
HAZARDOUS DECOMPOSITION PRODUCTS:
Contact with acids will release sulfur dioxide.

## 9. SPILL OR LEAK PROCEDURES

STEP TO BE TAKEN IF MATERIAL SPILLS OR LEAKS:
Wear safety equipment. For small spills, absorb on sand or other non-combustible absorbent, and sweep into drums. For larger spills, dike the spill and put the material into drums, flush residue to the drain with plenty of water.

WASTE DISPOSAL METHOD:
Dispose of in landfill or other suitable disposal site. Comply with all local, state and federal regulations.

THIS INFORMATION IS TO THE BEST OF OUR KNOWLEDGE, ACCURATE BUT MAY NOT BE COMPLETE. THATCHER COMPANY AND CORROSION CONTROL TECHNOLOGY, INC FURNISHES THIS INFORMATION IN GOOD FAITH, BUT WITHOUT WARRANTY, REPRESENTATION OR GUARANTEE OF ITS ACCURACY, COMPLETENESS OR RELIABILITY.

**ACGIH:** American Conference of Governmental Industrial Hygienists.
**CL:** Ceiling Level.
**IARC:** International Agency for Research on Cancer: Monographs.
**OSHA:** Occupational Safety and Health Administration.
**N/A** Not Applicable.
**MTP:** National Toxicology Program: Annual Report on Carcinogens.
**PEL:** Permissible Exposure Level (OSHA).
**TLV:** Threshold Limit Value (ACGIH)
**TWA:** Time Weighed Average Over 8 Hours.
**STEL:** Short Term Exposure Limit (ACGIH)
**ND:** Not Determined.



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# MATERIAL SAFETY DATA SHEET
# CALCIUM CHLORIDE

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

| | |
|---|---|
| **TRADE NAME:** | CALCIUM CHLORIDE |
| **CHEMICAL CLASS:** | Inorganic salts. |
| **APPLICATIONS:** | Oil well drilling fluid additive. Oil well completion fluid additive. Weighting agent. |
| **EMERGENCY TELEPHONE:** | 281-561-1600 |
| **SUPPLIER:** | Supplied by a Business Unit of<br>M-I L.L.C.<br>P.O. Box 42842, Houston, Texas 77242-2842<br>See cover sheet for local supplier. |
| **TELEPHONE:** | 281-561-1509 |
| **FAX:** | 281-561-7240 |
| **CONTACT PERSON:** | Sam Hoskin - Manager, Occupational Health |

## 2. COMPOSITION, INFORMATION ON INGREDIENTS

| INGREDIENT NAME: | CAS No.: | CONTENTS : | EPA RQ: | TPQ: |
|---|---|---|---|---|
| Calcium chloride | 10043-52-4 | 60-100 % | | |

## 3. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW:**

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing airborne product. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

This product is a/an white powder. A nuisance dust. Dike and contain spills. Keep out of sewers and waterways. No significant immediate hazards for emergency response personnel are known.

**ACUTE EFFECTS:**
**HEALTH HAZARDS, GENERAL:**

Particulates may cause mechanical irritation to the eyes, nose, throat and lungs. Particulate inhalation may lead to pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma. Dermatitis and asthma may result from short contact periods.

**INHALATION:** Irritating to the respiratory tract if inhaled.

**INGESTION:** Harmful if swallowed. May cause gastric distress, nausea and vomiting if ingested.

**SKIN:** Irritating to the skin.

**EYES:** Irritating to the eyes.

**CHRONIC EFFECTS:**



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**CARCINOGENICITY:**
IARC: Not listed. OSHA: Not regulated. NTP: Not listed.

**ROUTE OF ENTRY:**
Inhalation. Skin and/or eye contact.

**TARGET ORGANS:**
Respiratory system, lungs. Skin. Eyes.

## 4. FIRST AID MEASURES

**GENERAL:** Persons seeking medical attention should carry a copy of this MSDS with them.

**INHALATION:** Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.

**INGESTION:** Drink a couple of glasses water or milk. Do not give victim anything to drink of he is unconscious. Get medical attention.

**SKIN:** Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

**EYES:** Promptly wash eyes with lots of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

## 5. FIRE FIGHTING MEASURES

**FLAMMABILITY LIMIT - LOWER(%):** N/D
**FLAMMABILITY LIMIT - UPPER(%):** N/D

**EXTINGUISHING MEDIA:**
Use extinguishing media appropriate for surrounding fire. Carbon dioxide ($CO_2$). Dry chemicals. Foam. Water spray, fog or mist.

**SPECIAL FIRE FIGHTING PROCEDURES:**
No specific fire fighting procedure given.

**UNUSUAL FIRE & EXPLOSION HAZARDS:**
No unusual fire or explosion hazards noted.

**HAZARDOUS COMBUSTION PRODUCTS:**
This material is not combustible. No specific hazardous combustion products noted.

## 6. ACCIDENTAL RELEASE MEASURES

**PERSONAL PRECAUTIONS:**
Wear proper personal protective equipment (see MSDS Section 8).

**SPILL CLEAN-UP PROCEDURES:**
Avoid generating and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate drainage or waterways. Repackage or recycle if possible.

## 7. HANDLING AND STORAGE



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**HANDLING PRECAUTIONS:**

Avoid handling causing generation of dust. Wear full protective clothing for prolonged exposure and/or high concentrations. Eye wash and emergency shower must be available at the work place. Wash hands often and change clothing when needed. Provide good ventilation. Mechanical ventilation or local exhaust ventilation is required.

**STORAGE PRECAUTIONS:**

Store at moderate temperatures in dry, well ventilated area. Keep in original container.

## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

| INGREDIENT NAME: | CAS No.: | OSHA PEL: TWA: | OSHA PEL: STEL: | ACGIH TLV: TWA: | ACGIH TLV: STEL: | OTHER: TWA: | OTHER: STEL: | UNITS: |
|---|---|---|---|---|---|---|---|---|
| Calcium chloride | 10043-52-4 | | | | | | | No std. |

**INGREDIENT COMMENTS:**

No exposure limits noted for ingredient(s). *Exposure limits are for Particulates Not Otherwise Classified (PNOC).

**PROTECTIVE EQUIPMENT:**

**ENGINEERING CONTROLS:**

Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to reduce air contamination and keep worker exposure below the applicable limits.

**VENTILATION:** Supply natural or mechanical ventilation adequate to exhaust airborne product and keep exposures below the applicable limits.

**RESPIRATORS:** Use at least a NIOSH-approved N95 half-mask disposable or reuseable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reuseable particulate respirator.

**PROTECTIVE GLOVES:**

Use suitable protective gloves if risk of skin contact.

**EYE PROTECTION:**

Wear dust resistant safety goggles where there is danger of eye contact.

**PROTECTIVE CLOTHING:**

Wear appropriate clothing to prevent repeated or prolonged skin contact.

**HYGIENIC WORK PRACTICES:**

Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| **APPEARANCE/PHYSICAL STATE:** | Powder, dust. | |
| **COLOR:** | White. | |
| **ODOR:** | Odorless or no characteristic odor. | |
| **SOLUBILITY DESCRIPTION:** | Very soluble in water. | |
| **SOLUBILITY VALUE (g/100g H2O 68°F):** | 75 | |
| **DENSITY/SPECIFIC GRAVITY (g/ml):** | 2.2 | TEMPERATURE (°F): 68 |
| **VAPOR DENSITY (air=1):** | N/D | |
| **VAPOR PRESSURE:** | N/D | TEMPERATURE (°F): |
| **pH-VALUE, DILUTED SOLUTION:** | N/D | CONCENTRATION (%,M): |

## 10. STABILITY AND REACTIVITY

**STABILITY:** Normally stable.

**CONDITIONS TO AVOID:**
Avoid contact with water.

**HAZARDOUS POLYMERIZATION:**
Will not polymerize.

**POLYMERIZATION DESCRIPTION:**
Not relevant.

**MATERIALS TO AVOID:**
Sulfuric acid

**HAZARDOUS DECOMPOSITION PRODUCTS:**
No specific hazardous decomposition products noted.

## 11. TOXICOLOGICAL INFORMATION

**TOXIC DOSE - LD 50:** 1000

## 12. ECOLOGICAL INFORMATION

**ECOLOGICAL INFORMATION:**
Contact M-I Environmental Affairs for ecological information.

## 13. DISPOSAL CONSIDERATIONS

**WASTE MANAGEMENT:**
This product, should it become a waste, is not hazardous by U.S. RCRA criteria.

**DISPOSAL METHODS:**
Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that containers are empty by RCRA criteria prior to disposal in a permitted industrial landfill.

## 14. TRANSPORT INFORMATION

**PRODUCT RQ:** N/A

**U.S. DOT:**
**U.S. DOT CLASS:** Not regulated.

**CANADIAN TRANSPORT:**
**TDGR CLASS:** Not regulated.

**SEA TRANSPORT:**
**IMDG CLASS:** Not regulated.

**AIR TRANSPORT:**

**ICAO CLASS:** Not regulated.

## 15. REGULATORY INFORMATION

**REGULATORY STATUS OF INGREDIENTS:**

| NAME: | CAS No: | TSCA: | CERCLA: | SARA 302: | SARA 313: | DSL(CAN): |
|---|---|---|---|---|---|---|
| Calcium chloride | 10043-52-4 | Yes | No | No | No | Yes |

**US FEDERAL REGULATIONS:**

**WASTE CLASSIFICATION:** Not a hazardous waste by U.S. RCRA criteria. See Section 13.

**REGULATORY STATUS:** This Product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.
SARA 311 Categories:
1: Immediate (Acute) Health Effects.

The components of this product are listed on or are exempt from the following international chemical registries:
TSCA (U.S.)
DSL (Canada)
EINECS (Europe)

**STATE REGULATIONS:**

**STATE REGULATORY STATUS:** This product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):.

None.
PROPOSITION 65: This product does not contain chemicals considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer or reproductive toxicity, and for which warnings are now required.

**CANADIAN REGULATIONS:**

**LABELS FOR SUPPLY:**

**REGULATORY STATUS:** This Material Safety Data Sheet has been prepared in compilance with the Controled Product Regulations.

Canadian WHMIS Classification: D2B - Other Toxic Effects: Toxic Material

## 16. OTHER INFORMATION

**NPCA HMIS HAZARD INDEX:** 1 Slight Hazard
**FLAMMABILITY:** 0 Minimal Hazard
**REACTIVITY:** 1 Slight Hazard
**NPCA HMIS PERS. PROTECT. INDEX:** E - Safety Glasses, Gloves, Dust Respirator

**USER NOTES:** N/A = Not applicable N/D = Not determined

**INFORMATION SOURCES:**

OSHA Permissible Exposure Limits, 29 CFR 1910, Subpart Z, Section 1910.1000, Air Contaminants.

ACGIH Threshold Limit Values and Biological Exposure Indices for Chemical Substances and Physical Agents (latest edition).

Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).
Product information provided by the commercial vendor(s).

**PREPARED BY:** Sam Hoskin

**REVISION No./Repl. MSDS of:** 2/August 19, 1998

**MSDS STATUS:** Approved.

**DATE:** June 6, 2001

**DISCLAIMER:**
MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditiions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.



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# MATERIAL SAFETY DATA SHEET
# DIELECTRIC GREASE
# Panef Inc.



Revision Date: 01/01/12

## Section 1: Chemical Product and Company Identification

**Product Name:** Chemplex 710
**Manufacturer:** Panef Inc.
5700 West Douglas Ave.
Milwaukee, WI 53218
**Total Pages:** 4

**Product Number:** DG-13 & DG-20
**Emergency Telephone:** 800-535-5053
**Information Telephone:** 414-464-7200

## Section 2: Composition/Information on Ingredients

Components listed in this section may contribute to the potential hazards associated with exposure to the concentrate. The product may contain additional non-hazardous or trade-secret components.

**Fumed Silica** **Cas#: Proprietary** **Percent: < 10**

Exposure Limit:
ACGIH TLV: 10 mg/m3
OSHA PEL: 6 mg/m3

- Carcinogenic Components: This product contains no carcinogens.

*** EMERGENCY OVERVIEW**
This product is a semi-solid that is insoluble in water. Direct eye contact may cause minor, short term irritation. Short term skin exposure is not expected to be irritating. Inhalation and ingestion are not anticipated routes of exposure during normal conditions of use.

*** HMIS Rating**: Health – 1 Flammability –1 Reactivity – 0 PPE - X

## Section 3: Hazards Identification

**POTENTIAL HEALTH EFFECTS AND SYMPTOMS FROM SHORT TERM/ACUTE EXPOSURE:**
**Eye Exposure:** This product is not expected to cause eye irritation under normal conditions of use. Symptoms of slight eye irritation may result when direct contact occurs, or when exposed to high mist levels in poorly ventilated areas.
**Skin Exposure:** Short term skin contact is not expected to cause skin irritation. Prolonged or repeated direct exposure to the skin may result in symptoms of irritation and redness.
**Inhalation:** This product has low volatility and so is not expected to cause respiratory tract irritation during normal conditions of use. Exposure to high mist levels in poorly ventilated areas may cause temporary irritation to the upper respiratory tract.
**Ingestion:** Ingestion may cause slight stomach irritation and discomfort.
**Potential Chronic Health Effects:** No further data known.
**Medical Conditions Aggravated by Exposure:** No further data known.
**Carcinogenicity:** This product is not listed as a known or suspected carcinogen by IARA, OSHA, or the NTP.

## Section 4: First Aid Measures

**Eyes Contact:** Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. If symptoms persist, contact a physician.
**Skin Contact:** Remove product from skin by washing with a mild soap and water. Contaminated clothing should be removed to prevent prolonged exposure. If product is injected under the skin, seek treatment immediately. If symptoms of exposure persist, contact a physician.
**Ingestion:** If ingested, dilute stomach contents with two glasses of milk or water. (NOTE: DO NOT give anything by mouth to an unconscious person.) Do not induce vomiting without medical supervision. If vomiting occurs spontaneously, keep airway clear. If symptoms of ingestion persist, seek medical attention.
**Inhalation:** If signs or symptoms of overexposure occur, remove the employee to fresh air. If symptoms persist, seek medical attention.
**Note to Physician:** No further data known.

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# Material Safety Data Sheet
# DIELECTRIC GREASE



## Section 5: Fire Fighting Measures

**Fire and Explosive Properties:**

Flashpoint .....: 600.0 °F COC
Flammability Limits .....: LEL -N/A
UEL -N/A

**Extinguishing Media:** In accordance with NFPA guidance, dry chemical, form, or CO2 fire extinguishers are all acceptable. Note that while water fog extinguishers are also acceptable, no NOT apply a direct stream of water onto burning product because it may cause spreading and increase fire intensity.
**Unusual Fire & Explosion Hazards:** No further data known.
**Fire-Fighting Procedures and Equipment:** Emergency responders in the danger area should wear bunker gear and self-contained breathing apparatus for fires beyond the incipient stage. See Section 8 of the MSDS for other PPE to be worn as conditions warrant.

## Section 6: Accidental Release Measures

**Clean-up Measures:** Important: As with any spill or leak, before responding ensure that you are familiar with the potential hazards and recommendations of the MSDS. Appropriate personal protective equipment
must be worn. See Section 8 of this MSDS for PPE recommendations.
If possible, safely contain the spill with dikes or other spill response equipment appropriate for petroleum or organic material releases. Take measures to prevent spreading of product. Note that while product will ignite it will not readily burn. However, as a precaution eliminate ignition sources. Prevent from entering sewers or waterways. Large volumes may be transferred to an appropriate container for proper disposal. Small volumes or residues may be soaked up with absorbents. Spill response materials should be collected for proper disposal.

## Section 7: Handling and Storage

**Handling:** As with any industrial chemical, handle the product in a manner that minimizes exposure to practicable levels. Prior to handling, consult Section 8 of this MSDS to evaluate person protective equipment needs. Open containers slowly to relieve any pressure. Follow all other standard industrial hygiene practices.
Empty containers may contain product residue. All safety precautions taken when handling this product should also be taken when handling empty drums and containers. Keep containers closed when not in use.
Product residue in empty containers is combustible but will not readily burn. NOTE however, that excessive heating or cutting or empty containers may create an ignition source sufficient to start a fire and in extreme cases, cause an explosion.
**Storage:** Protect product quality by storing indoors and away from extreme temperatures. Close all containers when not in use.
**Special Comments:** No further data known.

## Section 8: Exposure Controls / Personal Protection

**Personal Protective Equipment:** Selection of person protective equipment should be based upon the anticipated exposure and made in accordance with OSHA's Personal Protective Equipment Standard found in 29 CFR 1910 Subpart I. The following information may be used to assist in PPE selection.
**Eye Protection:** Wear eye protection appropriate to prevent eye exposure. Where splashing is not likely, chemical safety glasses with side shields are recommended. Where splashing may occur, chemical goggles or full face shield is recommended.
**Skin Protection:** Gloves are not normally needed during normal conditions of use. If health effects are experienced, oil or chemical resistant gloves such as butyl or nitrile are recommended.
Where splashing or soaking is likely, wear oil or chemical resistant clothing to prevent exposure.
**Respiratory Protection:** A respirator may be worn to reduce exposure to vapors, dust, or mist. Select a NIOSH/MSHA approved respirator appropriate for the type and physical character of the airborne material. A self-contained breathing apparatus is recommended in all situations where airborne contaminant concentration has not been confirmed to be below safe levels. Respirator use should comply with the OSHA Respirator Protection Standard found in 29 CFR 1910.134.
**Engineering Controls:** Normal general ventilation is expected to be adequate. It is recommended that ventilation be designed in all instances to maintain airborne concentrations at lowest practicable levels. Ventilation should at a minimum, prevent airborne concentrations from exceeding any exposure limits listed in Section 2 of this MSDS.
The user may wish to refer to 29 CFR 1910.1000 (d) (2) and the ACGIH "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indicies" (Appendix C) for the determination of exposure limits of mixtures. An industrial hygienist or similar professional may be consulted to confirm that the calculated exposure limits apply.

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# Material Safety Data Sheet
# DIELECTRIC GREASE



Revision Date: 01/01/12

## Section 9: Physical / Chemical Properties

Physical Appearance . . . . . : White
Odor . . . . . : Odorless
Physical State . . . . . : Semi-solid
Water Gravity . . . . . : Insoluble
Specific Gravity . . . . . : .970

## Section 10: Stability and Reactivity

**Incompatibilities:** This product is incompatible with strong oxidizing agents.
**Decomposition Products May Include:** Thermal decomposition products are dependent on combustion conditions. A complex mixture of airborne solid, liquid, particulates and gasses may evolve when the material burns. Combustion byproducts may include: oxides or carbon, incompletely burned hydrocarbons as fumes and smoke.
**Conditions To Avoid:** Avoid contact with incompatible materials and exposure to extreme temperatures.
**Stability:** This Product is stable

## Section 11: Toxicology Information

None available

## Section 12: Ecological Information

**Ecotoxicological Information:** This product has not been evaluated for ecotoxicity. As with any industrial chemical, exposure to the environment should be prevented and minimized wherever possible.
**Environmental Fate**: The degree of biodegradability and persistence of this product has not been determined.

## Section 13: Disposal Considerations

**Waste Disposal:** Ensure that collection, transport, treatment, and disposal of waste product, containers and rinsate complies with all applicable laws and regulations. Note that use, mixture, processing, or contamination of the product may cause the material to be classified as a hazardous waste. It is the responsibility of the product user or owner to determine at the time of disposal, whether the product is regulated as hazardous waste.

## Section 14: Transportation Information

**DOT Hazardous Material Information:** Not regulated by US DOT unless shipped in pressurized containers. See bill of lading for proper DOT classification of pressurized container.

## Section 15: Regulatory Information

**Federal Regulations:**
**SARA 313:** This product contains NONE of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.
**CERCLA Reportable Quantity:** Any components listed below have been assigned a reportable quantity (RQ) by the Federal EPA. Releases of the product into the environment that exceed the RQ for a Particular component must be reported to the National Response Center at 1-800-424-8802.

| Component | RQ |
|---|---|

**Toxic Substance Control Act:** The components of this product are listed on the TSCA Inventory.
**Ozone Depleting Substances:** This product contains no ozone depleting substances as defined by the Clean Air Act.
**Hazardous Air Pollutants:** Any components listed below are defined by the Federal EPA as hazardous air pollutants.

| Components |
|---|

**State Regulations:** No further data known.

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## Section 16: Other Information

Disclaimer: The information contained herein is based on data available. However, no warranty is expressed or implied regarding the accuracy of the data or the results obtained from use thereof. Because the information contained herein may be applied under conditions beyond our control, we assume no responsibility for its use.

DOW CORNING

# DOW CORNING CORPORATION
# Material Safety Data Sheet



## DOW CORNING(R) 700 INDUSTRIAL GRADE SILICONE SEALANT - CLEAR

## 1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

Dow Corning Corporation
South Saginaw Road
Midland, Midland 48686

**24 Hour Emergency Telephone: (517) 496-5900**
Customer Service: (517) 496-6000
Product Disposal Information: (517) 496-6315
CHEMTREC: (800) 424-9300

MSDS No.: 01802887

Revision Date: 1999/09/17

Generic Description: Silicone elastomer
Physical Form: Paste
Color: Colorless
Odor: Acetic acid odor
NFPA Profile: Health 1 Flammability 1 Instability/Reactivity 0

Note: NFPA = National Fire Protection Association

## 2. OSHA HAZARDOUS COMPONENTS

| CAS Number | Wt % | Component Name |
|---|---|---|
| 4253-34-3 | 1.0 - 5.0 | Methyltriacetoxysilane |
| 17689-77-9 | 1.0 - 5.0 | Ethyltriacetoxysilane |

The above components are hazardous as defined in 29 CFR 1910.1200.

## 3. EFFECTS OF OVEREXPOSURE

Acute Effects

Eye: Direct contact may cause moderate irritation.

Skin: May cause moderate irritation.

Inhalation: Irritates respiratory passages very slightly.

Oral: Low ingestion hazard in normal use.

Prolonged/Repeated Exposure Effects

Skin: No known applicable information.

Inhalation: No known applicable information.

Oral: No known applicable information.

Signs and Symptoms of Overexposure

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# Material Safety Data Sheet



## DOW CORNING(R) 700 INDUSTRIAL GRADE SILICONE SEALANT - CLEAR

No known applicable information.

Medical Conditions Aggravated by Exposure

No known applicable information.

The above listed potential effects of overexposure are based on actual data, results of studies performed upon similar compositions, component data and/or expert review of the product. Please refer to Section 11 for the detailed toxicology information.

## 4. FIRST AID MEASURES

| | |
|---|---|
| Eye: | Immediately flush with water for 15 minutes. Get medical attention. |
| Skin: | Remove from skin and wash thoroughly with soap and water or waterless cleanser. Get medical attention if irritation or other ill effects develop or persist. |
| Inhalation: | No first aid should be needed. |
| Oral: | No first aid should be needed. |
| Comments: | Treat according to person's condition and specifics of exposure. |

## 5. FIRE FIGHTING MEASURES

| | |
|---|---|
| Flash Point: | Not applicable. |
| Autoignition Temperature: | Not determined. |
| Flammability Limits in Air: | Not determined. |
| Extinguishing Media: | On large fires use dry chemical, foam or water spray. On small fires use carbon dioxide ($CO_2$), dry chemical or water spray. Water can be used to cool fire exposed containers. |
| Fire Fighting Measures: | Self-contained breathing apparatus and protective clothing should be worn in fighting large fires involving chemicals. Determine the need to evacuate or isolate the area according to your local emergency plan. Use water spray to keep fire exposed containers cool. |
| Unusual Fire Hazards: | None. |

Hazardous Decomposition Products

Thermal breakdown of this product during fire or very high heat conditions may evolve the following hazardous decomposition products: Silicon dioxide. Carbon oxides and traces of incompletely burned carbon compounds. Formaldehyde.

## 6. ACCIDENTAL RELEASE MEASURES

DOW CORNING

# DOW CORNING CORPORATION
# Material Safety Data Sheet



## DOW CORNING(R) 700 INDUSTRIAL GRADE SILICONE SEALANT - CLEAR

Containment/Clean up: Observe all personal protection equipment recommendations described in Sections 5 and 8. Wipe up or scrape up and contain for salvage or disposal. Clean area as appropriate since some silicone materials, even in small quantities, may present a slip hazard. Final cleaning may require use of steam, solvents or detergents. Dispose of saturated absorbant or cleaning materials appropriately, since spontaneous heating may occur. Local, state, and federal laws and regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which federal, state and local laws and regulations are applicable. Sections 13 and 15 of this MSDS provide information regarding certain federal and state requirements.

Note: See section 8 for Personal Protective Equipment for Spills. Call Dow Corning Corporation, (517) 496-5900, if additional information is required.

## 7. HANDLING AND STORAGE

Use with adequate ventilation. Product evolves acetic acid (HOAc) when exposed to water or humid air. Provide ventilation during use to control HOAc within exposure guidelines or use respiratory protection. Avoid eye contact. Avoid skin contact.

Use reasonable care and store away from oxidizing materials. Keep container closed and store away from water or moisture.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Component Exposure Limits**

| CAS Number | Component Name | Exposure Limits |
|---|---|---|
| 4253-34-3 | Methyltriacetoxysilane | See acetic acid comments. |
| 17689-77-9 | Ethyltriacetoxysilane | See acetic acid comments. |

Acetic acid is formed upon contact with water or humid air. Provide adequate ventilation to control exposures within guidelines of OSHA PEL: TWA 10 ppm and ACGIH TLV: TWA 10 ppm, STEL 15 ppm.

**Engineering Controls**

Local Ventilation: None should be needed.
General Ventilation: Recommended.

**Personal Protective Equipment for Routine Handling**

Eyes: Use proper protection - safety glasses as a minimum.

Skin: Wash at mealtime and end of shift. Contaminated clothing and shoes should be removed as soon as practical and thoroughly cleaned before reuse. Chemical protective gloves are recommended.

Suitable Gloves: Silver Shield(R). 4H(R).

DOW CORNING

# DOW CORNING CORPORATION
## Material Safety Data Sheet



## DOW CORNING(R) 700 INDUSTRIAL GRADE SILICONE SEALANT - CLEAR

| | |
|---|---|
| Inhalation: | No respiratory protection should be needed. |
| Suitable Respirator: | None should be needed. |

**Personal Protective Equipment for Spills**

| | |
|---|---|
| Eyes: | Use proper protection - safety glasses as a minimum. |
| Skin: | Wash at mealtime and end of shift. Contaminated clothing and shoes should be removed as soon as practical and thoroughly cleaned before reuse. Chemical protective gloves are recommended. |
| Inhalation/Suitable Respirator: | No respiratory protection should be needed. |
| Precautionary Measures: | Avoid eye contact. Avoid skin contact. Use reasonable care. |
| Comments: | Product evolves acetic acid (HOAc) when exposed to water or humid air. Provide ventilation during use to control HOAc within exposure guidelines or use respiratory protection.<br><br>When heated to temperatures above 150 degrees C in the presence of air, product can form formaldehyde vapors. Formaldehyde is a potential cancer hazard, a known skin and respiratory sensitizer, and an irritant to the eyes, nose, throat, skin, and digestive system. Safe handling conditions may be maintained by keeping vapor concentrations within the OSHA Permissible Exposure Limit for formaldehyde. |

Note: These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| Physical Form: | Paste |
| Color: | Colorless |
| Odor: | Acetic acid odor |
| Specific Gravity @ 25°C: | 1.024 |
| Viscosity: | Not applicable - Solid |
| Freezing/Melting Point: | Not determined. |
| Boiling Point: | Not determined. |
| Vapor Pressure @ 25°C: | Not determined. |
| Vapor Density: | Not determined. |
| Solubility in Water: | Not determined. |
| pH: | Not determined. |
| Volatile Content: | Not determined. |

Note: The above information is not intended for use in preparing product specifications. Contact Dow Corning before writing specifications

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| Chemical Stability: | Stable. |

DOW CORNING

# DOW CORNING CORPORATION
## Material Safety Data Sheet



## DOW CORNING(R) 700 INDUSTRIAL GRADE SILICONE SEALANT - CLEAR

| | |
|---|---|
| Hazardous Polymerization: | Hazardous polymerization will not occur. |
| Conditions to Avoid: | None. |
| Materials to Avoid: | Oxidizing material can cause a reaction. Water, moisture, or humid air can cause hazardous vapors to form as described in Section 8. |

## 11. TOXICOLOGICAL INFORMATION

**Acute Toxicology Data for Product**

Complete information is not yet available.

**Component Toxicology Information**

Complete information is not yet available.

**Special Hazard Information on Components**

## 12. ECOLOGICAL INFORMATION

**Environmental Fate and Distribution**

No specific information is available.

**Environmental Effects**

No specific information is available.

**Fate and Effects in Waste Water Treatment Plants**

No specific information is available.

Ecotoxicity Classification Criteria

| Hazard Parameters (LC50 or EC50) | High | Medium | Low |
|---|---|---|---|
| Acute Aquatic Toxicity (mg/L) | <=1 | >1 and <=100 | >100 |
| Acute Terrestrial Toxicity | <=100 | >100 and <= 2000 | >2000 |

This table is adapted from "Environmental Toxicology and Risk Assessment", ASTM STP 1179, p.34, 1993.

This table can be used to classify the ecotoxicity of this product when ecotoxicity data is listed above. Please read the other information presented in the section concerning the overall ecological safety of this material.

## 13. DISPOSAL CONSIDERATIONS

RCRA Hazard Class (40 CFR 261)

When a decision is made to discard this material, as received, is it classified as a hazardous waste? No

State or local laws may impose additional regulatory requirements regarding disposal.

DOW CORNING

# DOW CORNING CORPORATION
## Material Safety Data Sheet



## DOW CORNING(R) 700 INDUSTRIAL GRADE SILICONE SEALANT - CLEAR

Call Dow Corning Corporate Environmental Management, (517) 496-6315, if additional information is required.

## 14. TRANSPORT INFORMATION

**DOT Road Shipment Information (49 CFR 172.101)**

Not subject to DOT.

**Ocean Shipment (IMDG)**

Not subject to IMDG code.

**Air Shipment (ICAO)**

Not subject to ICAO regulations.

Call Dow Corning Transporation, (517) 496-8577, if additional information is required.

## 15. REGULATORY INFORMATION

Contents of this MSDS comply with the OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA Status: All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

**EPA SARA Title III Chemical Listings**

**Section 302 Extremely Hazardous Substances:**

None.

**Section 304 CERCLA Hazardous Substances:**

None.

**Section 312 Hazard Class:**

Acute: Yes
Chronic: No
Fire: No
Pressure: No
Reactive: No

**Section 313 Toxic Chemicals:**

None present or none present in regulated quantities.

**Supplemental State Compliance Information**

**California**

Warning: This product contains the following chemical(s) listed by the State of California under the Safe Drinking

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DOW CORNING

# DOW CORNING CORPORATION
## Material Safety Data Sheet



## DOW CORNING(R) 700 INDUSTRIAL GRADE SILICONE SEALANT - CLEAR

Water and Toxic Enforcement Act of 1986 (Proposition 65) as being known to cause cancer, birth defects or other reproductive harm.

None known.

**Massachusetts**

| CAS Number | Wt % | Component Name |
|---|---|---|
| 7631-86-9 | 7.0 - 13.0 | SILICA, AMORPHOUS |

**New Jersey**

| CAS Number | Wt % | Component Name |
|---|---|---|
| 70131-67-8 | > 60.0 | Dimethyl siloxane, hydroxy-terminated |
| 7631-86-9 | 7.0 - 13.0 | SILICA, AMORPHOUS FUMED |
| 4253-34-3 | 1.0 - 5.0 | Methyltriacetoxysilane |
| 17689-77-9 | 1.0 - 5.0 | Ethyltriacetoxysilane |

**Pennsylvania**

| CAS Number | Wt % | Component Name |
|---|---|---|
| 70131-67-8 | > 60.0 | Dimethyl siloxane, hydroxy-terminated |
| 7631-86-9 | 7.0 - 13.0 | Silica |

## 16. OTHER INFORMATION

Prepared by: Dow Corning Corporation

These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

(R) indicates Registered Trademark

**MATERIAL SAFETY DATA SHEET**
GARRATT-CALLAHAN COMPANY
111 ROLLINS ROAD
MILLBRAE, CA 94030

**MSDS No. 0765016**

REVISED: 1/28/02
PRINTED: 1/30/02

# FORMULA 151

FOR A CHEMICAL EMERGENCY SPILL, LEAK, FIRE, OR ACCIDENT CALL CHEMTREC (800) 424-9300 24 HRS

FOR MEDICAL EMERGENCY CALL (650) 697-5811, 8 AM-4:30 PM PST or CALL (303) 623-5716 (ROCKY MTN POISON CENTER) 24 HOUR NUMBER

FOR NON-EMERGENCY PRODUCT INFORMATION CALL (650) 697-5811 BETWEEN 8 AM AND 4 PM PACIFIC TIME

## SECTION #1 - IDENTIFICATION (LA IDENTIFICACION)

PRODUCT NAME: **Formula 151**
PRODUCT USE:
Internal boiler water treatment.

HAZARD RATING
HEALTH: 3
FLAMMABILITY : 0
REACTIVITY: 1

## SECTION #2 - HAZARDOUS COMPONENTS (LOS COMPONETES PELIGROSOS)

| COMPONENT: | CAS NO: | PERCENT: | ACGIH TLV: | OSHA PEL: |
|---|---|---|---|---|
| Sodium Hydroxide | 1310-73-2 | <5 | 2 $mg/m^3$ | 2 $mg/m^3$ |
| Diethylaminoethanol | 100-37-8 | 1-2 | 2 ppm( skin) | 10 ppm (skin) |

OSHA does not list sodium sulfite as hazardous, however some sensitive individuals may have allergic reactions.

NOTE: OSHA requires only that hazardous components be listed in this section.

## SECTION #3 - PHYSICAL DATA (LA INFORMACION FISICA)

APPEARANCE: DARK LIQUID

BOILING POINT: 212 F

VAPOR DENSITY: UNKNOWN

VAPOR PRESSURE: UNKNOWN

pH: 12.5-14.0

% VOLATILES BY VOL: 78

SOLUBILITY IN WATER: COMPLETE

SPECIFIC GRAVITY: 1.1-1.3

EVAPORATION RATE: = <1 Where Butyl Acetate = 1

ODOR: AMINE

COLOR: DARK BROWN



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## SECTION #4 - FIRE AND EXPLOSION DATA (LA INFORMACION DE FUEGO Y EXPLOSION)

FLASHPOINT (PMCC): NONE AUTOIGNITION: NONE

EXTINGUISHING MEDIA: Product is water based and will not flash at its boiling point. Use media appropriate for the surrounding fire.

FIRE AND EXPLOSION HAZARDS: None known.

SPECIAL FIRE FIGHTING INSTRUCTIONS: No special instructions.

## SECTION #5 - EXPOSURE & EFFECT (LA EXPOSICION Y EFECTOS)

ROUTES AND EFFECTS OF EXPOSURE:

INHALATION: Symptoms include irritation light headiness, central nervous systems, depression, excitation nausea, vomiting, slurred speech , bronchi.

SKIN CONTACT: May irritate or burn skin

EYE CONTACT: Will burn or severely irritate eyes.

INGESTION: May irritate or burn mouth, throat, and stomach. May cause serious damage to mouth, throat, and stomach.

CHRONIC EXPOSURE: Repeated or prolonged contact may cause dermatitis (skin Redness, drying, scaling, etc.)

EMERGENCY AND FIRST AID PROCEDURES:

SKIN: Wash with water for at least 15 minutes; consult a physician if pain, irritation, or other problems persist.

EYES: Flood the eye with copious amounts of water. Do this for 15 minutes. Have patient blink as much as possible while flooding the eye. Do not force eyelid open. CALL A PHYSICIAN.

INGESTION: Do not induce vomiting. Drink water, orange or tomato juice, soft drinks. Call a physician.

INHALATION: Immediately get the person to fresh air. Avoid breathing vapors. Open doors and windows wide. If patient is not breathing, start artificial respiration and call a physician. Call a physician if pain, irritation, breathing problems, or other symptoms persist.

## SECTION #6 - REACTIVITY & POLYMERIZATION (LA REACTIVIDAD Y POLIMERIZACION)

STABILITY: STABLE CONDITIONS TO AVOID (STABILITY): NONE

INCOMPATIBLE MATERIALS: strong acids

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of sulfur, nitrogen and carbon.

CONDITIONS TO AVOID (POLYMERIZATION): NONE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

## SECTION #7 - SPILL, LEAK & DISPOSAL PROCEDURES (LA ATILLA, GOTERA, & LOS PROCEDIMIENTOS DE ELIMINACION)

Wear protective clothing. Small spills of one gallon or less may be flushed to drain with large amounts of water. For larger spills, contain with absorbent material. Place in plastic bag.

Dispose of in waste management facility or in compliance with federal, state and local regulations. If spill is not contaminated you may be able to dispose of material where normally used.

## SECTION #8 - SPECIAL PROTECTIVE MEASURES (LAS MEDIDAS PROTECTORAS ESPECIALES)

VENTILATION: NORMAL ROOM.

SKIN PROTECTION: PLASTIC OR RUBBER GLOVES, ELBOW LENGTH.

EYE PROTECTION: CHEMICAL WORKER'S GOGGLES OR FACE MASK.

OTHER: PLASTIC OR RUBBER APRON.

RESPIRATORY PROTECTION: NONE NEEDED UNDER NORMAL CONDITIONS OF USE.

WORK/HYGIENIC PRACTICES: Have eyewash and safety shower, ANSI Z358.1-1998 certified, in work area Remove contaminated clothing. Wash contaminated clothing before reuse. If liquid is adsorbed into shoes or gloves, discard.

## SECTION #9 - STORAGE & HANDLING INFORMATION (INFORMACION DE ALACENAMIENTO Y MANIPULACION)

STORAGE AND HANDLING CONDITIONS:

Keep container covered and sealed when not in use. Store in a cool, dry area. Do not add water or any other material to drum of product or otherwise contaminate it. Wash thoroughly after handling. Read product label for further instructions.

## SECTION #10 - TRANSPORTATION INFORMATION (INFORMACION DE TRANSPORTACION)

DOT SHIPPING NAME: Sodium hydroxide solution (<40%)

DOT HAZARD CLASS: 8, PGII

UN/NA#: UN1824

DOT LABEL REQUIRED: Corrosive

## SECTION #11 - REGULATORY INFORMATION (INFORMACION REGULADOR)

The concentrations shown are maximum or ceiling levels (weight %) to be used for calculations for regulations. Trade secrets are indicated by "TS".

**SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III** requires emergency planning based upon Threshold Planning Quantities (TPQ's) and release reporting based on Reportable Quantities (RQ's) in 40 CFR 355 (used for SARA 302, 304, 311, AND 312).

Components present in this product at the level which would require reporting under the statute are:

| Substance | CAS No. | Percent |
|---|---|---|
| SODIUM HYDROXIDE | 1310-73-2 | <5 |

TPQ: 10,000 LBS; RQ: 1000 LBS

SARA HAZARD CLASS: Acute health hazard and Chronic health hazard

**The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)** requires notification of the National Response Center of release of quantities of hazardous substances equal to or greater than the reportable quantities (RQ's) in 40 CFR 302.4.

Components present in this product at the level which would require reporting under the statute are:

| Substance | CAS No. | Percent |
|---|---|---|
| SODIUM HYDROXIDE | 1310-73-2 | <5 |

RQ: 1000 LBS

## SECTION #12 - TOXICOLOGICAL INFORMATION (INFORMACIÓN TÓXICA)

**$LC_{50}$**

Daphnia magna, 48 HOUR: 6830.2 mg/L

Pimephales promelas, 96 HOUR: > 10,000 mg/L (55% survival at 10,000 ppm)

ALTHOUGH REASONABLE CARE HAS BEEN TAKEN IN THE PREPARATION OF THIS DOCUMENT, WE EXTEND NO WARRANTIES AND MAKE NO REPRESENTATIONS AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION CONTAINED HEREIN, AND ASSUME NO RESPONSIBILITY REGARDING THE SUITABILITY OF THIS INFORMATION FOR THE USER'S INTENDED PURPOSE OR FOR THE CONSEQUENCES OF ITS USE. EACH INDIVIDUAL SHOULD MAKE A DETERMINATION AS TO THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSE.

Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m3) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury. Current exposure guidelines are expected to protect against these effects reported for MDI.

### Developmental Toxicity

In laboratory animals, MDI/polymeric MDI did not cause birth defects; other fetal effects occurred only at high doses which were toxic to the mother.

### Reproductive Toxicity

No relevant information found.

### Genetic Toxicology

In vitro genetic toxicity studies were negative for component(s) tested. Genetic toxicity data on MDI are inconclusive. MDI was weakly positive in some in vitro studies; other in vitro studies were negative. Animal mutagenicity studies were predominantly negative.

## 12. Ecological Information

**ENVIRONMENTAL FATE**

Data for Component: **Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.,.alpha.',.alpha."-1,2,3-propanetriyltris[.omega.-hydroxypoly**

#### Movement & Partitioning

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

#### Persistence and Degradability

In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.

Data for Component: **Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer**

#### Movement & Partitioning

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

#### Persistence and Degradability

In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.

Data for Component: **Diphenylmethane Diisocyanate, isomers and homologues**

#### Movement & Partitioning

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

#### Persistence and Degradability

In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.

Data for Component: **Paraffin waxes and Hydrocarbon waxes, chlorinated**

#### Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7). Expected to be relatively immobile in soil (Koc > 5000). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
**Henry's Law Constant (H):** < 1.0E-07 atm*m3/mole; 25 °C Estimated.

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**Partition coefficient, n-octanol/water (log Pow):** 7.4 Estimated.
**Partition coefficient, soil organic carbon/water (Koc):** > 5,000 Estimated.

### Persistence and Degradability
Expected to degrade only slowly in the environment.
**Theoretical Oxygen Demand:** 2.89 mg/mg

Data for Component: **Isobutane**

### Movement & Partitioning
Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).
**Henry's Law Constant (H):** 1.19E+00 atm*m3/mole; 25 °C Measured
**Partition coefficient, n-octanol/water (log Pow):** 2.76 Measured
**Partition coefficient, soil organic carbon/water (Koc):** 35 Estimated.
**Distribution in Environment: Mackay Level 1 Fugacity Model:**

| Air | Water. | Biota | Soil | Sediment |
|---|---|---|---|---|
| 100 % | 0 % | 0 % | 0 % | 0 % |

### Persistence and Degradability
Biodegradation may occur under aerobic conditions (in the presence of oxygen).
**Indirect Photodegradation with OH Radicals**

| Rate Constant | Atmospheric Half-life | Method |
|---|---|---|
| 2.44E-12 cm3/s | 4.4 d | Estimated. |

**Theoretical Oxygen Demand:** 3.58 mg/mg

Data for Component: **Propane**

### Movement & Partitioning
Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).
**Henry's Law Constant (H):** 7.07E-01 atm*m3/mole; 25 °C Measured
**Partition coefficient, n-octanol/water (log Pow):** 2.36 Measured
**Partition coefficient, soil organic carbon/water (Koc):** 24 - 460 Estimated.
**Distribution in Environment: Mackay Level 1 Fugacity Model:**

| Air | Water. | Biota | Soil | Sediment |
|---|---|---|---|---|
| 100 % | 0 % | 0 % | 0 % | 0 % |

### Persistence and Degradability
No relevant information found.
**Indirect Photodegradation with OH Radicals**

| Rate Constant | Atmospheric Half-life | Method |
|---|---|---|
| 1.27E-12 cm3/s | 8.4 d | Estimated. |

**Theoretical Oxygen Demand:** 3.64 mg/mg

Data for Component: **Methyl ether**

### Movement & Partitioning
Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).
**Henry's Law Constant (H):** 9.78E-04 atm*m3/mole; 25 °C Measured
**Partition coefficient, n-octanol/water (log Pow):** 0.10 Measured
**Partition coefficient, soil organic carbon/water (Koc):** 1.29 - 14 Estimated.

### Persistence and Degradability
Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.
**Indirect Photodegradation with OH Radicals**

| Rate Constant | Atmospheric Half-life | Method |
|---|---|---|
| 1.66E-12 cm3/s | 6.4 d | Estimated. |

**OECD Biodegradation Tests:**

| Biodegradation | Exposure Time | Method |
|---|---|---|
| 5 % | 28 d | OECD 301A Test |

**Theoretical Oxygen Demand:** 2.08 mg/mg

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Data for Component: **4,4' -Methylenediphenyl diisocyanate**

### Movement & Partitioning

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

### Persistence and Degradability

In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.

Data for Component: **N,N'-Dimorpholinodiethylether**

### Movement & Partitioning

Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is very high (Koc between 0 and 50). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
**Henry's Law Constant (H):** 3.79E-18 atm*m3/mole; 25 °C Estimated.
**Partition coefficient, n-octanol/water (log Pow):** -1.31 Estimated.
**Partition coefficient, soil organic carbon/water (Koc):** 10 Estimated.

### Persistence and Degradability

**Indirect Photodegradation with OH Radicals**

| Rate Constant | Atmospheric Half-life | Method |
|---|---|---|
| 3.5646E-10 cm3/s | 0.03 d | Estimated. |

**Theoretical Oxygen Demand:** 2.49 mg/mg

## ECOTOXICITY

Data for Component: **Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.,.alpha.',.alpha."-1,2,3-propanetriyltris[.omega.-hydroxypoly**

The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species. Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

**Toxicity to Soil Dwelling Organisms**

LC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

Data for Component: **Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer**

The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species. Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

**Toxicity to Soil Dwelling Organisms**

LC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

Data for Component: **Diphenylmethane Diisocyanate, isomers and homologues**

The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species. Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

**Toxicity to Soil Dwelling Organisms**

LC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

Data for Component: **Paraffin waxes and Hydrocarbon waxes, chlorinated**

Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).

**Fish Acute & Prolonged Toxicity**

LC50, rainbow trout (Oncorhynchus mykiss), static, 96 h: > 100 mg/l

**Aquatic Invertebrate Acute Toxicity**

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EC50, water flea Daphnia magna, immobilization: 0.037 mg/l

Data for Component: **Isobutane**

No relevant information found.

Data for Component: **Propane**

No relevant information found.

Data for Component: **Methyl ether**

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

**Fish Acute & Prolonged Toxicity**

LC50, guppy (Poecilia reticulata), 96 h: > 4,000 mg/l

**Aquatic Invertebrate Acute Toxicity**

LC50, water flea Daphnia magna, 48 h: > 4,000 mg/l

Data for Component: **4,4' -Methylenediphenyl diisocyanate**

The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species. Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

**Toxicity to Soil Dwelling Organisms**

LC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

Data for Component: **N,N'-Dimorpholinodiethylether**

Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L). May increase pH of aquatic systems to > pH 10 which may be toxic to aquatic organisms.

**Fish Acute & Prolonged Toxicity**

LC50, zebra fish (Brachydanio rerio), 96 h: > 2,150 mg/l

## 13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device. For additional information, refer to: Handling & Storage Information, MSDS Section 7 Stability & Reactivity Information, MSDS Section 10 Regulatory Information, MSDS Section 15 As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989-832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details.

## 14. Transport Information

**DOT Non-Bulk**

**Proper Shipping Name:** AEROSOLS, FLAMMABLE

**Hazard Class:** 2.1 **ID Number:** UN1950

CONSUMER COMMODITY RECLASSIFIED AS ORM-D MATERIAL

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### DOT Bulk
NOT AVAILABLE IN BULK CONTAINERS

### IMDG
**Proper Shipping Name:** AEROSOLS, FLAMMABLE
**Hazard Class:** 2.1 **ID Number:** UN1950
**EMS Number:** F-D,S-U

LIMITED QUANTITY

### ICAO/IATA
**Proper Shipping Name:** AEROSOLS, FLAMMABLE
**Hazard Class:** 2.1 **ID Number:** UN1950**Cargo Packing Instruction:** 203
**Passenger Packing Instruction:** 203

LIMITED QUANTITY

*This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.*

## 15. Regulatory Information

### OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

### Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

| | |
|---|---|
| **Immediate (Acute) Health Hazard** | Yes |
| **Delayed (Chronic) Health Hazard** | Yes |
| **Fire Hazard** | Yes |
| **Reactive Hazard** | No |
| **Sudden Release of Pressure Hazard** | Yes |

### Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

| Component | CAS # | Amount |
|---|---|---|
| 4,4' -Methylenediphenyl diisocyanate | 101-68-8 | >= 7.0 - <= 13.0 % |
| Paraffin waxes and Hydrocarbon waxes, chlorinated | 63449-39-8 | >= 5.0 - <= 10.0 % |
| Diphenylmethane Diisocyanate, isomers and homologues | 9016-87-9 | >= 10.0 - <= 30.0 % |

### Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

| Component | CAS # | Amount |
|---|---|---|
| 4,4' -Methylenediphenyl diisocyanate | 101-68-8 | >= 7.0 - <= 13.0 % |
| Methyl ether | 115-10-6 | >= 1.0 - <= 5.0 % |
| Propane | 74-98-6 | >= 1.0 - <= 5.0 % |
| Isobutane | 75-28-5 | >= 3.0 - <= 7.0 % |

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**Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:**
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

**California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)**
This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

**US. Toxic Substances Control Act**
All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30
**CEPA - Domestic Substances List (DSL)**
All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

## 16. Other Information

### Recommended Uses and Restrictions
Component(s) for the manufacture of urethane polymers. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

### Revision
Identification Number: 1041500 / 1001 / Issue Date 01/08/2010 / Version: 1.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

### Legend

| | |
|---|---|
| N/A | Not available |
| W/W | Weight/Weight |
| OEL | Occupational Exposure Limit |
| STEL | Short Term Exposure Limit |
| TWA | Time Weighted Average |
| ACGIH | American Conference of Governmental Industrial Hygienists, Inc. |
| DOW IHG | Dow Industrial Hygiene Guideline |
| WEEL | Workplace Environmental Exposure Level |
| HAZ_DES | Hazard Designation |
| Action Level | A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded. |

*The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.*

04/14/2023

MI SWACO

MATERIAL SAFETY DATA SHEET

**MSDS No.** 10726 **Trade Name:** HRP* **Revision Date:** 08/11/2009

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Trade Name:** HRP*

**Chemical Family:** Mixture
**Product Use:** Oil well drilling fluid additive. Viscosifier.

**Supplied by:** M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.com
**Telephone Number:** 281-561-1512
**Emergency Telephone (24 hr.):** 281-561-1600
**Prepared by:** Product Safety Group

**Revision No.** 6

**HMIS Rating**
**Health:** 2 **Flammability:** 1 **Physical Hazard:** 0 **PPE:** J

4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

## 2. HAZARDS IDENTIFICATION

**Emergency Overview:** Warning! May cause severe eye irritation. Prolonged contact may cause burns. May cause skin irritation.

**Canadian Classification:**
**UN PIN No:** Not regulated. **WHMIS Class:** D2B

**Physical State:** Liquid **Color:** Amber **Odor:** Mild

**Potential Health Effects:**
**Acute Effects**

**Eye Contact:** May cause severe eye irritation. Prolonged contact may damage eye.
**Skin Contact:** May be irritating to the skin.
**Inhalation:** Not expected to be an inhalation hazard under anticipated workplace exposures. Overexposure to vapors and mists which may be released at high temperatures may cause respiratory tract irritation.
**Ingestion:** May cause gastric distress, nausea and vomiting if ingested.

**Carcinogenicity & Chronic Effects:** See Section 11 - Toxicological Information.

**Routes of Exposure:** Eyes. Dermal (skin) contact. Inhalation.
**Target Organs/Medical Conditions Aggravated by Overexposure:** Eyes. Skin. Respiratory System.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredient | CAS No. | Wt. % | Comments: |
|---|---|---|---|
| Polyamide | | 30 - 60 | No comments. |
| Triethylene glycol monobutyl ether | 143-22-6 | 30 - 60 | No comments. |
| Propylene carbonate | 108-32-7 | 1 - 5 | No comments. |

## 4. FIRST AID MEASURES

**Eye Contact:** Immediately flush eyes with large amounts of water. Look for and remove contact lenses. Continue to rinse for at least 15 minutes. Seek immediate medical attention.

**Skin Contact:** Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

**Inhalation:** Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Ingestion:** Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

**General notes:** Persons seeking medical attention should carry a copy of this MSDS with them.

## 5. FIRE FIGHTING MEASURES

**Flammable Properties**

**Flash Point: F (C):** >200F (>93C)
**Flash Point Method:** PMCC
**Flammable Limits in Air - Lower (%):** ND
**Flammable Limits in Air - Upper (%):** ND
**Autoignition Temperature: F (C):** ND
**Flammability Class:** IIIB
**Other Flammable Properties:** ND
**Extinguishing Media:** Water fog, carbon dioxide, foam, dry chemical.

**Protection Of Fire-Fighters:**

**Special Fire-Fighting Procedures:** Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.

**Hazardous Combustion Products:** Propylene oxide. Oxides of carbon and nitrogen.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Use personal protective equipment identified in Section 8.

**Spill Procedures:** Evacuate the spill area with the exception of the spill response team. Keep personnel removed and upwind of spill. Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Shut off leak if it can be done safely. Contain spilled material. Do not allow spilled material to enter sewers, storm drains or surface waters. Absorb in vermiculite, dry sand or earth. Place into containers for disposal.

**Environmental Precautions:** Waste must be disposed of in accordance with federal, state and local laws. In the U.S., for products with reportable quanitity (RQ) components - if the RQ is exceeded, report to National Spill Response Office at 1 800 424 8802.

## 7. HANDLING AND STORAGE

**Handling:** Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid breathing vapors or spray mists. Use only in a well ventilated area. Wash thoroughly after handling.

**Storage:** Store in dry, well-ventilated area. Keep container closed. Keep away from heat, sparks and flames. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure Limits (TLV & PEL - 8H TWA):**

| Ingredient | CAS No. | Wt. % | ACGIH TLV | OSHA PEL | Other | Notes |
|---|---|---|---|---|---|---|
| Polyamide | | 30 - 60 | NA | NA | NA | None |
| Triethylene glycol monobutyl ether | 143-22-6 | 30 - 60 | NA | NA | NA | None |
| Propylene carbonate | 108-32-7 | 1 - 5 | NA | NA | NA | None |

**Engineering Controls:** Local exhaust ventilation as necessary to maintain exposures to within applicable limits.

**Personal Protection Equipment**

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

**Eye/Face Protection:** Wear chemical safety goggles.

**Skin Protection:** Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear chemical resistant gloves such as: Butyl rubber.

**Respiratory Protection:** All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne mist/aerosol of this product, use at least a NIOSH-approved N95 half-mask disposable or re-usable particulate respirator. In work environments containing oil mist/aerosol, use at least a NIOSH-approved P95 half-mask disposable or reuseable particulate respirator.

If exposed to vapors from this product use a NIOSH/MSHA-approved respirator with an Organic Vapor cartridge.

**General Hygiene Considerations:** Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Color:** | Amber |
| **Odor:** | Mild |
| **Physical State:** | Liquid |
| **pH:** | 8 - 10 (1% solution) |
| **Specific Gravity (H2O = 1):** | 0.99 - 1.01 g/cc |
| **Solubility (Water):** | Soluble |
| **Flash Point: F (C):** | >200F (>93C) |
| **Melting/Freezing Point:** | ND |
| **Boiling Point:** | ND |
| **Vapor Pressure:** | ND |
| **Vapor Density (Air=1):** | ND |
| **Evaporation Rate:** | ND |
| **Odor Threshold(s):** | ND |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **Chemical Stability:** | Stable |
| **Conditions to Avoid:** | Keep away from heat, sparks and flame. |
| **Materials to Avoid:** | Oxidizers. Acids. Alkalies. Aluminum, aluminum alloys. Galvanized metals. Nitrile. Natural rubber. Viton. |
| **Hazardous Decomposition Products:** | None known |
| **Hazardous Polymerization** | Will not occur |

## 11. TOXICOLOGICAL INFORMATION

**Component Toxicological Data:** Any adverse component toxicological effects are listed below. If no effects are listed, no such data were found.

| Ingredient | CAS No. | Acute Data |
|---|---|---|
| Triethylene glycol monobutyl ether | 143-22-6 | Oral LD50: 5300 mg/kg (rat); Dermal LD50: 3540 ul/kg (rabbit); Inhalation LC50: >200 mg/l/1H (rat) |

| Ingredient | CAS No. | Acute Data |
|---|---|---|
| Propylene carbonate | 108-32-7 | Oral LD50: 29,000 mg/kg (rat); Dermal LD50: >20,000 mg/kg (rabbit) |

**Product Toxicological Information:**
No toxicological data is available for this product.

## 12. ECOLOGICAL INFORMATION

**Component Ecotoxicity Data:** Component ecotoxicity data are listed below. If no data are listed, none was found in the component review.

| Ingredient | CAS No. | Data |
|---|---|---|
| Triethylene glycol monobutyl ether | 143-22-6 | LC50 48H: 2990 - 5520 mg/l (Daphnia); EC50 48H: 4300 - 5200 mg/l (Daphnia); NOEC 96H: 1400 mg/l (fathead minnow); LC50 96H 2400 - 5000 mg/l (fathead minnow); LC50 96H: 2200 - 2600 mg/l (Leuciscus idus (carp)); 72H EC50: >500 mg/l (Scenedesmus subspicatus (green algae)) |
| Propylene carbonate | 108-32-7 | LC50 96H: 2200 - 5300 mg/l (Leuciscus idus); EC50 48H: >500 mg/l (Daphnia magna); EC50 72H: >500 mg/l (Scenedesmus subspicatus); 17H EC50: >10,000 mg/l (Pseudomonas putida) |

**Product Ecotoxicity Data:** Contact M-I Environmental Affairs Department for available product ecotoxicity data.

**Biodegration:** ND
**Bioaccumulation:** ND
**Octanol/Water Partition Coefficient:** ND

## 13. DISPOSAL CONSIDERATIONS

**Waste Classification:** ND

**Waste Management:** Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act ( RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

**Disposal Method:** Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

## 14. TRANSPORT INFORMATION

**U.S. DOT Shipping Description:** Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.

**Canada TDG Shipping Description:** Not regulated.

**UN PIN No:** Not regulated.

**IMDG Shipping Description:** Not regulated.
**ICAO/IATA Shipping Description:** Not regulated.

## 15. REGULATORY INFORMATION

**U.S. Federal and State Regulations**

**SARA 311/312 Hazard Catagories:** Immediate (acute) health hazard.

**SARA 302/304, 313; CERCLA RQ, California Proposition 65:** Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

| Ingredient | SARA 302 / TPQs | SARA 313 | CERCLA RQ | CA 65 Cancer | CA 65 Dev. Tox. | CA 65 Repro. F | CA 65 Repro. M |
|---|---|---|---|---|---|---|---|
| Triethylene glycol monobutyl ether | --- | 1.0% | --- | --- | --- | --- | --- |

**International Chemical Inventories**

Australia AICS - Contains a component that is not listed.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Contains a component that is not listed.
European Union EINECS/ELINCS - Contains a component(s) that is not listed.
Japan METI ENCS - Contains a component that is not listed.
Korea TCCL ECL - Contains a component that is not listed.
New Zealand - Contains a component that is not listed.
Philippine PICCS - Contains a component that is not listed.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

**Canadian Classification:**

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

**WHMIS Class:** D2B

## 16. OTHER INFORMATION

**The following sections have been revised:** 1, 2, 4, 5, 6, 8, 10, 15, 16

**NA - Not Applicable, ND - Not Determined.**

*A mark of M-I L.L.C.

**Disclaimer:**

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We can not make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guartantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

# JET-LUBE, INC.

## MATERIAL SAFETY DATA SHEET

**I**

**Product Name:** **KOPR-KOTE®** Bulk & Aerosol
**Chemical Family:** Petroleum based lubricating grease
**Use:** Tool joint and drill collar compound/anti-seize (MIL-PRF-907E)/ jacking lubricant

**Manufacturer/Supplier:** JET-LUBE, INC.
**Address:** 4849 Homestead Rd., Ste. #200
Houston, TX, 77028 USA **Phone:** 713-674-7617
**Emergency Phone:** 713-674-7617 **Fax:** 713-678-4604
**Chemtrec 24 hours (USA):** 800-424-9300

**II**

| Hazardous Components | CAS No. | Wt% | OSHA PEL | ACGIH TLV | Other Limits of Exposure |
|---|---|---|---|---|---|
| Petroleum oil | 64742570/64742525 | 40-60 | Oil mist TWA-5mg/M³ | N/A | STEL: 10mg/M³ |
| Nonhazardous Blend | 82980549/1317653 7782435/1317335 12001262/14807966 | 30-60 | UN | UN | STEL: UN |
| Metallic Copper | 7440508 | 10-20 | N/A | 1mg/M³ | STEL: 2mg/M³ |
| Petroleum Solvent (aerosol) | 64742898 | 0-10 | TWA-300ppm | 300ppm | UN |
| Hydrocarbon Propellant (aerosol) | 68476857 | 15-25 | 1000ppm | 1000ppm | N/A |

**III**

**Main Hazards–Health Effects**
**Eyes:** May cause irritation. **Inhalation:** Viscous nature may block breathing passages if inhaled. **Ingestion:** May cause diarrhea.
**Skin:** For hypersensitive persons, may irritate the skin after prolonged periods of contact.

**IV**

**Eyes:** Flush with water until all residual material is gone. If irritation persists, seek medical help. **Inhalation:** Clear air passage. If respiratory difficulty continues, seek medical help. **Ingestion:** Wash out mouth immediately. Consult physician. **Skin:** Wash thoroughly with hand cleanser, followed by soap & water. Contaminated clothing should be dry cleaned before reuse.

**V**

**Extinguishing Media:** Foam, dry powder, Halon®, carbon dioxide, sand, earth & water mist. **Unsuitable Extinguishing Media:** Water jet.
**Protective Equipment for Fire fighting:** Self-contained breathing apparatus.

**VI**

**Personal Precautions:** Wear gloves & protective overalls. **Environmental Precautions:** Do not allow it to enter drains. **Spillage:** Scrape up bulk, then wipe up remainder with cloth. To prevent walking hazard, pick up remaining residue with diatomaceous earth.

**VII**

**Handling:** No special handling precautions necessary. **Storage:** Do not store at elevated temperatures.

**VIII**

**Respiratory Protection:** None needed. **Hand Protection:** Protective gloves for hypersensitive persons.
**Eye Protection:** Glasses, if applied to parts in motion. **Body Protection:** Overalls.

**IX**

**Physical State:** Semisolid paste **Color:** Copper/Bronze **Odor:** Petroleum **pH:** Neutral **Boiling Range/Point °F (°C):** <600 (316)
**Melting Point °F (°C):** 500 (260) **Flash Point (COC) °F (°C):** 430 (221) **Autoignition Temperature °F (°C):** >500 (260)
**Propellant Flash Point (COC) °F (°C):** -76 (-60) **Explosive Properties:** **LEL:** 0.9% **UEL:** 7% **Evaporation Rate (Butyl Acetate):** <0.01
**Partition Coefficient (Log Pow):** N/A **Vapor Pressure (kPa):** <0.01 **Density (g/cm³):** 1.10 **OAR Value:** N/A
**Flammability:** Not flammable at ambient temp. **Oxidizing Properties:** None **Water Solubility:** Nil **Vapor Density:** >5 **% Volatiles:** Nil

**X**

**Stability:** Chemically stable under normal conditions. No photoreactive agents. **Conditions to Avoid:** Powerful sources of ignition & extreme temps. **Materials to Avoid:** Strong inorganic & organic acids, oxidizing & copper reactive agents. **Hazardous Decomposition Products:** Burning generates smoke, airborne soot, hydrocarbons & oxides of carbon, sulfur & nitrogen. Residue mainly comprised of soot & mineral oxides.

**XI**

**Acute Toxicity:** Not known. **Irritancy–Skin:** Very mild. **Skin Sensitization:** Not known. **Subacute/Sub-chronic Toxicity:** Not known.
**Genotoxicity:** None known. **Chronic Toxicity:** None known. **California Prop 65:** N/A **Carcinogen:** **NTP:** No **IARC:** No **OSHA:** No
**EC Classification (67/548/EEC):** No **Allergens:** None known. **LC-50:** >1.98mg/l (actual test data-mysidopsi bahia). **LD-50:** N/A

**XII**

**Possible Effects:** Highly unlikely to may gernerate oil fractions that could act as a marine pollutant. **Behavior:** Bioaccumulation potential nil. **Environmental Fate:** Highly unlikely to cause widespread contamination. Nontoxic to marine or land organisms.

**XIII**

**Product Disposal:** Do not incinerate. Contact waste disposal company or local authority for advice.
**Container Disposal:** Pails without liner–see Product Disposal section above. Pails with plastic liner–pail may only be disposed of via standard waste disposal services, recycled or reused. Liner–see Product Disposal section above.

**XIV**

**D.O.T.:** Consumer Commodity ORM-D **UN No.:** Bulk N/A Aero 1950, Class 2.1 **Air Transport (ICAO & IATA):** Bulk N/A Aero 1950, Class 2.1
**Sea Transport (IMO & IMDG):** Bulk N/A Aero 1950, Class 2 **Road & Rail Transport (ADR/RID):** Bulk N/A Aero Class 2, Aerosols

**XV**

**Labeling Information:** None needed **EC Annex 1 Classification:** Not Applicable. **R Phrases:** R22—harmful if swallowed.
**S Phrases:** N/A, as known. **Ozone Depleting Chemicals:** N/A **TSCA:** All components are listed. **SARA 311/312:** None
**WHMIS (Canada):** Bulk Not regulated Aero Class A, B-5 **Canadian DSL:** All components listed. **TSCA 12B Components:** None
**40 CFR Part 372 (SARA Section 313):** This product contains copper. **CERCLA:** Nonhazardous **RCRA Hazard Class:** Nonhazardous

**XVI**

SDS first issued. SDS data revised. **New Jersey Right To Know:** See Section II

**Signature:** [illegible]
**Prepared by: Donald A. Oldiges**
**Date Issued: March 5, 2001**

As of issue date, the information contained herein is accurate and reliable to the best of JET-LUBE'S knowledge. JET-LUBE® does not warrant or guarantee its accuracy or reliability and shall not be liable for any loss or damage arising out of the use thereof. It is the user's responsibility to satisfy itself that the information offered for its consideration is suitable for its particular use.

**LEGEND**

I. Identification of the substance/preparation and company
II. Composition information on ingredients
III. Hazards identification
IV. First aid measures
V. Fire fighting measures
VI. Accidental release measures
VII. Handling and storage
VIII. Exposure control/personal protection
IX. Physical and chemical properties
X. Stability and reactivity
XI. Toxicological information
XII. Ecological information
XIII. Waste Disposal
XIV. Transport information
XV. Regulatory Information
XVI. Other information

**HMIS SYMBOL - BULK**

| | |
|---|---|
| HEALTH | 1 |
| FLAMMABILITY | 1 |
| REACTIVITY | 1 |
| PPI | B |

**HMIS SYMBOL - AEROSOL**

| | |
|---|---|
| HEALTH | 1 |
| FLAMMABILITY | 4 |
| REACTIVITY | 1 |
| PPI | G |

**NFPA SYMBOL**

**NFPA SYMBOL**

04/14/2023

# KOPR-KOTE®

## HIGH TEMPERATURE ANTI-SEIZE AND GASKET COMPOUND

### DESCRIPTION

**KOPR-KOTE®** is a low friction, anti-seize lubricant manufactured from a combination of micro-size copper flakes and graphite, dispersed in a water resistant grease and fortified with antioxidants, plus rust and corrosion inhibitors. **KOPR-KOTE** contains **CZ-EX® JET-LUBE's** EP additive, providing protection unequalled by competitive brands.

**KOPR-KOTE** provides a shield against metal-to-metal contact, preventing seizure and corrosion. Its ingredients create an effective matrix between mated surfaces and are unaffected by contraction or expansion. It fills irregularities and imperfections and resists welding, hardening or setting. **KOPR-KOTE** provides low friction and cushions impact and shock loads. Low shear between particles reduces stick-slip, allowing quick disassembly with minimum wrench torque. It will not squeeze out of the threads, gum up or wash off.

- Conforms to MIL-PRF-907E.
- Service rating: -65°F (-54°C) to 1800°F (982°C).
- Contains no lead or zinc.
- Lowers friction; reduces wrench torque.
- Permits reuse of fittings; saves stud, bolt and nut replacement.
- Aluminum complex base for brushability and stability over a wide temperature range.
- Not affected by contraction, expansion or vibration.
- Will not run, drip or settle out.
- Available in convenient aerosol form.

### APPLICATIONS

**KOPR-KOTE** has no equal in temperature services up to 1800°F (982°C). Fittings that are heated red hot, then allowed to cool, can quickly be disassembled without seizure of distortion. **KOPR-KOTE** is recommended for production and maintenance jobs where speed in assembling and dismantling is essential.

### PRODUCT CHARACTERISTICS

| | |
|---|---|
| Thickener | Aluminum Complex |
| Fluid Type | Petroleum |
| Dropping Point (ASTM D-566) | 450°F (232°C) |
| Specific Gravity | 1.15 |
| Density (lb/gal) | 9.6 |
| Oil Separation (ASTM D-6184) Wt. % Loss @ 212°F (100°C) | <3.0 |
| Flash Point (ASTM D-92) | >430°F (221°C) |
| Coefficient of Friction | 0.11 (316 stainless) |
| Penetration @77°F (ASTM D-217) | 310 - 330 |
| Copper Strip Corrosion (ASTM D-4048) | 1A |
| 4-Ball (ASTM D-2596) | |
| Weld Point, kgf | 800 |
| Load Wear Index | 125 |
| Propellant | Hydrocarbon |
| Spray Pattern | 2-4" Cone @ 1' |
| V.O.C. Content | <330 g/liter |

### PACKAGING

| Code No. | Container Size | Container |
|---|---|---|
| 10055 | ¼ lb. | Brush Top can |
| 10002 | ½ lb. | Brush Top can |
| 10004 | 1 lb. | Brush Top can |
| 10007 | 2 lb. | Plug Top can |
| 10041 | 12 oz. | Aerosol |
| 10050 | 14 oz. | Cartridge |
| 10091 | 1 gal. | Pail |
| 10092 | 2½ gal. | Pail |
| 10093 | 5 gal. | Pail |
| 10024 | 15 gal. | Drum |
| 10029 | 50 gal. | Drum |

### LIMITED WARRANTY

Jet-Lube, Inc. makes the Limited Express Warranty that at the date of delivery, this product shall be free from defects in Jet-Lube, Inc. materials and workmanship.

This Limited Express Warranty is expressly in lieu of any other express or implied warranties, including any implied warranty of merchantability or fitness for a particular purpose, and of any other obligation on the part of Jet-Lube, Inc.

The sole remedy for breach of the Limited Express Warranty shall be the refund of the purchase price. All other liability is negated and disclaimed, and Jet-Lube, Inc. shall not be liable for incidental or consequential damages.

### CORPORATE LOCATIONS

Houston, Texas–World Headquarters

Maidenhead, England

Edmonton, Canada

JET-LUBE, INC.
4849 HOMESTEAD RD.,
P.O. BOX 21258 (77226-1258)
HOUSTON, TX 77028

WATS: 800-538-5823
PHONE: 713-674-7617
FAX: 713-678-4604
E-MAIL: sales@jetlube.com

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04/14/2023

# JET-LUBE, INC.
## MATERIAL SAFETY DATA SHEET

**I**

**Product Name:** **KOV'R-KOTE®**
**Chemical Family:** Petroleum based lubricating grease
**Use:** Tool joint and drill collar compound/anti-seize (MIL-PRF-907E)/ Tubing and casing line pipe sealant.

**Manufacturer/Supplier:** JET-LUBE, INC.
**Address:** 4849 Homestead Rd., Ste. #200
Houston, TX, 77028 USA **Phone:** 713-674-7617
**Emergency Phone:** 713-674-7617 **Fax:** 713-678-4604
**Chemtrec 24 hours (USA):** 800-424-9300

**II**

| Hazardous Components | CAS No. | Wt% | OSHA PEL | ACGIH TLV | Other Limits of Exposure |
|---|---|---|---|---|---|
| Petroleum oil | 64742525/64742014 | 60-100 | Oil mist TWA-5mg/M³ | N/A | STEL: 10mg/M³ |
| Nonhazardous Blend | 82980549/7620771 7782435/12001262 14807966/1317653 | 30-60 | UN | >2.5mg/M³ | STEL: UN |

**III**

**Main Hazards–Health Effects**
**Eyes:** May cause irritation. **Inhalation:** Viscous nature may block breathing passages if inhaled. **Ingestion:** May cause diarrhea.
**Skin:** For hypersensitive persons, may irritate the skin after prolonged periods of contact.

**IV**

**Eyes:** Flush with water until all residual material is gone. If irritation persists, seek medical help. **Inhalation:** Clear air passage. If respiratory difficulty continues, seek medical help. **Ingestion:** Wash out mouth immediately. Consult physician. **Skin:** Wash thoroughly with hand cleanser, followed by soap & water. Contaminated clothing should be dry cleaned before reuse.

**V**

**Extinguishing Media:** Foam, dry powder, Halon®, carbon dioxide, sand, earth & water mist. **Unsuitable Extinguishing Media:** Water jet. **Protective Equipment for Fire fighting:** Self-contained breathing apparatus.

**VI**

**Personal Precautions:** Wear gloves & protective overalls. **Environmental Precautions:** Do not allow it to enter drains. **Spillage:** Scrape up bulk, then wipe up remainder with cloth. To prevent walking hazard, pick up remaining residue with diatomaceous earth.

**VII**

**Handling:** No special handling precautions necessary. **Storage:** Do not store at elevated temperatures.

**VIII**

**Respiratory Protection:** None needed. **Hand Protection:** Protective gloves for hypersensitive persons.
**Eye Protection:** Glasses, if applied to parts in motion. **Body Protection:** Overalls.

**IX**

**Physical State:** Semisolid paste **Color:** Opaque Black **Odor:** Petroleum **pH:** Neutral **Boiling Range/Point °F (°C):** >525 (274)
**Melting Point °F (°C):** 450 (232) **Flash Point (COC) °F (°C):** 450 (232) **Autoignition Temperature °F (°C):** >500 (260)
**Explosive Properties:** **LEL:** 0.9% **UEL:** 7% **Evaporation Rate (Butyl Acetate):** <0.01 **Partition Coefficient (Log Pow):** N/A
**Vapor Pressure (kPa):** <0.01 **Percent Volatiles:** Nil **Density (g/cm³):** 1.22 **Flammability:** Not flammable at ambient temperature.
**OAR Value:** N/A **Oxidizing Properties:** None **Water Solubility:** Nil **Vapor Density:** >5

**X**

**Stability:** Chemically stable under normal conditions. No photoreactive agents. **Conditions to Avoid:** Powerful sources of ignition & extreme temps. **Materials to Avoid:** Strong inorganic & organic acids, oxidizing & copper reactive agents. **Hazardous Decomposition Products:** Burning generates smoke, airborne soot, hydrocarbons & oxides of carbon, sulfur & nitrogen. Residue mainly comprised of soot & mineral oxides.

**XI**

**Acute Toxicity:** Not known. **Irritancy–Skin:** Very mild. **Skin Sensitization:** Not known. **Subacute/Sub-chronic Toxicity:** Not known.
**Genotoxicity:** None known. **Chronic Toxicity:** None known. **California Prop 65:** N/A **Carcinogen:** **NTP:** No **IARC:** No **OSHA:** No
**EC Classification (67/548/EEC):** No **Allergens:** None known. **LC-50:** >2000mg/l—actual test data - mysidopsis bahia. **LD-50:** N/A

**XII**

**Possible Effects:** In extreme cases, may gernerate oil fractions that could act as a marine pollutant. Occurrences of this nature are highly unlikely. **Behavior:** Relatively well behaved. Bioaccumulation potential nil.
**Environmental Fate:** Highly unlikely to cause widespread contamination. Nontoxic to marine or land organisms.

**XIII**

**Product Disposal:** Do not incinerate. Contact waste disposal company or local authority for advice.
**Container Disposal:** Pails without liner–see Product Disposal section above. Pails with plastic liner–pail may only be disposed of via standard waste disposal services, recycled or reused. Liner–see Product Disposal section above.

**XIV**

Not classified as hazardous for transport. **D.O.T.:** Nonhazardous **UN No.:** Nonhazardous **Air Transport (ICAO & IATA):** Nonhazardous
**Sea Transport (IMO & IMDG):** Nonhazardous **Road & Rail Transport (ADR/RID):** Nonhazardous

**XV**

**Labeling Information:** None needed **EC Annex 1 Classification:** Not Applicable. **R Phrases:** R22—harmful if swallowed.
**S Phrases:** None applicable, as known. **Ozone Depleting Chemicals:** Not applicable. **TSCA:** All components are listed.
**WHMIS (Canada):** Not controlled. **Canadian DSL:** All components listed. **40 CFR Part 372 (SARA Section 313):** N/A
**SARA 311/312:** None **CERCLA:** Nonhazardous **RCRA Hazard Class:** Nonhazardous **TSCA 12B Components:** None

**XVI**

SDS first issued. SDS data revised. **New Jersey Right To Know:** See Section II

**Signature:** [illegible]
**Prepared by: Donald A. Oldiges**
**Date Issued: October 22, 2003**

As of issue date, the information contained herein is accurate and reliable to the best of JET-LUBE'S knowledge. JET-LUBE® does not warrant or guarantee its accuracy or reliability and shall not be liable for any loss or damage arising out of the use thereof. It is the user's responsibility to satisfy itself that the information offered for its consideration is suitable for its particular use.

**LEGEND**

I. Identification of the substance/preparation and company
II. Composition information on ingredients
III. Hazards identification
IV. First aid measures
V. Fire fighting measures
VI. Accidental release measures
VII. Handling and storage
VIII. Exposure control/personal protection
IX. Physical and chemical properties
X. Stability and reactivity
XI. Toxicological information
XII. Ecological information
XIII. Waste Disposal
XIV. Transport information
XV. Regulatory Information
XVI. Other information

**HMIS SYMBOL**

| | |
|---|---|
| HEALTH | 1 |
| FLAMMABILITY | 1 |
| REACTIVITY | 0 |
| PPI | B |

**NFPA SYMBOL**

04/14/2023

# KOV'R-KOTE®

## PREMIUM, NONMETALLIC, THREAD COMPOUND FOR USE ON DRILL COLLARS, DRILL PIPE, TUBING & CASING

### DESCRIPTION

**KOV'R-KOTE®** is the next logical step for the new generation premium compounds manufactured by **JET-LUBE®**. Based on the same patented Polymer Chemistry used to develop **POW'R-KOTE®, KOV'R-KOTE** is an economical, multifunctional, nonmetallic thread compound.

High strength polymers, graphite and other naturally occurring, extreme pressure and anti-wear additives lock together under pressure to resist galling, seizure and downhole makeup. **KOV'R-KOTE's** exceptionally high film strength (1000 kgf measured by ASTM D-2596, 4-Ball EP Test) is among the highest in the industry for nonmetallic compounds. This makes it well suited for use on drill strings in any drilling environment, and for bottom hole assemblies in most drilling situations.*

- Multifunctional (for use on both shouldered and interference threads)
- Nonmetallic
- Formulated with a patented blend of high-tech polymers, graphite and other nonmetallic additives
- Sticks to wet joints
- Aluminum complex base for brushability and stability over a wide temperature range
- Contains additives for rust, corrosion and oxidation protection
- Exceeds all performance specs described in API specification 5CT and set forth in API Recommended Practice 5A3
- Available in Arctic and Thermal Grades

### DESCRIPTION

**KOV'R-KOTE** is designed to work as an anti-seize compound on shouldered connections, a running and sealing compound on interference threaded connections, and as a storage compound for all types of threaded connections.

*NSF H2 & K2 Reg. #127360*

***For the most severe applications, KOPR-KOTE® or POW'R-KOTE is recommended.***

### PRODUCT CHARACTERISTICS

| | |
|---|---|
| Thickener | Aluminum Complex |
| Fluid Type | Petroleum |
| Dropping Point (ASTM D-566) | 450°F (232°C) |
| Specific Gravity | 1.2 |
| Density (lb/gal) | 10.2 |
| Oil Separation (ASTM D-6184) Wt. % Loss @ 212°F (100°C) | <3.0 |
| Flash Point (ASTM D-92) | >450°F (232°C) |
| NLGI Grade | 1 |
| Penetration @77°F (ASTM D-217) | 310 - 340 |
| Copper Strip Corrosion (ASTM D-4048) | 1A |
| 4-Ball (ASTM D-2596) Weld Point, kgf | 1000 |
| Friction Factor (relative to API-Modified) | 1.0 |
| Friction Factor (Per API RP 7G) | 1.0 |

### PACKAGING

| Code No. | Container Size | Shipping Wt. |
|---|---|---|
| 13923 | 1 gal. | 11 lb. |
| 13913 | 2½ gal. | 29 lb. |
| 13915 | 5 gal. | 54 lb. |
| 13924 | 15 gal. | 163 lb. |
| 13929 | 50 gal. | 540 lb. |

### LIMITED WARRANTY

Jet-Lube, Inc. makes the Limited Express Warranty that at the date of delivery, this product shall be free from defects in Jet-Lube, Inc. materials and workmanship.

This Limited Express Warranty is expressly in lieu of any other express or implied warranties, including any implied warranty of merchantability or fitness for a particular purpose, and of any other obligation on the part of Jet-Lube, Inc.

The sole remedy for breach of the Limited Express Warranty shall be the refund of the purchase price. All other liability is negated and disclaimed, and Jet-Lube, Inc. shall not be liable for incidental or consequential damages.

## CORPORATE LOCATIONS

**Houston, Texas–World Headquarters**

**Maidenhead, England**

**Edmonton, Canada**


**JET-LUBE, INC.**
**4849 HOMESTEAD RD.,**
**P.O. BOX 21258 (77226-1258)**
**HOUSTON, TX 77028 USA**

**WATS: 800-538-5823**
**PHONE: 713-674-7617**
**FAX: 713-678-4604**
**E-MAIL: sales@jetlube.com**
**www.jetlube.com**


OILFIELD OILFIELD OILFIELD OILFIELD OILFIELD

04/14/2023

CRC 02018

# CRC MATERIAL SAFETY DATA SHEET SILOO

CRC Industries, Inc. • 885 Louis Drive • Warminster, PA 18974 • (215) 674-4300

FOR 24 HR EMERGENCY INFORMATION CALL CHEMTREC 1-800-424-9300

PRODUCT NAME LECTRA CLEAN AEROSOL #-MSDS02018

PRODUCT-2018, 2018T



## 1. INGREDIENTS

| | CAS # | ACGIH TLV | OSHA PEL | OTHER LIMITS | % |
|---|---|---|---|---|---|
| Trichloroethylene | 79-01-6 | 50 ppm | 50 ppm | | 70-95 |
| 1,2 Butylene Oxide | 106-88-7 | NA | NA | NA | 1-10 |
| Carbon Dioxide | 124-38-9 | 5000 ppm | 10000 | | 1-10 |

## 2. PHYSICAL DATA : without propellant

Specific Gravity : 1.46 @ 70 F

Boiling Point : 189 F

Freezing Point : ND

Appearance and Odor:

Colorless liquid- irritating odor at high concentrations.

Vapor Pressure : 60 mm @ 20 C

% Volatile : 100

Evaporation Rate : fast

Vapor Density : 4.55 (air=1)

pH: NA

Solubility : Slight solubility in water- good solvent for many organic materials.

## 3. FIRE AND EXPLOSION DATA

Flashpoint : None Method : TCC, COC, TOC

Flammable Limits : LEL:8.0 UEL:44.8

Extinguishing Media : Water fog

Unusual Hazards : Aerosol cans may explode when heated above 120 F.

## 4. REACTIVITY AND STABILITY

Stability : Good--avoid exposure to open flame, arcs, hi temps

Hazardous decomposition products : Thermal--hydrogen chloride, chlorine, phosgene

Materials to avoid : Avoid storing in aluminum containers or contact with aluminum powder or zinc powder.

## 5. PROTECTION INFORMATION

Ventilation : Adequate to prevent accumulation of vapors.

Respiratory : Use NIOSH/MSHA approved respirators or self contained breathing apparatus if vapors accumulate

Gloves : Solvent resistant Eye & Face : Safety glasses

Other Protective Equipment: Not normally required with aerosol product use.

04/14/2023

CRC 02018

# MATERIAL SAFETY DATA SHEET

PRODUCT NAME : LECTRA CLEAN AEROSOL #-MSDS02018
PRODUCTS-2018, 2018T

MANUFACTURED BY : CRC INDUSTRIES, INC. PHONE (215) 674-4300
885 LOUIS DRIVE, WARMINSTER, PA. 18974



## 6. HEALTH HAZARD DATA

Primary Routes of Entry : Inhalation, Skin

Signs and Symptoms of Exposure

1. Acute Overexposure:
   Inhalation-headaches, dizziness, anesthesia, unconsciousness
   Eyes- causes pain and some irritation.
   Skin: irritation on repeated exposures.

2. Chronic overexposure: Repeated overexposures may cause liver and kidney effects and dermatitis.

Medical Conditions Generally Aggravated by Exposure
: High levels of vapor (8000+ ppm) may cause cardiac arrhythmias

| | | |
|---|---|---|
| Chemical Listed as Carcinogen | : No | National Toxicology Program |
| or Potential Carcinogen | : No | IARC Monographs |
| | : No | OSHA |

Emergency and First Aid Procedures :(If symptoms persist, call a physician)

1. Inhalation : Remove to fresh air. Apply artificial respiration if necessary.
2. Eyes : Flush with large amounts of water for 15 minutes.
3. Skin : Remove contaminted clothing, wash exposed area with soap and water.
4. Ingestion : DO NOT induce vomiting- Call a physician

## 7. SPILL OR LEAK PROCEDURES

Precautions to be taken in Handling and Storage : Store in a cool, dry area.

Steps to be taken in case Material is released or spilled : Usually not a problem with aerosols. Area should be ventilated and absorbent used to pick up excess material.

Waste Disposal : All used and unused Product should be disposed of in conformance with local, state and federal regulations.

## 8. SPECIAL PRECAUTIONS AND USE DIRECTIONS :

Avoid skin contact or breathing of vapors. Vapors are heavier than air and will collect in low areas. Do not use in confined areas or low spots without adequate ventilation. If vapors are suspected in a low area, do not enter unless special breathing apparatus is used and an observer is present for assistance. Keep aerosols away from heat.

## 9. NFPA HAZARD RATINGS

Health:2 Flammability:1 Reactivity:0

## 10. SARA Information

This product contains the following chemicals that are subject to release reporting under Section 313 of SARA Title III.

| Chemical Name | CAS-# | Percent |
|---|---|---|
| Trichloroethylene | 79-01-6 | 70-95 |

PREPARED BY: Adam Selisker ORIGINAL DATE or DATE OF REVISION: 05/15/95

04/14/2023

# Material Safety Data Sheet
## For Coatings, Resins and Related Materials

American Coatings Corporation
3037 NW 60th St
Ft. Lauderdale, FL 33309
April 22, 2005

Emergency Phone
800-533-0151

Information Phone
800-533-0151

### Section I - Product Identification

Product Number: MAR-T126 Product Name: Water-based Anti-Mold Coating

Product Class: Latex Based Coating (Mixture)

Transportation Information: Shipping Class 55, Non-hazardous Paint (no special labels required)

### Section I I- Hazardous Ingredients

| Ingredient | Percent By Weight | Occupational Exposure Limits TLV | Vapor Pressure |
|---|---|---|---|
| Tetrachloroisophthalonitrile (1897-45-6) | 0.15% | Not established | Not available |

### Section III - Physical Data

Boiling Range: 212°F Vapor Density: Lighter than air pH: 8.0 to 9.0

Evaporation Rate: Slower than ether Volatile Volume: 50% Wt/Gal: 10.4 lbs.

Specific Gravity: 1.25 Solubility in Water: Appreciable Freezing Point: 32°F (0°C)

Viscosity: Approximately 5,000 -20,000 centipoises Decomposition Temperature: Approximately 240°F (115°C)

### Section IV - Fire and Explosion Hazard Data

Flammability Classification: Flash Point: No flash to boiling 212°F (TCC); OSHA - IIIB; DOT - Not regulated
LEL: Not available

Extinguishing Media: Alcohol Foam, $CO_2$, Dry Chemical, Water Fog

Unusual Fire and Explosion Hazards: None known

Special Firefighting Procedure: Product will not burn until water has boiled or evaporated. For dried film or residual solids, full protective equipment is recommended, including self-contained breathing apparatus.

### Section V - Health Hazard Data

General Health Hazards:

- Eye : May be an irritant
- Skin : Prolonged contact may cause irritation, dermatitis
- Ingestion : No information, assumed to cause gastrointestinal irritation. Low toxicity.
- Inhalation : May cause irritation to the respiratory tracts. Overexposure could cause headache, nausea, fatigue.

Medical Conditions Prone to Aggravation by Exposure: None known.

Primary Routes of Entry: Dermal or inhalation

Emergency and First Aid Procedure: *Skin:* wash with soap and water. *Eyes:* flush with clean water at least 15 minutes. If irritation persists, consult physician. *Inhalation:* remove to fresh air. If breathing is difficult, administer oxygen. If irritation persists, consult physician. *Ingestion*: rinse mouth with water then give two glasses of water, induce vomiting, consult physician or poison control center. ***Never give anything by mouth to an unconscious person.***

We believe the information here is current as of the date of this MSDS. Please study it carefully and apply appropriate engineering controls and industrial hygiene practices. As the conditions of use of this product and information are not within our control, it is the user's obligation to determine the conditions of safe use.



04/14/2023

## Section VI - Reactivity Data

Stability: Stable Hazardous Polymerization: Will not occur Conditions to avoid: None known

Hazardous Decomposition Products: Thermal decomposition will yield CO, $CO_2$, and trace vapors of HCl, and/or oxides of carbon and nitrogen.

Incompatibility (Materials to Avoid): Materials incompatible with water and oxidizers.

## Section VII - Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled: Spills should be collect for disposal. Eliminate all ignition sources. Prevent material from entering drains, sewers, waterways. **Spills may be slippery.** Before drying, product may be washed away with water; after drying, remove with a paint scraper, or strong solvent.

Waste Disposal Method: In accordance with all applicable regulations. Review hazard section of this sheet before attempting cleanup. Empty containers are non hazardous under RCRA as industrial waste.

## Section VIII - Safe Handling and Use Information

Respiratory Protection: In restricted ventilation areas, use approved chemical vapor respirator. In applications where mists or spray may be generated, avoid inhalation of airborne particulates by using an approved respirator with organic vapor cartridge with prefilter for mist or dust.

Ventilation: General (mechanical) room ventilation is expected to be satisfactory. Supplementary local exhaust and respiratory protection may be needed in poorly ventilated spaces, or evaporation from large surfaces, or when spraying.

Other Protective Equipment: None Protective Gloves: Impervious gloves

Eye Protection: Goggles, faceshield, or other eye wear to protect from splash.

Hygienic Practices: Thoroughly cleanse hands after handling. Launder contaminated clothing before reuse.

## Section IX - Special Precautions

Precautions to be Taken in Handling and Storing: Avoid breathing vapors and application to hot surfaces, as vapor may be irritating. Keep container closed. Use with adequate ventilation. Store indoors at temperatures of 40°F to 100°F. Do not store at elevated temperatures, as containers could pressurize and rupture. Protect from freezing.

Other Precautions: For Industry/professional use only. Not intended for retail sale or use by individual consumers. Do not reuse container for potables or edibles.

## Section X - Sara Status

This mixture contains the following materials regulated under Section 313:

NONE

We believe the information here is current as of the date of this MSDS. Please study it carefully and apply appropriate engineering controls and industrial hygiene practices. As the conditions of use of this product and information are not within our control, it is the user's obligation to determine the conditions of safe use.



04/14/2023

# MATERIAL SAFETY DATA SHEET

## MC-122

CAUTION CODE 1-2-0
10-24-02-DATE


## SECTION I, GENERAL INFORMATION

| | |
|---|---|
| COMPANY NAME: | MAYCO CHEMICAL PRODUCTS, INC. |
| ADDRESS: | 1936 E. HWY 66<br>EL RENO, OK 73036 |
| PHONE NUMBER: | 405-262-4400 |
| FAX NUMBER: | 405-262-3596 |
| EMERGENCY NUMBER: | 1-800-535-5053 |

## SECTION II, HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

| HAZARDOUS COMPONENTS – (CAS Number) | OSHA PEL | ACGIH TLV | OTHER |
|---|---|---|---|
| METHYL ALCOHOL (67-56-1) | 200 PPM | 400 PPM | |

## SECTION III, PHYSICAL/CHEMICAL CHARACTERISTICS

| | |
|---|---|
| Flash Point | <140 degrees F. |
| Specific Gravity (H2O=1) | 1.20 |
| Vapor Pressure | <1 |
| Vapor Density (Air+1) | >1.0 |
| pH | 7-8 |
| Freeze Point | -18 deg. F. |
| Pour Point | -10 deg. F. |
| Evaporation Rate (BuAc=1) | ND |
| Solubility in Water | SOLUBLE |
| Appearance and Odor | Clear Amber Liquid, Slight Odor |

## SECTION IV, FIRE AND EXPLOSION HAZARD DATA

| | | |
|---|---|---|
| Flash Point (Method), | Flash <140 degrees F. | |
| Flammable Limits | Lower-ND | Upper-ND |

Extinguishing Media, Water Fog or Spray, Alcohol Foam, Dry Powder, Carbon Dioxide (CO2).

Special Fire Fighting Procedures, APPROACH FIRE FROM UPWIND SIDE. AVOID BREATHING SMOKE, FUMES, MIST, OR VAPORS ON THE DOWNWIND SIDE.

Unusual Fire and Explosion Hazards: CONTAINERS MAY RUPTURE FROM INTERNAL PRESSURE IF CONFINED TO FIRE AREA. COOL WITH WATER. GET NON-ESSENTIAL PEOPLE OUT OF THE AREA.

## SECTION V, REACTIVITY INFORMATION

STABILITY?

Product is : Stable? YES Unstable? NO

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## SECTION V, REACTIVITY INFORMATION, Cont.



INCOMPATABILITY

Materials to avoid: OXIDIZERS OR OXIDIZING MATERIALS.

Hazardous Decomposition or Byproducts: FROM FIRE; SMOKE, CARBON DIOXIDE, CARBON MONOXIDE, Oxides of Sulfur and Oxides of Nitrogen.

Hazardous Polymerization: WILL NOT OCCUR.

## SECTION VI, HEALTH HAZARD DATA

ROUTES OF ENTRY

Inhalation? IRRITANT Skin/Eyes? IRRITANT Ingestion? IRRITANT

HEALTH HAZARDS

Acute, *INHALATION OF VAPORS* MAY BE NARCOTIC AND CAN BE FATAL. *INGESTION OF LIQUID* WILL CAUSE GASTROINTESTINAL DISTRESS, IRRITATION, POSSIBLY NAUSEA AND CAN BE FATAL. CORROSIVE TO SKIN, EYES, AND MUCOUS MEMBRANES.

Chronic, N/A

CARCINOGENICITY

Listed in: NTP? NO IARC Monographs? NO OSHA Regulated? TABLE Z1

*SKIN IRRITATION* DEVELOPS SLOWLY AFTER CONTACT, *EYE IRRITATION* DEVELOPS IMMEDIATELY UPON CONTACT.

Medical Conditions Generally Aggravated by Exposure, BREATHING DISORDERS, DERMATITIS.

Emergency and First Aid Procedures: *INHALATION*: REMOVE VICTIM TO FRESH AIR AND, IF NEEDED, IMMEDIATELY BEGIN ARTIFICIAL RESPIRATION. GIVE OXYGEN IF BREATHING IS LABORED. GET EMERGENCY MEDICAL HELP. CONTACT PHYSICIAN IMMEDIATELY.

*INGESTION:* INDUCE VOMITING IF VICTIM IS CONSCIOUS BY GIVING WATER AND STICKING FINGERS DOWN THROAT. GET MEDICAL ATTENTION. NEVER GIVE UNCONSCIOUS PERSON ANYTHING BY MOUTH.

FLUSH EYES WITH WATER FOR 15 MINUTES, GET MEDICAL ATTENTION. WASH SKIN WITH WATER AND SOAP. GET MEDICAL ADVICE IF SYMPTOMS DEVELOP AND PERSIST.

## SECTION VII, PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released or spilled, SMALL SPILLS: Pick Up with absorbent media. Store as hazardous waste.
LARGE SPILLS: Contain with dikes, pick up with vacuum truck. Handle as hazardous waste. Notify proper local, state, and federal agencies.

## SECTION VII, PRECAUTIONS FOR SAFE HANDLING AND USE, Cont.

*For vapor release*, Get people out of the area, shut off ignition sources, ventilate the area. Notify proper authorities if required by SARA TITLE III.

*Waste disposal method*, EPA APPROVED HAZARDOUS WASTE DISPOSAL SITE. Follow applicable local, state, and federal regulations.

*Precautions to be taken in handling and storage*, STORE IN A COOL, VENTILATED AREA, AWAY FROM IGNITION SOURCES.

Other precautions, STORE AWAY FROM OXIDIZERS OR MATERIALS BEARING A YELLOW "DOT" LABEL.

## SECTION VIII, CONTROL MEASURES

Respiratory Protection, NIOSH APPROVED ORGANIC VAPOR MASK.

Ventilation; Local Exhaust, RECOMMENDED
Mechanical, RECOMMENDED
Special, ---
Other, ---

Protective Gloves, CHEMICAL RESISTANT GLOVES

Eye Protection, CHEMICAL GOGGLES OR FULL FACE SHIELD.

Other Protective Equipment, APRONS.

Work Hygienic Practices, *AVOID* CONTACT WITH SKIN, EYES, AND CLOTHING. AFTER HANDLING THIS PRODUCT, WASH HANDS BEFORE EATING, DRINKING, OR SMOKING. IF CONTACT OCCURS, REMOVE CONTAMINATED CLOTHING. IF NEEDED, TAKE FIRST AID ACTION SHOWN IN SECTION VI.

LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

## SECTION IX, TRANSPORTATION INFORMATION

DOT Proper Shipping Name, Hazard Class., UN/UA Number, RQ (If Needed)

CHEMICALS,N.O.S., NOT REGULATED MATERIAL (IF TRANSPORTED IN CONTAINERS OF LESS THAN 119 GALS.)

IF TRANSPORTED IN CONTAINERS OF 119 GALS. OR MORE INFO SHOULD READ

COMBUSTIBLE LIQUID, NOS, 3, UN1993, PGIII RQ 11,100 METHANOL

## SECTION X, OTHER DATA

EPA Hazards, 1-Acute YES 2-Chronic YES 3-Flammability NO
4-Sudden Release of Pressure NO 5-Reactive NO

CERCLA 11,100 (METHANOL)

Hazardous Waste Number – D001 IGNITABLE

## SECTION X, OTHER DATA, Cont.

Clean Air Act Yes

SARA TITLE III YES

Clean Water Act No

NA-Not applicable
CS-Cancer Suspect Agent OX-Oxidizer ND-Not available
COR-Corrosive

The data presented is true and correct to the best of our knowledge and belief, however, neither seller nor preparer makes any warranties, express or implied, concerning the information presented. The user is cautioned to perform his own hazard evaluation and to rely upon his own determinations.

L010

# MATERIAL SAFETY DATA SHEET
# OF MARVEL MYSTERY OIL

Marvel Oil Company Inc.
331 North Main Street
Port Chester, NY 10573
Emergency Telephone No.
(914) 937-4000
Date Issued: 05/30/95

HAZARD RATING
4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

HMIS®
H HEALTH 2
F FLAMMABILITY 2
R REACTIVITY 0
PERSONAL PROTECTION 0

***

# MATERIAL SAFETY DATA SHEET
# OF MARVEL MYSTERY OIL

FLASH POINT: 79°C (174°F) FLAMMABILITY LIMITS: Lower-0.9%, Upper-7.0%
EXTINGUISHING MEDIA: Foam, dry chemical or carbon dioxide
SPECIAL FIRE FIGHTING PROCEDURE: Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection to personnel attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products.

UNUSUAL FIRE & EXPLOSION HAZARDS: Vapors are heavier than air and may travel along the ground or be moved by ventilation and ignited by heat, pilot lights, other flames and ignition sources at locations distant from material handling point.

**********

## HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: 100ppm, 8 hour time weighted average
EFFECTS OF OVEREXPOSURE: Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation or dermatitis. Product contacting the eyes may cause eye irritation. Product has a low order of acute oral and dermal toxicity, but minute amounts of aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury.

EMERGENCY AND FIRST AID PROCEDURE: If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent , early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen, if available. If over exposure to oil mist, remove from further exposure until excessive oil mist condition subsides. If ingested, DO NOT induce vomiting; call a physician.

CHRONIC EFFECT(S) OF OVEREXPOSURE: None recognized

**********

## REACTIVITY DATA

| | |
|---|---|
| STABILITY: | stable |
| INCOMPATIBLE/AVOID CONTACT WITH: | strong oxidants |
| HAZARDOUS DECOMPOSITION PRODUCT: | carbon dioxide/monoxide |
| HAZARDOUS POLYMERIZATION: | will not occur |
| CONDITION TO AVOID: | skin contact |

**********



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# MATERIAL SAFETY DATA SHEET
# OF MARVEL MYSTERY OIL

## SPILL OR LEAK PROCEDURE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Recover free product. Add sand, earth, or other suitable absorbent to spill area. Minimize skin contact. Keep product out of sewers and watercourses by diking or impounding.

WASTE DISPOSAL METHOD: Preferred method is incineration. Dispose of in accordance with all Local, State, and Federal regulations.

**********

## SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE): Use supplied-air respiratory protection in confined or enclosed space, if needed.

VENTILATION:

| | |
|---|---|
| LOCAL EXHAUST: | To capture vapor, mist or fumes if necessary. |
| MECHANICAL (GENERAL): | Acceptable |
| SPECIAL: | No smoking or flames. |
| OTHER: | None |
| PROTECTIVE GLOVES: | Hydrocarbon resistant |
| EYE PROTECTION: | Splash goggles |
| OTHER PROTECTIVE EQUIPMENT: | Apron or impervious clothing if needed. |

**********

## SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

OTHER PRECAUTIONS: Avoid prolonged or repeated contact with skin.

**********

## REQUIREMENTS FOR TRANSPORTATION

| | |
|---|---|
| PROPER SHIPPING NAME: | Marvel Mystery Oil |
| HAZARDOUS CLASSIFICATION: | Not DOT regulated. |
| IDENTIFICATION NUMBER: | UN-1270, UN-1271 |
| REPORTABLE QUANTITY: | No Reportable Quantity for product or any constituent greater than 1% or 0.1% of carcinogen. |
| ADDITIONAL LABELING: | Combustible Liquid |



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# MATERIAL SAFETY DATA SHEET
# OF MARVEL MYSTERY OIL

**********

## REGULATORY INFORMATION

### Status on Substance List
### EPA

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous substances equal to or greater than the Reportable Quantities (RQs) in 40 CFR 302.4.

Components present in this product at a level which could require reporting under the statute are: None

**********

### Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III

Requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (Rqs) in 40 CFR 355 (used for SARA 302, 304, 311 and 312).

Components present in this product at a level which could require reporting under the statute are: None

Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDSs that are copied and distributed for this material.

Components present in this product at a level which could require reporting under the statute are: None

**********

MSDS Prepared by Chemtest Laboratories on May 30, 1995.
While Chemtest Laboratories believes that the data contained herein are factual and the opinions expressed are those of qualified experts regarding the results of the test conducted, this data is not to be taken as a warranty or representation for which assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of this data and information must be determined by the user to be in accordance with applicable federal, state and local laws and regulations.

Chemtest Laboratories at 101 Midland Avenue
Elmwood Park, NJ 07407
(201)797-2770



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# Mystik® JT-6® Multi-Purpose Grease, No. 2
## Material Safety Data Sheet

**CITGO Petroleum Corporation**
**P.O. Box 4689**
**Houston, TX 77210**

**MSDS No.** 665006002
**Revision Date** 6/20/2011

**IMPORTANT: This MSDS is prepared in accordance with 29 CFR 1910.1200. Read this MSDS before transporting, handling, storing or disposing of this product and forward this information to employees, customers and users of this product.**

### Hazard Rankings

| | HMIS | NFPA |
|---|---|---|
| Health Hazard | 1 | 1 |
| Fire Hazard | 1 | 1 |
| Reactivity | 0 | 0 |

* = Chronic Health Hazard

### Emergency Overview

**Physical State** Semi-solid to solid (Smooth and adhesive)
**Color** Amber. **Odor** Mild petroleum odor

**WARNING:**
**Injection under the skin can cause severe injury.**
**Most damage occurs in the first few hours.**
**Initial symptoms may be minimal.**
**Hot grease will cause thermal burns upon contact.**
**Spills may create a slipping hazard.**

### Protective Equipment

**Minimum Recommended**
**See Section 8 for Details**

## SECTION 1. PRODUCT IDENTIFICATION

| | | | |
|---|---|---|---|
| **Trade Name** | Mystik® JT-6® Multi-Purpose Grease, No. 2 | **Technical Contact** | (800) 248-4684 |
| **Product Number** | 665006002 | **Medical Emergency** | (832) 486-4700 |
| **CAS Number** | Mixture. | **CHEMTREC Emergency (United States Only)** | (800) 424-9300 |
| **Product Family** | Lubricating grease | | |
| **Synonyms** | Lubricating grease; CITGO® Material Code: 665006002, 665995002, 663996002 | | |

## SECTION 2. COMPOSITION

| Component Name(s) | CAS Registry No. | Concentration (%) |
|---|---|---|
| Highly-refined petroleum lubricant oils | Various | 60 - 100 |
| Calcium, 12-hydroxy Stearate | 3159-62-4 | 7 - 13 |
| Zinc and zinc compounds | Proprietary | <1 |
| Antimony and antimony compounds | Proprietary | <1 |

## SECTION 3. HAZARDS IDENTIFICATION

**Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.**

**Major Route(s) of Entry** Skin contact.

**Signs and Symptoms of Acute Exposure**

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**Inhalation** No significant adverse health effects are expected to occur upon short-term exposure at ambient temperatures. At elevated temperatures, product vapor may cause respiratory tract irritation. Repeated or prolonged overexposure to product mists can result in respiratory tract inflammation and an increased risk of infection.

**Eye Contact** This product can cause transient mild eye irritation with short-term contact with liquid sprays or mists. Symptoms include stinging, watering, redness, and swelling.

**Skin Contact** This material can cause mild skin irritation from prolonged or repeated skin contact. Injection under the skin can cause inflammation and swelling. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention. Skin contact with hot material may result in severe burns.

**Ingestion** This material can cause a laxative effect. If swallowed in large quantities, this material can obstruct the intestine.

**Chronic Health Effects Summary** This product contains a petroleum-based mineral oil. Prolonged or repeated skin contact can cause mild irritation and inflammation characterized by drying, cracking, (dermatitis) or oil acne. Repeated or prolonged inhalation of petroleum-based mineral oil mists at concentrations above applicable workplace exposure levels can cause respiratory irritation or other pulmonary effects.

**Conditions Aggravated by Exposure** Disorders of the following organs or organ systems that may be aggravated by significant exposure to this material or its components include: Skin

**Target Organs** May cause damage to the following organs: skin.

**Carcinogenic Potential** This product is not known to contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC or NTP.

**OSHA Hazard Classification is indicated by an "X" in the box adjacent to the hazard title. If no "X" is present, the product does not exhibit the hazard as defined in the OSHA Hazard Communication Standard (29 CFR 910.1200).**

| OSHA Health Hazard Classification | | | | OSHA Physical Hazard Classification | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Irritant | | Sensitizer | | Combustible | | Explosive | | Pyrophoric | |
| Toxic | | Highly Toxic | | Flammable | | Oxidizer | | Water-reactive | |
| Corrosive | | Carcinogenic | | Compressed Gas | | Organic Peroxide | | Unstable | |

## SECTION 4. FIRST AID MEASURES

**Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid. For more specific information, refer to Exposure Controls and Personal Protection in Section 8 of this MSDS.**

**Inhalation** Vaporization is not expected at ambient temperatures. This material is not expected to cause inhalation-related disorders under anticipated conditions of use. In case of overexposure, move the person to fresh air.

**Eye Contact** Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness, or pain persists.

**Skin Contact** If burned by hot material, cool skin by quenching with large amounts of cool water. For contact with product at ambient temperatures, remove contaminated shoes and clothing. Wipe off excess material. Wash exposed skin with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists. Thoroughly clean contaminated clothing before reuse. Clean or discard contaminated leather goods. If material is injected under the skin, seek medical attention immediately.

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**Ingestion** Do not induce vomiting unless directed to by a physician. Rinse out mouth with water. Never give anything by mouth to a person who is not fully conscious. Allow small quantities to pass through the digestive system. If large amounts are swallowed or irritation or discomfort occurs, seek medical attention immediately.

**Notes to Physician** SKIN: In the event of injection in underlying tissue, immediate treatment should include extensive incision, debridement and saline irrigation. Inadequate treatment can result in ischemia and gangrene. Early symptoms may be minimal.

INGESTION: Check for possible bowel obstruction with ingestion of large quantities of material.

## SECTION 5. FIRE FIGHTING MEASURES

**NFPA Flammability Classification** NFPA Class-IIIB combustible material.

**Flash Point** Open cup: >150°C (>302°F) (Estimated.).

**Lower Flammable Limit** No data. **Upper Flammable Limit** No data.

**Autoignition Temperature** Not available.

**Hazardous Combustion Products** Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons and oxides of sulfur, antimony, zinc, phosphorus and nitrogen.

**Special Properties** Fight the fire from a safe distance in a protected location. Open any masses with a water stream to prevent reignition due to smoldering. Cool surface with water fog. Molten material can form flaming droplets if ignited. Water or foam can cause frothing. Use of water on product above 100° C (212° F) can cause product to expand with explosive force. Do not allow liquid runoff to enter sewers or public waters.

**Extinguishing Media** Use dry chemical, foam, carbon dioxide or water fog. Water or foam may cause frothing. Carbon dioxide and inert gas can displace oxygen. Use caution when applying carbon dioxide or inert gas in confined spaces.

**Protection of Fire Fighters** Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

**Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8 and Disposal Considerations in Section 13 of this MSDS.**

Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard; do not walk through spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spill as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulations.

## SECTION 7. HANDLING AND STORAGE

**Handling**

If this product is stored or applied in high-pressure systems such as grease guns or hydraulic lines, there is the potential for accidental injection into the skin and underlying tissues. Hydrocarbons injected into skin or underlying tissues are not readily removed by body fluids and can cause pain, swelling, chemical irritation, infection and tissue destruction. Early symptoms may be minimal. Workers must be aware of the significant hazards associated with a hydrocarbon injection injury. In the event of an injection injury, workers should seek medical treatment immediately. Avoid water contamination and elevated temperatures to minimize product degradation. Empty containers may contain product residues that can ignite with explosive force. Do not pressurize, cut, weld, braze solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.

**Storage**

Keep container tightly closed. Store in a cool, dry, well-ventilated area. Store only in approved containers. Do not store with strong oxidizing agents. Do not store at elevated temperatures. Avoid storing product in direct sunlight for extended periods of time. Storage area must meet OSHA requirements and applicable fire codes. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers or waste residues of this product.

## SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Engineering Controls**

Ventilation controls are not normally required under anticipated conditions of use. Provide exhaust ventilation or other engineering controls if airborne mists or vapors concentrations exceed recommended occupational exposure limits listed below. An eye wash station and safety shower should be located near the work-station.

**Personal Protective Equipment**

Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.

**Eye Protection**

Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. Wear goggles if splashing or spraying is anticipated. Wear goggles and face shield if material is heated above 125°F (51°C). Have suitable eye wash water available.

**Hand Protection**

None required for incidental contact. Use gloves constructed of chemical resistant materials such as heavy nitrile rubber if frequent or prolonged contact is expected. Use heat-protective gloves when handling product at elevated temperatures.

**Body Protection**

Use clean protective clothing if splashing or spraying conditions are present. Protective clothing may include long-sleeve outer garment, apron, or lab coat. If significant contact occurs, remove oil-contaminated clothing as soon as possible and promptly shower. Launder contaminated clothing before reuse or discard. Wear heat protective boots and protective clothing when handling material at elevated temperatures.

**Respiratory Protection**

The need for respiratory protection is not anticipated under normal use conditions and with adequate ventilation. If elevated airborne concentrations above applicable workplace exposure levels are anticipated, a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter should be used. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).

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**General Comments** Use good personal hygiene practices. Wash hands and other exposed skin areas with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities, or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners. Since specific exposure standards/control limits have not been established for this product, the "Oil Mist, Mineral" exposure limits shown below are suggested as minimum control guidelines.

**Occupational Exposure Guidelines**

| Substance | Applicable Workplace Exposure Levels |
|---|---|
| Oil, Mineral (Mist) | **ACGIH TLV (United States).**<br>TWA: 5 mg/m$^3$ 8 hour(s).<br>STEL: 10 mg/m$^3$ 15 minute(s).<br>**OSHA PEL (United States).**<br>TWA: 5 mg/m$^3$ 8 hour(s). |
| Stearates | **ACGIH TLV (United States).**<br>TWA: 10 mg/m$^3$ 8 hour(s). |
| Antimony and antimony compounds | **ACGIH TLV (United States).**<br>TWA: 0.5 mg/m$^3$ 8 hour(s).<br>**OSHA PEL (United States).**<br>TWA: 0.5 mg/m$^3$ 8 hour(s). |

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES (TYPICAL)

| | | | | | |
|---|---|---|---|---|---|
| **Physical State** | Semi-solid to solid (Smooth and adhesive) | **Color** | Amber. | **Odor** | Mild petroleum odor |
| **Specific Gravity** | 0.92 (Water = 1) | **pH** | Not applicable | **Vapor Density** | >10 (Air = 1) |
| **Boiling Range** | Not available. | | | **Melting/Freezing Point** | Not available. |
| **Vapor Pressure** | <0.001 kPa (<0.01 mm Hg) (at 20°C) | | | **Volatility** | Negligible volatility. |
| **Solubility in Water** | Negligible solubility in cold water. | | | **Viscosity (cSt @ 40°C)** | 1080 |
| **Flash Point** | Open cup: >150°C (>302°F) (Estimated.). | | | | |
| **Additional Properties** | NLGI Grade: 2<br>Thickener: Calcium<br>Texture: Adhesive | | | | |

## SECTION 10. STABILITY AND REACTIVITY

| | | | |
|---|---|---|---|
| **Chemical Stability** | Stable. | **Hazardous Polymerization** | Not expected to occur. |
| **Conditions to Avoid** | Keep away from extreme heat, sparks, open flame, and strongly oxidizing conditions. | | |
| **Materials Incompatibility** | Strong oxidizers. | | |
| **Hazardous Decomposition Products** | No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS. | | |

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## SECTION 11. TOXICOLOGICAL INFORMATION

**For other health-related information, refer to the Emergency Overview on Page 1 and the Hazards Identification in Section 3 of this MSDS.**

**Toxicity Data**

**Highly-refined petroleum lubricant oils**

| | |
|---|---|
| ORAL (LD50): | Acute: >5000 mg/kg [Rat]. |
| DERMAL (LD50): | Acute: >2000 mg/kg [Rabbit]. |

Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested.

**Grease**

Injection of pressurized hydrocarbons under the skin, in muscle or into the blood stream can cause irritation, inflammation, swelling, fever and mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage.

## SECTION 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

Ecotoxicity data are not available for this product.

**Environmental Fate**

An environmental fate analysis is not available for this specific product. Plants and animals may experience harmful or fatal effects when coated with petroleum products. Petroleum-based (mineral) lubricating oils normally will float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway may be sufficient to cause a fish kill or create an anaerobic environment.

## SECTION 13. DISPOSAL CONSIDERATIONS

**Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.**

Conditions of use may cause this material to become a "hazardous waste", as defined by federal or state regulations. It is the responsibility of the user to determine if the material is a "hazardous waste" at the time of disposal. Transportation, treatment, storage, and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact your regional US EPA office for guidance concerning case specific disposal issues. Empty drums and pails retain residue. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose this product's empty container to heat, flame, or other ignition sources. DO NOT attempt to clean it. Empty drums and pails should be drained completely, properly bunged or sealed, and promptly sent to a reconditioner.

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## SECTION 14. TRANSPORT INFORMATION

**The shipping description below may not represent requirements for all modes of transportation, shipping methods or locations outside of the United States.**

**US DOT Status** Not regulated by the U.S. Department of Transportation as a hazardous material.

**Proper Shipping Name** Not regulated.

**Hazard Class** Not regulated.

**Packing Group** Not applicable.

**UN/NA Number** Not regulated.

**Reportable Quantity** A Reportable Quantity (RQ) has not been established for this material.

**Placard(s)**

**Emergency Response Guide No.** Not applicable.

**MARPOL III Status** Not a DOT "Marine Pollutant" per 49 CFR 171.8.

**Oil:** The product(s) represented by this MSDS is (are) regulated as "oil" under 49 CFR Part 130. Shipments by rail or highway in packaging having a capacity of 3500 gallons or more or in a quantity greater 42,000 gallons are subject to these requirements. In addition, mixtures containing 10% or more of this product may be subject to these requirements.

## SECTION 15. REGULATORY INFORMATION

**TSCA Inventory** This product and/or its components are listed on the Toxic Substances Control Act (TSCA) inventory.

**SARA 302/304 Emergency Planning and Notification** The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs) for "Extremely Hazardous Substances" listed in 40 CFR 302.4 and 40 CFR 355. No components were identified.

**SARA 311/312 Hazard Identification** The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories:

No SARA 311/312 hazard categories identified.

**SARA 313 Toxic Chemical Notification and Release Reporting** This product contains the following components in concentrations above *de minimis* levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA: No components were identified.

**CERCLA** The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. Chemical substances present in this product or refinery stream that may be subject to this statute are:
Zinc and zinc compounds, Concentration: <1%
Antimony and Antimony Compounds, Concentration: <1%

**Clean Water Act (CWA)** This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.

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| | |
|---|---|
| **California Proposition 65** | This product is not known to contain any components for which the State of California has found to cause cancer, birth defects or other reproductive harm. |
| **New Jersey Right-to-Know Label** | Petroleum Oil |
| **Additional Remarks** | No additional regulatory remarks. |

## SECTION 16. OTHER INFORMATION

**Refer to the top of Page 1 for the HMIS and NFPA Hazard Ratings for this product.**

**REVISION INFORMATION**

| | |
|---|---|
| **Version Number** | 4.0 |
| **Revision Date** | 6/20/2011 |

**ABBREVIATIONS**

| | | | |
|---|---|---|---|
| AP: Approximately | EQ: Equal | >: Greater Than | <: Less Than |
| NA: Not Applicable | ND: No Data | NE: Not Established | |

ACGIH: American Conference of Governmental Industrial Hygienists

AIHA: American Industrial Hygiene Association

IARC: International Agency for Research on Cancer

NIOSH: National Institute of Occupational Safety and Health

NPCA: National Paint and Coating Manufacturers Association

EPA: US Environmental Protection Agency

HMIS: Hazardous Materials Information System

OSHA: Occupational Safety and Health Administration

NTP: National Toxicology Program

NFPA: National Fire Protection Association

**DISCLAIMER OF LIABILITY**

**THE INFORMATION IN THIS MSDS WAS OBTAINED FROM SOURCES WHICH WE BELIEVE ARE RELIABLE. HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESSED OR IMPLIED REGARDING ITS CORRECTNESS. SOME INFORMATION PRESENTED AND CONCLUSIONS DRAWN HEREIN ARE FROM SOURCES OTHER THAN DIRECT TEST DATA ON THE SUBSTANCE ITSELF. THIS MSDS WAS PREPARED AND IS TO BE USED ONLY FOR THIS PRODUCT. IF THE PRODUCT IS USED AS A COMPONENT IN ANOTHER PRODUCT, THIS MSDS INFORMATION MAY NOT BE APPLICABLE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION OR PRODUCTS FOR THEIR PARTICULAR PURPOSE.**

**THE CONDITIONS OR METHODS OF HANDLING, STORAGE, USE, AND DISPOSAL OF THE PRODUCT ARE BEYOND OUR CONTROL AND MAY BE BEYOND OUR KNOWLEDGE. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.**

***** END OF MSDS *****

The Valvoline Company

# MATERIAL SAFETY DATA SHEET


Date Prepared: 02/10/95
Date Printed: 11/04/95
MSDS No: 0177783-006.004

## PYROIL PREM STARTING FL SFP-11 - 12/11

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Material Identity**
Product Name: PYROIL PREM STARTING FL SFP-11 - 12/11
General or Generic ID: SOLVENT BLEND

**Company**
The Valvoline Company
P.O. Box 14000
Lexington, KY 40512

**Telephone Numbers**
Emergency: 1-800-274-5203
Information: 1-606-357-7847

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredient(s) | CAS Number | % (by weight) |
|---|---|---|
| HEPTANE | 142-82-5 | 49.0- 59.0 |
| ETHYL ETHER | 60-29-7 | 26.0- 36.0 |
| CARBON DIOXIDE | 124-38-9 | 3.0- 13.0 |
| HEXANE | 110-54-3 | 6.0 |

## 3. HAZARDS IDENTIFICATION

**Potential Health Effects**

**Eye**
Exposure causes eye irritation. Symptoms may include stinging, tearing, redness, and swelling. Additional symptoms of eye exposure may include: blurred vision

**Skin**
Exposure may cause mild skin irritation. Prolonged or repeated exposure may dry the skin. Symptoms may include redness, burning, drying and cracking, and skin burns. Pre-existing skin disorders may be aggravated by exposure to this material.

**Swallowing**
Single dose oral toxicity is low. Swallowing small amounts during normal handling is not likely to cause harmful effects; swallowing large amounts may be harmful. This material can enter the lungs during swallowing or vomiting and cause lung inflammation and/or damage.

**Inhalation**
No data

**Symptoms of Exposure**
gastrointestinal irritation (nausea, vomiting, diarrhea), irritation (nose, throat, respiratory tract) (pre-existing lung disorders , e.g. asthma-like conditions, may be aggravated by exposure to this material), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), and death.

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**Target Organ Effects**
Prolonged and repeated inhalation of high levels of mixed isomers of hexane resulted in kidney damage in male rats. The effects observed are the same as those seen in male rats exposed to other hydrocarbons. The mechanism by which these chemicals cause the characteristic kidney toxicity is unique to the male rat and the kidney effects are not expected to occur in man.

**Developmental Information**
No data

**Cancer Information**
No data

**Other Health Effects**
No data

**Primary Route(s) of Entry**
Inhalation, Skin contact.

## 4. FIRST AID MEASURES

**Eyes**
If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

**Skin**
Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

**Swallowing**
Do not induce vomiting. This material is an aspiration hazard. If individual is drowsy or unconscious, place on left side with the head down. Seek medical attention. If possible, do not leave individual unattended.

**Inhalation**
If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

**Note to Physicians**
No data

## 5. FIRE FIGHTING MEASURES

**Flash Point**
< -58.0 F (-50.0 C) TC

**Explosive Limit**
Lower 1.0 %

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**Autoignition Temperature**
No data

**Hazardous Products of Combustion**
May form:, carbon dioxide and carbon monoxide, various hydrocarbons.

**Fire and Explosion Hazards**
Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.

**Extinguishing Media**
regular foam, carbon dioxide, dry chemical.

**Fire Fighting Instructions**
Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment. Refer to the personal protective equipment section of this MSDS.

**NFPA Rating**
Health - 1, Flammability - 4, Reactivity - 0

## 6. ACCIDENTAL RELEASE MEASURES

**Small Spill**
Allow to evaporate. Eliminate all sources of ignition such as flares, flames (including pilot lights), and electrical sparks. Ventilate area.

**Large Spill**
Allow to evaporate. Persons not wearing protective equipment should be excluded from area until leak has been repaired. Eliminate all ignition sources (flares, flames, including pilot lights,electrical sparks).

## 7. HANDLING AND STORAGE

**Handling**
Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.

**Storage**
Not applicable

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Eye Protection**
Not required under normal conditions of use.

**Skin Protection**
Not required under normal conditions of use., Other protective equipment: not required under normal conditions of use..

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**Respiratory Protections**

If workplace exposure limit(s) of product or any component is exceeded (See Exposure Guidelines), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (consult your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

**Engineering Controls**

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).

**Exposure Guidelines**

Component
---

HEPTANE (142-82-5)
OSHA VPEL 400.00 ppm - TWA
OSHA VPEL 500.00 ppm - STEL
ACGIH TLV 400.00 ppm - TWA
ACGIH TLV 500.00 ppm - STEL

ETHYL ETHER (60-29-7)
OSHA VPEL 400.00 ppm - TWA
OSHA VPEL 500.00 ppm - STEL
ACGIH TLV 400.00 ppm - TWA
ACGIH TLV 500.00 ppm - STEL

CARBON DIOXIDE (124-38-9)
OSHA VPEL 10000.00 ppm - TWA
OSHA VPEL 30000.00 ppm - STEL
ACGIH TLV 5000.00 ppm - TWA
ACGIH TLV 30000.00 ppm - STEL

HEXANE (110-54-3)
OSHA VPEL 50.00 ppm - TWA
ACGIH TLV 50.00 ppm - TWA

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Boiling Point**
(for component) 94.0 F (34.4 C) @ 760.00 mmHg

**Vapor Pressure**
(for component) 439.000 mmHg @ 68.00 F

**Specific Vapor Density**
> 1.000 @ AIR=1

**Specific Gravity**
.758 @ 77.00 F

**Liquid Density**
5.800 lbs/gal @ 77.00 F
.758 kg/l @ 25.00 C

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**Percent Volatiles**
100.0 %

**Evaporation Rate**
SLOWER THAN ETHYL ETHER

**Appearance**
No data

**State**
LIQUID

**Physical Form**
No data

**Color**
No data

**Odor**
No data

**pH**
Not applicable

## 10. STABILITY AND REACTIVITY

**Hazardous Polymerization**
Product will not undergo hazardous polymerization.

**Hazardous Decomposition**
May form:, carbon dioxide and carbon monoxide, various hydrocarbons.

**Chemical Stability**
Stable.

**Incompatibility**
Avoid contact with:, strong oxidizing agents.

## 11. TOXICOLOGICAL INFORMATION

No data

## 12. ECOLOGICAL INFORMATION

No data

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## 13. DISPOSAL CONSIDERATION

**Waste Management Information**
Ventilate area of spill. Allow material to evaporate.

## 14. TRANSPORT INFORMATION

**DOT Information - 49 CFR 172.101**
**DOT Description:**
ENGINE STARTING FLUID,2.1,UN 1960

**Container/Mode:**
CASES/SURFACE - NO EXEMPTIONS

**NOS Component:**
None

**RQ (Reportable Quantity) - 49 CFR 172.101**

| Product Quantity (lbs) | Component |
|---|---|
| 272 | ETHYL ETHER |

## 15. REGULATORY INFORMATION

**Federal Regulations**
**CERCLA RQ - 40 CFR 302.4**

| Component | Component |
|---|---|
| ETHYL ETHER | 100 |
| HEXANE | 1 |

**SARA 302 Components - 40 CFR 355 Appendix A**
None

**Section 311/312 Hazard Class - 40 CFR 370.2**
Immediate(X) Delayed(X) Fire( ) Reactive( ) Sudden Release of Pressure( )

**SARA 313 Components - 40 CFR 372.65**

| Section 313 Component(s) | CAS Number | Max % |
|---|---|---|
| N-HEXANE | 110-54-3 | 5.50 |

**International Regulations**
**Inventory Status**
Not determined

**State and Local Regulations**
**California Proposition 65**
None

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# MATERIAL SAFETY DATA SHEET

RAIN-X® DE-ICER WINDSHIELD WASHER FLUID

## 1. PRODUCT AND COMPANY IDENTIFICATION

**MSDS Number: 15590**
**Version Date: 10/11/2006**

**Product Name:** RAIN-X® DE-ICER WINDSHIELD WASHER FLUID
**Product Use:** Windshield washer
**Synonyms:** RX68102, RX68106, RX68116, RX68904

**Company Information**
SOPUS Products
P.O. Box 4427
Houston, TX 77210-4427
USA

**Phone Numbers**
**Medical Emergency:** 1-800-546-6040
**Transportation Emergency (USA):** 1-800-424-9300
**Transportation Emergency (International):** 1-703-527-3887 (Call collect)
**MSDS Assistance:** 1-800-546-6227
**Fax On Demand:** 1-800-546-6227
**Technical Assistance:** 1-800-416-1600
**Customer Service:** 1-800-416-1600
**Fax Number:** 713-217-3181
**Internet Address:** www.MSDS.PZLQS.com

## 2. COMPONENT INFORMATION

| Component | CAS No. | Weight Percent Range | Hazardous in Blend |
|---|---|---|---|
| WATER | 7732-18-5 | 50 - 90 | No |
| METHYL ALCOHOL | 67-56-1 | 20 - 40 | Yes |
| BITREX | 3734-33-6 | < 1 | No |

This product meets the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**Hazards:**

**Flammable/Combustible** X **Acute Toxin** X **Chronic Toxin** X **Carcinogen** -
**Pressure** - **Reactive** - **Exposure Limit** X **Target Organ** - **Other** -

**Other:** No information available

## 3. HAZARDS IDENTIFICATION

**Emergency and Hazards Overview**
DANGER: (Skull & Crossbone symbol) POISON. MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED. VAPOR HARMFUL. FLAMMABLE.

**NFPA Ratings:** **Health** 1 **Flammability** 2 **Reactivity** 0

**Primary Route of Exposure:** **Skin** X **Inhalation** -- **Eye** --

**Health Effect Information**

**Eye Contact:** Avoid eye contact. May be irritating to the eyes upon direct contact.

**Skin Contact:** Avoid skin contact. Single, short exposures, as expected with consumer use of this product, are expected to be practically non-irritating to the skin. Prolonged or repeated skin contact may result in dryness, chapping, and reddening. May be absorbed through skin.

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**Inhalation:** Avoid inhalation of mists or vapors. Acute and chronic overexposures may be irritating to the respiratory tract. Inhalation of high concentrations of this product can cause central nervous system depression and narcosis. When high concentrations are inhaled, human signs may include a reddening of the face and a feeling of increased body heat, in addition, disturbed vision, dizziness, tremors, salivation, cardiac stress, drowsiness, dullness, numbness, weakness, headache, nausea, and confusion, as well as respiratory difficulties may be apparent. Intentional misuse by deliberately concentrating and inhaling this product can be harmful or fatal.

**Ingestion:** Do not ingest. Harmful or fatal if swallowed. Can cause reversible or permanent blindness. Visual symptoms include eye pain, blurred vision and constriction of visual fields. Can cause central nervous system (CNS) depression if ingested. Severe oral intoxication will lead to intense burning of the throat and may result in drowsiness, dullness, numbness, and headache followed by dizziness, weakness, and nausea. Loss of consciousness and convulsions followed by death may result. Initial symptoms are often followed by a period with few symptoms. After a latent period, symptoms usually recur with greater severity and visual disturbances, shortness of breath, abdominal pain and diarrhea. Ingestion of large quantities can lead to a metabolic acidosis, which can be fatal if untreated. Ingestion may result in lung aspiration. Aspiration may lead to chemical pneumonitis which is characterized by pulmonary edema and hemorrhage and may be fatal. Signs of lung involvement include increased respiratory rate, increased heart rate, and a bluish discoloration of the skin. Coughing, choking, and gagging are often noted at the time of aspiration.

**Medical Conditions Aggravated by Exposure:** Drying and chapping may make the skin more susceptible to other irritants, sensitizers and disease.

**Other:** No information available

## 4. FIRST AID INFORMATION

**Eye Contact:** Immediately flush eyes with large amounts of water and continue flushing until irritation subsides. If irritation persists, seek medical attention.

**Skin Contact:** Remove contaminated clothing. Wash contaminated area thoroughly with soap and water. If redness or irritation occurs and persists, seek medical attention.

**Inhalation:** If victim exhibits signs of vapor intoxication remove to fresh air. If discomfort persists seek medical attention. If breathing has stopped or is irregular, administer artificial respiration and supply oxygen if it is available. If victim is unconscious, remove to fresh air and seek immediate medical attention.

**Ingestion:** If large quantity is ingested and if person is conscious, give large quantities of water immediately. Seek immediate medical attention. If vomiting occurs lower head below knees to avoid aspiration.

**Notes to Physician:** Immediate medical treatment is imperative, especially if a large dose has been ingested. Administer alkali to correct acidosis. Hemodialysis is effective in the management of poisoning. Intravenous administration of ethanol has been effective.

**Other:** No information available

## 5. FIRE AND EXPLOSION INFORMATION

**Flammable Properties**

**Flash Point: 73.4 F, 23 C** — **Test Method:** ASTM D 3828-81-Setaflash

**Flammable Limits in Air**

**Upper Percent:** No data available

**Lower Percent:** No data available

**Autoignition Temperature:** No data available — **Test Method:** No information available

**NFPA Classification:** Class IC - flammable liquid

**Extinguishing Media:** Use water spray (fog), dry chemical, foam, or carbon dioxide.

**Fire Fighting Measures**

**Special Fire Fighting Procedures and Equipment:** Water may be ineffective but can be used to cool containers exposed to heat or flame to prevent vapor pressure buildup and possible container rupture.

**Unusual Fire and Explosion Conditions:** Dense smoke may be generated while burning. Carbon monoxide, and other oxides may be generated as products of combustion.

**Hazardous Combustion By-Products:** None

**Other:** No information available

## 6. ACCIDENTAL RELEASE MEASURES

**Personnel Safeguards:** Remove all sources of ignition. Provide adequate ventilation during clean-up. Consult Health Effect Information in Section 3, Personal Protection Information in Section 8, Fire and Explosion Information in Section 5, and Stability and Reactivity Information in Section 10.

**Regulatory Notifications:** Notify appropriate authorities of spill.

**Containment and Clean up:** Contain spill immediately. Do not allow spill to enter sewers or watercourses. Absorb with appropriate inert material such as sand, clay, etc.

**Other:** No information available

## 7. HANDLING AND STORAGE INFORMATION

**Handling:** Fire extinguishers should be kept readily available. See NFPA 30 and OSHA 1910.106--Flammable and Combustible Liquids.

**Storage:** Do not transfer to unmarked containers. Store in a cool, well ventilated area in closed containers away from heat, sparks, open flame or oxidizing materials.

**Empty Container Warnings**

**Drums:** Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed. Empty containers retain product residue and can be dangerous. DO NOT PRESSURIZE, CUT WELD, BRAZE SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

**Plastic:** Do not reuse this container. Empty container may retain product residues.

**Other:** No information available

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION INFORMATION

**Exposure Limits and Guidelines**

| Component | CAS No. | Exposure Limit |
|---|---|---|
| METHYL ALCOHOL | 67-56-1 | OSHA - PEL: TWA 200 ppm<br>ACGIH - TLV: TWA 200 ppm<br>ACGIH - TLV: STEL 250 ppm |

**Personal Protective Equipment**

**Eye/Face Protection:** Eye protection is not required under conditions of normal use. If material is handled such that it could be splashed into eyes, wear plastic face shield or splash-proof safety goggles.

**Skin Protection:** No skin protection is required for single, short duration exposures. Launder soiled clothes.

**Respiratory Protection:** Respiratory protection is not required under conditions of normal use. If excessive levels of mists or vapors are generated while using this product, use an organic vapor respirator. All respirators must be NIOSH certified. See Section 3, Health Effect Information, Inhalation.

**Personal Hygiene:** Consumption of food and beverage should be avoided in work areas where hydrocarbons are present. Always wash hands and face with soap and water before eating, drinking, or smoking.

**Engineering Controls / Work Practices**

**Ventilation:** If product is used in enclosed or confined spaces, adequate ventilation must be provided to prevent buildup of vapors or mists. Adequate ventilation in accordance with good engineering practice must be provided to maintain concentrations below the specified exposure or flammable limits. See also Fire and Explosion Information in Section 5.

**Other:** No information available

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Appearance:** Orange | |
| **Odor:** Alcohol | **Vapor Pressure:** No data available |
| **Physical state:** Liquid | **Vapor Density (air=1):** No data available |
| **pH:** 7.5 - 8.1 | **Percent Volatile by Volume:** No data available |
| **Boiling Point:** 154.4 F, 68 C | **Volatile Organic Content:** 35 WGT % |
| **Melting Point:** No data available | **Molecular Weight:** No data available |
| **Specific Gravity:** 0.95 | **Average Carbon Number:** No data available |
| **Pour Point:** No data available | **Viscosity @ 100 F:** Not applicable |
| | **Viscosity @ 40 C:** Not applicable |
| **Solubility in Water:** No information available | |
| **Octanol / Water Coefficient: Log $K_{ow}$ =** No data available | |

## 10. STABILITY AND REACTIVITY INFORMATION

**Chemical Stability:** Stable

**Conditions to Avoid:** Keep away from heat, sparks, open flames and other ignition sources.

**Incompatible Materials to Avoid:** May react with strong oxidizing agents.

**Other:** No information available

## 11. TOXICOLOGICAL INFORMATION

**Primary Eye Irritation:** Moderate irritation in Draize test in rabbits (methanol).

**Primary Skin Irritation:** Moderate irritation in Draize test in rabbits (methanol).

**Acute Dermal Toxicity:** No information available

**Subacute Dermal Toxicity:** No information available

**Dermal Sensitization:** No information available

**Inhalation Toxicity:** LC50 (rat) = 64,000 ppm (4 hours) (methanol)

**Inhalation Sensitization:** No information available

**Oral Toxicity:** LD50 (rat) = 5628 mg/kg (methanol)

**Mutagenicity:** No information available

**Carcinogenicity:** Methanol is not considered to be carcinogenic by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or OSHA.

**Reproductive and Developmental Toxicity:** No information available

**Teratogenicity:** No information available

**Immunotoxicity:** No information available

**Neurotoxicity:** .

**Other:** No information available

## 12. ECOLOGICAL INFORMATION

**Aquatic Toxicity:** No information available

**Terrestrial Toxicity:** No information available

**Chemical Fate and Transport:** No information available

**Other:** No information available

## 13. DISPOSAL INFORMATION

**Regulatory Information:** Dispose of residual products and empty containers responsibly.

**Waste Disposal Methods:** Waste material may be landfilled or incinerated at an approved facility. Materials should be recycled if possible.

**Other:** No information available.

## 14. TRANSPORTATION INFORMATION

**U.S. Department of Transportation (DOT)**
**Highway / Rail (Bulk):** NOT APPLICABLE
**Highway / Rail (Non-Bulk):** CONSUMER COMMODITY, ORM-D

**For US shipments, US DOT law requires the shipper to determine the proper shipping description of the material that is being shipped. The shipping information and description contained in this section may not be suitable for all shipments of this material, but may help the shipper determine the proper shipping description for a particular shipment.**

**International Information**

| | | | | |
|---|---|---|---|---|
| **Vessel:** | **IMDG Regulated:** | X | **IMDG Not Regulated:** | -- |
| **Air:** | **ICAO Regulated:** | X | **ICAO Not Regulated:** | -- |

**Other:** No information available

## 15. Regulatory Information

**Regulatory Lists Searched: The components listed in Section 2 of this MSDS were compared to substances that appear on the following regulatory lists. Each list is numerically identified. See Regulatory Search Results below.**

**Health & Safety:** 10 - IARC carcinogen, 11 - NTP carcinogen, 12 - OSHA carcinogen, 15 - ACGIH TLV, 16 - OSHA PEL, 17 - NIOSH exposure limit, 20 - US DOT Appendix A, Hazardous substances, 22 - FDA 21 CFR Total food additives, 23 - NFPA 49 or 325

**Environmental:** 30 - CAA 1990 Hazardous air pollutants, 31 - CAA Ozone depletors, 33 - CAA HON rule, 34 - CAA Toxic substance for accidental release prevention, 35 - CAA Volatile organic compounds (VOC's) in SOCMI, 41 - CERCLA / SARA Section 302 extremely hazardous substances, 42 - CERCLA / SARA Section 313 emissions reporting, 43 - CWA Hazardous substances, 44 - CWA Priority pollutants, 45 - CWA Toxic pollutants, 46 - EPA Proposed test rule for hazardous air pollutants, 47 - RCRA Basis for listing - Appendix VII, 48 - RCRA waste, 49 - SDWA - (S)MCLs

**International:** 50 - Canada - WHMIS Classification of substance, 54 - Mexico - Drinking water - ecological criteria, 55 - Mexico - Wastewater discharges, 56 - US -TSCA Section (12)(b) - export notification

**State Lists:** 60 - CA - Proposition 65, 61 - FL - Substances, 62 - MI - Critical materials, 63 - MA - RTK, 64 - MA - Extraordinarily hazardous substances, 65 - MN - Hazardous substances, 66 - PA - RTK, 67 - NJ - RTK, 68 - NJ - Environmental hazardous substances, 69 - NJ - Special hazardous substances

**Inventories:** 80 - Canada - Domestic substances , 81 - European - EINECS, 82 - Japan - ENCS, 83 - Korea - Existing and evaluated chemical substances, 84 - US - TSCA , 85 - China Inventory

**Regulatory Search Results:**
BITREX: 80, 81, 82, 83, 84, 85
METHYL ALCOHOL: 15, 16, 17, 20, 22, 23, 30, 33, 35, 42, 47, 48, 50, 61, 63, 65, 66, 67, 68, 69, 80, 81, 82, 83, 84, 85
WATER: 80, 81, 83, 84, 85

**U.S. TSCA Inventory:** All components of this material are on the US TSCA Inventory.

**SARA Section 313:** Consumer products are not regulated under SARA, Title III, Section 313.

**IARC:** No information available

**SARA 311 / 312 Categories**
**Acute:** X **Chronic:** X **Fire:** X **Pressure:** -- **Reactive:** --
**Not Regulated:** --

**Canadian WHMIS Classification**
Class B - Flammable and Combustible Material, Division 2, Flammable Liquids
Class D - Poisonous and infectious material, Division 2B, Toxic Material
Class D - Poisonous and infectious material, Division 1B, Toxic Material

**European Union Classification**
**Hazard Symbols:**
Toxic / T / skull and crossbones in square.
Highly flammable / F / flame in square.
**Risk Phrases:**
R10: Flammable.
R23/24/25: Toxic by inhalation, in contact with the skin and if swallowed.
R39/23/24/25: Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
**Safety Phrases:**
S1/2: Keep locked up and out of the reach of children
S7: Keep container tightly closed.
S16: Keep away from sources of ignition - No smoking.
S45: In case of accident or if you feel unwell seek medical advice immediately ...(show the label where possible).

**Other:** No information available

## 16. OTHER INFORMATION

**Health and Environmental Label Language**

Front Label:
DANGER: (Skull & Crossbone symbol) POISON. MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED. FLAMMABLE. VAPOR HARMFUL.
Read carefully other cautions on back.

Back Label:
DANGER:
CONTAINS METHYL ALCOHOL. CANNOT BE MADE NON-POISONOUS.
PRECAUTIONARY MEASURES: Do not drink or inhale. Keep away from heat, sparks, flames and other ignition sources. Store below 120F. Use only in a well-ventilated area. Do not store in open or unlabeled containers. Avoid contact with eyes. FIRST AID: If swallowed, give one or two glasses of water. Call physician, hospital emergency room or Poison Control Center immediately. Get prompt attention. Eyes: Flush with water for 15 minutes and get prompt medical attention.

KEEP OUT OF REACH OF CHILDREN.
This product contains a bittering agent.

**MSDS Revisions**

**Previous Version Date:** 9/6/2002

**Previous Version Information**

Section 9. - Appearance

**Other**

No information available

**Prepared By:**

SOPUS Products
P.O. Box 4427
Houston, TX 77210-4453 USA

**Disclaimer of Warranty:** The information contained herein is based upon data and information available to us, and reflects our best professional judgment. This product may be formulated in part with components purchased from other companies. In many instances, especially when proprietary or trade secret materials are used, SOPUS Products must rely upon the hazard evaluation of such components submitted by that product's manufacturer or importer. No warranty of merchantability, fitness for any use, or any other warranty is expressed or implied regarding the accuracy of such data or information, the results to be obtained from the use thereof, or that any such use do not infringe any patent. Since the information contained herein may be applied under conditions of use beyond our control and with which we may be unfamiliar, we do not assume responsibility for the results of such application. This information is furnished upon the condition that the person receiving it shall make his own determination of the suitability of the material for his particular use.

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Laboratory
Data Report
#81428

Shadow Mountain Bottled Water
Dwayne Gillette
533 South 1325 West
Orem , UT 84058

Samples Received
06/18/01

**PURIFIED (2106180001)** **Sampled on 06/18/01 00:00**

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| 06/29/01 | 06/29/01 10:38 | 145728 | ( EPA/ML 200.8 ) | Silver, Total, ICAP/MS | ND | ug/l | 0.50 | 1 |
| 06/29/01 | 06/29/01 10:38 | 145735 | ( EPA/ML 200.8 ) | Aluminum, Total, ICAP/MS | ND | ug/l | 25 | 1 |
| 06/29/01 | 06/29/01 10:38 | 145721 | ( EPA/ML 200.8 ) | Arsenic, Total, ICAP/MS | ND | ug/l | 1.0 | 1 |
| 06/29/01 | 06/29/01 10:38 | 145732 | ( EPA/ML 200.8 ) | Barium, Total, ICAP/MS | ND | ug/l | 2.0 | 1 |
| 06/29/01 | 06/29/01 10:38 | 145712 | ( EPA/ML 200.8 ) | Beryllium, Total, ICAP/MS | ND | ug/l | 1.0 | 1 |
| 06/29/01 | 06/29/01 10:38 | 145730 | ( EPA/ML 200.8 ) | Cadmium, Total, ICAP/MS | ND | ug/l | 0.50 | 1 |
| | 06/18/01 00:00 | 144584 | ( ML/EPA 300 ) | Chloride | ND | mg/l | 1.0 | 1 |
| | 06/24/01 00:00 | 145207 | ( SM4500CN-F ) | Cyanide | ND | mg/l | 0.025 | 1 |
| | 06/14/01 00:00 | 144402 | ( ML/S2120B ) | Apparent Color | ND | ACU | 3.0 | 1 |
| 29/01 | 06/29/01 10:38 | 145743 | ( EPA/ML 200.8 ) | Chromium, Total, ICAP/MS | ND | ug/l | 1.0 | 1 |
| 29/01 | 06/29/01 10:38 | 145717 | ( EPA/ML 200.8 ) | Copper, Total, ICAP/MS | ND | ug/l | 2.0 | 1 |
| 06/20/01 | 06/27/01 00:00 | 145625 | ( ML/EPA 548.1 ) | Endothall | ND | ug/l | 5.0 | 1 |
| | 06/21/01 00:00 | 144747 | ( SM4500F-C ) | Fluoride | ND | mg/l | 0.050 | 1 |
| 06/22/01 | 06/25/01 11:38 | 144971 | ( ML/EPA 200.7 ) | Iron, Total, ICAP | ND | mg/l | 0.10 | 1 |
| | 06/26/01 00:00 | 145510 | ( ML/EPA 547 ) | Glyphosate | ND | ug/l | 6.0 | 1 |
| 06/27/01 | 06/30/01 15:24 | 145521 | ( EPA/ML 245.1 ) | Mercury | ND | ug/l | 0.20 | 1 |
| 06/29/01 | 06/29/01 10:38 | 145745 | ( EPA/ML 200.8 ) | Manganese, Total, ICAP/MS | ND | ug/l | 2.0 | 1 |
| 06/29/01 | 06/29/01 10:38 | 145715 | ( EPA/ML 200.8 ) | Nickel, Total, ICAP/MS | ND | ug/l | 5.0 | 1 |
| | 06/18/01 16:26 | 144864 | ( ML/EPA 300.0 ) | Nitrite, Nitrogen by IC | ND | mg/l | 0.10 | 1 |
| | 06/28/01 17:46 | | ( ML/EPA 300.0 ) | Total Nitrate, Nitrite-N, CALC | ND | mg/l | 0.010 | 1 |
| | 06/18/01 16:26 | 144870 | ( ML/EPA 300.0 ) | Nitrate-N by IC | ND | mg/l | 0.10 | 1 |
| | 06/14/01 10:00 | 144458 | ( ML/S2150B ) | Odor | 1 | TON | 1.0 | 1 |
| 06/29/01 | 06/29/01 10:38 | 145739 | ( EPA/ML 200.8 ) | Lead, Total, ICAP/MS | ND | ug/l | 0.50 | 1 |
| 06/20/01 | 06/21/01 00:00 | 145150 | ( 420.1, 420.2 ) | Phenolic Compounds | ND | mg/l | 0.010 | 1 |
| 06/29/01 | 06/29/01 10:38 | 145734 | ( EPA/ML 200.8 ) | Antimony, Total, ICAP/MS | ND | ug/l | 1.0 | 1 |
| 06/29/01 | 06/29/01 10:38 | 145723 | ( EPA/ML 200.8 ) | Selenium, Total, ICAP/MS | ND | ug/l | 5.0 | 1 |
| | 06/18/01 00:00 | 144904 | ( ML/EPA 300.0 ) | Sulfate | ND | mg/l | 2.0 | 1 |
| 06/22/01 | 06/24/01 00:00 | | ( EPA 1613 ) | 2,3,7,8 - TCDD | ND | pg/l | 3.1 | 1 |
| 06/25/01 | 06/25/01 00:00 | 145483 | ( SM2540C/E160.1) | Total Dissolved Solid (TDS) | ND | mg/l | 10 | 1 |
| 06/29/01 | 06/29/01 10:38 | 145737 | ( EPA/ML 200.8 ) | Thallium, Total, ICAP/MS | ND | ug/l | 1.0 | 1 |
| | 06/14/01 14:00 | 144398 | ( ML/EPA 180.1 ) | Turbidity | ND | NTU | 0.050 | 1 |
| 06/29/01 | 06/29/01 10:38 | 145719 | ( EPA/ML 200.8 ) | Zinc, Total, ICAP/MS | ND | ug/l | 5.0 | 1 |

04/14/2023

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Laboratory
Data Report
#81428

Shadow Mountain Bottled Water
(continued)

## 525 Semivolatiles by GC/MS

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | 2,4-Dinitrotoluene | NA | ug/l | 0.10 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | alpha-Chlordane | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Acenaphthylene | NA | ug/l | 0.10 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Alachlor | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Aldrin | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Anthracene | NA | ug/l | 0.020 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Atrazine | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Benz(a)Anthracene | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Benzo(a)pyrene | NA | ug/l | 0.020 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Benzo(b)Fluoranthene | NA | ug/l | 0.020 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Benzo(g,h,i)Perylene | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Benzo(k)Fluoranthene | NA | ug/l | 0.020 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Di(2-Ethylhexyl)phthalate | NA | ug/l | 0.60 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Butylbenzylphthalate | NA | ug/l | 0.50 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Bromacil | NA | ug/l | 0.20 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Butachlor | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Caffeine | NA | ug/l | 0.020 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Chrysene | NA | ug/l | 0.020 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Dibenz(a,h)Anthracene | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Di-(2-Ethylhexyl)adipate | NA | ug/l | 0.60 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Diethylphthalate | NA | ug/l | 0.50 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Dieldrin | NA | ug/l | 0.20 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Dimethylphthalate | NA | ug/l | 0.50 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Dimethoate | NA | ug/l | 10 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Di-n-Butylphthalate | NA | ug/l | 0.50 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Endrin | NA | ug/l | 0.10 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Fluoranthene | NA | ug/l | 0.10 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Fluorene | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | gamma-Chlordane | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Hexachlorobenzene | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Hexachlorocyclopentadiene | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Heptachlor | NA | ug/l | 0.040 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Heptachlor Epoxide | NA | ug/l | 0.020 | 1 |

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#81428

Shadow Mountain Bottled Water
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Indeno(1,2,3,c,d)Pyrene | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Isophorone | NA | ug/l | 0.50 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Lindane | NA | ug/l | 0.020 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Methoxychlor | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Metribuzin | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Molinate | NA | ug/l | 0.20 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Metolachlor | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | trans-Nonachlor | NA | ug/l | 0.050 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Pentachlorophenol | NA | ug/l | 1.0 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Phenanthrene | NA | ug/l | 0.020 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Prometryn | NA | ug/l | 0.50 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Propachlor | NA | ug/l | 0.050 | 1 |
| 30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Pyrene | NA | ug/l | 0.050 | 1 |
| 30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Simazine | NA | ug/l | 0.050 | 1 |
| 30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Thiobencarb | NA | ug/l | 0.20 | 1 |
| 06/30/01 | 07/14/01 00:00 | 146202 | ( ML/EPA 525.2 ) | Trifluralin | NA | ug/l | 0.10 | 1 |
| | | | ( Surrogate ) | Perylene-d12 | NA | % Rec | | |
| | | | **Aldicarbs** | | | | | |
| | 07/11/01 00:00 | 146557 | ( ML/EPA 531.1 ) | 3-Hydroxycarbofuran | ND | ug/l | 2.0 | 1 |
| | 07/11/01 00:00 | 146557 | ( ML/EPA 531.1 ) | Aldicarb (Temik) | ND | ug/l | 0.50 | 1 |
| | 07/11/01 00:00 | 146557 | ( ML/EPA 531.1 ) | Aldicarb sulfone | ND | ug/l | 0.70 | 1 |
| | 07/11/01 00:00 | 146557 | ( ML/EPA 531.1 ) | Aldicarb sulfoxide | ND | ug/l | 0.50 | 1 |
| | 07/11/01 00:00 | 146557 | ( ML/EPA 531.1 ) | Baygon | ND | ug/l | 2.0 | 1 |
| | 07/11/01 00:00 | 146557 | ( ML/EPA 531.1 ) | Carbofuran (Furadan) | ND | ug/l | 0.90 | 1 |
| | 07/11/01 00:00 | 146557 | ( ML/EPA 531.1 ) | Carbaryl | ND | ug/l | 2.0 | 1 |
| | 07/11/01 00:00 | 146557 | ( ML/EPA 531.1 ) | Methiocarb | ND | ug/l | 2.0 | 1 |
| | 07/11/01 00:00 | 146557 | ( ML/EPA 531.1 ) | Methomyl | ND | ug/l | 1.0 | 1 |
| | 07/11/01 00:00 | 146557 | ( ML/EPA 531.1 ) | Oxamyl (Vydate) | ND | ug/l | 2.0 | 1 |
| | | | ( Surrogate ) | BDMC | 96 | % Rec | | |
| | | | **Diquat and Paraquat** | | | | | |
| 06/20/01 | 07/02/01 00:00 | 146076 | ( ML/EPA 549.2 ) | Diquat | ND | ug/l | 0.40 | 1 |
| 06/20/01 | 07/02/01 00:00 | 146076 | ( ML/EPA 549.2 ) | Paraquat | ND | ug/l | 2.0 | 1 |

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#81428

Shadow Mountain Bottled Water
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | | | **EDB and DBCP by GC-ECD** | | | | | |
| 06/27/01 | 06/28/01 00:00 | 145528 | ( ML/EPA 504.1 ) | Dibromochloropropane (DBCP) | ND | ug/l | 0.010 | 1 |
| 06/27/01 | 06/28/01 00:00 | 145528 | ( ML/EPA 504.1 ) | Ethylene Dibromide (EDB) | ND | ug/l | 0.010 | 1 |
| | | | ( Surrogate ) | 1,2-dibromopropane | 106 | % Rec | | |
| | | | **Gross Alpha and Beta Radiation** | | | | | |
| | 08/01/01 00:00 | 148582 | ( ML/EPA 900.0 ) | Alpha, Gross | <1.00 | pCi/l | 1.0 | 1 |
| | 08/01/01 00:00 | 148582 | ( ML/EPA 900.0 ) | Alpha, Two Sigma Error | NA | pCi/l | 0.0000 | 1 |
| | 08/01/01 00:00 | 148582 | ( ML/EPA 900.0 ) | Alpha, Min Detectable Activity | 1.00 | pCi/l | 0.0000 | 1 |
| | 08/01/01 00:00 | 148582 | ( ML/EPA 900.0 ) | Beta, Gross | <1.07 | pCi/l | 1.1 | 1 |
| | 08/01/01 00:00 | 148582 | ( ML/EPA 900.0 ) | Beta, Two Sigma Error | NA | pCi/l | 0.0000 | 1 |
| | 08/01/01 00:00 | 148582 | ( ML/EPA 900.0 ) | Beta, Min Detectable Activity | 1.07 | pCi/l | 0.0000 | 1 |
| | | | **Herbicides by 515.1** | | | | | |
| 6/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | 2,4,5-T | ND | ug/l | 0.20 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | 2,4,5-TP (Silvex) | ND | ug/l | 0.20 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | 2,4-D | ND | ug/l | 0.10 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | 2,4-DB | ND | ug/l | 2.0 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | Dichlorprop | ND | ug/l | 0.50 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | Acifluorfen (qualitative) | ND | ug/l | 0.20 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | Bentazon | ND | ug/l | 0.50 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | Dalapon (qualitative) | ND | ug/l | 1.0 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | 3,5-Dichlorobenzoic acid | ND | ug/l | 0.50 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | Tot DCPA Mono&Diacid Degradate | ND | ug/l | 0.10 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | Dicamba | ND | ug/l | 0.080 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | Dinoseb | ND | ug/l | 0.20 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | Pentachlorophenol | ND | ug/l | 0.040 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | Picloram | ND | ug/l | 0.10 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | 4-Nitrophenol (qualitative) | ND | ug/l | 5.0 | 1 |
| 06/26/01 | 06/29/01 00:00 | 145677 | ( ML/EPA 515.1 ) | 2,4-Dichlorophenylacetic acid | ND | %R | 0.0000 | 1 |
| | | | ( Surrogate ) | 2,4-Dichlorophenylacetic acid | 100 | % Rec | | |

04/14/2023

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Laboratory
Data Report
#81428

Shadow Mountain Bottled Water
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | | | | **Regulated VOCs plus Lists 1&3** | | | | |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,1,1,2-Tetrachloroethane | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,1,1-Trichloroethane | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,1,2,2-Tetrachloroethane | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,1,2-Trichloroethane | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,1-Dichloroethane | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,1-Dichloroethylene | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,1-Dichloropropene | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,2,3-Trichlorobenzene | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,2,3-Trichloropropane | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,2,4-Trichlorobenzene | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,2,4-Trimethylbenzene | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,2-Dichloroethane | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,2-Dichloropropane | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,3,5-Trimethylbenzene | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 1,3-Dichloropropane | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | p-Dichlorobenzene (1,4-DCB) | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 2,2-Dichloropropane | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 2-Butanone (MEK) | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | o-Chlorotoluene | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | p-Chlorotoluene | ND | ug/l | 5.0 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | 4-Methyl-2-Pentanone (MIBK) | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | Benzene | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | Bromobenzene | ND | ug/l | 5.0 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | Bromomethane (Methyl Bromide) | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | cis-1,2-Dichloroethylene | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | Chlorobenzene | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | Carbon Tetrachloride | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | cis-1,3-Dichloropropene | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | Bromoform | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | Chloroform (Trichloromethane) | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | Bromochloromethane | 3.5 | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | Chloroethane | ND | ug/l | 0.50 | 1 |
| 06/28/01 | 00:00 | 145553 | ( ML/EPA 524.2 ) | Chloromethane (Methyl Chloride) | ND | ug/l | 0.50 | 1 |
| | | | | | ND | ug/l | 0.50 | 1 |

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Laboratory
Data Report
#81428

Shadow Mountain Bottled Water
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Chlorodibromomethane | 0.6 | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Dibromomethane | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Bromodichloromethane | 1.8 | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Dichloromethane | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Di-isopropyl ether | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Ethyl benzene | ND | ug/l | 5.0 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Dichlorodifluoromethane | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Fluorotrichloromethane-Freon11 | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Hexachlorobutadiene | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Isopropylbenzene | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | m-Dichlorobenzene (1,3-DCB) | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | m,p-Xylenes | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Methyl Tert-butyl ether (MTBE) | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Naphthalene | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | n-Butylbenzene | ND | ug/l | 3.0 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | n-Propylbenzene | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | o-Xylene | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | o-Dichlorobenzene (1,2-DCB) | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Tetrachloroethylene (PCE) | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | p-Isopropyltoluene | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | sec-Butylbenzene | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Styrene | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | trans 1,2 Dichloroethylene | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | tert-amyl Methyl Ether | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | tert-Butyl Ethyl Ether | ND | ug/l | 3.0 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | tert-Butylbenzene | ND | ug/l | 3.0 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Trichloroethylene (TCE) | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Trichlorotrifluoroethane(Freon | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | trans-1,3-Dichloropropene | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Toluene | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Total THM | 5.9 | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Total xylenes | ND | ug/l | 0.50 | 1 |
| | 06/28/01 00:00 | 145553 | ( ML/EPA 524.2 ) | Vinyl chloride (VC) | ND | ug/l | 0.30 | 1 |
| | | | ( Surrogate ) | 1,2-Dichloroethane-d4 | 100 | % Rec | | |
| | | | ( Surrogate ) | 4-Bromofluorobenzene | 98 | % Rec | | |
| | | | ( Surrogate ) | Toluene-d8 | 99 | % Rec | | |

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#81428

Shadow Mountain Bottled Water
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | | | | **SDWA Pesticides** | | | | |
| '20/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) PCB 1016 Aroclor | ND | ug/l | 0.070 | 1 |
| 06/20/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) PCB 1221 Aroclor | ND | ug/l | 0.10 | 1 |
| 20/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) PCB 1232 Aroclor | ND | ug/l | 0.10 | 1 |
| '20/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) PCB 1242 Aroclor | ND | ug/l | 0.10 | 1 |
| 6/20/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) PCB 1248 Aroclor | ND | ug/l | 0.10 | 1 |
| 6/20/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) PCB 1254 Aroclor | ND | ug/l | 0.10 | 1 |
| 0/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) PCB 1260 Aroclor | ND | ug/l | 0.10 | 1 |
| 5/20/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Alpha-BHC | ND | ug/l | 0.10 | 1 |
| 5/20/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Alachlor (Alanex) | ND | ug/l | 0.10 | 1 |
| | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Aldrin | ND | ug/l | 0.010 | 1 |
| | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Beta-BHC | ND | ug/l | 0.050 | 1 |
| | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Chlordane | ND | ug/l | 0.010 | 1 |
| /01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Chlorthalonil (Draconil,Bravo) | ND | ug/l | 0.010 | 1 |
| '20/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Delta-BHC | ND | ug/l | 0.10 | 1 |
| /01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) p,p' DDD | ND | ug/l | 0.010 | 1 |
| '01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) p,p' DDE | ND | ug/l | 0.010 | 1 |
| 20/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) p,p' DDT | ND | ug/l | 0.010 | 1 |
| .01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Dieldrin | ND | ug/l | 0.010 | 1 |
| 01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Endrin Aldehyde | ND | ug/l | 0.010 | 1 |
| 0/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Endrin | ND | ug/l | 0.010 | 1 |
| .01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Endosulfan I (alpha) | ND | ug/l | 0.010 | 1 |
| 1 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Endosulfan II (beta) | ND | ug/l | 0.010 | 1 |
| 0/01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Endosulfan sulfate | ND | ug/l | 0.010 | 1 |
| .01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Heptachlor | ND | ug/l | 0.010 | 1 |
| | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Heptachlor Epoxide | ND | ug/l | 0.010 | 1 |
| /01 | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Lindane (gamma-BHC) | ND | ug/l | 0.010 | 1 |
| | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Methoxychlor | ND | ug/l | 0.010 | 1 |
| | 06/29/01 00:00 | 145659 | ( ML/EPA 508 | ) Toxaphene | ND | ug/l | 0.010 | 1 |
| | 06/29/01 00:00 | 145659 | ( Surrogate | ) Dibutyl Chlorendate | ND | ug/l | 0.050 | 1 |
| | 06/29/01 00:00 | 145659 | ( Surrogate | ) Tetrachlorometaxylene | 96 | % Rec | 0.50 | 1 |
| | | | | | 100 | % Rec | | |

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Shadow Mountain Bottled Water
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | | | | **Total & Fecal Coliform,24 Hour** | | | | |
| 06/18/01 | 06/19/01 12:12 | | ( ML/SM9221B | ) 24 Hour E. Coli Confirmed | 0 | PTUB | 0.0000 | 1 |
| 06/18/01 | 06/19/01 12:12 | | ( ML/SM9221B | ) 24 Hour Total Coliform Confrm | 0 | PTUB | 0.0000 | 1 |
| 06/18/01 | 06/19/01 12:12 | | ( ML/SM9221 | ) E. coli Bacteria | <1.1 | MPNM | 1.1 | 1 |
| 06/18/01 | 06/19/01 12:12 | | ( ML/SM9221 | ) Total Coliform Bacteria | <1.1 | MPNM | 1.1 | 1 |
| 06/18/01 | 06/19/01 12:12 | | ( ML/SM 9223 | ) E. coli Bacteria | A | PA | 0.0000 | 1 |
| 06/18/01 | 06/19/01 12:12 | | ( ML/SM 9223 | ) Total Coliform Bacteria | A | PA | 0.0000 | 1 |

04/14/2023

Purified Drinking Water is treated as follows

1 .Municipal water
2. 5 micron filtration
3. Water softening
4. Processed over Activated Carbon
5. 5 micron filtration
6. Purified to 4 PPM T.D.S. by Reverse Osmosis
7. Ozonation to residual level of 0.4 PPM Ozone
8. Final filtration through a 1 micron filter just prior to the bottling fill head

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5 Gallon Cleaning,Sanitizing and Filling

1. Remove cap and inspect bottle for damage and for any foreign liquids(gas,diesel,antifreeze and oil)
2.Then the bottles are placed into the 5 gallon washer for cleaning,sanitizing and filling the procedure is as follows.
a. 30 sec. pre-rinse
b. 60 sec. washing water temp. 140 degrees
c. 30 sec. rinse
d. 60 sec chlorine rinse
e. 30 sec. rinse
f. 30 sec product water rinse

3. Filling the 5 gallon bottles
From the washer the bottles are dumped on to a conveyor that goes to the filling station and are filled with ozonated product water.

4. Capping of the bottle
From the filling station the bottles continue down the conveyor to the capper which puts the cap onto the bottle, and then the bottles are stacked on pallets or racks for shipment.

Water testing
The product water is checked three times during a production run for the following items.
a. Total Dissolved Solids
b. Chlorine levels
c. PH
d. Taste

Bacteriological Testing
In house testing are done daily on all product water.
Outside Lab testing is done on a weekly basics on all product water.

Washing conditions are checked three times per production run.
a. Wash temp.
b. Chlorine level
c. Rinse water jets
d. Wash jets

# Material Safety Data Sheet

## 1. MATERIAL AND COMPANY IDENTIFICATION

**Material Name** : **Shell Rotella T 15W-40 (CJ-4)**
**Uses** : Engine oil.

**Manufacturer/Supplier** : **SOPUS Products**
PO BOX 4427
Houston, TX 77210-4427
USA
**MSDS Request** : 877-276-7285

**Emergency Telephone Number**
**Spill Information** : 877-242-7400
**Health Information** : 877-504-9351

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Highly refined mineral oils and additives.
The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

## 3. HAZARDS IDENTIFICATION

**Emergency Overview**

**Appearance and Odour** : Amber. Liquid at room temperature. Slight hydrocarbon.

**Health Hazards** : Not classified as dangerous for supply or conveyance.
**Safety Hazards** : Not classified as flammable but will burn.
**Environmental Hazards** : Not classified as dangerous for the environment.

**Health Hazards** : Not expected to be a health hazard when used under normal conditions.

**Health Hazards**
**Inhalation** : Under normal conditions of use, this is not expected to be a primary route of exposure.
**Skin Contact** : Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
**Eye Contact** : May cause slight irritation to eyes.
**Ingestion** : Low toxicity if swallowed.
**Other Information** : Used oil may contain harmful impurities.
**Signs and Symptoms** : Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.
**Aggravated Medical Condition** : Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Skin.
**Environmental Hazards** : Not classified as dangerous for the environment.
**Additional Information** : Under normal conditions of use or in a foreseeable emergency,

this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

## 4. FIRST AID MEASURES

| | | |
|---|---|---|
| **General Information** | : | Not expected to be a health hazard when used under normal conditions. |
| **Inhalation** | : | No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice. |
| **Skin Contact** | : | Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention. |
| **Eye Contact** | : | Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention. |
| **Ingestion** | : | In general no treatment is necessary unless large quantities are swallowed, however, get medical advice. |
| **Advice to Physician** | : | Treat symptomatically. |

## 5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

| | | |
|---|---|---|
| **Flash point** | : | Typical 400 °C / 752 °F (COC) |
| **Upper / lower Flammability or Explosion limits** | : | Typical 1 - 10 %(V)(based on mineral oil) |
| **Auto ignition temperature** | : | > 320 °C / 608 °F |
| **Specific Hazards** | : | Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Unidentified organic and inorganic compounds. |
| **Suitable Extinguishing Media** | : | Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only. |
| **Unsuitable Extinguishing Media** | : | Do not use water in a jet. |
| **Protective Equipment for Firefighters** | : | Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space. |

## 6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal. Observe all relevant local and international regulations.

| | | |
|---|---|---|
| **Protective measures** | : | Avoid contact with skin and eyes. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. |
| **Clean Up Methods** | : | Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an |



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| | | |
|---|---|---|
| **Additional Advice** | : | absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly. Local authorities should be advised if significant spillages cannot be contained. |

## 7. HANDLING AND STORAGE

| | | |
|---|---|---|
| **General Precautions** | : | Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. |
| **Handling** | : | Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. |
| **Storage** | : | Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Storage Temperature: 0 - 50 °C / 32 - 122 °F |
| **Recommended Materials** | : | For containers or container linings, use mild steel or high density polyethylene. |
| **Unsuitable Materials** | : | PVC. |
| **Additional Information** | : | Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion. |

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Occupational Exposure Limits**

| Material | Source | Type | ppm | mg/m3 | Notation |
|---|---|---|---|---|---|
| Oil mist, mineral | ACGIH | TWA(Mist.) | | 5 mg/m3 | |
| Oil mist, mineral | ACGIH | STEL(Mist.) | | 10 mg/m3 | |

| | | |
|---|---|---|
| **Exposure Controls** | : | The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated. |
| **Personal Protective Equipment** | : | Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers. |
| **Respiratory Protection** | : | No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene |



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| | | |
|---|---|---|
| | | practices, precautions should be taken to avoid breathing of material. If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65°C(149 °F)]. |
| **Hand Protection** | : | Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended. |
| **Eye Protection** | : | Wear safety glasses or full face shield if splashes are likely to occur. |
| **Protective Clothing** | : | Skin protection not ordinarily required beyond standard issue work clothes. |
| **Monitoring Methods** | : | Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. |
| **Environmental Exposure Controls** | : | Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| Appearance | : | Amber. Liquid at room temperature. |
| Odour | : | Slight hydrocarbon. |
| pH | : | Not applicable. |
| Initial Boiling Point and Boiling Range | : | > 280 °C / 536 °F estimated value(s) |
| Pour point | : | Typical -20 °C / -4 °F |
| Flash point | : | Typical 400 °C / 752 °F (COC) |
| Upper / lower Flammability or Explosion limits | : | Typical 1 - 10 %(V) (based on mineral oil) |
| Auto-ignition temperature | : | > 320 °C / 608 °F |
| Vapour pressure | : | < 0.5 Pa at 20 °C / 68 °F (estimated value(s)) |
| Specific gravity | : | Typical 0.85 |
| Water solubility | : | Negligible. |
| n-octanol/water partition coefficient (log Pow) | : | > 6 (based on information on similar products) |



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| | | |
|---|---|---|
| Kinematic viscosity | : | Typical 118 mm2/s at 40 °C / 104 °F |
| Vapour density (air=1) | : | > 1 (estimated value(s)) |
| Evaporation rate (nBuAc=1) | : | Data not available |

## 10. STABILITY AND REACTIVITY

| | | |
|---|---|---|
| **Stability** | : | Stable. |
| **Conditions to Avoid** | : | Extremes of temperature and direct sunlight. |
| **Materials to Avoid** | : | Strong oxidising agents. |
| **Hazardous Decomposition Products** | : | Hazardous decomposition products are not expected to form during normal storage. |

## 11. TOXICOLOGICAL INFORMATION

| | | |
|---|---|---|
| **Basis for Assessment** | : | Information given is based on data on the components and the toxicology of similar products. |
| **Acute Oral Toxicity** | : | Expected to be of low toxicity: LD50 > 5000 mg/kg |
| **Acute Dermal Toxicity** | : | Expected to be of low toxicity: LD50 > 5000 mg/kg |
| **Acute Inhalation Toxicity** | : | Not considered to be an inhalation hazard under normal conditions of use. |
| **Skin Irritation** | : | Expected to be slightly irritating. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis. |
| **Eye Irritation** | : | Expected to be slightly irritating. |
| **Respiratory Irritation** | : | Inhalation of vapours or mists may cause irritation. |
| **Sensitisation** | : | Not expected to be a skin sensitiser. |
| **Repeated Dose Toxicity** | : | Not expected to be a hazard. |
| **Mutagenicity** | : | Not considered a mutagenic hazard. |
| **Carcinogenicity** | : | Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC). Other components are not known to be associated with carcinogenic effects. |
| **Reproductive and Developmental Toxicity** | : | Not expected to be a hazard. |
| **Additional Information** | : | Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible. Continuous contact with used engine oils has caused skin cancer in animal tests. |

## 12. ECOLOGICAL INFORMATION

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

| | | |
|---|---|---|
| **Acute Toxicity** | : | Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be practically non toxic: LL/EL/IL50 > |



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100 mg/l (to aquatic organisms) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.

**Mobility** : Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.

**Persistence/degradability** : Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.

**Bioaccumulation** : Contains components with the potential to bioaccumulate.

**Other Adverse Effects** : Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

## 13. DISPOSAL CONSIDERATIONS

**Material Disposal** : Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses.

**Container Disposal** : Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.

**Local Legislation** : Disposal should be in accordance with applicable regional, national, and local laws and regulations.

## 14. TRANSPORT INFORMATION

**US Department of Transportation Classification (49CFR)**
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

**IMDG**
This material is not classified as dangerous under IMDG regulations.

**IATA (Country variations may apply)**
This material is not classified as dangerous under IATA regulations.

## 15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

**Federal Regulatory Status**

**Notification Status**



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| | |
|---|---|
| EINECS | All components listed or polymer exempt. |
| DSL | All components listed. |
| TSCA | All components listed. |

**SARA Hazard Categories (311/312)**
No SARA 311/312 Hazards.

**State Regulatory Status**

**California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)**

This material does not contain any chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

## 16. OTHER INFORMATION

| | | |
|---|---|---|
| **NFPA Rating (Health, Fire, Reactivity)** | : | 0, 1, 0 |
| **MSDS Version Number** | : | 17.1 |
| **MSDS Effective Date** | : | 06/22/2009 |
| **MSDS Revisions** | : | A vertical bar (\|) in the left margin indicates an amendment from the previous version. |
| **MSDS Regulation** | : | The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200. |
| **MSDS Distribution** | : | The information in this document should be made available to all who may handle the product. |
| **Disclaimer** | : | The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product. |

65407

Indicator Fluide K-15



05/18/93

SHELL MATERIAL SAFETY DATA SHEET
BE SAFE. READ OUR PRODUCT SAFETY INFORMATION ... AND PASS IT ON.
PRODUCT LIABILITY LAW REQUIRES IT!

********** MATERIAL SAFETY DATA SHEET 60536 - 01 **********

SHELL TELLUS(R) T OIL 15 SH MSDS: 60536 - 01 05/18/93

MANUFACTURER'S NAME AND ADDRESS
SHELL OIL COMPANY
PRODUCT SAFETY & COMPLIANCE
P.O. BOX 4320
HOUSTON, TX 77210

TELEPHONE NUMBERS:
24 HOUR EMERGENCY ASSISTANCE
SHELL: 713-473-9461 CHEMTREC: 800-424-9300

GENERAL MSDS ASSISTANCE
SHELL: 713-241-4819

SECTION I | NAME

PRODUCT: SHELL TELLUS(R) T OIL 15
CHEM NAME: MIXTURE (SEE SECTION II-A)
CHEM FAMILY: PETROLEUM HYDROCARBON; INDUSTRIAL OIL
SHELL CODE: 65407

ACUTE HEALTH HAZARD: 1
FIRE HAZARD: 1
REACTIVITY: 0

SECTION II-A | PRODUCT/INGREDIENT

| NO. | COMPOSITION | CAS | PERCENT |
|---|---|---|---|
| P | SHELL TELLUS(R) T OIL 15 | MIXTURE | 100 |
| 1 | SEVERELY HYDROTREATED LIGHT NAPHTHENIC DISTILLATE | 64742-53-6 | 60-65 |
| 2 | SOLVENT REFINED, HYDROTREATED MIDDLE DISTILLATE | 64742-46-7 | 30-35 |
| 3 | SOLVENT REFINED, HYDROTREATED HEAVY PARAFFINIC DISTILLATE | 64742-54-7 | <5 |
| 4 | ADDITIVE PACKAGE | MIXTURE | <5 |

NFPA HAZARD RATING: HEALTH 0 FIRE 1 REACTIVITY 0

SECTION II-B | ACUTE TOXICITY DATA

| NO. | ACUTE ORAL LD50 | ACUTE DERMAL LD50 | ACUTE INHALATION LC50 |
|---|---|---|---|
| P | NOT AVAILABLE | | |

BASED UPON DATA AVAILABLE TO SHELL, COMPONENT 4 IN THIS PRODUCT IS NOT HAZARDOUS UNDER OSHA HAZARD COMMUNICATION (29 CFR 1910.1200).

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ENTERPRISES
EDMOND OKLAHOMA
(405) 340-0895

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## SECTION III | HEALTH INFORMATION

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

EYE CONTACT:
BASED ON ESSENTIALLY SIMILAR PRODUCT TESTING PRODUCT IS PRESUMED TO BE NONIRRITATING TO THE EYES.

SKIN CONTACT:
BASED ON ESSENTIALLY SIMILAR PRODUCT TESTING PRODUCT IS PRESUMED TO BE SLIGHTLY IRRITATING TO THE SKIN. PROLONGED AND REPEATED CONTACT MAY RESULT IN VARIOUS SKIN DISORDERS SUCH AS DERMATITIS, FOLLICULITIS OR OIL ACNE.

INHALATION:
INHALATION OF VAPORS (GENERATED AT HIGH TEMPERATURES ONLY) OR OIL MIST MAY CAUSE A MILD IRRITATION OF THE UPPER RESPIRATORY TRACT.

INGESTION:
INGESTION OF PRODUCT MAY RESULT IN VOMITING; ASPIRATION (BREATHING OF VOMITUS INTO THE LUNGS) MUST BE AVOIDED AS EVEN SMALL QUANTITIES MAY RESULT IN ASPIRATION PNEUMONITIS.

SIGNS AND SYMPTOMS:
IRRITATION AS NOTED ABOVE. ASPIRATION PNEUMONITIS MAY BE EVIDENCED BY COUGHING; LABORED BREATHING AND CYANOSIS (BLUISH SKIN); IN SEVERE CASES DEATH MAY OCCUR.

AGGRAVATED MEDICAL CONDITIONS:
PREEXISTING SKIN AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

OTHER HEALTH EFFECTS:
THIS PRODUCT AND ITS COMPONENTS ARE NOT CLASSIFIED AS CARCINOGENS BY INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), NATIONAL TOXICOLOGY PROGRAM (NTP) OR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

## SECTION IV | OCCUPATIONAL EXPOSURE LIMITS

| NO. | OSHA PEL/TWA | OSHA PEL/CEILING | ACGIH TLV/TWA | ACGIH TLV/STEL | OTHER |
|---|---|---|---|---|---|
| P | *5 MG/M3 | NONE | *5 MG/M3 | *10 MG/M3 | |

* OIL MIST, MINERAL

## SECTION V | EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT: FLUSH EYES WITH WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION.

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING/SHOES AND WIPE EXCESS FROM SKIN. FLUSH SKIN WITH WATER. FOLLOW BY WASHING WITH SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION.

INHALATION: REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION: DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN: IF MORE THAN 2.0 ML PER KG HAS BEEN INGESTED AND VOMITING HAS NOT OCCURRED, EMESIS SHOULD BE INDUCED WITH SUPERVISION. KEEP VICTIM'S HEAD BELOW HIPS TO PREVENT ASPIRATION. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE USING A CUFFED ENDOTRACHEAL TUBE SHOULD BE CONSIDERED.

## SECTION VI | SUPPLEMENTAL HEALTH INFORMATION

AMOCO HAS REPORTED TO THE U.S. EPA PURSUANT TO SECTION 8(E) OF TSCA THAT A SAMPLE OF HYDROTREATED MIDDLE DISTILLATE (CAS REGISTRY NUMBER 64742-46-7) APPLIED REPEATEDLY TO THE SKIN OF EXPERIMENTAL ANIMALS OVER THEIR LIFETIME PRODUCED A WEAK TUMORIGENIC RESPONSE IN THE SKIN. THE FULL REFINING/PROCESS HISTORY OF THIS SAMPLE WAS NOT PROVIDED IN AMOCO'S SUBMISSION.

## SECTION VII | PHYSICAL DATA

| | | |
|---|---|---|
| BOILING POINT (DEG F): >400 | SPECIFIC GRAVITY (H20=1): 0.8816 | VAPOR PRESSURE (MM HG): NOT AVAILABLE |
| MELTING POINT (DEG F): -50 (POUR POINT) | SOLUBILITY (IN WATER): NEGLIBLE | VAPOR DENSITY (AIR=1): NOT AVAILABLE |

VISCOS.: 14.0-16.0 (CS @ 104 DEG F)

EVAPORATION RATE (NORMAL BUTYL ACETATE = 1): NOT AVAILABLE

APPEARANCE AND ODOR: WHITE LIQUID. SLIGHT HYDROCARBON ODOR.

## SECTION VIII | FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
295 DEG F (PMCC)

FLAMMABLE LIMITS/% VOLUME IN AIR:
LOWER: N. A. UPPER: N. A.

EXTINGUISHING MEDIA:
USE WATER FOG, FOAM, DRY CHEMICAL OR CO2. DO NOT USE A DIRECT STREAM OF WATER. PRODUCT WILL FLOAT AND CAN BE REIGNITED ON SURFACE OF WATER.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS:
MATERIAL WILL NOT BURN UNLESS PREHEATED. DO NOT ENTER CONFINED FIRE-SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE-PRESSURE NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

## SECTION IX | REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, OPEN FLAMES AND OXIDIZING MATERIALS.

HAZARDOUS DECOMPOSITION PRODUCTS:
THERMAL DECOMPOSITION PRODUCTS ARE HIGHLY DEPENDENT ON THE COMBUSTION CONDITIONS. A COMPLEX MIXTURE OF AIRBORNE SOLID, LIQUID, PARTICULATES AND GASES WILL EVOLVE WHEN THIS MATERIAL UNDERGOES PYROLYSIS OR COMBUSTION. CARBON MONOXIDE AND OTHER UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FOUND UPON COMBUSTION.

## SECTION X | EMPLOYEE PROTECTION

RESPIRATORY PROTECTION:
IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SECTION IV) USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS AND PARTICULATES.

PROTECTIVE CLOTHING:
WEAR CHEMICAL RESISTANT GLOVES AND OTHER PROTECTIVE CLOTHING AS REQUIRED TO MINIMIZE SKIN CONTACT. NO SPECIAL EYE PROTECTION IS ROUTINELY NECESSARY. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROVIDED BY NITRITE GLOVES.

ADDITIONAL PROTECTIVE MEASURES:

## SECTION XI | ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES:
MAY BURN ALTHOUGH NOT READILY IGNITABLE. USE CAUTIOUS JUDGMENT WHEN CLEANING UP LARGE SPILLS. *** LARGE SPILLS *** WEAR RESPIRATOR AND PROTECTIVE CLOTHING AS APPROPRIATE. SHUT OFF SOURCE OF LEAK IF SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACCUM TRUCKS OR PUMP TO STORAGE SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND, OR OTHER SUITABLE MATERIALS; DISPOSE OF PROPERLY. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND DISPOSE OF PROPERLY.

## SECTION XII | SPECIAL PRECAUTIONS

MINIMIZE SKIN CONTACT. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. PROPERLY DISPOSE OF CONTAMINATED LEATHER ARTICLES, INCLUDING SHOES, THAT CANNOT BE DECONTAMINATED.STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM OPEN FLAMES AND HIGH TEMPERATURES.

## SECTION XIII | TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:
NOT HAZARDOUS BY D.O.T. REGULATIONS

D.O.T. PROPER SHIPPING NAME:

OTHER REQUIREMENTS:

## SECTION XIV | OTHER REGULATORY CONTROLS

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

PROTECTION OF STRATOSPHERIC OZONE (PURSUANT TO SECTION 511 OF THE CLEAN AIR ACT AMENDMENTS OF 1990): PER 40 CFR PART 82, THIS PRODUCT DOES NOT CONTAIN NOR WAS IT DIRECTLY MANUFACTURED WITH ANY CLASS I OR CLASS II OZONE DEPLETING SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ATTACHED ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

## SECTION XV | STATE REGULATORY INFORMATION

THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES; OTHER PRODUCT SPECIFIC HEALTH AND SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMENTS. FOR DETAILS ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

| STATE LISTED COMPONENT | CAS NUMBER | PERCENT | STATE CODE |
|---|---|---|---|
| SOLVENT REFINED, HYDROTREATED LIGHT NAPHTHENIC DISTILLATE | 64742-53-6 | 60-65 | MA |

CA = CALIFORNIA HAZ. SUBST. LIST; CA65C, CA65R, CA65C/R = CALIFORNIA SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT OF 1986 OR PROPOSITION 65 LIST. CT = CONNECTICUT TOXIC. SUBST. LIST; FL = FLORIDA SUBST. LIST; IL = ILLINOIS TOX. SUBST. LIST; LA = LOUISIANA HAZ. SUBST. LIST; MA = MASSACHUSETTS SUBST. LIST; ME = MAINE HAZ. SUBST. LIST; MN = MINNESOTA HAZ. SUBST. LIST. NJ = NEW JERSEY HAZ. SUBST. LIST; PA = PENNSYLVANIA HAZ. SUBST. LIST; RI = RHODE ISLAND HAZ. SUBST. LIST.

## SECTION XVI SPECIAL NOTES

PRODUCT REFORMULATED. MSDS REVISED IN SECTION(S) II-A (% INGREDIENTS VII (SPEC. GRAVITY, VISCOSITY), VIII (FLASH POINT), XV (STATES INFO.), AND EDS SECTION I, TO REFLECT NEW INGREDIENT(S).

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

WE ARE PROVIDING OUR MOST RECENT MATERIAL SAFETY DATA SHEET AND/OR ENVIRONMENTAL DATA SHEET. IF YOU WISH TO RECEIVE UPDATES TO THIS INFORMATION, PLEASE CALL SHELL'S GENERAL MSDS ASSISTANCE LINE (713-241-4819) TO ENSURE THAT YOU ARE ADDED TO SHELL'S REGULAR MSDS DISTRIBUTION SYSTEM.

BE SAFE. READ OUR PRODUCT SAFETY INFORMATION...AND PASS IT ON. (PRODUCT LIABILITY LAW REQUIRES IT)

SHELL OIL COMPANY
PRODUCT SAFETY AND COMPLIANCE
P. O. BOX 4320
HOUSTON, TX. 77210

## ********** ENVIRONMENTAL DATA SHEET 60536 - 01 **********

PRODUCT NAME: SHELL TELLUS(R) T OIL 15
PRODUCT CODE: 65407

EDS: 60536 - 01 10/18/93

MANUFACTURER'S NAME AND ADDRESS
SHELL OIL COMPANY

04/14/2023

P.O. BOX 4320
HOUSTON, TX 77210

TELEPHONE NUMBERS:
24 HOUR EMERGENCY ASSISTANCE
SHELL: 713-473-9461 CHEMTREC: 800-424-9300

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL 713-241-2252

## SECTION I | PRODUCT COMPOSITION

| NO. | COMPOSITION | CAS | PERCENT |
|---|---|---|---|
| P | SHELL TELLUS(R) T OIL 15 | MIXTURE | 100 |
| 1 | SEVERELY HYDROTREATED LIGHT NAPHTHENIC DISTILLATE | 64742-53-6 | 60-65 |
| 2 | SOLVENT REFINED, HYDROTREATED MIDDLE DISTILLATE | 64742-46-7 | 30-35 |
| 3 | SOLVENT REFINED, HYDROTREATED HEAVY PARAFFINIC DISTILLATE | 64742-54-7 | <5 |
| 4 | ADDITIVE PACKAGE | MIXTURE | <5 |

## SECTION II | SARA TITLE III INFORMATION

| NO. | EHS RQ* (*1) | EHS TPQ* (*2) | SEC-313 (*3) | 313 CATEGORY (*4) | 311/312 CATEGORY (*5) |
|---|---|---|---|---|---|

BASED ON THE DATA AVAILABLE TO SHELL THIS PRODUCT CONTAINS NO SUBSTANCES SUBJECT TO REPORTING OR PLANNING REQUIREMENTS UNDER SARA TITLE III.

*1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*3 = TOXIC CHEMICAL, SEC 313
*4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.42), MUST BE USED ON TOXIC RELEASE INVENTORY FORM
*5 = HAZARD CATEGORY FOR SARA SEC. 311/312 REPORTING
HEALTH: H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD
H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL: P-3 = FIRE HAZARD
P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
P-5 = REACTIVE HAZARD

## SECTION III | ENVIRONMENTAL RELEASE INFORMATION

THIS PRODUCT IS COVERED BY EPA'S COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA) PETROLEUM EXCLUSION. THEREFORE RELEASES TO AIR, LAND, OR WATER ARE NOT REPORTABLE UNDER CERCLA ("SUPERFUND"). HOWEVER UNDER SECTION 311 OF EPA'S CLEAN WATER ACT (CWA), THIS PRODUCT IS CONSIDERED AN OIL. AS SUCH , SPILLS INTO OR LEADING TO

WD-40

# MATERIAL SAFETY DATA SHEET

## I. PRODUCT IDENTIFICATION

| | | | |
|---|---|---|---|
| Manufacturer: | WD-40 Company | Telephone: | |
| Address: | 1061 Cudahy Place (92110)<br>P.O. Box 80607<br>San Diego, California<br>92138-0607 | Emergency only:<br>Information:<br>Chemical Name:<br>Trade Name: | 1-(800) 424-9300 (CHEMTREC)<br>(619) 275-1400<br>Organic Mixture<br>WD-40 Bulk Liquid |

## II. HAZARDOUS INGREDIENTS

| Chemical Name | CAS Number | % | Exposure Limit ACGIH/OSHA |
|---|---|---|---|
| Aliphatic Petroleum Distillates | 8052-41-3 | 45-50 | 100 ppm PEL |
| Petroleum Base Oil | 64742-65-0 | 30-35 | 5 mg/M$^3$ TWA (mist) |
| LVP Hydrocarbon Fluid | 64742-47-8 | 12-18 | 1200 mg/M$^3$ TWA |
| Non-hazardous Ingredients | | < 10 | |

## III. PHYSICAL DATA

| | | | |
|---|---|---|---|
| Boiling Point: | 323°F (minimum) | Evaporation Rate: | Not determined |
| Vapor Density (air=1): | Greater than 1 | Vapor Pressure: | Not determined |
| Solubility in Water: | insoluble | Appearance: | Cloudy light amber |
| Specific Gravity ($H_2O$=1): | 0.832 @ 72°F | Odor: | Characteristic odor |
| Percent Volatile (volume): | 74% | VOC: | 412 grams/liter (49.5%) |

## IV. FIRE AND EXPLOSION

| | |
|---|---|
| Flash Point: | 131°F Tag Closed Cup |
| Flammable Limits: | (Solvent Portion) [Lel] 1.0% [Uel] 6.0% |
| Extinguishing Media: | $CO_2$, Dry Chemical, Foam. |
| Special Fire Fighting Procedures: | None |
| Unusual Fire and Explosion Hazards: | None |

## V. HEALTH HAZARD / ROUTE(S) OF ENTRY

| | |
|---|---|
| **Threshold Limit Value** | Aliphatic Petroleum Distillates (Stoddard Solvent) lowest TLV (ACGIH 100 ppm.) |
| **Symptoms of Overexposure** | |
| **Inhalation (Breathing):** | May cause anesthesia, headache, dizziness, nausea and upper respiratory irritation. |
| **Skin contact:** | May cause drying of skin and/or irritation. |
| **Eye contact:** | May cause irritation, tearing and redness. |
| **Ingestion (Swallowed):** | May caused irritation, nausea, vomiting and diarrhea. |
| **First Aid Emergency Procedures** | |
| **Ingestion (Swallowed):** | Do not induce vomiting, seek medical attention. |
| **Eye Contact:** | Immediately flush eyes with large amounts of water for 15 minutes. |
| **Skin Contact:** | Wash with soap and water. |
| **Inhalation (Breathing):** | Remove to fresh air. Give artificial respiration if necessary.<br>If breathing is difficult, give oxygen. |
| | Pre-existing medical conditions such as eye, skin and respiratory disorders may be aggravated by exposure. |
| **DANGER!** | |
| **Aspiration Hazard:** | If swallowed, can enter lungs and may cause chemical pneumonitis. Do not induce vomiting. Call physician immediately. |
| **Suspected Cancer Agent**<br>Yes___ No_X_ | The components in this mixture have been found to be noncarcinogenic by NTP, IARC and OSHA |

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## VI. REACTIVITY DATA

| | | |
|---|---|---|
| Stability: | Stable _X_ | Unstable____ |
| Conditions to avoid: | Heat and open flame. | |
| Incompatibility: | Strong oxidizing agents | |
| Hazardous decomposition products: | Thermal decomposition may yield carbon monoxide and/or carbon dioxide. | |
| Hazardous polymerization: | May occur ____ | Will not occur_X_ |

## VII. SPILL OR LEAK PROCEDURES

**Spill Response Procedures**
Absorb small quantities with sand, earth, sawdust. Large quantities pump into tank.
**Waste Disposal Method**
Incinerated liquid, bury saturated absorbent in land fill. Dispose of in accordance with local, state and federal regulations.

## VIII. SPECIAL HANDLING INFORMATION

| | |
|---|---|
| Ventilation: | Sufficient to keep solvent vapor less than TLV. |
| Respiratory Protection: | Advised when concentrations exceed TLV. |
| Protective Gloves: | Advised to prevent possible skin irritation. |
| Eye Protection: | Approved eye protections to safeguard against potential eye contact, irritation or injury. |
| Other Protective Equipment: | None required. |

## IX. SPECIAL PRECAUTIONS

Keep from open flame, do not take internally. Avoid excessive inhalation of spray particles. Keep from children.

## X.TRANSPORTATION DATA (49 CFR 172.101)

**Domestic Surface**

| | |
|---|---|
| Description: | WD-40 Bulk Lubricant |
| Hazard Class: | Non-Regulated Per 49 CFR 173.150 (F)(2) |
| ID No: | None |
| Label Required: | None (Under 119 Gallons) |

## XI. REGULATORY INFORMATION

All ingredients for this product are listed on the TSCA inventory.

| | |
|---|---|
| SARA Title III chemicals: | None |
| California Prop 65 chemicals: | None |
| CERCLA reportable quantity: | None |
| RCRA hazardous waste no: | D001 (Ignitable) |

SIGNATURE: R. Miles R Miles TITLE: Technical Director

REVISION DATE: NOVEMBER 2003 SUPERSEDES: MARCH 2001

NA: Not applicable NDA: No data available < = Less than > = More than

We believe the statements, technical information and recommendations contained herein are reliable. However, the data is provided without warranty, expressed or implied. It is the user's responsibility both to determine safe conditions for use of this product and assume loss, damage or expense, direct or consequential, arising from its use. Before using product, read label.



04/14/2023

WD-40

# MATERIAL SAFETY DATA SHEET

## I. PRODUCT IDENTIFICATION

| | | | |
|---|---|---|---|
| Manufacturer: | WD-40 Company | Telephone: | |
| Address: | 1061 Cudahy Place (92110)<br>P.O. Box 80607<br>San Diego, California<br>92138-0607 | Emergency only:<br>Information:<br>Chemical Name:<br>Trade Name: | 1-(800) 424-9300 (CHEMTREC)<br>(619) 275-1400<br>Organic Mixture<br>WD-40 Aerosol |

## II. HAZARDOUS INGREDIENTS

| Chemical Name | CAS Number | % | Exposure Limit ACGIH/OSHA |
|---|---|---|---|
| Aliphatic Petroleum Distillates | 8052-41-3 | 45-50 | 100 ppm PEL |
| Petroleum Base Oil | 64742-65-0 | 15-25 | 5 mg/M$^3$ TWA (mist) |
| LVP Hydrocarbon Fluid | 64742-47-8 | 12-18 | 1200 mg/M$^3$ TWA |
| Carbon Dioxide | 124-38-9 | 2-3 | 5000 ppm PEL |
| Non-hazardous Ingredients | | < 10 | |

## III. PHYSICAL DATA

| | | | |
|---|---|---|---|
| Boiling Point: | 323°F (minimum) | Evaporation Rate: | Not determined |
| Vapor Density (air=1): | Greater than 1 | Vapor Pressure: | 110 ±5 PSI @ 70°F |
| Solubility in Water: | insoluble | Appearance: | Light amber |
| Specific Gravity ($H_2O$=1): | 0.832 @ 72°F | Odor: | Characteristic odor |
| Percent Volatile (volume): | 74% | VOC: | 412 grams/liter (49.5%) |

## IV. FIRE AND EXPLOSION

| | |
|---|---|
| Flash Point: | 131°F Tag Closed Cup |
| Flammable Limits: | (Solvent Portion) [Lel] 1.0% [Uel] 6.0% |
| Extinguishing Media: | $CO_2$, Dry Chemical, Foam. |
| Special Fire Fighting Procedures: | Contents Under Pressure |
| Unusual Fire and Explosion Hazards: | FLAMMABLE - U.F.C. level 3 AEROSOL |

## V. HEALTH HAZARD / ROUTE(S) OF ENTRY

| | |
|---|---|
| **Threshold Limit Value** | Aliphatic Petroleum Distillates (Stoddard Solvent) lowest TLV (ACGIH 100 ppm.) |
| **Symptoms of Overexposure** | |
| **Inhalation (Breathing):** | May cause anesthesia, headache, dizziness, nausea and upper respiratory irritation. |
| **Skin contact:** | May cause drying of skin and/or irritation. |
| **Eye contact:** | May cause irritation, tearing and redness. |
| **Ingestion (Swallowed):** | May caused irritation, nausea, vomiting and diarrhea. |
| **First Aid Emergency Procedures** | |
| **Ingestion (Swallowed):** | Do not induce vomiting, seek medical attention. |
| **Eye Contact:** | Immediately flush eyes with large amounts of water for 15 minutes. |
| **Skin Contact:** | Wash with soap and water. |
| **Inhalation (Breathing):** | Remove to fresh air. Give artificial respiration if necessary.<br>If breathing is difficult, give oxygen. |
| | Pre-existing medical conditions such as eye, skin and respiratory disorders may be aggravated by exposure. |
| **DANGER!** | |
| **Aspiration Hazard:** | If swallowed, can enter lungs and may cause chemical pneumonitis.<br>Do not induce vomiting. Call Physician immediately. |
| **Suspected Cancer Agent**<br>Yes___ No_X_ | The components in this mixture have been found to be noncarcinogenic by NTP, IARC and OSHA |

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## VI. REACTIVITY DATA

| | | |
|---|---|---|
| Stability: | Stable _X_ | Unstable____ |
| Conditions to avoid: | NA | |
| Incompatibility: | Strong oxidizing agents | |
| Hazardous decomposition products: | Thermal decomposition may yield carbon monoxide and/or carbon dioxide. | |
| Hazardous polymerization: | May occur ____ | Will not occur_X_ |

## VII. SPILL OR LEAK PROCEDURES

**Spill Response Procedures**

Spill unlikely from aerosol cans. Leaking cans should be placed in plastic bag or open pail until pressure has dissipated.

**Waste Disposal Method**

Empty aerosol cans should not be punctured or incinerated; bury in land fill. Liquid should be incinerated or buried in land fill. Dispose of in accordance with local, state and federal regulations.

## VIII. SPECIAL HANDLING INFORMATION

| | |
|---|---|
| Ventilation: | Sufficient to keep solvent vapor less than TLV. |
| Respiratory Protection: | Advised when concentrations exceed TLV. |
| Protective Gloves: | Advised to prevent possible skin irritation. |
| Eye Protection: | Approved eye protections to safeguard against potential eye contact, irritation or injury. |
| Other Protective Equipment: | None required. |

## IX. SPECIAL PRECAUTIONS

Keep from sources of ignition. Avoid excessive inhalation of spray particles, do not take internally. Do not puncture, incinerate or store container above 120°F. Exposure to heat may cause bursting. Keep can away from electrical current or battery terminals. Electrical arcing can cause burn-through (puncture) which may result in flash fire, causing serious injury. Keep from children.

## X.TRANSPORTATION DATA (49 CFR 172.101)

**Domestic Surface**

| | |
|---|---|
| Description: | Consumer Commodity |
| Hazard Class: | ORM-D |
| ID No: | None |
| Label Required: | Consumer commodity (ORM-D) |

## XI. REGULATORY INFORMATION

All ingredients for this product are listed on the TSCA inventory.

| | |
|---|---|
| SARA Title III chemicals: | None |
| California Prop 65 chemicals: | None |
| CERCLA reportable quantity: | None |
| RCRA hazardous waste no: | D001 (Ignitable) |

SIGNATURE: R. Miles R Miles TITLE: Technical Director

REVISION DATE: NOVEMBER 2003 SUPERSEDES: MARCH 2001

NA: Not applicable NDA: No data available < = Less than > = More than

We believe the statements, technical information and recommendations contained herein are reliable. However, the data is provided without warranty, expressed or implied. It is the user's responsibility both to determine safe conditions for use of this product and assume loss, damage or expense, direct or consequential, arising from its use. Before using product, read label.



04/14/2023

# Material Safety Data Sheet

## 1 - Chemical Product and Company Identification

**Manufacturer:** WD-40 Company
**Address:** 1061 Cudahy Place (92110)
P.O. Box 80607
San Diego, California, USA
92138 –0607
**Telephone:**
**Emergency only:** 1-888-324-7596 (PROSAR)
**Information:** 1-888-324-7596
**Chemical Spills:** 1-800-424-9300 (Chemtrec)
1-703-527-3887 (International Calls)

**Chemical Name:** Organic Mixture

**Trade Name:** WD-40 Aerosol

**Product Use:** Lubricant, Penetrant, Drives Out Moisture, Removes and Protects Surfaces From Corrosion

**MSDS Date Of Preparation:** 6/8/12

## 2 – Hazards Identification

**Emergency Overview:**
**DANGER!** Flammable aerosol. Contents under pressure. Harmful or fatal if swallowed. If swallowed, may be aspirated and cause lung damage. May cause eye irritation. Avoid eye contact. Use with adequate ventilation. Keep away from heat, sparks and all other sources of ignition.

**Symptoms of Overexposure:**
**Inhalation:** High concentrations may cause nasal and respiratory irritation and central nervous system effects such as headache, dizziness and nausea. Intentional abuse may be harmful or fatal.
**Skin Contact:** Prolonged and/or repeated contact may produce mild irritation and defatting with possible dermatitis.
**Eye Contact:** Contact may be irritating to eyes. May cause redness and tearing.
**Ingestion:** This product has low oral toxicity. Swallowing may cause gastrointestinal irritation, nausea, vomiting and diarrhea. This product is an aspiration hazard. If swallowed, can enter the lungs and may cause chemical pneumonitis, severe lung damage and death.
**Chronic Effects:** None expected.
**Medical Conditions Aggravated by Exposure:** Preexisting eye, skin and respiratory conditions may be aggravated by exposure.

**Suspected Cancer Agent:**
Yes No X

## 3 - Composition/Information on Ingredients

| Ingredient | CAS # | Weight Percent |
|---|---|---|
| Aliphatic Hydrocarbon | 64742-47-8 | 45-50 |
| Petroleum Base Oil | 64742-58-1<br>64742-53-6<br>64742-56-9<br>64742-65-0 | <25 |
| LVP Aliphatic Hydrocarbon | 64742-47-8 | 12-18 |
| Carbon Dioxide | 124-38-9 | 2-3 |
| Non-Hazardous Ingredients | Mixture | <10 |

## 4 – First Aid Measures

**Ingestion (Swallowed):** Aspiration Hazard. DO NOT induce vomiting. Call physician, poison control center or the WD-40 Safety Hotline at 1-888-324-7596 immediately.
**Eye Contact:** Flush thoroughly with water. Remove contact lenses if present after the first 5 minutes and continue flushing for several more minutes. Get medical attention if irritation persists.
**Skin Contact:** Wash with soap and water. If irritation develops and persists, get medical attention.



04/14/2023

# Material Safety Data Sheet

**MSDS ID NO.:** 0290MAR019
**Revision date:** 12/07/2010

## 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

**Product name:** Marathon No. 2 Ultra Low Sulfur Diesel 15 ppm Sulfur Max
**Synonym:** Ultra Low Sulfur Diesel No. 2 15 ppm Sulfur Max; Ultra Low Sulfur Diesel No. 2 15 ppm Sulfur Max with Polar Plus; No. 2 Diesel, Motor Vehicle Use, Undyed; No. 2 Diesel, Motor Vehicle Use, Undyed, with Polar Plus; ULSD No. 2 Diesel 15 ppm Sulfur Max; ULSD No. 2 Diesel 15 ppm Sulfur Max with Polar Plus; No. 2 MV 15 Diesel; No. 2 MV 15 Diesel with Polar Plus.
**Chemical Family:** Petroleum Hydrocarbon
**Formula:** Mixture

**Manufacturer:**
Marathon Petroleum Company LP
539 South Main Street Findlay OH 45840

**Other information:** 419-421-3070
**Emergency telephone number:** 877-627-5463

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

No. 2 Ultra Low Sulfur Diesel is a complex mixture of paraffins, cycloparaffins, olefins and aromatic hydrocarbon chain lengths predominantly in the range of C9-C16. Can contain small amounts of dye and other additives (<0.15%) which are not considered hazardous at the concentrations used.

Note: May contain up to 5% Renewable Diesel, CASN 928771-01-1.

**Product information:**

| Name | CAS Number | Weight % | ACGIH Exposure Limits: | OSHA - Vacated PELs - Time Weighted Ave | Other: |
|---|---|---|---|---|---|
| Marathon No. 2 Ultra Low Sulfur Diesel | 68476-30-2 | 100 | Skin - potential significant contribution to overall exposure by the cutaneous route 100 mg/m$^3$ TWA | | |

**Component Information:**

| Name | CAS Number | Weight % | ACGIH Exposure Limits: | OSHA - Vacated PELs - Time Weighted Ave | Other: |
|---|---|---|---|---|---|
| Saturated Hydrocarbons | Mixture | 70-80 | | | |

| Name | CAS Number | Weight % | ACGIH Exposure Limits: | OSHA - Vacated PELs - Time Weighted Ave | Other: |
|---|---|---|---|---|---|
| Aromatic Hydrocarbons | Mixture | 17-25 | | | |
| Unsaturated Hydrocarbons | Mixture | 3-6 | | | |
| Naphthalene | 91-20-3 | 0.01-0.5 | Skin - potential significant contribution to overall exposure by the cutaneous route<br>10 ppm TWA<br>15 ppm STEL | = 10 ppm TWA<br>= 50 mg/m$^3$ TWA<br>= 15 ppm STEL<br>= 75 mg/m$^3$ STEL | |

**Notes:** The manufacturer has voluntarily elected to reflect exposure limits contained in OSHA's 1989 air contaminants standard in its MSDS's, even though certain of those exposure limits were vacated in 1992.

# EMERGENCY OVERVIEW

CAUTION!

VAPORS, FUMES, OR MISTS MAY CAUSE RESPIRATORY TRACT IRRITATION
MAY BE HARMFUL OR FATAL IF SWALLOWED
MAY CAUSE LUNG DAMAGE
OVEREXPOSURE MAY CAUSE CNS DEPRESSION

MAY CAUSE CANCER BASED ON ANIMAL DATA
SEE TOXICOLOGICAL INFORMATION SECTION FOR MORE INFORMATION

COMBUSTIBLE LIQUID AND VAPOR
VAPOR MAY CAUSE FLASH FIRE
MATERIAL MAY ACCUMULATE STATIC CHARGE

STABLE

**Inhalation:**

Breathing high concentrations may be harmful.
May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.
Overexposure to this material may cause systemic damage including target organ effects listed under "Toxicological Information."

**Ingestion:**

Swallowing this material may be harmful.
May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.
Aspiration into lungs may cause chemical pneumonia and lung damage. Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section).

**Skin contact:**

Contact may cause reddening, itching and inflammation. Effects may become more serious with repeated or prolonged contact. Skin contact may cause harmful effects in other parts of the body.

**Eye contact:**

Contact may cause pain and severe reddening and inflammation of the conjunctiva. Effects may become more serious with repeated or prolonged contact.

**Carcinogenic Evaluation:**

**Product information:**

| Name | IARC Carcinogens: | NTP Carcinogens: | ACGIH - Carcinogens: | OSHA - Select Carcinogens: |
|---|---|---|---|---|
| Marathon No. 2 Ultra Low Sulfur Diesel<br>68476-30-2 | NE | | | |

**Notes:**

The International Agency for Research on Cancer (IARC) has determined that there is inadequate evidence for the carcinogenicity of diesel fuel/fuel oil in humans. IARC determined that there was limited evidence for the carcinogenicity of marine diesel fuel in animals. Distillate (light) diesel fuels were not classifiable as to their carcinogenicity to humans (Group 3A).

IARC has determined that there is sufficient evidence for the carcinogenicity in experimental animals of diesel engine exhaust and extracts of diesel engine exhaust particles. IARC determined that there is only limited evidence for the carcinogenicity in humans of diesel engine exhaust. However, IARC's overall evaluation has resulted in the IARC designation of diesel engine exhaust as probably carcinogenic to humans (Group 2A) because of the presence of certain engine exhaust components.

The International Agency for Research on Cancer (IARC) has also determined that there is sufficient evidence for the carcinogenicity in experimental animals of light and heavy vacuum distillates, of light and heavy catalytically cracked distillates and of cracked residues (including heavy thermocracked distillates/residues) derived from the refining of crude oil.

**Component Information:**

| Name | IARC Carcinogens: | NTP Carcinogens: | ACGIH - Carcinogens: | OSHA - Select Carcinogens: |
|---|---|---|---|---|
| Naphthalene<br>91-20-3 | Monograph 82 [2002] | Reasonably Anticipated To Be A Human Carcinogen male rat-clear evidence; female rat-clear evidence; male mice-no evidence; female mice-some evidence | A4 - Not Classifiable as a Human Carcinogen | Present |

**Notes:**

The International Agency for Research on Cancer (IARC) and the Environmental Protection Agency (EPA) have determined that naphthalene is a possible human carcinogen.

## 4. FIRST AID MEASURES

**Eye Contact:**

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. GET IMMEDIATE MEDICAL ATTENTION.

**Skin Contact:**

Immediately wash exposed skin with plenty of soap and water while removing contaminated clothing and shoes. Get medical attention if irritation persists. Place contaminated clothing in closed container until cleaned or discarded. If clothing is to be laundered, inform the person performing the operation of contaminant's hazardous properties.

**Ingestion:**

Do not induce vomiting. If spontaneous vomiting is about to occur, place victim's head below knees. If victim is drowsy or unconscious, place on the left side with head down. Never give anything by mouth to an unconscious person. Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

**Inhalation:**

Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear and give oxygen. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

**NOTES TO PHYSICIAN:**

INGESTION: If ingested this material represents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended.

**Medical Conditions Aggravated By Exposure:**

skin,

## 5. FIRE FIGHTING MEASURES

**Suitable extinguishing media:**

For small fires, Class B fire extinguishing media such as CO2, dry chemical, foam (AFFF/ATC) or water spray can be used. For large fires, water spray, fog or foam (AFFF/ATC) can be used. Fire fighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

**Specific hazards:**

This product has been determined to be a combustible liquid per the OSHA Hazard Communication Standard and should be handled accordingly. For additional fire related information, see NFPA 30 or the North American Emergency Response Guide 128.

**Special protective equipment for firefighters:**

Avoid using straight water streams. Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and from as far a distance as possible. Avoid excessive water spray application. Keep surrounding area cool with water spray from a distance and prevent further ignition of combustible material. Keep run-off water out of sewers and water sources.

**Flash point:** 120-190 F
**Autoignition temperature:** 489 F
**Flammable limits in air - lower (%):** 0.7

## 5. FIRE FIGHTING MEASURES

**Flammable limits in air - upper (%):** 5.0

**NFPA rating:**
Health: 1
Flammability: 2
Instability: 0
Other: -

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Eliminate all ignition sources. Advise authorities and National Response Center (800-424-8802) if the product has entered a water course or sewer. Notify local health and pollution control agencies, if appropriate. Contain liquid with sand or soil. Recover and return free product to proper containers. Use suitable absorbent materials such as vermiculite, sand, or clay to clean up residual liquids.

## 7. HANDLING AND STORAGE

**Handling:**

Comply with all applicable EPA, OSHA, NFPA and consistent state and local requirements. Use appropriate grounding and bonding practices. Store in properly closed containers that are appropriately labeled and in a cool well-ventilated area. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. Do not cut, drill, grind or weld on empty containers since they may contain explosive residues.

Avoid repeated and prolonged skin contact. Never siphon this product by mouth. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**PERSONAL PROTECTIVE EQUIPMENT**

**Engineering measures:** Local or general exhaust required when using at elevated temperatures that generate vapors or mists.

**Respiratory protection:** Use approved organic vapor chemical cartridge or supplied air respirators when material produces vapors that exceed permissible limits or excessive vapors are generated. Observe respirator assigned protection factors (APFs) criteria cited in federal OSHA 1910.134. Self-contained breathing apparatus should be used for fire fighting.

**Skin and body protection:** Neoprene, nitrile, polyvinyl alcohol (PVA), polyvinyl chloride and polyurethane gloves to prevent skin contact.

**Eye protection:** No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields.

**Hygiene measures:** No special protective clothing is normally required. Select protective clothing depending on industrial operations. Use mechanical ventilation equipment that is explosion-proof.

## 9. PHYSICAL AND CHEMICAL PROPERTIES:

**Appearance:** Colorless Liquid

## 9. PHYSICAL AND CHEMICAL PROPERTIES:

| | |
|---|---|
| **Physical state (Solid/Liquid/Gas):** | Liquid |
| **Substance type (Pure/Mixture):** | Mixture |
| **Color:** | Colorless |
| **Odor:** | Not applicable. |
| **Molecular weight:** | 180 |
| **pH:** | Neutral |
| **Boiling point/range (5-95%):** | 360-550 F |
| **Melting point/range:** | Not determined. |
| **Decomposition temperature:** | Not applicable. |
| **Specific gravity:** | C.A. 0.8 |
| **Density:** | 6.76 lbs/gal |
| **Bulk density:** | No data available. |
| **Vapor density:** | 4-5 |
| **Vapor pressure:** | 1-10 mm Hg @ 100 F |
| **Evaporation rate:** | No data available. |
| **Solubility:** | Negligible |
| **Solubility in other solvents:** | No data available. |
| **Partition coefficient (n-octanol/water):** | No data available. |
| **VOC content(%):** | 10% |
| **Viscosity:** | 1.3-2.1 @ 50 C |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **Stability:** | The material is stable at 70 F, 760 mm pressure. |
| **Polymerization:** | Will not occur. |
| **Hazardous decomposition products:** | Combustion produces carbon monoxide, aldehydes, aromatic and other hydrocarbons. |
| **Materials to avoid:** | Strong oxidizers such as nitrates, perchlorates, chlorine, fluorine. |
| **Conditions to avoid:** | Excessive heat, sources of ignition and open flames. |

## 11. TOXICOLOGICAL INFORMATION

**Acute toxicity:**

**Product information:**

| Name | CAS Number | Inhalation: | Dermal: | Oral: |
|---|---|---|---|---|
| Marathon No. 2 Ultra Low Sulfur Diesel | 68476-30-2 | No data available | No data available | No data available |

**Toxicology Information:**

MIDDLE DISTILLATES, PETROLEUM: Long-term repeated (lifetime) skin exposure to similar materials has been reported to result in an increase in skin tumors in laboratory rodents. The relevance of these findings to humans is not clear at this time.

MIDDLE DISTILLATES WITH CRACKED STOCKS: Light cracked distillates have been shown to be carcinogenic in animal tests and have tested positive with in vitro genotoxicity tests. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and reduction in lung function.

ISOPARAFFINS: Studies in laboratory animals have shown that long-term exposure to similar materials (isoparaffins) can cause kidney damage and kidney cancer in male laboratory rats. However, in-depth research indicates that these findings are unique to the male rat, and that these effects are not relevant to humans.

NAPHTHALENE: Severe jaundice, neurotoxicity (kernicterus) and fatalities have been reported in young children and infants as a result of hemolytic anemia from overexposure to naphthalene. Persons with Glucose 6-phosphate dehydrogenase (G6PD) deficiency are more prone to the hemolytic effects of naphthalene. Adverse effects on the kidney have been reported in persons overexposed to naphthalene but these effects are believed to be a consequence of hemolytic anemia, and not a direct effect. Hemolytic anemia has been observed in laboratory animals exposed to naphthalene. Laboratory rodents exposed to naphthalene vapor for 2 years (lifetime studies) developed non-neoplastic and neoplastic tumors and inflammatory lesions of the nasal and respiratory tract. Cataracts and other adverse effects on the eye have been observed in laboratory animals exposed to high levels of naphthalene. Findings from a large number of bacterial and mammalian cell mutation assays have been negative. A few studies have shown chromosomal effects (elevated levels of Sister Chromatid Exchange or chromosomal aberrations) in vitro. Naphthalene has been classified as Possibly Carcinogenic to Humans (2B) by IARC, based on findings from studies in laboratory animals.

DIESEL EXHAUST: Chronic inhalation studies of whole diesel engine exhaust in mice and rats produced a significant increase in lung tumors. Combustion of kerosine and/or diesel fuels produces gases and particulates which include carbon monoxide, carbon dioxide, oxides of nitrogen and/or sulfur and hydrocarbons. Significant exposure to carbon monoxide vapors decreases the oxygen carrying capacity of the blood and may cause tissue hypoxia via formation of carboxyhemoglobin.

**TARGET ORGANS:** central nervous system, skin, respiratory system, lungs, kidney, liver, thymus, reproductive organs,

## 12. ECOTOXICOLOGICAL INFORMATION

**Mobility:**

May partition into air, soil and water.

**Ecotoxicity:**

Toxic to aquatic organisms.

**Bioaccummulation:**

Not expected to bioaccumulate in aquatic organisms.

**Persistance/Biodegradation:**

Readily biodegradable in the environment.

## 13. DISPOSAL CONSIDERATIONS

**Cleanup Considerations:** This product as produced is not specifically listed as an EPA RCRA hazardous waste according to federal regulations (40 CFR 261). However, when discarded or disposed of, it may meet the criteria of an "characteristic" hazardous waste. This material could become a hazardous waste if mixed or contaminated with a hazardous waste or other substance(s). It is the responsibility of the user to determine if disposal material is hazardous according to federal, state and local regulations.

## 14. TRANSPORT INFORMATION

**49 CFR 172.101:**

**DOT:**

**Transport Information:** This material when transported via US commerce would be regulated by DOT Regulations.

| | |
|---|---|
| **Proper shipping name:** | Fuel Oil, No. 2 |
| **UN/Identification No:** | NA 1993 |
| **Hazard Class:** | 3 |
| **Packing group:** | III |
| **DOT reportable quantity (lbs):** | Not applicable. |

| | |
|---|---|
| **Proper shipping name:** | Fuel Oil, No. 2 |
| **UN/Identification No:** | NA 1993 |
| **Hazard Class:** | 3 |
| **Packing group:** | III |

## 15. REGULATORY INFORMATION

**US Federal Regulatory Information:**

US TSCA Chemical Inventory Section 8(b): This product and/or its components are listed on the TSCA Chemical Inventory.

OSHA Hazard Communication Standard: This product has been evaluated and determined to be hazardous as defined in OSHA's Hazard Communication Standard.

**EPA Superfund Amendment & Reauthorization Act (SARA):**

**SARA Section 302:** This product contains the following component(s) that have been listed on EPA's Extremely Hazardous Substance (EHS) List:

| Name | CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs |
|---|---|
| Saturated Hydrocarbons | NA |
| Aromatic Hydrocarbons | NA |
| Unsaturated Hydrocarbons | NA |
| Naphthalene | NA |

**SARA Section 304:** This product contains the following component(s) identified either as an EHS or a CERCLA Hazardous substance which in case of a spill or release may be subject to SARA reporting requirements:

| Name | CERCLA/SARA - Hazardous Substances and their Reportable Quantities |
|---|---|
| Saturated Hydrocarbons | NA |
| Aromatic Hydrocarbons | NA |
| Unsaturated Hydrocarbons | NA |
| Naphthalene | = 100 lb final RQ<br>= 45.4 kg final RQ |

**SARA Section 311/312** The following EPA hazard categories apply to this product:

Acute Health Hazard
Fire Hazard
Chronic Health Hazard

**SARA Section 313:** This product contains the following component(s) that may be subject to reporting on the Toxic Release Inventory (TRI) From R:

| Name | CERCLA/SARA 313 Emission reporting: |
|---|---|
| Saturated Hydrocarbons | None |
| Aromatic Hydrocarbons | None |
| Unsaturated Hydrocarbons | None |
| Naphthalene | = 0.1 % de minimis concentration |

**State and Community Right-To-Know Regulations:**
The following component(s) of this material are identified on the regulatory lists below:

Saturated Hydrocarbons

| | |
|---|---|
| Louisiana Right-To-Know: | Not Listed |
| California Proposition 65: | Not Listed |
| New Jersey Right-To-Know: | Not Listed. |
| Pennsylvania Right-To-Know: | Not Listed. |
| Massachusetts Right-To Know: | Not Listed. |
| Florida substance List: | Not Listed. |
| Rhode Island Right-To-Know: | Not Listed |
| Michigan critical materials register list: | Not Listed. |

Saturated Hydrocarbons

| | |
|---|---|
| Massachusetts Extraordinarily Hazardous Substances: | Not Listed |
| California - Regulated Carcinogens: | Not Listed |
| Pennsylvania RTK - Special Hazardous Substances: | Not Listed |
| New Jersey - Special Hazardous Substances: | Not Listed |
| New Jersey - Environmental Hazardous Substances List: | Not Listed |
| Illinois - Toxic Air Contaminants | Not Listed |
| New York - Reporting of Releases Part 597 - List of Hazardous Substances: | Not Listed |

Aromatic Hydrocarbons

| | |
|---|---|
| Louisiana Right-To-Know: | Not Listed |
| California Proposition 65: | Not Listed |
| New Jersey Right-To-Know: | Not Listed. |
| Pennsylvania Right-To-Know: | Not Listed. |
| Massachusetts Right-To Know: | Not Listed. |
| Florida substance List: | Not Listed. |
| Rhode Island Right-To-Know: | Not Listed |
| Michigan critical materials register list: | Not Listed. |
| Massachusetts Extraordinarily Hazardous Substances: | Not Listed |
| California - Regulated Carcinogens: | Not Listed |
| Pennsylvania RTK - Special Hazardous Substances: | Not Listed |
| New Jersey - Special Hazardous Substances: | Not Listed |
| New Jersey - Environmental Hazardous Substances List: | Not Listed |
| Illinois - Toxic Air Contaminants | Not Listed |
| New York - Reporting of Releases Part 597 - List of Hazardous Substances: | Not Listed |

Unsaturated Hydrocarbons

| | |
|---|---|
| Louisiana Right-To-Know: | Not Listed |
| California Proposition 65: | Not Listed |
| New Jersey Right-To-Know: | Not Listed. |
| Pennsylvania Right-To-Know: | Not Listed. |
| Massachusetts Right-To Know: | Not Listed. |
| Florida substance List: | Not Listed. |
| Rhode Island Right-To-Know: | Not Listed |
| Michigan critical materials register list: | Not Listed. |
| Massachusetts Extraordinarily Hazardous Substances: | Not Listed |
| California - Regulated Carcinogens: | Not Listed |
| Pennsylvania RTK - Special Hazardous Substances: | Not Listed |
| New Jersey - Special Hazardous Substances: | Not Listed |
| New Jersey - Environmental Hazardous Substances List: | Not Listed |
| Illinois - Toxic Air Contaminants | Not Listed |
| New York - Reporting of Releases Part 597 - List of Hazardous Substances: | Not Listed |

Naphthalene

| | |
|---|---|
| Louisiana Right-To-Know: | Not Listed |

Saturated Hydrocarbons

| | |
|---|---|
| California Proposition 65: | carcinogen, initial date 4/19/02 |
| New Jersey Right-To-Know: | sn 1322 |
| Pennsylvania Right-To-Know: | Environmental hazard |
| Massachusetts Right-To Know: | Present |
| Florida substance List: | Not Listed. |
| Rhode Island Right-To-Know: | Toxic; Flammable |
| Michigan critical materials register list: | Not Listed. |
| Massachusetts Extraordinarily Hazardous Substances: | Not Listed |
| California - Regulated Carcinogens: | Not Listed |
| Pennsylvania RTK - Special Hazardous Substances: | Not Listed |
| New Jersey - Special Hazardous Substances: | carcinogen |
| New Jersey - Environmental Hazardous Substances List: | SN 1322 TPQ 500 lb |
| Illinois - Toxic Air Contaminants | Present |
| New York - Reporting of Releases Part 597 - List of Hazardous Substances: | = 1 lb RQ land/water<br>= 100 lb RQ air |

**Canadian Regulatory Information:**

Canada DSL/NDSL Inventory: This product and/or its components are listed either on the Domestic Substances List (DSL) or are exempt.

| Name | Canada - WHMIS: Classifications of Substances: | Canada - WHMIS: Ingredient Disclosure: |
|---|---|---|
| Naphthalene | B4, D2A | 1 % |

**NOTE:** Not Applicable.

## 16. OTHER INFORMATION

**Additional Information:** No data available.

**Prepared by:** Mark S. Swanson, Manager, Toxicology and Product Safety

The information and recommendations contained herein are based upon tests believed to be reliable. However, Marathon Petroleum Company LP (MPC) does not guarantee their accuracy or completeness nor shall any of this information constitute a warranty, whether expressed or implied, as to the safety of the goods, the merchantability of the goods, or the fitness of the goods for a particular purpose. Adjustment to conform to actual conditions of usage maybe required. MPC assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied.

**End of Safety Data Sheet**

# MATERIAL SAFETY DATA SHEET

TORQUELESS

## SECTION I – Product Identification

| | |
|---|---|
| MANUFACTURER'S NAME: | Control Chemical (1989) Corporation |
| MANUFACTURER'S ADDRESS: | 7016, 30th Street S.E.<br>Calgary, Alberta, Canada<br>T2C 1N9 |
| EMERGENCY PHONE NUMBER: | (403) 720-7044 |
| SUPPLIER IDENTIFIER: | |
| SUPPLIER'S ADDRESS: | |
| SUPPLIER'S EMERGENCY PHONE NUMBER: | |
| PRODUCT IDENTIFIER: | TORQUELESS |
| PRODUCT USE: | |

## SECTION II – Hazardous Ingredients of Materials

| Chemical Identity | Concentration | CAS#/NA#/UN# | LD (50) | LC (50) |
|---|---|---|---|---|

This is not a hazardous or controlled product.

## SECTION III – Physical Data for Product

| | |
|---|---|
| PHYSICAL STATE: | Liquid |
| ODOUR AND APPEARANCE: | Dark brown, distinctive |
| ODOUR THRESHOLD: | |
| SPECIFIC GRAVITY: | 0.887 |
| VAPOR PRESSURE: | Not established |
| VAPOR DENSITY (Air = 1): | Not established |
| EVAPORATION RATE: | Not established |
| POILING POINT: | >300 degrees C |
| FREEZING POINT: | -18 degrees C |
| pH: | 7.0 – 7.2 |
| DENSITY (g/ml): | |
| COEFFICIENT OF WATER / OIL DISTRIBUTION: | Not available |

## SECTION IV – Fire and Explosion Hazard of Product

| | |
|---|---|
| CONDITIONS OF FLAMMABILITY: | |
| MEANS OF EXTINCTION: | Foam, $CO_2$, Dry Chemical, water spray |
| FLASHPOINT AND METHOD OF DETERMINATION: | 290 degrees C C.C. |
| UPPER EXPLOSION LIMIT (% by Vol): | Not available |
| LOWER EXPLOSION LIMIT (% by Vol): | Not available |
| AUTO-IGNITION TEMPERATURE: | Not available |
| FLAMMABILITY CLASSIFICATION: | |
| HAZARDOUS COMBUSTION PRODUCTS: | Not available |
| EXPLOSION DATA: | Not available |
| SENSITIVITY TO STATIC DISCHARGE: | None |



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## SECTION V – Reactivity Data

| | |
|---|---|
| CHEMICAL STABILITY: | Stable |
| INCOMPATIBLE MATERIALS: | None |
| CONDITIONS OF REACTIVITY: | None |
| HAZARDOUS DECOMPOSITION PRODUCTS: | If burnt, oxides of sulphur |

## SECTION VI – Toxicological Properties of Product

| | |
|---|---|
| ROUTES OF ENTRY: | |
| SKIN CONTACT: | Wash with soap and water |
| SKIN ABSORBTION: | None |
| EYE: | Flush with water for 15 minutes |
| INHALATION: | No hazard during normal use |
| INGESTION: | Do not induce vomiting, contact physician. Not toxic. |
| ACUTE OVER EXPOSURE EFFECTS: | Inhalation: Not hazardous unless burning toxic fumes possible.<br>Ingestion: Greater than 5000 mg/kg in rats.<br>Eyes: Eye irritation not expected.<br>Skin: No skin irritation or allergic reaction expected |
| CHRONIC OVER EXPOSURE EFFECTS: | Inhalation: Not hazardous unless burning toxic fumes possible.<br>Ingestion: Greater than 5000 mg/kg in rats.<br>Eyes: Eye irritation not expected.<br>Skin: No skin irritation or allergic reaction expected |
| EXPOSURE LIMITS: | Not available |
| IRRITANCY OF PRODUCT: | Not an irritant |
| SENSITIZATION TO MATERIAL: | None |
| CARCINOGENICITY, REPRODUCTIVE EFFECTS: | Not available |
| TERATOGENICITY, MUTAGENICITY: | Not available |
| TOXICOLOGICALLY SYNERGISTIC PRODUCTS: | Not available |

## SECTION VII – Preventive Measures

| | |
|---|---|
| PERSONAL PROTECTIVE EQUIPMENT: | Not necessary |
| SPECIFIC ENGINEERING CONTROLS: | |
| LEAK AND SPILL PROCEDURES: | Although product is environmentally safe, spills should be contained and wiped up |



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WASTE DISPOSAL: Although product is environmentally safe, spills should be contained and wiped up. Dispose according to Federal, Provincial or Municipal Laws

HANDLING PROCEDURES AND EQUIPMENT: None

STORAGE REQUIREMENTS: None

SPECIAL SHIPPING INFORMATION: None

## SECTION VIII – First Aid Measures

SPECIFIC FIRST AID PROCEDURES: Eyes: Flush with water for 15 minutes

Ingestion: Do not induce vomiting, contact physician.

Not toxic.

Skin: Wash with soap and water.

## SECTION X – Preparation Date of Material Safety Data Sheet

PREPARED BY: Safety Committee

PHONE NUMBER OF PREPARER: (403) 720-7044

DATE PREPARED: January 02, 2003

The information contained herein is based on data believed to be reliable, but is presented without guarantee or warranty and Control Chemical (1989) Corporation disclaims any liability incurred from the use thereof.



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# NOBLE ENVIRONMENTAL INC.

04/14/2023

**DRILLING**

**Noble Environmental Inc. Products stored on location**

**Tier II Determination**

| CAS # | Chemical | Max. on Location | Units | Specific Gravity | % by Weight | Gal | Pounds /gal | Total Pounds | Reportable Quantity | Reportable on Tier II | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 37247-91-9 | **Dolomite Quick Lime** / Calcium magnesium oxide | 4.5 | tons | 2.8 | 100.0% | | | 9,920.8 | 10,000 | no | CERCLA: NL; nonflammable |
| 1305-78-8 | Calcium Oxide | | | | > 55.0% | | | | | no | NL |
| 1309-48-4 | Magnesium Oxide | | | | > 21.0% | | | | | no | NL |
| 1309-37-1 | Iron Oxide | | | | < 2.0% | | | | | no | NL |
| 14808-60-7 | Silica - crystalline quartz | | | | < 2.0% | | | | | no | NL |

When there is a range, maximum quantity or percentage is used in calculation

NL = Not Listed

Carmeuse Lime & Stone
11 Stanwix Street, 21st Floor
Pittsburgh, PA 15222
Phone: 412-995-5500
Fax: 412-995-5594

| | |
|---|---|
| Date of Origin: | 06/05/2002 |
| Date of Revision: | 9/14/2012 |
| Revision No. | 13 |

# Material Safety Data Sheet

| Product Name: | DOLOMITIC QUICKLIME |
|---|---|

*INFOTRAC: 800-535-5053 [In case of an emergency call this number 24 HOURS a day 7 DAYS a week.]*

## 1. IDENTIFICATION OF THE SUBSTANCE AND COMPANY

**1.1. Identification of the substance:**

| | |
|---|---|
| Chemical name: | Calcium magnesium oxide |
| Product name: | InjectoLime™ Pebble Lime-Large, Pebble Lime-Small, Pebble Lime-Rescreened, Mini Pebble, Pebble Lime, Rice, Fines, Pulverized Lime, Dolopel, Dolopel Fines, HD Dolopel |
| Formula: | MgO · CaO |
| CAS #: | 37247-91-9 |
| Molecular Weight: | 96.38 |
| Material Uses: | Water treatment, steel flux, caustic agent, pH adjustment, acid gas absorption, construction |

**1.2. Company:**

Main Office:
11 Stanwix Street, 21st Floor
Pittsburgh, PA 15222
Telephone: 412-995-5500
Fax: 412-995-5594

Canadian Office:
P.O. Box 190
Ingersoll, Ontario N5C 3K5
Telephone: 519-423-6283
Fax: 519-423-6545

## 2. COMPOSITION / INFORMATION ON INGREDIENTS

| Ingredient | % by Weight | CAS # | Exposure Limits |
|---|---|---|---|
| Calcium oxide | > 55 | 1305-78-8 | OSHA PEL: 5 mg/m$^3$<br>ACGIH TLV: 2 mg/m$^3$<br>O. Reg. 833 TWAEV: 2 mg/m$^3$ |
| Magnesium oxide | > 21 | 1309-48-4 | OSHA PEL: 10 mg/m$^3$<br>ACGIH TLV: 10 mg/m$^3$<br>O. Reg. 833 TWAEV: 10 mg/m$^3$ |
| Iron Oxide | < 2 | 1309-37-1 | OSHA PEL: 10 mg/m$^3$<br>ACGIH TLV: 5 mg/m$^3$<br>O. Reg. 833 TWAEV: 5 mg/m$^3$ |
| Silica - crystalline quartz | <2 | 14808-60-7 | OSHA PEL*: 7.5 mg/m$^3$ (total dust); 2.5 mg/m$^3$ (respirable)<br>ACGIH TLV: 0.025 mg/m$^3$ (respirable)<br>O. Reg. 845: 0.1 mg/m$^3$ |

*PEL (total dust) = (30 mg/m$^3$) / (% silica + 2) ; PEL (respirable) = (10 mg/m$^3$) / (% silica + 2)



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## 3. HAZARDS IDENTIFICATION AND CLASSIFICATION

**Overview:** Dolomitic Quicklime is in the form of lumps, pebbles, granules or powder and is odorless, white or grayish-white in color. Contact can cause irritation to eyes, skin, respiratory system, and gastrointestinal tract. Contact may aggravate disorders of eyes, skin, gastrointestinal tract, and respiratory system.

**Eyes:** Can cause severe irritation or burning of eyes, including permanent damage.

**Skin:** Can cause severe irritation or burning of skin, especially in the presence of moisture.

**Ingestion:** Can cause severe irritation or burning of gastrointestinal tract if swallowed.

**Inhalation:** Can cause severe irritation or the respiratory system. Long-term exposure may cause permanent damage. Dolomitic Quicklime is not listed by MSHA, OSHA, or IARC as a carcinogen, but this product may contain crystalline quartz silica, which has been classified by IARC as (Group I) carcinogenic to humans when inhaled. Inhalation of silica can also cause a chronic lung disorder, silicosis.

**Irritant**: Eyes, mucous membranes, moist skin, respiratory tract.

**Flammability**: This product is not flammable or combustible

**Explosive**: This product is not explosive in dust form

**Reactivity:** May react violently with strong acids producing heat and possible steam explosion in confined space

**Symbols**: WHMIS Symbol: "E" Corrosive Material; "D2A" Materials causing other toxic effects

## 4. HEALTH EFFECTS AND TREATMENTS

**Health Effects**:

Inhalation: Acute: irritation, sore throat, cough, sneezing. Chronic: persistent coughing and breathing problems. Long-term exposure to silica can cause a chronic lung disorder, silicosis.

Eyes: Acute: severe irritation, intense tearing, burns. Chronic: possible blindness when exposure is prolonged.

Skin: Acute: removes natural skin oils, blotches, itching and superficial burns in case of sweating. Chronic: no known effects.

Ingestion: Acute: sore throat, stomach aches, cramps, diarrhea, vomiting. Chronic: no known effects.

**Treatments:**

Inhalation: Move victim to fresh air. Seek medical attention if necessary. If breathing has stopped, give artificial respiration.

Eyes: Immediately flush eyes with large amounts of water for at least 15 minutes. Pull back the eyelid to make sure all the lime dust has been washed out. Seek medical attention immediately. Do not rub eyes.

Skin: Flush exposed area with large amounts of water. Seek medical attention immediately.

Ingestion: Give large quantities of water or fruit juice. Do not induce vomiting. Seek medical attention immediately. Never give anything by mouth if victim is rapidly losing consciousness or is unconscious or convulsing.

## 5. FIRE FIGHTING MEASURES

| | |
|---|---|
| **Flash point**: | Non-flammable |
| **Autoignition temperature**: | Non-flammable |
| **Inflammability limits:** | None |
| **Explosion risk**: | None by itself, but heat produced by reaction with strong acids can generate steam and pressure |
| **Hazardous combustion products**: | None |
| **Extinguishing media:** | Use dry chemical fire extinguisher. Do not use water or halogenated compounds, except that large amounts of water may be used to deluge small quantities of hydrated lime. Use appropriate extinguishing media for surrounding fire conditions. |
| **Fire fighting instructions:** | Keep personnel away from and upwind of fire. Wear full fire-fighting turn-out gear (full Bunker gear), and respiratory protection (self-contained breathing apparatus). |

## 6. ACCIDENT PREVENTION MEASURES

| | |
|---|---|
| **Individual and collective precautions:** | Avoid creating conditions which release dust – use mechanical ventilation to remove dust from work spaces |
| **Avoid inhalation of dust:** | Wear respiratory protection - minimum NIOSH N-95 Dust Mask |
| **Cleaning methods for spills:** | Use personal protective equipment (eyes, skin and inhalation, see Section 8). Use dry methods (vacuuming, sweeping) to collect spilled materials. Avoid generating dust. For large spills, evacuate area downwind of clean-up area operations to minimize dust exposure. For small spills, store spilled materials in dry, sealed plastic or metal containers. Dust residue on surfaces may be washed with water. |
| **Precautions for the protection of the environment:** | May not be released into surface waters without controls (increases pH) |
| **Waste Disposal:** | Dispose according to federal, provincial/state and local environmental regulations |

## 7. HANDLING AND STORAGE

| | |
|---|---|
| **Handling:** | In open air or in ventilated places, avoid skin and eye contact, avoid creating airborne dust |
| **Storage:** | Store in dry places sheltered from humidity. Keep away from acids and incompatible substances Keep out of reach of children |

## 8. EXPOSURE CONTROL / PERSONAL PROTECTION

**Exposure Limits**: Calcium oxide: 5 $mg/m^3$ (OSHA); 2 $mg/m^3$ (ACGIH, O. Reg. 833);
Magnesium oxide: 15 $mg/m^3$ (OSHA); 10 $mg/m^3$ (ACGIH, O. Reg. 833)
Iron oxide: 10 $mg/m^3$ (OSHA); 5 $mg/m^3$ (ACGIH, O. Reg. 833)
Silica (crystalline quartz): 7.5 $mg/m^3$ (total dust); 2.5 $mg/m^3$ (respirable) (OSHA); 0.05 $mg/m^3$ (respirable - ACGIH); 0.1 $mg/m^3$ (O. Reg. 845)

**Engineering Controls:** Use ventilation and dust collection to control exposure to below applicable limits.

**Respiratory Protection**: Wear NIOSH N-95 Dust Mask.

**Eye Protection**: Eye protection (chemical goggles, safety glasses and/or face shield) should be worn where there is a risk of lime exposure. Contact lenses should not be worn when working with lime products

**Hand Protection:** Use clean dry gloves

**Skin Protection**: When there is a risk of skin contact, wear suitable clothing to prevent such contact.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical State:** Solid
**Odor & Appearance:** Odorless, white, grayish-white powder
**pH:** 12.4 in saturated water solution at 25°C
**Melting point:** 2570° C
**Boiling point:** 2850° C
**Vapor pressure:** Non volatile
**Vapor density:** Non volatile
**Specific Gravity:** 2.0 – 2.8
**Solubility**: Reacts with water to produce $Ca(OH)_2$ and $Mg(OH)_2$ with large amounts of heat.
Soluble in acids, glycerin and sugar solutions

## 10. STABILITY AND REACTIVITY

**Stability:** Reacts with water to form $Ca(OH)_2$, $Mg(OH)_2$ and heat.
**Decomposition temperature:** None
**Reactivity:** Reacts with acids to form calcium salts while generating heat.
Reacts with carbon dioxide in air to form calcium carbonate.
**Conditions to avoid:** Vicinity of incompatible materials

**Incompatible materials:** Acids; reactive fluoridated, brominated or phosphorous compounds; aluminum (may form hydrogen gas), reactive powdered metals; organic acid anhydrides; nitro-organic compounds; interhalogenated compounds

**Hazardous decomposition products:** None

## 11. TOXICOLOGICAL INFORMATION

**Toxicity:** This product is not listed by MSHA, OSHA, or IARC as a carcinogen, but this product may contain crystalline silica, which has been classified by IARC as (Group I) carcinogenic to humans when inhaled in the form of quartz or cristobalite. No reported Carcinogenicity, Reproductive Effects, Teratogenicity or Mutagenicity.

**Exposure Limits:** Refer to Section 8

**Irritancy:** Can cause severe irritation of eyes, skin, respiratory tract and gastrointestinal tract.

**Chronic Exposure:** Inhalation of silica can cause a chronic lung disorder, silicosis.

## 12. ECOLOGICAL INFORMATION

Alkaline substance that increases pH to a maximum of 12.4 in a saturated water solution at 25$^{o}$C
Calcium magnesium oxide gradually reacts with $CO_2$ in air to form calcium carbonate ($CaCO_3$)
Calcium carbonate is ecologically neutral
Uncontrolled spillage in surface waters should be avoided since the increase pH could be detrimental to fish
Harmful to aquatic life in high concentration

## 13. DISPOSAL CONSIDERATIONS

Dispose according to federal, provincial/state and local environmental regulations.

## 14. TRANSPORTATION INFORMATION

**Classification:**

| | |
|---|---|
| TDG | Not listed for ground transportation |
| HMR | Not listed for ground transportation |

TDG: Transportation of Dangerous Goods Regulation (CAN)
HMR: Hazardous Materials Regulation (USA)

## 15. REGULATORY INFORMATION

**Symbol:**

**WHMIS RATING**
D2A, E
**NFPA RATING**
HEALTH – 3 SPECIFIC HAZARD - ALK FLASH POINTS – 0 REACTIVITY – 1
**HMIS RATING**
HEALTH – 2 SPECIFIC HAZARD - ALK FLASH POINTS – 0 REACTIVITY – 1

**Risk Phases:** Risk of serious damage to the eyes
Keep out of reach of children

**Safety Phases:** Keep storage container away from humidity
Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with water for at least 15 minutes

**CPR (Canada):** This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR) of Canada and this MSDS contains all information required by the CPR.

## 16. MISCELLANEOUS OTHER INFORMATION

Lime dust can be removed from objects (such as vehicles) using rags dampened with dilute vinegar. After applying dilute vinegar, vehicles (especially chrome surfaces) must be washed with water.

The information contained herein is believed to be accurate and reliable as of the date hereof. However, Carmeuse makes no representation, warranty or guarantee as to results or as to the information's accuracy, reliability or completeness. Carmeuse has no liability for any loss or damage that may result from use of the information. Each user is responsible to review this information, satisfy itself as to the information's suitability and completeness, and circulate the information to its employees, customers and other appropriate third parties.

# WHITE’S EQUIPMENT

04/14/2023

**DRILLING**

**White's Equipment Rental, LLC Products stored on location**

**Tier II Determination**

| CAS # | Chemical | Max. on Location | Units | Specific Gravity | % by Weight | Gal | Pounds /gal | Total Pounds | Reportable Quantity | Reportable on Tier II | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Calcium Nitrate** | 5,000 | pounds | 1.12 | 100.0% | | | 5,000.0 | 10,000 lbs | no | CERCLA: NL |
| 10124-37-5 | Hydrated Ammonium Calcium Nitrate | | | 1.45 | ≤ 100.0% | | | 5,000.0 | 10,000 lbs | no | < 10,000 lbs; acute toxicity |
| | Double Salt containing Calcium Nitrate | | | | NA | | | NA | NA | no | CERCLA: NL |
| 6484-52-2 | Ammonium Nitrate | | | | NA | | | NA | NA | no | CERCLA: NL |
| 7732-18-5 | Water | | | 1 | 16.6% | | | 830.0 | NA | no | CERCLA: NL |
| | **ECM C-496 (Floc C)** | 2,500 | pounds | | 100.0% | | | 2,500.0 | NA | no | CERCLA: NL |
| 124-04-9 | Adipic Acid (Polyacrylamide Polymer) | | | NA | 0-5% | | | 125 | 5,000 lbs | no | CERCLA 5,000 lbs |
| | **ECM FLOC A-3342** | 2,500 | pounds | NA | 100.0% | | | 2,500.0 | NA | no | CERCLA: NL |
| NA | Anionic polyacrylamide | | | NA | NA | | | NA | NA | no | CERCLA: NL |
| | **No-Tox2 Propylene Glycol / Alcohol** | 100 | gallons | 1.02 | 100.0% | 100.0 | 8.4966 | 849.7 | 10,000 lbs | no | < 10,000 lbs; flammable |
| 57-55-6 | 1,2-Propanediol | | | 1.036 | 40-70.0% | 70.0 | 8.62988 | 604.1 | NA | no | CERCLA: NL |
| 64-17-5 | Ethyl Alcohol | | | 0.785 | 1-5.0% | 5.0 | 6.539 | 32.7 | NA | no | not on List of Lists, OSHA, DOT, NIOSH |
| 124-68-5 | 2-Amino-2-methyl-1-propanol | | | 0.93 | 0.5-1.5% | 1.5 | 7.7469 | 11.6 | NA | no | CERCLA: NL |
| 26038-87-9 | Boric Acid compound with 2-amenoethenol | | | 1.16 | 0.1-1.0% | 1.0 | 7.7469 | 11.62035 | NA | no | CERCLA: NL |
| 26038-90-4 | Boric Acid compound with 1-amino-2-proponal | | | NA | 0.1-1.0% | 1.0 | NA | NA | NA | no | CERCLA: NL |
| 67-56-1 | Methyl alcohol | | | NA | NA | NA | NA | NA | NA | no | CERCLA 5,000 lbs, "313", U154 |
| 81-88-9 | CI Food Red 15 | | | 0.79 | NA | NA | NA | NA | NA | no | "313" |

When there is a range, maximum quantity or percentage is used in calculation

NL = Not Listed

"313" = Subject to reporting under Section 313 & 6607

ECM SUPPLY
ENGINEERS · CHEMICALS · MUD

# CALCIUM NITRATE

## SAFETY DATA SHEET

1. **IDENTIFICATION**
   1.1. Product Identification
      1.1.1. Trade Name — **ECM CALNIT**
      1.1.2. Trade Item Codes & U/M — 11175. (50 lb bag)
   1.2. Relevant Uses
      1.2.1. Drilling Fluid Additive
   1.3. Details of Supplier
      1.3.1. Company

| | |
|---|---|
| ECM Supply LLC | 724-206-9321 Main |
| 55 Hickory Street Ste. 201 | 724-249-2192 Fax |
| Washington, PA 15301 | ecmsupply.com |
| SDS Created Date: | 05/01/2015 |
| SDS Last Revised: | 00/00/0000 |

   1.4. Emergency Contact
      1.4.1. **CHEMTREC** — **800-424-9300**

2. **HAZARDS IDENTIFICATION**
   2.1. OSHA Disclaimer
      2.1.1. This document may include information on environmental effect even though OSHA has NOT adopted the environmental portion of the GHS regulations.
   2.2. Classification of substance/mixture
      HCS 2012 (29 CFR 1910.1200)

   2.3. Label Elements
      HCS 2012 (29 CFR 1910.1200)
      Pictogram

| | |
|---|---|
| Signal Word: | CAUTION |
| Hazard Statements: | Slightly irritating to the eyes.<br>Slightly irritating to the skin.<br>Slightly irritating to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.<br>Harmful if swallowed. |
| Precautionary Statement | Adverse symptoms may include the following: respiratory tract irritation coughing.<br>Adverse symptoms may include the following:<br>Irritation redness<br>Adverse symptoms may include the following: Skin<br>Irritation redness |
| Response: | N/A |
| Storage: | N/A |
| Disposal: | N/A |

2.4. Other Hazards – NOT Classified N/A

## 3. COMPOSITION & INFORMATION (INGREDIENTS)

3.1. Substance

Chemical Nature: N/A

3.2. Mixture

Chemical Nature: N/A

3.3. Ingredients & Impurities

| Chemical Name | CAS No. | Concentration % |
|---|---|---|
| Hydrated Ammonium Calcium Nitrate | 10124-37-5 | |
| Double Salt containing Calcium Nitrate | | |
| Ammonium Nitrate | 6484-52-2 | |
| Water | 7732-18-5 | 16.6% |

## 4. FIRST AID

4.1. General Advice

Show SDS to Doctor.
First Responder Needs Protection.
Place Affected Apparel in a Sealed Bag for Subsequent Decontamination.

4.2. Inhalation

Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

4.3. Skin Contact

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Clean shoes thoroughly before reuse.
Get medical attention immediately.

4.4. Eye Contact

Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.
Get medical attention immediately.

4.5. Ingestion

Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

4.6. Symptoms & Effects – Acute & Delayed

| | | |
|---|---|---|
| Symptoms: | Acute: | N/A |
| | Delayed: | N/A |
| Effects: | Acute: | N/A |
| | Delayed: | N/A |

4.7. Indication of Medical Attention & Special Treatment Needed

Physician: Treat Based on Observed Signs & Symptoms.

## 5. FIREFIGHTING

5.1. Flashpoint N/A Class: N/A

5.2. Autoignition Temperature N/A

5.3. Extinguishing Media

5.3.1. Suitable Extinguishing Media Use an extinguishing agent suitable for the surrounding fire.

5.3.2. Unsuitable Extinguishing Media N/A

5.4. Special Hazards

5.4.1. Specific Hazards



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Under Fire Conditions: Non-flammable

5.4.2. Hazardous Combustion Products

Hazardous Decomposition: These products are: nitrogen oxides (NO, NO2 etc.)

5.5. Advice for Firefighters

5.5.1. Special PPE Gloves, Googles, Clothing. NIOSH/MSHA Approved SCBA.

5.5.2. Specific Fire Fighting Methods In case of fire, use water spray (fog), foam or dry chemical.

## 6. ACCIDENTAL RELEASE

6.1. Personal Precautions, PPE & Emergency Procedures

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

6.2. Environmental Precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air)..

6.3. Methods and Materials for Containment & Clean Up

6.3.1. Recovery

Soak Up w/ Inert Absorbent Material (If Wet).

Sweep Up & Shovel into Suitable Containers for Disposal

Never Return Spills in Original Containers for Re-Use.

6.3.2. Decontamination & Cleaning

Material free from contamination can be used for its original purpose. Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Large Spill Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

6.3.3. Disposal

Dispose of in Accordance w/ Local Regulations.

6.3.4. Additional Advice

Material Can Create Slippery Conditions.

6.4. Reference to Other Section

No Data Available

## 7. STORAGE & HANDLING

7.1. Precautions For Safe Handling

Avoid creating dusty conditions and prevent wind dispersal. Avoid all possible sources of ignition (spark or flame). Avoid contamination by any source including metals, dust and organic materials.

Handle in Accordance w/ Good Industrial Hygiene and Safety Practice.

7.1.1. Hygiene Measures

Personal Hygiene Is An Important Work Practice Exposure Control Measure:

Do Not Store, Use and/or Consume Foods, Beverages, Tobacco Products, or Cosmetics in Areas Where This Material Is Stored.

Wash Hands and Face Carefully Before Eating, Drinking, Using Tobacco, Applying Cosmetics, or Using the Toilet.

Wash Exposed Skin Promptly to Remove Accidental Splashes or Contact w/ Material.

7.2. Conditions for Safe Storage, Including any Incompatibilities.

7.2.1. Technical Measures & Storage Conditions

Store and use away from heat, sparks, open flame or any other ignition source. Avoid contact with combustible materials..

7.2.2. Requirements for Storage Rooms & Vessels

Recommended Storage Temp: N/A

7.3. Specific End Use(s)

No Data Available

## 8. EXPOSURE CONTROLS & PPE

8.1. Control Parameters

These Recommendations Provide General Guidance For Handling This Product. Because Specific Work Environments and Material Handling Practices Vary, Safety Procedures Should Be Developed for Each Intended Application. Assistance with Selection, Use and Maintenance of Worker Protection Equipment Is Generally Available From Equipment Manufacturers.

8.1.1. Components w/ Workplace Occupational Exposure Limits

| Ingredients | Type | Value | Basis |
|---|---|---|---|

8.2. Exposure Controls

8.2.1. Control Measures

8.2.1.1. Engineering Measures

Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

8.2.2. Individual Protection Measures

8.2.2.1. Respiratory Protection

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

8.2.2.2. Hand Protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. >8 hours (breakthrough time): butyl rubber, natural rubber (latex), nitrile rubber.

8.2.2.3. Eye Protection

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Recommended: safety glasses with side-shields

8.2.2.4. Skin & Body Protection

Personal protective equipment for the body should be selected based on the task being performed and the risks involved.

Protective Suit and Boots as Necessary.

8.2.2.5. Hygiene Measures

Do Not Store, Use and/or Consume Foods, Beverages, Tobacco Products or Cosmetics in Areas Where This Material is Stored.

Wash Hands and Face Carefully Before Eating, Drinking, Using Tobacco, Applying Cosmetics, or Using the Toilet.

Wash Exposed Skin Promptly.

8.2.2.6. Protective Measures

Ensure Eyewash and Safety Showers Are Near.

PPE Shall be In Accordance w/ Local Standards and In Cooperation w/ Supplier of the PPE.



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PPE Selected Should Be Based on Evaluation of the Performance of the Task(s).

## 9. PHYSICAL & CHEMICAL PROPERTIES

### 9.1. Basic Physical & Chemical Properties

| | |
|---|---|
| Appearance | Solid, White. Off-white. |
| Autoignition Temperature | N/A |
| Boil Point | N/A |
| Density | 1,12 |
| Evaporation Rate | N/A |
| Explosive Properties | N/A |
| Flammability | N/A |
| Flash Point | N/A |
| Melting/Freezing Point | 116,67°C (242°F) |
| Odor | Odorless. |
| Odor Threshold | N/A |
| Oxidizing Properties | N/A |
| Partition Coefficient | N/A |
| pH | N/A |
| Solubility | Soluble in the following materials: cold water. |
| Thermal Decomposition | N/A |
| Vapor Density | N/A |
| Vapor Pressure | N/A |
| Viscosity | N/A |

### 9.2. Other Information

| | |
|---|---|
| Volatiles by Volume | N/A |

## 10. STABILITY & REACTIVITY

### 10.1. Reactivity

Stable under recommended storage and handling conditions (see section 7).

### 10.2. Chemical Stability

Stable under recommended storage and handling conditions (see section 7

### 10.3. Possible Hazardous Reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

### 10.4. Conditions to Avoid

N/A

### 10.5. Incompatible Materials

Reactive or incompatible with the following materials: combustible materials, acids and alkalis.

### 10.6. Hazardous Decomposition Products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## 11. TOXICOLOGICAL REPORT

### 11.1. Effects

#### 11.1.1. Acute

| | |
|---|---|
| Acute Oral | N/A |
| Acute Inhalation | N/A |
| Acute Dermal | N/A |
| Acute Other | N/A |

#### 11.1.2. Skin Corrosion & Irritation

| | |
|---|---|
| Skin Irritation | Slightly irritating to the skin. |

#### 11.1.3. Eye Damage & Irritation

| | |
|---|---|
| Eye Irritation | Slightly irritating to the eyes. |

| | |
|---|---|
| 11.1.4. Respiratory or Skin Sensitization | |
| Sensitization | Slightly irritating to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure. |
| 11.1.5. Mutagenicity | |
| Genotoxicity in Vitro | N/A |
| Genotoxicity in Vibo | N/A |
| 11.1.6. Carcinogenicity | N/A |
| 11.1.7. Toxicity for Reproduction & Development | |
| Fertility | N/A |
| Teratogenicity | N/A |
| 11.1.8. Specific Target Organ Toxicant | |
| Single Exposure | N/A |
| Repeated Exposure | N/A |
| 11.1.9. Neurological | N/A |
| 11.1.10. CMR | N/A |
| 11.1.11. Aspiration | N/A |

## 12. ECOLOGICAL REPORT

| | |
|---|---|
| 12.1. Toxicity | |
| 12.1.1. Aquatic Compartment | |
| Acute – Fish | Acute LC50 >100 mg/L |
| Acute – Daphnia & Other | Not available. |
| Aquatic Plants | Not available. |
| Chronic – Fish | Not available. |
| 12.2. Persistence & Degradability | |
| 12.2.1. Biodegradation | |
| Biodegradability | Most inorganic compounds are not biodegradable. The product does not show any bioaccumulation phenomena. |
| 12.3. Bioaccumulative Potential | |
| 12.3.1. Bioconcentration Factor (BCF) | N/A |
| 12.4. Mobility in Soil | N/A |
| 12.5. PBT & vPvB Assessment Report | N/A |
| 12.6. Other Adverse Effects | N/A |
| 12.7. Ecotoxicity Assessment | |
| 12.7.1. Acute | N/A |
| 12.7.2. Chronic | N/A |

## 13. DISPOSAL

13.1. Waste Treatment Methods

13.1.1. Disposal

Altering or Alterations of this Material May Make the Waste Management Information Presented in this SDS Incomplete, Inaccurate or Otherwise Inappropriate. Please be Advised to all Federal, State and Local Regulation for Waste Disposal.

13.1.2. Waste Code

N/A

13.1.3. Advice- Cleaning, Disposal, Packaging

The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this



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product, solutions and any byproducts should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

13.1.4. Waste Avoidance & Recovery

N/A

## 14. TRANSPORT

14.1. Department of Transportation

| | |
|---|---|
| 14.1.1. UN Number | Not regulated. |
| 14.1.2. Proper Shipping Name | N/A |
| 14.1.3. Transport Hazard Class | N/A |
| 14.1.4. Packaging Group | N/A |
| 14.1.5. Environmental Hazards | N/A |

14.2. TDG

14.2.1. UN Number
14.2.2. Proper Shipping Name
14.2.3. Transport Hazard Class
14.2.4. Packaging Group
14.2.5. Environmental Hazards

14.3. NOM

14.3.1. UN Number
14.3.2. Property Shipping Name
14.3.3. Transport Hazard Class
14.3.4. Packaging Group
14.3.5. Environmental Hazards

14.4. IMDG

14.4.1. UN Number
14.4.2. Proper Shipping Name
14.4.3. Transport Hazard Class
14.4.4. Packaging Group
14.4.5. Environmental Hazards
14.4.6. Special Precautions

14.5. IATA

14.5.1. UN Number
14.5.2. Proper Shipping Name
14.5.3. Transport Hazard Class
14.5.4. Packaging Group
14.5.4.1. Passenger Aircraft Packing
14.5.4.2. Max
14.5.4.3. Cargo Aircraft Packaging
14.5.4.4. Max
14.5.5. Environmental Hazards
14.5.6. Special Precautions

## 15. REGULATORY

15.1. Notification Status

15.1.1. Inventory Info

| | |
|---|---|
| United States TSCA Inventory | Not determined. |

15.2. Federal Regulations



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15.2.1. US EPA EPCRA SARA Title III

15.2.1.1. SARA Hazard Designation Section 311/312 (40 CFR 370)

| | |
|---|---|
| Fire Hazard | No |
| Reactivity Hazard | No |
| Sudden Release of Pressure Hazard | No |
| Acute Health Hazard | No |
| Chronic Health Hazard | No |

15.2.1.2. Section 313 Toxic Chemicals (40 CFR 372.65)

No products were found.

15.2.1.3. Section 302 Emergency Planning- Hazardous Substance Threshold (40 CFR 355)

No products were found.

15.2.1.4. Section 302 Emergency Planning- Hazardous Substance Reporting (40 CFR 355)

| Ingredient | CAS No. | Quantity |
|---|---|---|

No products were found.

15.2.1.5. Section 304 Emergency Release Notification (40 CFR 355)

| Ingredient | CAS No. | Quantity |
|---|---|---|

No products were found.

15.2.2. US EPA CERCLA Hazardous Substance & Reporting Quantities (40 CFR 302.4)

| Ingredient | CAS No. | Quantity |
|---|---|---|

No products were found.

15.3. State Regulations

15.3.1. US California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

15.3.1.1. This Product Contains a Chemical Known by the State to Cause Cancer

| Ingredient | CAS No. |
|---|---|

No products were found.

15.3.1.2. This Product Contains a Chemical Known by the State to Cause Birth Defects

| Ingredient | CAS No. |
|---|---|

No products were found.

## 16. OTHER

16.1. National Fire Protection Association Classification (NFPA)

| | |
|---|---|
| Health | 0 |
| Flammability | 0 |
| Instability/Reactivity | 0 |

16.2. Hazardous Materials Identification System Classification (HMIS)

| | |
|---|---|
| Health | 0 |
| Flammability | 0 |
| Reactivity | 0 |
| PPE | Determined by User- Consult Direct Supervisor |

16.3. Further Information

US GHS Evaluated Format

16.4. Abbreviations / Acronyms Used in This SDS

| | |
|---|---|
| Gov't | Government |
| SDS | Safety Data Sheet |
| ST | STEL- 15 Minute TWA Exposure, Not To Be Exceeded |
| STEL | Short Term Exposure Limit |
| TWA | 8 Hour, Time Weighted Average |
| ACGIH | American Conference of Gov't Industrial Hygienists |
| OSHA | Occupational Safety and Health Administration |
| NTP | National Toxicology Program |



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| | |
|---|---|
| IARC | International Agency for Research on Cancer |
| NIOSH | National Institute for Occupational Safety and Health |

17. **DISCLAIMER**

The information provided in this Safety Data Sheet is correct to the best of ECM Supply, LLC knowledge, information and belief at the time and date of its publication. Such information is only given as a guidance to help users handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or intended to replace technical data sheets and product specifications and does not release the user from obligated regulation linked to its activity thereof. This information relates only to the product designated herein and does not relate to its use in conjunction and/or combination with other material(s) and/or other processes.

# SAFETY DATA SHEET

## 1. Identification

**Material name:** ACCELGUARD 80 - BULK GALLONS
**Material:** 019 99

**Recommended use and restriction on use**

**Recommended use:** Additive
**Restrictions on use:** Not known.

**Manufacturer/Importer/Supplier/Distributor Information**
EUCLID CHEMICAL COMPANY
19218 REDWOOD ROAD
CLEVELAND OH 44110
US

| | |
|---|---|
| **Contact person:** | EH&S Department |
| **Telephone:** | 216-531-9222 |
| **Emergency telephone number:** | 1-800-424-9300 (US); 1-613-996-6666 (Canada) |

## 2. Hazard(s) identification

**Hazard Classification**

**Health Hazards**

| | |
|---|---|
| Acute toxicity (Oral) | Category 4 |

**Unknown toxicity - Health**

| | |
|---|---|
| Acute toxicity, oral | 0.15 % |
| Acute toxicity, dermal | 0.15 % |
| Acute toxicity, inhalation, vapor | 54.23 % |
| Acute toxicity, inhalation, dust or mist | 54.23 % |

**Label Elements**

**Hazard Symbol:**

**Signal Word:** Warning

**Hazard Statement:** Harmful if swallowed.

**Precautionary Statements**

**Prevention:** Wash thoroughly after handling. Do not eat, drink or smoke when using this product.

**Response:** IF SWALLOWED: Call a POISON CENTER/doctor/ if you feel unwell. Rinse mouth.

**Disposal:** Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

**Hazard(s) not otherwise classified (HNOC):** None.

## 3. Composition/information on ingredients

**Mixtures**

| Chemical Identity | CAS number | Content in percent (%)* |
|---|---|---|
| Calcium nitrate | 10124-37-5 | 50 - <100% |

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

## 4. First-aid measures

**Ingestion:** Call a POISON CENTER/doctor/ if you feel unwell. Rinse mouth.

**Inhalation:** Move to fresh air.

**Skin Contact:** Wash skin thoroughly with soap and water. Get medical attention if symptoms occur.

**Eye contact:** Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lenses. If eye irritation persists: Get medical advice/attention.

**Most important symptoms/effects, acute and delayed**

**Symptoms:** May cause skin and eye irritation.

**Indication of immediate medical attention and special treatment needed**

**Treatment:** Symptoms may be delayed.

## 5. Fire-fighting measures

**General Fire Hazards:** No unusual fire or explosion hazards noted.

**Suitable (and unsuitable) extinguishing media**

| | |
|---|---|
| **Suitable extinguishing media:** | Use fire-extinguishing media appropriate for surrounding materials. |
| **Unsuitable extinguishing media:** | Do not use water jet as an extinguisher, as this will spread the fire. |
| **Specific hazards arising from the chemical:** | During fire, gases hazardous to health may be formed. |

**Special protective equipment and precautions for firefighters**

| | |
|---|---|
| **Special fire fighting procedures:** | No data available. |
| **Special protective equipment for fire-fighters:** | Self-contained breathing apparatus and full protective clothing must be worn in case of fire. |

## 6. Accidental release measures

| | |
|---|---|
| **Personal precautions, protective equipment and emergency procedures:** | No data available. |
| **Methods and material for containment and cleaning up:** | Dam and absorb spillages with sand, earth or other non-combustible material. Collect spillage in containers, seal securely and deliver for disposal according to local regulations. |
| **Notification Procedures:** | In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. |
| **Environmental Precautions:** | Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. |

## 7. Handling and storage

| | |
|---|---|
| **Precautions for safe handling:** | Do not taste or swallow. Wash hands thoroughly after handling. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. |
| **Conditions for safe storage, including any incompatibilities:** | Store away from incompatible materials. Store in original tightly closed container. |

## 8. Exposure controls/personal protection

**Control Parameters**

**Occupational Exposure Limits**

None of the components have assigned exposure limits.

None of the components have assigned exposure limits.

**Appropriate Engineering Controls** Observe good industrial hygiene practices. Observe occupational exposure limits and minimize the risk of inhalation of vapors and mist. Mechanical ventilation or local exhaust ventilation may be required.

**Individual protection measures, such as personal protective equipment**

**General information:** Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation, closed systems, or respiratory and eye protection may be needed in special circumstances, such as poorly ventilated spaces, heating, evaporation of liquids from large surfaces, spraying of mists, mechanical generation of dusts, drying of solids, etc.

**Eye/face protection:** Wear safety glasses with side shields (or goggles).

**Skin Protection**

**Hand Protection:** Use suitable protective gloves if risk of skin contact.

**Other:** Wear suitable protective clothing.

**Respiratory Protection:** In case of inadequate ventilation use suitable respirator. Seek advice from local supervisor.

**Hygiene measures:** Observe good industrial hygiene practices. Do not eat, drink or smoke when using the product. Wash hands after handling.

## 9. Physical and chemical properties

**Appearance**

| | |
|---|---|
| **Physical state:** | liquid |
| **Form:** | liquid |
| **Color:** | Colorless |
| **Odor:** | Mild |
| **Odor threshold:** | No data available. |
| **pH:** | 3.0 - 6.0 |
| **Melting point/freezing point:** | No data available. |
| **Initial boiling point and boiling range:** | No data available. |
| **Flash Point:** | No data available. |
| **Evaporation rate:** | Slower than Ether |
| **Flammability (solid, gas):** | No |
| **Upper/lower limit on flammability or explosive limits** | |
| **Flammability limit - upper (%):** | No data available. |
| **Flammability limit - lower (%):** | No data available. |
| **Explosive limit - upper (%):** | No data available. |
| **Explosive limit - lower (%):** | No data available. |
| **Vapor pressure:** | No data available. |
| **Vapor density:** | Vapors are heavier than air and may travel along the floor and in the bottom of containers. |

| | |
|---|---|
| **Relative density:** | 1.442 - 1.450 |
| **Solubility(ies)** | |
| **Solubility in water:** | Soluble |
| **Solubility (other):** | No data available. |
| **Partition coefficient (n-octanol/water):** | No data available. |
| **Auto-ignition temperature:** | No data available. |
| **Decomposition temperature:** | No data available. |
| **Viscosity:** | No data available. |

## 10. Stability and reactivity

| | |
|---|---|
| **Reactivity:** | No data available. |
| **Chemical Stability:** | Material is stable under normal conditions. |
| **Possibility of hazardous reactions:** | No data available. |
| **Conditions to avoid:** | Avoid heat or contamination. |
| **Incompatible Materials:** | Strong acids. Strong bases. |
| **Hazardous Decomposition Products:** | Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapors. |

## 11. Toxicological information

**Information on likely routes of exposure**

| | |
|---|---|
| **Inhalation:** | In high concentrations, vapors, fumes or mists may irritate nose, throat and mucus membranes. |
| **Skin Contact:** | May be harmful in contact with skin. |
| **Eye contact:** | Eye contact is possible and should be avoided. |
| **Ingestion:** | Harmful if swallowed. |

**Symptoms related to the physical, chemical and toxicological characteristics**

| | |
|---|---|
| **Inhalation:** | No data available. |
| **Skin Contact:** | No data available. |
| **Eye contact:** | No data available. |
| **Ingestion:** | No data available. |

## Information on toxicological effects

### Acute toxicity (list all possible routes of exposure)

**Oral**
**Product:** ATEmix: 554.71 mg/kg

**Dermal**
**Product:** ATEmix: 3,698.06 mg/kg

**Inhalation**
**Product:** Not classified for acute toxicity based on available data.

**Repeated dose toxicity**
**Product:** No data available.

**Skin Corrosion/Irritation**
**Product:** No data available.

**Specified substance(s):**

| | |
|---|---|
| Calcium nitrate | in vivo (Rabbit): Not irritant Read-across from supporting substance (structural analogue or surrogate), Key study |

**Serious Eye Damage/Eye Irritation**
**Product:** No data available.
**Specified substance(s):**

| | |
|---|---|
| Calcium nitrate | Rabbit, 24 - 72 hrs: Category 1 |

**Respiratory or Skin Sensitization**
**Product:** No data available.

**Carcinogenicity**
**Product:** No data available.

**IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:**
No carcinogenic components identified

**US. National Toxicology Program (NTP) Report on Carcinogens:**
No carcinogenic components identified

**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):**
No carcinogenic components identified

**Germ Cell Mutagenicity**

**In vitro**
**Product:** No data available.

**In vivo**
**Product:** No data available.

**Reproductive toxicity**
**Product:** No data available.

**Specific Target Organ Toxicity - Single Exposure**
**Product:** No data available.

**Specific Target Organ Toxicity - Repeated Exposure**
**Product:** No data available.

**Aspiration Hazard**
**Product:** No data available.

**Other effects:** No data available.

## 12. Ecological information

**Ecotoxicity:**

**Acute hazards to the aquatic environment:**

**Fish**
**Product:** No data available.

**Specified substance(s):**
Calcium nitrate LC 50 (Oncorhynchus mykiss, 96 h): > 100 mg/l

**Aquatic Invertebrates**
**Product:** No data available.

**Specified substance(s):**
Calcium nitrate EC 50 (Daphnia magna, 48 h): 490 mg/l

**Chronic hazards to the aquatic environment:**

**Fish**
**Product:** No data available.

**Aquatic Invertebrates**
**Product:** No data available.

**Toxicity to Aquatic Plants**
**Product:** No data available.

**Persistence and Degradability**

**Biodegradation**
**Product:** No data available.

**BOD/COD Ratio**
**Product:** No data available.

**Bioaccumulative potential**
**Bioconcentration Factor (BCF)**
**Product:** No data available.

**Partition Coefficient n-octanol / water (log Kow)**
**Product:** No data available.

**Mobility in soil:** No data available.

**Other adverse effects:** No data available.

## 13. Disposal considerations

**Disposal instructions:** Dispose of waste at an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

**Contaminated Packaging:** No data available.

## 14. Transport information

**TDG:**

Not Regulated

**CFR / DOT:**

Not Regulated

**IMDG:**

Not Regulated

## 15. Regulatory information

**US Federal Regulations**

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**
None present or none present in regulated quantities.

**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**
None present or none present in regulated quantities.

**CERCLA Hazardous Substance List (40 CFR 302.4):**
None present or none present in regulated quantities.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories**
Immediate (Acute) Health Hazards
Acute toxicity

**SARA 302 Extremely Hazardous Substance**
None present or none present in regulated quantities.

**SARA 304 Emergency Release Notification**
None present or none present in regulated quantities.

**SARA 311/312 Hazardous Chemical**

| Chemical Identity | Threshold Planning Quantity |
|---|---|
| Calcium nitrate | 10000 lbs |

**SARA 313 (TRI Reporting)**

| Chemical Identity |
|---|
| Calcium nitrate |

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)**
None present or none present in regulated quantities.

**Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)**
None present or none present in regulated quantities.

**US State Regulations**

**US. California Proposition 65**
No ingredient regulated by CA Prop 65 present.

**US. New Jersey Worker and Community Right-to-Know Act**

| Chemical Identity |
|---|
| Calcium nitrate |

**US. Massachusetts RTK - Substance List**
No ingredient regulated by MA Right-to-Know Law present.

**US. Pennsylvania RTK - Hazardous Substances**
No ingredient regulated by PA Right-to-Know Law present.

**US. Rhode Island RTK**
No ingredient regulated by RI Right-to-Know Law present.

**International regulations**

**Montreal protocol**
not applicable

**Stockholm convention**
not applicable

**Rotterdam convention**
not applicable

**Kyoto protocol**
not applicable

**VOC:**

| | | |
|---|---|---|
| Regulatory VOC (less water and exempt solvent) | : | 0 g/l |
| VOC Method 310 | : | 0.00 % |

**Inventory Status:**

| | |
|---|---|
| Australia AICS: | All components in this product are listed on or exempt from the Inventory. |
| Canada DSL Inventory List: | All components in this product are listed on or exempt from the Inventory. |
| EINECS, ELINCS or NLP: | All components in this product are listed on or exempt from the Inventory. |
| Japan (ENCS) List: | All components in this product are listed on or exempt from the Inventory. |
| China Inv. Existing Chemical Substances: | All components in this product are listed on or exempt from the Inventory. |
| Korea Existing Chemicals Inv. (KECI): | All components in this product are listed on or exempt from the Inventory. |
| Canada NDSL Inventory: | One or more components in this product are not listed on or exempt from the Inventory. |
| Philippines PICCS: | All components in this product are listed on or exempt from the Inventory. |
| US TSCA Inventory: | All components in this product are listed on or exempt from the Inventory. |
| New Zealand Inventory of Chemicals: | All components in this product are listed on or exempt from the Inventory. |
| Japan ISHL Listing: | One or more components in this product are not listed on or exempt from the Inventory. |
| Japan Pharmacopoeia Listing: | One or more components in this product are not listed on or exempt from the Inventory. |

## 16.Other information, including date of preparation or last revision

| | |
|---|---|
| **Revision Date:** | 10/26/2017 |
| **Version #:** | 2.1 |
| **Further Information:** | No data available. |

**Disclaimer:** For Industrial Use Only. Keep out of Reach of Children. The hazard information herein is offered solely for the consideration of the user, subject to their own investigation of compliance with applicable regulations, including the safe use of the product under every foreseeable condition.

ECM SUPPLY
ENGINEERS · CHEMICALS · MUD

# ECM C-496

## SAFETY DATA SHEET

1. **IDENTIFICATION**
   1.1. Product Identification
      1.1.1. Trade Name — **ECM C-496**
      1.1.2. Trade Item Codes & U/M — 11205 (55Lbs. Bag)
   1.2. Relevant Uses
      1.2.1. Drilling Additive - Polymer
   1.3. Details of Supplier
      1.3.1. Company


ECM Supply LLC
55 Hickory Street Ste. 201
Washington, PA 15301

724-206-9321 Main
724-249-2192 Fax
ecmsupply.com


SDS Created Date: 05/01/2015
SDS Last Revised: 00/00/0000

   1.4. Emergency Contact
      1.4.1. **CHEMTREC** — **800-424-9300**

2. **HAZARDS IDENTIFICATION**
   2.1. OSHA Disclaimer
      2.1.1. This document may include information on environmental effect even though OSHA has NOT adopted the environmental portion of the GHS regulations. This Material Is Not Hazardous as Defined by OSHA or US GHS.
   2.2. Classification of substance/mixture
      HCS 2012 (29 CFR 1910.1200)
         Hazard Type, Category Type
   2.3. Label Elements
      HCS 2012 (29 CFR 1910.1200)

| | |
|---|---|
| Pictogram | Product Not Hazardous Under US GHS. |
| Signal Word: | N/A |
| Hazard Statements: | May Cause Irritation to Skin.<br>May Cause Irritation to Eyes. |
| Precautionary Statement | Spills are Very Slippery When Wet. |
| Response: | N/A |
| Storage: | N/A |
| Disposal: | N/A |

   2.4. Other Hazards – NOT Classified — No Known Carcinogenic or Other Chronic Effects.

3. **COMPOSITION & INFORMATION (INGREDIENTS)**
   3.1. Substance
      Chemical Nature: — Polyacrylamide Polymer - Cationic
   3.2. Mixture
      Chemical Nature: — N/A
   3.3. Ingredients & Impurities

| Chemical Name | CAS No. | Concentration % |
|---|---|---|
| Adipic Acid | 124-04-9 | 0 - 5 |



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4. **FIRST AID**

4.1. General Advice

Show SDS to Doctor.
First Responder Needs Protection.
Place Affected Apparel in a Sealed Bag for Subsequent Decontamination.

4.2. Inhalation

Move to Fresh Air.
Give Oxygen- If Necessary.
Provide Artificial Respiration- If Necessary.
Consult a Doctor- If Necessary.

4.3. Skin Contact

Wash with Soap and Plenty of Water.
Remove Contaminated Clothing and Shoes.
Wash Contaminated Clothing Before Re-Use.
Consult a Doctor- If Necessary.

4.4. Eye Contact

Rinse Immediately w/ Plenty of Water- At Least Fifteen Minutes.
Consult a Doctor- If Necessary.

4.5. Ingestion

Risk of Product Entering Lungs on Vomiting After Ingestion.
Lay Victim on Side.
Seek Medical Advice.
Do Not Leave the Victim Alone.

4.6. Symptoms & Effects – Acute & Delayed

| | | |
|---|---|---|
| Symptoms: | Acute: | N/A |
| | Delayed: | N/A |
| Effects: | Acute: | N/A |
| | Delayed: | N/A |

4.7. Indication of Medical Attention & Special Treatment Needed

Physician: Treat Based on Observed Signs & Symptoms.

5. **FIREFIGHTING**

| | | |
|---|---|---|
| 5.1. Flashpoint | N/A | Class: N/A |
| 5.2. Autoignition Temperature | N/A | |
| 5.3. Extinguishing Media | | |
| 5.3.1. Suitable Extinguishing Media | Water Mist or Spray, Carbon Dioxide, Dry Chemical | |
| 5.3.2. Unsuitable Extinguishing Media | N/A | |
| 5.4. Special Hazards | | |
| 5.4.1. Specific Hazards | | |
| Under Fire Conditions: | Dust May Be Explosive if Mixed w/ Air in Presence of a Ignition. | |
| 5.4.2. Hazardous Combustion Products | | |
| Hazardous Decomposition: | N/A | |
| 5.5. Advice for Firefighters | | |
| 5.5.1. Special PPE | Gloves, Googles, Clothing. NIOSH/MSHA Approved SCBA. | |
| 5.5.2. Specific Fire Fighting Methods | Collect Contaminated Water- No Drains. | |

6. **ACCIDENTAL RELEASE**

6.1. Personal Precautions, PPE & Emergency Procedures

Avoid Contact w/ Skin and Eyes.
Wear Suitable PPE - See Section 8.



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6.2. Environmental Precautions

Do Not Let Product Enter Any Drains.

Prevent Product From Entering Sewage/Drain Systems.

Spills May be Reported to the National Response Center (800-424-8802).

6.3. Methods and Materials for Containment & Clean Up

6.3.1. Recovery

Soak Up w/ Inert Absorbent Material (If Wet).

Sweep Up & Shovel into Suitable Containers for Disposal

Never Return Spills in Original Containers for Re-Use.

6.3.2. Decontamination & Cleaning

Clean Contaminated Surface Thoroughly.

Wash Off w/ Plenty of Water.

Recover the Cleaning Water for Subsequent Disposal.

Decontaminate Tools, Equipment & PPE in Separate Area.

6.3.3. Disposal

Dispose of in Accordance w/ Local Regulations.

6.3.4. Additional Advice

Material Can Create Slippery Conditions.

6.4. Reference to Other Section

No Data Available

## 7. STORAGE & HANDLING

7.1. Precautions For Safe Handling

Avoid Inhalation, Ingestion and Contact w/ Skins and Eyes.

Handle in Accordance w/ Good Industrial Hygiene and Safety Practice.

7.1.1. Hygiene Measures

Personal Hygiene Is An Important Work Practice Exposure Control Measure:

Do Not Store, Use and/or Consume Foods, Beverages, Tobacco Products, or Cosmetics in Areas Where This Material Is Stored.

Wash Hands and Face Carefully Before Eating, Drinking, Using Tobacco, Applying Cosmetics, or Using the Toilet.

Wash Exposed Skin Promptly to Remove Accidental Splashes or Contact w/ Material.

7.2. Conditions for Safe Storage, Including any Incompatibilities.

7.2.1. Technical Measures & Storage Conditions

Take All Necessary Measures to Avoid Accidental Discharge of Products into Drains and Waterways.

Keep in a Dry, Cool and Well-Ventilated Place.

Keep Container Tightly Closed.

Do Not Freeze.

Keep Away From Open Flames, Hot Surfaces and Sources of Ignition.

Keep Away From Incompatible Materials to Be Indicated By the Manufacturer.

7.2.2. Requirements for Storage Rooms & Vessels

Recommended Storage Temp: 45 – 80F

7.3. Specific End Use(s)

Do Not Use Iron, Copper or Aluminum Containers or Equipment w/ this Product.

Avoid Oxidizing Agents.

## 8. EXPOSURE CONTROLS & PPE

8.1. Control Parameters

These Recommendations Provide General Guidance For Handling This Product. Because Specific Work Environments and Material Handling Practices Vary, Safety Procedures Should Be Developed for Each Intended

Application. Assistance with Selection, Use and Maintenance of Worker Protection Equipment Is Generally Available From Equipment Manufacturers.

8.1.1. Components w/ Workplace Occupational Exposure Limits

| Ingredients | Type | Value | Basis |
|---|---|---|---|
| Adipic Acid | TWA | 5 mg/m3 | ACGIH |

8.2. Exposure Controls

8.2.1. Control Measures

8.2.1.1. Engineering Measures

Where Engineering Controls are Indicated by Use Conditions or a Potential for Excessive Exposure Exists, The Following Traditional Exposure Control Techniques May Be Used To Effectively Minimize Employee Exposures.

Effective Exhaust Ventilation System.

8.2.2. Individual Protection Measures

8.2.2.1. Respiratory Protection

When Respirators are Required, Select NIOSH/MSHA Approved Equipment Based On Actual or Potential Airborne Concentrations and in Accordance w/ the Appropriate Regulatory Standards and/or Industrial Recommendations.

Use a Respirator w/ an Approved Filter If A Risk Assessment Indicated Necessary.

8.2.2.2. Hand Protection

Where There is a Risk of Contact w/ Hands- Use Appropriate Gloves.

Observe and Follow Supplier Instructions Regarding Permeability and Breakthrough Time.

Gloves Must Be Inspected Prior to Use.

Gloves Must Be Discarded and Replaced if There Is Any Breakthrough.

8.2.2.3. Eye Protection

Work Environments and Material Handling Practices Determine Eye and Face Requirements. Approved ANSI Z87 Equipment Shall Be Selected.

Eye Contact Should be Prevented Through the Use of Safety Glasses w/ Side Shields.

8.2.2.4. Skin & Body Protection

Remove and Wash Contaminated Clothing Before Re-Use.

Choose Body Protection According to the Amount and Concentration of the Dangerous Substance at the Work Place.

Protective Suit and Boots as Necessary.

8.2.2.5. Hygiene Measures

Do Not Store, Use and/or Consume Foods, Beverages, Tobacco Products or Cosmetics in Areas Where This Material is Stored.

Wash Hands and Face Carefully Before Eating, Drinking, Using Tobacco, Applying Cosmetics, or Using the Toilet.

Wash Exposed Skin Promptly.

8.2.2.6. Protective Measures

Ensure Eyewash and Safety Showers Are Near.

PPE Shall be In Accordance w/ Local Standards and In Cooperation w/ Supplier of the PPE.

PPE Selected Should Be Based on Evaluation of the Performance of the Task(s).

## 9. PHYSICAL & CHEMICAL PROPERTIES

9.1. Basic Physical & Chemical Properties

| | |
|---|---|
| Appearance | Whitish Solid Powder |
| Autoignition Temperature | N/A |
| Boil Point | N/A |
| Density | 750 kg/m3 |
| Evaporation Rate | N/A |

| | |
|---|---|
| Explosive Properties | N/A |
| Flammability | N/A |
| Flash Point | N/A |
| Freezing Point | N/A |
| Odor | Odorless |
| Odor Threshold | N/A |
| Oxidizing Properties | N/A |
| Partition Coefficient | N/A |
| pH | 3 – 5 (.5%) |
| Solubility | N/A |
| Thermal Decomposition | > 302F |
| Vapor Density | N/A |
| Vapor Pressure | N/A |
| Viscosity | N/A |

9.2. Other Information

| | |
|---|---|
| Volatiles by Volume | N/A |

## 10. STABILITY & REACTIVITY

10.1. Reactivity

N/A

10.2. Chemical Stability

N/A

10.3. Possible Hazardous Reactions

Hazardous Polymerization Does Not Occur

10.4. Conditions to Avoid

Alkaline Materials

10.5. Incompatible Materials

Oxidizing Agents

10.6. Hazardous Decomposition Products

Ammonia, Carbon Oxides, Nitrogen Oxides, Hydrogen Chloride

## 11. TOXICOLOGICAL REPORT

11.1. Effects

| | |
|---|---|
| 11.1.1. Acute | |
| Acute Oral | 5000mg (Rat) |
| Acute Inhalation | 20 mg (Rat) |
| Acute Dermal | 10000 mg (Rat) |
| Acute Other | N/A |
| 11.1.2. Skin Corrosion & Irritation | |
| Skin Irritation | N/A |
| 11.1.3. Eye Damage & Irritation | |
| Eye Irritation | N/A |
| 11.1.4. Respiratory or Skin Sensitization | |
| Sensitization | N/A |
| 11.1.5. Mutagenicity | |
| Genotoxicity in Vitro | N/A |
| Genotoxicity in Vibo | N/A |
| 11.1.6. Carcinogenicity | N/A |
| 11.1.7. Toxicity for Reproduction & Development | |
| Fertility | N/A |

| | |
|---|---|
| Teratogenicity | N/A |
| 11.1.8. Specific Target Organ Toxicant | |
| Single Exposure | N/A |
| Repeated Exposure | N/A |
| 11.1.9. Neurological | N/A |
| 11.1.10. CMR | N/A |
| 11.1.11. Aspiration | N/A |

## 12. ECOLOGICAL REPORT

| | |
|---|---|
| 12.1. Toxicity | Not Classified as Dangerous For the Environment |
| 12.1.1. Aquatic Compartment | |
| Acute – Fish | > 100 mg |
| Acute – Daphnia & Other | > 85 mg |
| Aquatic Plants | N/A |
| Chronic – Fish | N/A |
| 12.2. Persistence & Degradability | |
| 12.2.1. Biodegradation | |
| Biodegradability | < 70% |
| 12.3. Bioaccumulative Potential | |
| 12.3.1. Bioconcentration Factor (BCF) | Material isn't Biodegradable- Degrades by Hydrolysis |
| 12.4. Mobility in Soil | N/A |
| 12.5. PBT & vPvB Assessment Report | N/A |
| 12.6. Other Adverse Effects | N/A |
| 12.7. Ecotoxicity Assessment | |
| 12.7.1. Acute | N/A |
| 12.7.2. Chronic | N/A |

## 13. DISPOSAL

13.1. Waste Treatment Methods

13.1.1. Disposal

Altering or Alterations of this Material May Make the Waste Management Information Presented in this SDS Incomplete, Inaccurate or Otherwise Inappropriate. Please be Advised to all Federal, State and Local Regulation for Waste Disposal.

13.1.2. Waste Code

N/A

13.1.3. Advice- Cleaning, Disposal, Packaging

N/A

13.1.4. Waste Avoidance & Recovery

N/A

## 14. TRANSPORT

| | |
|---|---|
| 14.1. Department of Transportation | NOT CLASSIFIED – NOT REGULATED |
| 14.1.1. UN Number | N/A |
| 14.1.2. Proper Shipping Name | N/A |
| 14.1.3. Transport Hazard Class | N/A |
| 14.1.4. Packaging Group | N/A |
| 14.1.5. Environmental Hazards | N/A |
| 14.2. TDG | |
| 14.2.1. UN Number | |
| 14.2.2. Proper Shipping Name | |



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14.2.3. Transport Hazard Class
14.2.4. Packaging Group
14.2.5. Environmental Hazards

14.3. NOM
14.3.1. UN Number
14.3.2. Property Shipping Name
14.3.3. Transport Hazard Class
14.3.4. Packaging Group
14.3.5. Environmental Hazards

14.4. IMDG
14.4.1. UN Number
14.4.2. Proper Shipping Name
14.4.3. Transport Hazard Class
14.4.4. Packaging Group
14.4.5. Environmental Hazards
14.4.6. Special Precautions

14.5. IATA
14.5.1. UN Number
14.5.2. Proper Shipping Name
14.5.3. Transport Hazard Class
14.5.4. Packaging Group
14.5.4.1. Passenger Aircraft Packing
14.5.4.2. Max
14.5.4.3. Cargo Aircraft Packaging
14.5.4.4. Max
14.5.5. Environmental Hazards
14.5.6. Special Precautions

## 15. REGULATORY

15.1. Notification Status
15.1.1. Inventory Info

| | |
|---|---|
| United States TSCA Inventory | Listed on Inventory |
| Japanese ENCS Inventory | Listed on Inventory |
| Korean ECL Inventory | Listed on Inventory |

15.2. Federal Regulations
15.2.1. US EPA EPCRA SARA Title III
15.2.1.1. SARA Hazard Designation Section 311/312 (40 CFR 370)

| | |
|---|---|
| Fire Hazard | No |
| Reactivity Hazard | No |
| Sudden Release of Pressure Hazard | No |
| Acute Health Hazard | No |
| Chronic Health Hazard | No |

15.2.1.2. Section 313 Toxic Chemicals (40 CFR 372.65)
N/A

15.2.1.3. Section 302 Emergency Planning- Hazardous Substance Threshold (40 CFR 355)
N/A

15.2.1.4. Section 302 Emergency Planning- Hazardous Substance Reporting (40 CFR 355)

| Ingredient | CAS No. | Quantity |
|---|---|---|

15.2.1.5. Section 304 Emergency Release Notification (40 CFR 355)



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| Ingredient | CAS No. | Quantity |
|---|---|---|

15.2.2. US EPA CERCLA Hazardous Substance & Reporting Quantities (40 CFR 302.4)

| Ingredient | CAS No. | Quantity |
|---|---|---|

15.3. State Regulations

15.3.1. US California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

15.3.1.1. This Product Contains a Chemical Known by the State to Cause Cancer

| Ingredient | CAS No. |
|---|---|
| Acrylamide | 79-06-1 |

15.3.1.2. This Product Contains a Chemical Known by the State to Cause Birth Defects

| Ingredient | CAS No. |
|---|---|
| Acrylamide | 79-06-1 |

## 16. OTHER

16.1. National Fire Protection Association Classification (NFPA)

| | |
|---|---|
| Health | 0 |
| Flammability | 1 |
| Instability/Reactivity | 0 |

16.2. Hazardous Materials Identification System Classification (HMIS)

| | |
|---|---|
| Health | 0 |
| Flammability | 0 |
| Reactivity | 0 |
| PPE | Determined by User- Consult Direct Supervisor |

16.3. Further Information

US GHS Evaluated Format

16.4. Abbreviations / Acronyms Used in This SDS

| | |
|---|---|
| Gov't | Government |
| SDS | Safety Data Sheet |
| ST | STEL- 15 Minute TWA Exposure, Not To Be Exceeded |
| STEL | Short Term Exposure Limit |
| TWA | 8 Hour, Time Weighted Average |
| ACGIH | American Conference of Gov't Industrial Hygienists |
| OSHA | Occupational Safety and Health Administration |
| NTP | National Toxicology Program |
| IARC | International Agency for Research on Cancer |
| NIOSH | National Institute for Occupational Safety and Health |

## 17. DISCLAIMER

The information provided in this Safety Data Sheet is correct to the best of ECM Supply, LLC knowledge, information and belief at the time and date of its publication. Such information is only given as a guidance to help users handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or intended to replace technical data sheets and product specifications and does not release the user from obligated regulation linked to its activity thereof. This information relates only to the product designated herein and does not relate to its use in conjunction and/or combination with other material(s) and/or other processes.

**Adipic Acid,**

## SECTION 1 : Identification of the substance/mixture and of the supplier

**Product name** : **Adipic Acid,**

**Manufacturer/Supplier Trade name**:

**Manufacturer/Supplier Article number**: **S25124**

**Recommended uses of the product and uses restrictions on use**:

**Manufacturer Details**:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

**Supplier Details**:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

**Emergency telephone number**:

Fisher Science Education Emergency Telephone No.: 800-535-5053

## SECTION 2 : Hazards identification

**Classification of the substance or mixture**:

**Corrosive**
Serious eye damage, category 1

Eye Damage. 1
Aquatic AcTox. 3

**Signal word** :Danger

**Hazard statements**:
Causes serious eye damage
Harmful to aquatic life
**Precautionary statements**:
If medical advice is needed, have product container or label at hand
Keep out of reach of children
Read label before use
Avoid release to the environment
Wear protective gloves/protective clothing/eye protection/face protection
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing
Immediately call a POISON CENTER or doctor/physician
Dispose of contents and container to an approved waste disposal plant

**Adipic Acid:**
Combustible dust.

**Other Non-GHS Classification**:

**WHMIS**
**NFPA/HMIS**

NFPA SCALE (0-4)

| | |
|---|---|
| Health | 2 |
| Flammability | 1 |
| Physical Hazard | 0 |
| Personal Protection | X |

HMIS RATINGS (0-4)

## SECTION 3 : Composition/information on ingredients

| Ingredients: | | |
|---|---|---|
| CAS 124-04-9 | Adipic Acid | 100 % |
| | | Percentages are by weight |

## SECTION 4 : First aid measures

**Description of first aid measures**

**After inhalation:** Loosen clothing as necessary and position individual in a comfortable position.Move exposed to fresh air. Give artificial respiration if necessary. If breathing is difficult give oxygen.Consult a physician.

**After skin contact:** Wash hands and exposed skin with soap and plenty of water. Remove contaminated clothing and shoes.Consult a physician.

**After eye contact:** Protect unexposed eye. Rinse or flush exposed eye gently using water for 15-20 minutes. Remove contact lenses while rinsing.Consult a physician.

**After swallowing:** Rinse mouth thoroughly. Do not induce vomiting. Seek medical attention if irritation, discomfort, or vomiting persists.Never give anything by mouth to an unconscious person.

**Most important symptoms and effects, both acute and delayed:**

Irritation.Headache.Nausea.Shortness of breath.;

**Indication of any immediate medical attention and special treatment needed:**

If seeking medical attention provide SDS document to physician. Physician should treat symptomatically.

## SECTION 5 : Firefighting measures

**Extinguishing media**

**Suitable extinguishing agents:** Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

**For safety reasons unsuitable extinguishing agents:**

**Special hazards arising from the substance or mixture:**

Thermal decomposition can lead to release of irritating gases and vapors.

**Advice for firefighters:**

**Protective equipment:** Wear protective eyeware, gloves, and clothing. Refer to Section 8.

**Additional information (precautions):** Avoid inhaling gases, fumes, dust, mist, vapor, and aerosols. Avoid contact with skin, eyes, and clothing.Avoid generating dust. Further processing of solid materials may result in the formation of combustible dusts.The potential for combustible dust formation should be taken into consideration before additional processing occurs.

## SECTION 6 : Accidental release measures

**Personal precautions, protective equipment and emergency procedures:**

Ensure adequate ventilation.Ensure that air-handling systems are operational.

**Environmental precautions:**

Should not be released into environment.Prevent from reaching drains, sewer, or waterway. Prevent further leakage or spillage if safe to do so.

**Methods and material for containment and cleaning up:**

Wear protective eyeware, gloves, and clothing. Refer to Section 8.Sweep up and containerize for disposal. Avoid generating dust. Always obey local regulations.If necessary use trained response staff or contractor. Evacuate personnel to safe areas. Pick up and arrange disposal without creating dust. Follow proper disposal methods. Refer to Section 13.Keep in suitable closed containers for disposal.

**Reference to other sections:**

## SECTION 7 : Handling and storage

**Precautions for safe handling:**

Follow good hygiene procedures when handling chemical materials. Refer to Section 8.Follow proper disposal methods. Refer to Section 13.Wash hands after handling. Avoid contact with skin and eyes. Do not eat, drink, smoke, or use personal products when handling chemical substances.Perform routine housekeeping to prevent dust generation.Containers of this material may be hazardous when empty.

**Conditions for safe storage, including any incompatibilities:**

Store in a cool location. Keep away from food and beverages.Protect from freezing and physical damage.Provide ventilation for containers. Keep container tightly sealed.Store away from incompatible materials.

## SECTION 8 : Exposure controls/personal protection

| | |
|---|---|
| **Control Parameters:** | 124-04-9 , Adipic Acid , ACGIH: 5 mg/m3 TWA |
| **Appropriate Engineering controls:** | Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above. |
| **Respiratory protection:** | Not required under normal conditions of use. Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls.When necessary use NIOSH approved breathing equipment. |
| **Protection of skin:** | Select glove material impermeable and resistant to the substance.Select glove material based on rates of diffusion and degradation. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.Use proper glove removal technique without touching outer surface. Avoid skin contact with used gloves.Wear protective clothing. |

**Eye protection:** Wear equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).Safety glasses or goggles are appropriate eye protection.

**General hygienic measures:** Wash hands before breaks and at the end of work. Avoid contact with skin, eyes, and clothing.Before wearing wash contaminated clothing.Perform routine housekeeping to prevent dust generation.Perform routine housekeeping to prevent dust generation.

## SECTION 9 : Physical and chemical properties

| | | | |
|---|---|---|---|
| **Appearance (physical state,color)**: | White solid | **Explosion limit lower**:<br>**Explosion limit upper**: | Non Explosive<br>Non Explosive |
| **Odor**: | Odorless | **Vapor pressure**: | 1 hPa (1 mmHg) at 159.5 °C; 0.097 hPa (0.073 mmHg) at 18.5 °C |
| **Odor threshold**: | Not Determined | **Vapor density**: | 5.04 (air=1) |
| **pH-value**: | 3.2 (0.1% solution) | **Relative density**: | Not Determined |
| **Melting/Freezing point**: | 151 - 154 °C | **Solubilities**: | Methanol - soluble. Ethanol - soluble. Acetone - soluble. Benzene - slightly soluble. Soluble in water : 2.0 g/100g @ 25°C |
| **Boiling point/Boiling range**: | 265 °C at 133 hPa (100 mmHg) | **Partition coefficient (n-octanol/water)**: | log Pow: 0.093 at 25 °C |
| **Flash point (closed cup)**: | 196 °C | **Auto/Self-ignition temperature**: | > 400 °C |
| **Evaporation rate**: | Not Determined | **Decomposition temperature**: | Not Determined |
| **Flammability (solid,gaseous)**: | May form combustible dust concentrations in air. | **Viscosity**: | a. Kinematic:Not Determined<br>b. Dynamic: Not Determined |
| **Density**: Not Determined | | | |

## SECTION 10 : Stability and reactivity

**Reactivity:**Nonreactive under normal conditions.
**Chemical stability:**Stable under normal conditions.
**Possible hazardous reactions:**None under normal processing.
**Conditions to avoid:**Incompatible materials.Dust generation.
**Incompatible materials:**Strong oxidizing agents.Strong reducing agents.Strong bases.
**Hazardous decomposition products:**Carbon monoxide.Carbon dioxide.

## SECTION 11 : Toxicological information

**Acute Toxicity**:

**Adipic Acid,**

| | | |
|---|---|---|
| **Oral**: | 124-04-9 | LD50 Oral - Rat - male and female - 5,560 mg/kg |
| **Inhalation**: | 124-04-9 | LC0 Inhalation - Rat - male and female - 4 h - > 7.7 mg/l |
| **Dermal**: | 124-04-9 | LD0 Dermal - Rabbit - male and female - 7,940 mg/kg |
| **Chronic Toxicity**: No additional information. | | |
| **Corrosion Irritation**: | | |
| **Dermal**: | 124-04-9 | Skin - Rabbit Result: Mild skin irritation - 24 h |
| **Ocular**: | 124-04-9 | Eyes - Rabbit Result: Risk of serious damage to eyes. - 24 h |
| **Sensitization**: | | No additional information. |
| **Single Target Organ (STOT)**: | | No additional information. |
| **Numerical Measures**: | | No additional information. |
| **Carcinogenicity**: | | No additional information. |
| **Mutagenicity**: | | No additional information. |
| **Reproductive Toxicity**: | | No additional information. |

## SECTION 12 : Ecological information

**Ecotoxicity**

**Toxicity to fish static test LC0 - Brachydanio rerio (zebrafish) - >= 1,000 mg/l - 96 h**: 124-04-9

**Toxicity to daphnia and other aquatic invertebrates Immobilization LC50 - Daphnia magna (Water flea) - 46 mg/l - 48 h**: 124-04-9

**Toxicity to algae static test EC50 - Pseudokirchneriella subcapitata (aglae) - 59 mg/l - 72 h**: 124-04-9

**Toxicity to bacteria Respiration inhibition EC50 - Sludge Treatment - 7,910 mg/l - 3 h**: 124-04-9

**Fish: Bluegill/Sunfish: LC50 = 97-330 mg/L; 24-96 Hr**: 124-04-9

**Persistence and degradability**: 124-04-9: Biodegradability aerobic - Exposure time 30 d Result: 83 % - Readily biodegradable
**Bioaccumulative potential**:
**Mobility in soil**:
**Other adverse effects**:

## SECTION 13 : Disposal considerations

**Waste disposal recommendations**:

Contact a licensed professional waste disposal service to dispose of this material.Dispose of empty containers as unused product.It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.Dilute with water and flush to sewer.

## SECTION 14 : Transport information

**UN-Number**

3077

**UN proper shipping name**

Environmentally hazardous substance, solid, n.o.s. (Adipic acid)

**Transport hazard class(es)**

**Class:**
9 Miscellaneous dangerous substances and articles

**Packing group**:III
**Environmental hazard**:
**Transport in bulk**:
**Special precautions for user**:

## SECTION 15 : Regulatory information

**United States (USA)**

**SARA Section 311/312 (Specific toxic chemical listings)**:

Acute

**SARA Section 313 (Specific toxic chemical listings)**:

None of the ingredients is listed

**RCRA (hazardous waste code)**:

None of the ingredients is listed

**TSCA (Toxic Substances Control Act)**:

All ingredients are listed.

**CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act)**:

124-04-9 Adipic Acid 5000 lbs

**Proposition 65 (California)**:

**Chemicals known to cause cancer**:

None of the ingredients is listed

**Chemicals known to cause reproductive toxicity for females**:

None of the ingredients is listed

**Chemicals known to cause reproductive toxicity for males**:

None of the ingredients is listed

**Chemicals known to cause developmental toxicity**:

None of the ingredients is listed

**Canada**

**Canadian Domestic Substances List (DSL)**:

All ingredients are listed.

**Canadian NPRI Ingredient Disclosure list (limit 0.1%)**:

None of the ingredients is listed

**Canadian NPRI Ingredient Disclosure list (limit 1%)**:

124-04-9 Adipic Acid

## SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

**GHS Full Text Phrases**:

**Abbreviations and acronyms**:
IMDG: International Maritime Code for Dangerous Goods
PNEC: Predicted No-Effect Concentration (REACH)
CFR: Code of Federal Regulations (USA)
SARA: Superfund Amendments and Reauthorization Act (USA)
RCRA: Resource Conservation and Recovery Act (USA)
TSCA: Toxic Substances Control Act (USA)
NPRI: National Pollutant Release Inventory (Canada)
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)

**Effective date** : 01.20.2015
**Last updated** : 03.19.2015

ECM SUPPLY
ENGINEERS · CHEMICALS · MUD

# ECM FLOC A-3342

## SAFETY DATA SHEET

1. **IDENTIFICATION**
   1.1. Product Identification
      1.1.1. Trade Name — **ECM FLOC A-3342**
      1.1.2. Trade Item Codes & U/M — 11245. (55 LB BAG)
   1.2. Relevant Uses
      1.2.1. Drilling Mud Additive
   1.3. Details of Supplier
      1.3.1. Company

| | |
|---|---|
| ECM Supply LLC | 724-206-9321 Main |
| 55 Hickory Street Ste. 201 | 724-249-2192 Fax |
| Washington, PA 15301 | ecmsupply.com |
| SDS Created Date: | 05/01/2015 |
| SDS Last Revised: | 00/00/0000 |

   1.4. Emergency Contact
      1.4.1. **CHEMTREC** — **800-424-9300**

2. **HAZARDS IDENTIFICATION**
   2.1. OSHA Disclaimer
      2.1.1. This document may include information on environmental effect even though OSHA has NOT adopted the environmental portion of the GHS regulations.
   2.2. Classification of substance/mixture
      HCS 2012 (29 CFR 1910.1200)
      Product is not hazardous under US GHS.
   2.3. Label Elements
      HCS 2012 (29 CFR 1910.1200)

| | |
|---|---|
| Pictogram | Product is not hazardous under US GHS. |
| Signal Word: | Warning |
| Hazard Statements: | N/A |
| Precautionary Statement | N/A |
| Response: | N/A |
| Storage: | N/A |
| Disposal: | N/A |

   2.4. Other Hazards – NOT Classified — Skin; Repeated or prolonged exposure may cause: May cause slight irritation.
   Eyes; Dust contact with the eyes can lead to mechanical irritation.
   Spills are very slippery when wet.
   Ingestion; Essentially non-toxic.
   Chronic exposure; No known carcinogenic or other chronic effects.

3. **COMPOSITION & INFORMATION (INGREDIENTS)**

3.1. Substance

Chemical Nature: N/A

3.2. Mixture

Chemical Nature: Anionic polyacrylamide

3.3. Ingredients & Impurities

| Chemical Name | CAS No. | Concentration % |
|---|---|---|
| Anionic polyacrylamide. | | |

## 4. FIRST AID

4.1. General Advice

Show SDS to Doctor.
First Responder Needs Protection.
Place Affected Apparel in a Sealed Bag for Subsequent Decontamination.

4.2. Inhalation

No hazards which require special first aid measures. Remove to fresh air.

4.3. Skin Contact

Wash off with soap and water.

4.4. Eye Contact

Rinse thoroughly with plenty of water, also under the eyelids. If possible use lukewarm water.
Consult a Doctor- If Necessary.

4.5. Ingestion

Rinse mouth with water. Call a physician if symptoms occur. Do NOT induce vomiting.
Never give anything by mouth to an unconscious person.

4.6. Symptoms & Effects – Acute & Delayed

| | | |
|---|---|---|
| Symptoms: | Acute: | N/A |
| | Delayed: | N/A |
| Effects: | Acute: | N/A |
| | Delayed: | N/A |

4.7. Indication of Medical Attention & Special Treatment Needed

Physician: Treat Based on Observed Signs & Symptoms.

## 5. FIREFIGHTING

5.1. Flashpoint N/A Class: N/A

5.2. Autoignition Temperature N/A

5.3. Extinguishing Media

5.3.1. Suitable Extinguishing Media Water spray, Dry chemical and Carbon dioxide (CO2)

5.3.2. Unsuitable Extinguishing Media N/A

5.4. Special Hazards

5.4.1. Specific Hazards

Under Fire Conditions: Dust may form explosive mixture in air.

5.4.2. Hazardous Combustion Products

Hazardous Decomposition: N/A

5.5. Advice for Firefighters

5.5.1. Special PPE Gloves, Googles, Clothing. NIOSH/MSHA Approved SCBA.

5.5.2. Specific Fire Fighting Methods Collect Contaminated Water- No Drains.

## 6. ACCIDENTAL RELEASE

6.1. Personal Precautions, PPE & Emergency Procedures

Avoid Contact w/ Skin and Eyes.
Wear Suitable PPE - See Section 8.



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6.2. Environmental Precautions

Should not be released into the environment.

6.2.1. Decontamination & Cleaning

Product becomes slippery when it is wet. Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water. Prevent product from entering drains.

6.2.2. Disposal

Dispose of in Accordance w/ Local Regulations.

6.2.3. Additional Advice

Material Can Create Slippery Conditions.

6.3. Reference to Other Section

No Data Available

## 7. STORAGE & HANDLING

7.1. Precautions For Safe Handling

Avoid dust formation during handling. Handle in accordance with good industrial hygiene and safety practice. The product is hygroscopic. Protect from moisture.

7.1.1. Hygiene Measures

Personal Hygiene Is An Important Work Practice Exposure Control Measure:

Do Not Store, Use and/or Consume Foods, Beverages, Tobacco Products, or Cosmetics in Areas Where This Material Is Stored.

Wash Hands and Face Carefully Before Eating, Drinking, Using Tobacco, Applying Cosmetics, or Using the Toilet.

Wash Exposed Skin Promptly to Remove Accidental Splashes or Contact w/ Material.

7.2. Conditions for Safe Storage, Including any Incompatibilities.

7.2.1. Technical Measures & Storage Conditions

Store in original container. Materials to avoid: Strong oxidizing agents

7.2.2. Requirements for Storage Rooms & Vessels

Recommended Storage Temp: 40 - 90 °F

7.3. Specific End Use(s)

No Data Available

## 8. EXPOSURE CONTROLS & PPE

8.1. Control Parameters

These Recommendations Provide General Guidance For Handling This Product. Because Specific Work Environments and Material Handling Practices Vary, Safety Procedures Should Be Developed for Each Intended Application. Assistance with Selection, Use and Maintenance of Worker Protection Equipment Is Generally Available From Equipment Manufacturers.

8.1.1. Components w/ Workplace Occupational Exposure Limits

| Ingredients | Type | Value | Basis |
|---|---|---|---|

Contains no substances with occupational exposure limit values.

8.2. Exposure Controls

8.2.1. Control Measures

8.2.1.1. Engineering Measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes and clothing. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation. Ensure adequate ventilation.

8.2.2. Individual Protection Measures

8.2.2.1. Respiratory Protection

When there is potential for airborne exposures in excess of applicable limits, wear NIOSH/MSHA



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approved respiratory protection

8.2.2.2. Hand Protection

Glove material: Impervious gloves, Avoid contact with skin.Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

8.2.2.3. Eye Protection

Safety goggles

8.2.2.4. Skin & Body Protection

Protective clothing.

8.2.2.5. Hygiene Measures

Do Not Store, Use and/or Consume Foods, Beverages, Tobacco Products or Cosmetics in Areas Where This Material is Stored.

Wash Hands and Face Carefully Before Eating, Drinking, Using Tobacco, Applying Cosmetics, or Using the Toilet.

Wash Exposed Skin Promptly.

8.2.2.6. Protective Measures

Ensure Eyewash and Safety Showers Are Near.

PPE Shall be In Accordance w/ Local Standards and In Cooperation w/ Supplier of the PPE.

PPE Selected Should Be Based on Evaluation of the Performance of the Task(s).

## 9. PHYSICAL & CHEMICAL PROPERTIES

### 9.1. Basic Physical & Chemical Properties

| | |
|---|---|
| Appearance | solid, granular, off-white |
| Autoignition Temperature | Not applicable |
| Boil Point | Not applicable |
| Density | 7.09 |
| Evaporation Rate | Not applicable |
| Explosive Properties | No data available |
| Flammability | Not applicable |
| Flash Point | Not applicable |
| Freezing Point | N/A |
| Odor | none |
| Odor Threshold | Not applicable |
| Oxidizing Properties | The substance or mixture is not classified as oxidizing. |
| Partition Coefficient | N/A |
| pH | 7 - 9 ( 0.5 %) (as aqueous solution) |
| Solubility | Limited by viscosity. |
| Thermal Decomposition | 392 °F |
| Vapor Density | Not applicable |
| Vapor Pressure | Not applicable |
| Viscosity | N/A |

### 9.2. Other Information

| | |
|---|---|
| Volatiles by Volume | N/A |

## 10. STABILITY & REACTIVITY

### 10.1. Reactivity

N/A

### 10.2. Chemical Stability

N/A

10.3. Possible Hazardous Reactions

Hazardous polymerisation does not occur.

10.4. Conditions to Avoid

Material is stable under normal conditions.

10.5. Incompatible Materials

Strong oxidizing agents

10.6. Hazardous Decomposition Products

Ammonia, Carbon oxides (COx), Nitrogen oxides (NOx) Thermal decomposition: 392 °F

## 11. TOXICOLOGICAL REPORT

11.1. Effects

| | |
|---|---|
| 11.1.1. Acute | |
| Acute Oral | Conclusion: The acute toxicological results displayed may not be the results of actual testing of this material but based on a similar tested material.<br><br />/>Remarks: estimated<br>/Rat/2,500 mg/kg/LD50 |
| Acute Inhalation | LC50/Rat/4 h/> 20 mg/lRemarks: estimated |
| Acute Dermal | LD50/Rabbit/> /10,000 mg/kg |
| Acute Other | N/A |
| 11.1.2. Skin Corrosion & Irritation | |
| Skin Irritation | No skin irritation |
| 11.1.3. Eye Damage & Irritation | |
| Eye Irritation | No eye irritation |
| 11.1.4. Respiratory or Skin Sensitization | |
| Sensitization | Not sensitizing. |
| 11.1.5. Mutagenicity | |
| Genotoxicity in Vitro | N/A |
| Genotoxicity in Vibo | N/A |
| 11.1.6. Carcinogenicity | Based on available data, the classification criteria are not met. |
| 11.1.7. Toxicity for Reproduction & Development | |
| Fertility | N/A |
| Teratogenicity | N/A |
| 11.1.8. Specific Target Organ Toxicant | |
| Single Exposure | N/A |
| Repeated Exposure | N/A |
| 11.1.9. Neurological | N/A |
| 11.1.10. CMR | N/A |
| 11.1.11. Aspiration | N/A |

## 12. ECOLOGICAL REPORT

12.1. Toxicity

12.1.1. Aquatic Compartment

Remarks: Ecotoxicological information provided is based on a structurally or compositionally similar product.

LC50/96 h/Lepomis macrochirus (bluegill sunfish)/Acute toxicity/OECD Test Guideline 203: > 100 mg/l

Remarks: fresh water



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LC50/96 h/Oncorhynchus mykiss (rainbow trout)/Acute toxicity/OECD Test Guideline 203: > 100 mg/l
Remarks: fresh water
Remarks: Ecotoxicological information provided is based on a structurally or compositionally similar product.
EC50/48 h/Daphnia magna (Water flea)/Immobilization/OECD Test Guideline 202: > 100 mg/l
EC50/10 d/Corophium volutator (amphipoda)/Immobilization/OECD Test Guideline 202: 1,415 mg/l
EC50/48 h/Acartia tonsa (copepod)/Immobilization/OECD Test Guideline 202: 342 mg/l
Remarks: Ecotoxicological information provided is based on a structurally or compositionally similar product.
IC50/72 h/Green algae (Selenastrum capricornutum)/OECD Test Guideline 201: > 100 mg/l
IC50/72 h/Skeletonema costatum (diatom)/Growth inhibition/OECD Test Guideline 201: 2,276 mg/l

12.2. Persistence & Degradability

12.2.1. Biodegradation

Biodegradability

Remarks: Ecotoxicological information provided is based on a structurally or compositionally similar product.

Not readily biodegradable.

Ready biodegradability/OECD Test Guideline 301 D/28 d: < 10 %

Biodegradability in Seawater/OECD Test Guideline 306/28 d: 1.7

12.3. Bioaccumulative Potential

12.3.1. Bioconcentration Factor (BCF)

Bioaccumulation is unlikely. Because of the high molecular weight of the polymer diffusion through biological membranes is very small.
Partition coefficient: n-octanol/water: Not applicable

12.4. Mobility in Soil

Water solubility: Limited by viscosity.
Surface tension: Not applicable

12.5. PBT & vPvB Assessment Report

N/A

12.6. Other Adverse Effects

None known.

12.7. Ecotoxicity Assessment

12.7.1. Acute

N/A

12.7.2. Chronic

N/A

## 13. DISPOSAL

13.1. Waste Treatment Methods

13.1.1. Disposal

Altering or Alterations of this Material May Make the Waste Management Information Presented in this SDS Incomplete, Inaccurate or Otherwise Inappropriate. Please be Advised to all Federal, State and Local Regulation for Waste Disposal.

13.1.2. Waste Code

N/A

13.1.3. Advice- Cleaning, Disposal, Packaging

Recycling, recovery and reuse of materials is recommended if permitted by regulations.If recycling is not practicable, dispose of in compliance with local regulations.EPA Hazardous Waste – NO
Packages must be disposed of according to local and national regulations.

13.1.4. Waste Avoidance & Recovery

N/A



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## 14. TRANSPORT

14.1. Department of Transportation

| | |
|---|---|
| 14.1.1. UN Number | Not classified as dangerous |
| 14.1.2. Proper Shipping Name | N/A |
| 14.1.3. Transport Hazard Class | N/A |
| 14.1.4. Packaging Group | N/A |
| 14.1.5. Environmental Hazards | N/A |

14.2. TDG

| | |
|---|---|
| 14.2.1. UN Number | Not classified as dangerous |
| 14.2.2. Proper Shipping Name | |
| 14.2.3. Transport Hazard Class | |
| 14.2.4. Packaging Group | |
| 14.2.5. Environmental Hazards | |

14.3. NOM

| | |
|---|---|
| 14.3.1. UN Number | Not classified as dangerous |
| 14.3.2. Property Shipping Name | |
| 14.3.3. Transport Hazard Class | |
| 14.3.4. Packaging Group | |
| 14.3.5. Environmental Hazards | |

14.4. IMDG

| | |
|---|---|
| 14.4.1. UN Number | Not classified as dangerous |
| 14.4.2. Proper Shipping Name | |
| 14.4.3. Transport Hazard Class | |
| 14.4.4. Packaging Group | |
| 14.4.5. Environmental Hazards | |
| 14.4.6. Special Precautions | |

14.5. IATA

| | |
|---|---|
| 14.5.1. UN Number | Not classified as dangerous |
| 14.5.2. Proper Shipping Name | |
| 14.5.3. Transport Hazard Class | |
| 14.5.4. Packaging Group | |
| 14.5.4.1. Passenger Aircraft Packing | |
| 14.5.4.2. Max | |
| 14.5.4.3. Cargo Aircraft Packaging | |
| 14.5.4.4. Max | |
| 14.5.5. Environmental Hazards | |
| 14.5.6. Special Precautions | |

## 15. REGULATORY

15.1. Notification Status

15.1.1. Inventory Info

| | |
|---|---|
| United States TSCA Inventory | Listed on Inventory |

15.2. Federal Regulations

15.2.1. US EPA EPCRA SARA Title III

15.2.1.1. SARA Hazard Designation Section 311/312 (40 CFR 370)

| | |
|---|---|
| Fire Hazard | No |
| Reactivity Hazard | No |
| Sudden Release of Pressure Hazard | No |
| Acute Health Hazard | No |



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Chronic Health Hazard No

15.2.1.2. Section 313 Toxic Chemicals (40 CFR 372.65)

None Present ()

15.2.1.3. Section 302 Emergency Planning- Hazardous Substance Threshold (40 CFR 355)

None Present ()

15.2.1.4. Section 302 Emergency Planning- Hazardous Substance Reporting (40 CFR 355)

| Ingredient | CAS No. | Quantity |
|---|---|---|
| None Present () | | |

15.2.1.5. Section 304 Emergency Release Notification (40 CFR 355)

| Ingredient | CAS No. | Quantity |
|---|---|---|

15.2.2. US EPA CERCLA Hazardous Substance & Reporting Quantities (40 CFR 302.4)

| Ingredient | CAS No. | Quantity |
|---|---|---|

15.3. State Regulations

15.3.1. US California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

15.3.1.1. This Product Contains a Chemical Known by the State to Cause Cancer

| Ingredient | CAS No. |
|---|---|
| Acrylamide | 79-06-1 |

15.3.1.2. This Product Contains a Chemical Known by the State to Cause Birth Defects

| Ingredient | CAS No. |
|---|---|
| Acrylamide | 79-06-1 |

Remarks: This product contains a chemical or chemicals known to the state of California to cause cancer, birth defects or other reproduction harm.

## 16. OTHER

16.1. National Fire Protection Association Classification (NFPA)

| | |
|---|---|
| Health | 0 |
| Flammability | 1 |
| Instability/Reactivity | 0 |

16.2. Hazardous Materials Identification System Classification (HMIS)

| | |
|---|---|
| Health | 0 |
| Flammability | 1 |
| Reactivity | 0 |
| PPE | Determined by User- Consult Direct Supervisor |

16.3. Further Information

US GHS Evaluated Format

16.4. Abbreviations / Acronyms Used in This SDS

| | |
|---|---|
| Gov't | Government |
| SDS | Safety Data Sheet |
| ST | STEL- 15 Minute TWA Exposure, Not To Be Exceeded |
| STEL | Short Term Exposure Limit |
| TWA | 8 Hour, Time Weighted Average |
| ACGIH | American Conference of Gov't Industrial Hygienists |
| OSHA | Occupational Safety and Health Administration |
| NTP | National Toxicology Program |
| IARC | International Agency for Research on Cancer |
| NIOSH | National Institute for Occupational Safety and Health |

17. **DISCLAIMER**

The information provided in this Safety Data Sheet is correct to the best of ECM Supply, LLC knowledge, information and belief at the time and date of its publication. Such information is only given as a guidance to help users handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or intended to replace technical data sheets and product specifications and does not release the user from obligated regulation linked to its activity thereof. This information relates only to the product designated herein and does not relate to its use in conjunction and/or combination with other material(s) and/or other processes.

# NO-TOX2®

Safety Data Sheet

Prepared according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date: 06/15/2015 Supersedes: 10/01/2014 Version: 1.0

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

Trade name : NO-TOX2®

Product name : PROPYLENE GLYCOL/ALCOHOL

Product form : Mixture

Product code : NA1993

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : De-icant for compressed airlines. Not for human or animal consumption.

### 1.3. Details of the supplier of the safety data sheet

Tanner Systems, Inc
625 - 19th Avenue N.E
P.O. Box 488
St. Joseph, MN 56374, U.S.A.
Telephone: FACTORY, 800-461-6454
Email: info@tannersystems.com
Website: www.tannersystems.com

### 1.4. Emergency telephone number

Emergency number : CHEMTREC, 800-424-9300 (24 Hours)

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

**GHS-US classification**

Flam. Liq. 4 H227
Eye Irrit. 2B H320

### 2.2. Label elements

**GHS-US labelling**

Signal word (GHS-US) : **Warning**

Hazard statements (GHS-US) : H227 - Combustible liquid
H320 - Causes eye irritation

Precautionary statements (GHS-US) : P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking
P264 - Wash hands, forearms and face thoroughly after handling
P280 - Wear eye protection, protective gloves, protective clothing
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337+P313 - If eye irritation persists: Get medical advice/attention
P370+P378 - In case of fire: Use dry extinguishing powder, carbon dioxide (CO2) to extinguish
P403+P235 - Store in a well-ventilated place. Keep cool
P501 - Dispose of contents/container to a licensed hazardous-waste disposal contractor or collection site except for empty clean containers which can be disposed of as non-hazardous waste

### 2.3. Other hazards

Other hazards not contributing to the classification : None under normal conditions.

### 2.4. Unknown acute toxicity (GHS US)

No data available

## SECTION 3: Composition/information on ingredients

### 3.1. Substance

Not applicable

### 3.2. Mixture

| Name | Product identifier | % |
|---|---|---|
| 1,2-Propylene glycol | (CAS No) 57-55-6 | 40 - 70 |
| Ethyl alcohol | (CAS No) 64-17-5 | 1 - 5 |
| 2-Amino-2-methyl-1-propanol | (CAS No) 124-68-5 | 0.5 - 1.5 |
| Boric acid (H3BO3), compound with 2-aminoethanol | (CAS No) 26038-87-9 | 0.1 - 1 |



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| Name | Product identifier | % |
|---|---|---|
| Boric acid (H3BO3), compound with 1-amino-2-propanol | (CAS No) 26038-90-4 | 0.1 - 1 |

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if breathing is affected. If breathing is difficult, supply oxygen.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and thoroughly wash all exposed skin with mild soap water. If irritation develops or persists, seek medical attention.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of water. Remove contact lenses if present and easy to do so. If pain, blinking, or irritation develops or persists, seek medical attention. Continue rinsing.

First-aid measures after ingestion : IF SWALLOWED: rinse mouth thoroughly. Do not induce vomiting without advice from poison control center or medical professional. Get medical attention if you feel unwell.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Causes eye irritation.

Symptoms/injuries after inhalation : May cause respiratory irritation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Causes eye irritation.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

### 4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Dry chemical. Carbon dioxide.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : Combustible liquid.

Explosion hazard : Under fire conditions closed containers may rupture or explode.

Reactivity : No dangerous reactions known under normal conditions of use.

### 5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Do not dispose of fire-fighting water in the environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Evacuate area. Ventilate area. Keep upwind. Stop leak. No flames, no sparks. Eliminate all sources of ignition. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

#### 6.1.1. For non-emergency personnel

Protective equipment : Wear Protective equipment as described in Section 8.

Emergency procedures : Evacuate unnecessary personnel.

#### 6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves and eye or face protection. Approved supplied-air respirator, in case of emergency.

### 6.2. Environmental precautions

Prevent entry to sewers and public waters. Avoid release to the environment. Notify authorities if liquid enters sewers or public waters.

### 6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Small quantities of liquid spill: take up in non-combustible absorbent material and shovel into container for disposal. Prevent entry to sewers and public waters.

Methods for cleaning up : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Place in a suitable container for disposal in accordance with the waste regulations (see Section 13). Exclude sources of ignition and ventilate the area.



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### 6.4. Reference to other sections

No additional information available

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Avoid contact with skin, eyes and clothing. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not breathe vapours. Use only in well-ventilated areas. Ensure proper electrical grounding procedures are in place. When opening drum give bung no more than one (1) turn and stop. Allow pressure to vent before proceeding.

### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep container closed when not in use. Store in a dry, cool and well-ventilated place. Keep away from ignition sources. Use only D.O.T. approved containers.

### 7.3. Specific end use(s)

No additional information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

| **1,2-Propylene glycol (57-55-6)** | |
|---|---|
| Remark (ACGIH) | OELs not established |
| Remark (OSHA) | OELs not established |

| **Ethyl alcohol (64-17-5)** | |
|---|---|
| ACGIH STEL (ppm) | 1000 ppm |
| OSHA PEL (TWA) (mg/m³) | 1900 mg/m³ |
| OSHA PEL (TWA) (ppm) | 1000 ppm |

| **2-Amino-2-methyl-1-propanol (124-68-5)** | |
|---|---|
| Remark (ACGIH) | OELs not established |
| Remark (OSHA) | OELs not established |

| **Boric acid (H3BO3), compound with 2-aminoethanol (26038-87-9)** | |
|---|---|
| Remark (ACGIH) | OELs not established |
| Remark (OSHA) | OELs not established |

| **Boric acid (H3BO3), compound with 1-amino-2-propanol (26038-90-4)** | |
|---|---|
| Remark (ACGIH) | OELs not established |
| Remark (OSHA) | OELs not established |

### 8.2. Exposure controls

Appropriate engineering controls : Provide ventilation designed for combustible atmospheres. Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof equipment with flammable materials. Ensure adequate ventilation, especially in confined areas.

Personal protective equipment : Gloves. Protective goggles.

Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suggested glove materials are: Neoprene, Nitrile/butadiene rubber, Polyethylene, Ethyl vinyl alcohol laminate, PVC or vinyl. Suitable gloves for this specific application can be recommended by the glove supplier.

Eye protection : Wear eye protection, including chemical splash goggles and a face shield when possibility exists for eye contact due to spraying liquid or airborne particles.

Skin and body protection : Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.

Respiratory protection : Use NIOSH-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment.



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## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

| | |
|---|---|
| Physical state | : Liquid |
| Color | : Pink. |
| Odor | : Slight alcohol. |
| Odor Threshold | : No data available |
| pH | : No data available |
| Relative evaporation rate (butylacetate=1) | : No data available |
| Melting point | : No data available |
| Freezing point | : No data available |
| Boiling point | : 75 °C (167°F) |
| Flash point | : 64.9 °C (150°F) [Method: TCC] |
| Auto-ignition temperature | : No data available |
| Decomposition temperature | : No data available |
| Flammability (solid, gas) | : No data available |
| Vapour pressure | : No data available |
| Relative vapour density at 20 °C | : No data available |
| Relative density @ 20°C (69°F) | : 1.02 |
| Density | : No data available |
| Solubility in water | : 100 % |
| Log Pow | : No data available |
| Log Kow | : No data available |
| Viscosity, kinematic | : No data available |
| Viscosity, dynamic | : No data available |
| Explosive properties | : No data available |
| Oxidising properties | : No data available |
| Explosive limits | : No data available |

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No dangerous reactions known under normal conditions of use.

### 10.2. Chemical stability

Stable under recommended handling and storage conditions (see section 7).

### 10.3. Possibility of hazardous reactions

None known.

### 10.4. Conditions to avoid

Sparks. Heat. Open flame. Ignition sources.

### 10.5. Incompatible materials

Oxidizing agents.

### 10.6. Hazardous decomposition products

Carbon dioxide. Carbon monoxide.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Not classified

| **1,2-Propylene glycol (57-55-6)** | |
|---|---|
| LD50 oral rat | 20000 mg/kg |
| LD50 dermal rabbit | 20800 mg/kg |
| ATE CLP (oral) | 20000.000 mg/kg bodyweight |
| ATE CLP (dermal) | 20800.000 mg/kg bodyweight |



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| Ethyl alcohol (64-17-5) | |
|---|---|
| LC50 inhalation rat (mg/l) | 124.7 mg/l/4h |

| 2-Amino-2-methyl-1-propanol (124-68-5) | |
|---|---|
| LD50 oral rat | 2900 mg/kg |
| LD50 dermal rabbit | > 2000 mg/kg |

Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Causes eye irritation.
Respiratory or skin sensitisation : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified

| Ethyl alcohol (64-17-5) | |
|---|---|
| IARC group | 1 - Carcinogenic to humans |

Reproductive toxicity : Not classified
Specific target organ toxicity (single exposure) : Not classified
Specific target organ toxicity (repeated exposure) : Not classified
Aspiration hazard : Not classified
Symptoms/injuries after inhalation : May cause respiratory irritation.
Symptoms/injuries after skin contact : May cause skin irritation.
Symptoms/injuries after eye contact : Causes eye irritation.
Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general : No information available.

| 2-Amino-2-methyl-1-propanol (124-68-5) | |
|---|---|
| LC50 fishes 1 | 190 mg/l 96 hr Lepomis macrochirus |
| EC50 Daphnia 1 | 193 mg/l 48 hr Daphnia magna |
| ErC50 (algae) | 520 mg/l 72 hr Desmodesmus subspicatus |

### 12.2. Persistence and degradability

No additional information available

### 12.3. Bioaccumulative potential

No additional information available

### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

No additional information available

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Waste treatment methods : Do not discharge to public wastewater systems without permit of pollution control authorities. No discharge to surface waters is allowed without an NPDES permit.

Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations. Refer to current EPA regulations. Do not allow the product to be released into the environment.

## SECTION 14: Transport information

Ground (US DOT) : NA1993 Combustible liquid, n.o.s., 3, III
Water (IMDG) : NA1993 Combustible liquid, n.o.s., 3, III
Air (IATA) : NA1993 Combustible liquid, n.o.s., 3, III



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**14.3 Additional Information**

Other information : No supplementary information available.

**Overland Transport**

No additional information available

**Transport by sea**

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.

**Air transport**

Not classified for transport by air

## SECTION 15: Regulatory information

**15.1. US Federal regulations**

| **NO-TOX2®** | |
|---|---|
| All chemical substances in this product are listed in the EPA (Environment Protection Agency) TSCA (Toxic Substances Control Act) Inventory | |

| **Methyl alcohol** | **CAS #: 67-56-1** |
|---|---|
| Listed on the United States TSCA (Toxic Substances Control Act) inventory | |
| Section 302 (EHS) TPQ | lb |
| Section 304 EHS RQ | lb |
| CERCLA RQ | 5000 lb |
| Section 313 | Listed on US SARA Section 313 |

| **C.I. Food Red 15** | **CAS #: 81-88-9** |
|---|---|
| Listed on the United States TSCA (Toxic Substances Control Act) inventory | |
| Section 302 (EHS) TPQ | lb |
| Section 304 EHS RQ | lb |
| CERCLA RQ | lb |
| Section 313 | Listed on US SARA Section 313 |

**15.2. International regulations**

**CANADA**

| **NO-TOX2®** | | |
|---|---|---|
| Contains a substance not specified on the DSL (Domestic Substances List) or NDSL (Non-Domestic Substances List): 2-(methylamino)-2-methyl-propanol (27646-80-6) at < 0.1% | | |
| 2-(methylamino)-2-methyl-propanol | CAS#: 27646-80-6 | < 0.1% |

**15.3. US State regulations**

**California Proposition 65**

This product contains, or may contain, trace quantities of a substance(s) known to the state of California to cause cancer and/or reproductive toxicity

| **Ethyl alcohol (64-17-5)** | | | | |
|---|---|---|---|---|
| U.S. - California - Proposition 65 - Carcinogens List | U.S. - California - Proposition 65 - Developmental Toxicity | U.S. - California - Proposition 65 - Reproductive Toxicity - Female | U.S. - California - Proposition 65 - Reproductive Toxicity - Male | No significance risk level (NSRL) |
| No | Yes | No | No | |

| **Methyl alcohol (67-56-1)** | | | | |
|---|---|---|---|---|
| U.S. - California - Proposition 65 - Carcinogens List | U.S. - California - Proposition 65 - Developmental Toxicity | U.S. - California - Proposition 65 - Reproductive Toxicity - Female | U.S. - California - Proposition 65 - Reproductive Toxicity - Male | No significance risk level (NSRL) |
| No | Yes | No | No | |

| **C.I. Food Red 15 (81-88-9)** | | | | |
|---|---|---|---|---|
| U.S. - California - Proposition 65 - Carcinogens List | U.S. - California - Proposition 65 - Developmental Toxicity | U.S. - California - Proposition 65 - Reproductive Toxicity - Female | U.S. - California - Proposition 65 - Reproductive Toxicity - Male | No significance risk level (NSRL) |
| Yes | No | No | No | |



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| **1,2-Propylene glycol (57-55-6)** |
|---|
| U.S. - New Jersey - Right to Know Hazardous Substance List<br>U.S. - Pennsylvania - RTK (Right to Know) List |

| **Ethyl alcohol (64-17-5)** |
|---|
| U.S. - Massachusetts - Right To Know List<br>U.S. - New Jersey - Right to Know Hazardous Substance List<br>U.S. - Pennsylvania - RTK (Right to Know) List |

| **Methyl alcohol (67-56-1)** |
|---|
| U.S. - Massachusetts - Right To Know List<br>U.S. - New Jersey - Right to Know Hazardous Substance List<br>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List |

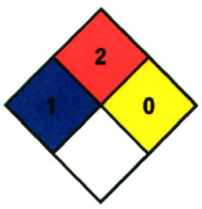
| **2-Amino-2-methyl-1-propanol (124-68-5)** |
|---|
| U.S. - Massachusetts - Right To Know List<br>U.S. - New Jersey - Right to Know Hazardous Substance List<br>U.S. - Pennsylvania - RTK (Right to Know) List |

| **C.I. Food Red 15 (81-88-9)** |
|---|
| U.S. - Massachusetts - Right To Know List<br>U.S. - New Jersey - Right to Know Hazardous Substance List<br>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List |

## SECTION 16: Other information

| | |
|---|---|
| Indication of changes | : Revision 1.0: New SDS Created. |
| Revision date | : 06/15/2015 |
| Other information | : Author: NMR. |

| | |
|---|---|
| NFPA health hazard | : 1 - Exposure could cause irritation but only minor residual injury even if no treatment is given. |
| NFPA fire hazard | : 2 - Must be moderately heated or exposed to relatively high temperature before ignition can occur. |
| NFPA reactivity | : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water. |




**HMIS III Rating**

| | |
|---|---|
| Health | : 1 |
| Flammability | : 2 |
| Physical | : 0 |
| Personal Protection | : |

The above information is believed to be accurate and represents the best information currently available to us. Users should make their own investigations to determine the suitability of the information for their particular purposes. This document is intended as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Tanner Systems, Inc makes no representations or warranties, either express or implied, including without limitation any warranties of merchantability, fitness for a particular purpose with the respect to the information set forth herein or the product to which the information refers. Accordingly, Tanner Systems, Inc will not be responsible for damages resulting from use of or reliance upon this information.



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# METHANOL FOR HPLC
# MSDS CAS: 000067-56-1

**00199**

## 1. Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

**Trade name** : METHANOL FOR HPLC
**Product code** : 00199
**Identification of the product** : Methanol
CAS No :67-56-1
EC No :200-659-6
Annex No :603-001-00-X
**Chemical formula** : CH4O

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

**Use** : Industrial. For professional use only.

### 1.3. Details of the supplier of the safety data sheet

**Company identification** : LOBA CHEMIE PVT.LTD.
107 Wode House Road, Jehangir Villa, Colaba
400005 Mumbai INDIA
Contact: +91 22 6663 6663 / Fax +91 22 6663 6699 / info@lobachemie.com
Safety Officer: + 91 98213 31336 / + 91 98214 86040 / safety@lobachemie.com

### 1.4. Emergency telephone number

**Phone nr** : + 91 22 6663 6663 (9:00am - 6:00 pm) [ Office hours ]

## 2. Hazards identification -DSD

### 2.1. Classification of the substance or mixture

**Classification EC 67/548 or EC 1999/45**

**Classification** : F; R11
T; R23/24/25-R39/23/24/25

**Hazard Class and Category Code(s), Regulation (EC) No 1272/2008 (CLP)**

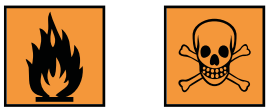
**Health hazards** : Specific Target Organ Toxicity - Single exposure - Category 1 - Danger (CLP : STOT SE 1) H370
Acute toxicity, Inhalation - Category 3 - Danger (CLP : Acute Tox. 3) H331
Acute toxicity, Oral - Category 3 - Danger (CLP : Acute Tox. 3) H301
Acute toxicity, dermal - Category 3 - Danger (CLP : Acute Tox. 3) H311
**Physical hazards** : Flammable liquids - Category 2 - Danger (CLP : Flam. Liq. 2) H225

## 2. Hazards identification -DSD (continued)

### 2.2. Label elements

**Labelling EC 67/548 or EC 1999/45**

**Symbol(s)**



**Symbol(s)** : F : Highly flammable
T : Toxic

**R Phrase(s)** : R11 : Highly flammable.
R23/24/25 : Toxic by inhalation, in contact with skin and if swallowed.
R39/23/24/25 : Toxic : danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.

**S Phrase(s)** : S1/2 : Keep locked up and out of reach of children.
S7 : Keep container tightly closed.
S16 : Keep away from sources of ignition - No smoking.
S36/37 : Wear suitable protective clothing and gloves.
S45 : In case of accident or if you feel unwell, seek medical advice immediately ( show the label when possible).

**Contains** : Methanol

**Labelling Regulation EC 1272/2008 (CLP)**

**Hazard pictograms**

**Signal words** : Danger

**Hazard statements** : H225 : Highly flammable liquid and vapour.
H301 : Toxic if swallowed.
H311 : Toxic in contact with skin.
H331 : Toxic if inhaled.
H370 : Causes damage to organ.

**Precautionary statements**

**• General** : P102: Keep out of reach of children.
P103: Read label before use.
P101: If medical advice is needed, have product container or label at hand.

**• Prevention** : P240: Ground/bond container and receiving equipment.
P241: Use explosion-proof electrical, ventilating, lighting, …, equipment.
P210: Keep away from heat, sparks, open flames or hot surfaces. – No smoking.
P280: Wear protective gloves, protective clothing, eye protection, face protection.
P271: Use only outdoors or in a well-ventilated area.
P260: Do not breathe dust, fume, gas, mist, vapours, spray.
P233: Keep container tightly closed.

## 2. Hazards identification -DSD (continued)

P264: Wash thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.

**• Response** : P301+P310: IF SWALLOWED : Immediately call a POISON CENTER or doctor.
P307+P311: IF EXPOSED : Call a POISON CENTER or doctor.
P302+P352: IF ON SKIN : Wash with plenty of soap and water.
P304+P340: IF INHALED : Remove to fresh air and keep at rest in a position comfortable for breathing.
P303+P361+P353: IF ON SKIN (or hair) : Remove immediately all contaminated clothing. Rinse skin with water/shower.
P363: Wash contaminated clothing before reuse.
P361: Remove immediately all contaminated clothing.
P370+P378: In case of fire: Use for extinction.

**• Storage** : P403+P233: Store in well-ventilated place. Keep container tightly closed.
P403+P235: Store in well-ventilated place. Keep cool.
P405: Store locked up.

**• Disposal considerations** : P501: Dispose of this material and its container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.
P501: Dispose of this material and its container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

**Contains** : Methanol

### 2.3. Other hazards

**Other hazards** : The substance does not fulfil the criteria to be identified as PBT substance or vPvB substance according to Annex XIII of Regulation REACH.

## 3. Composition/information on ingredients

**Substance / Preparation** : Methanol
CAS No :67-56-1
EC No :200-659-6
Annex No :603-001-00-X
Substance.

| Substance name | | Contents | CAS No | EC No | Annex No | REACH Ref. | Classification |
|---|---|---|---|---|---|---|---|
| **Methanol** | : | 100 % | 67-56-1 | 200-659-6 | 603-001-00-X | ---- | F; R11<br>T; R23/24/25-39/23/24/25<br>----------<br>Flam. Liq. 2 _ H225<br>Acute Tox. 3 (skin) _ H311<br>Acute Tox. 3 (inhal) _ H331<br>Acute Tox. 3 (oral) _ H301<br>STOT SE 1 _ H370 |

Contains no other components or impurities which will influence the classification of the product.

## 4. First aid measures

### 4.1. Description of first aid measures

## 4. First aid measures (continued)

**Inhalation** : Remove to fresh air and keep at rest in a position comfortable for breathing. Specific treatment (see on this label). Immediately call a POISON CENTER or doctor.

**Skin contact** : Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing. Specific treatment (see on this label). Immediately call a POISON CENTER or doctor. Wash contaminated clothing before reuse.

**Eye contact** : Obtain medical attention if pain, blinking or redness persist. Remove contact lenses, if present and easy to do. Continue rinsing. Rinse cautiously with water for several minutes.

**Ingestion** : Do NOT induce vomiting. Rinse mouth. Specific treatment (see on this label). Immediately call a POISON CENTER or doctor.

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms relating to use** : Causes damage to organ.
Repeated exposure to this material can result in absorption through skin causing significant health hazard.
Danger of serious damage to health by prolonged exposure through inhalation.
Swallowing a small quantity of this material will result in serious health hazard.

### 4.3. Indication of any immediate medical attention and special treatment needed

**General information** : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). Call a POISON CENTER or doctor. Specific treatment (see on this label).

## 5. Fire-fighting measures

### 5.1. Extinguishing media

**Suitable extinguishing media** : Foam. Dry powder. Carbon dioxide. Water spray. Sand.

**Unsuitable extinguishing media** : Do not use a heavy water stream.

**Surrounding fires** : Use water spray or fog for cooling exposed containers.

### 5.2. Special hazards arising from the substance or mixture

**Flammable class** : Highly flammable liquid and vapour.

**Hazardous combustion products** : Under fire conditions, hazardous fumes will be present.

### 5.3. Advice for fire-fighters

**Protection against fire** : Do not enter fire area without proper protective equipment, including respiratory protection.

**Special procedures** : Exercise caution when fighting any chemical fire. Avoid (reject) fire-fighting water to enter environment.

## 6. Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

**For emergency responders** : Equip cleanup crew with proper protection.
Ventilate area.
Avoid breathing dust, fume, gas, mist, vapours, spray.

**Technical measures** : Use special care to avoid static electric charges.

**Special precautions** : Remove ignition sources. No naked lights. No smoking.

**For non-emergency personnel** : Evacuate unnecessary personnel.

### 6.2. Environmental precautions

**Environmental precautions** : Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

### 6.3. Methods and material for containment and cleaning up

**Clean up methods** : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Store away from other materials. Collect spillage.

### 6.4. Reference to other sections

See section 8. Exposure controls/personal protection

## 7. Handling and storage

### 7.1. Precautions for safe handling

**Handling** : Handle empty containers with care because residual vapours are flammable. Do not breathe dust, fume, gas, mist, vapours, spray. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area.

**Technical protective measures** : Provide good ventilation in process area to prevent formation of vapour.
Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical, ventilating, lighting, …, equipment.

**Special precautions** : No naked lights. No smoking.

### 7.2. Conditions for safe storage, including any incompatibilities

**Storage** : Keep only in the original container in a cool, well ventilated place. Keep in fireproof place. Ground/bond container and receiving equipment. Keep container tightly closed.

**Storage - away from** : Strong bases. Strong acids. Sources of ignition. Direct sunlight. Heat sources.

### 7.3. Specific end use(s)

## 7. Handling and storage (continued)

**Specific end use(s)** : None.

## 8. Exposure controls/personal protection

### 8.1. Exposure controls

**Personal protection** : Avoid all unnecessary exposure.

**• Respiratory protection** : In case of insufficient ventilation, wear suitable respiratory equipment. Where exposure through inhalation may occur from use, respiratory protection equipment is recommended.

**• Hand protection** : Wear protective gloves.

**• Eye protection** : Chemical goggles or safety glasses.

**• Others** : When using, do not eat, drink or smoke.

### 8.2. Control parameters

**Occupational Exposure Limits** : No data available.

**VLA-ED [ppm]** : 200

**VLA-ED [mg/m³]** : 266

**VLA-EC [ppm]** : 250

**VLA-EC [mg/m³]** : 333

**ILV (EU) - 8 H - [ppm]** : ( 200 Skin. )

**ILV (EU) - 8 H - [mg/m³]** : ( 260 Skin. )

**OEL (UK)-LTEL [ppm]** : 200

**OEL (UK)-STEL [ppm]** : 250

## 9. Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

**Physical state at 20 °C** : Liquid.

**Colour** : Colourless

**Odour** : Characteristic

**Odour threshold** : No data available.

**pH value** : No data available.

**Melting point [°C]** : -98

**Decomposition point [°C]** : N/A

**Critical temperature [°C]** : N/A

**Auto-ignition temperature [°C]** : N/A

**Flammability (solid, gas)** : Highly flammable liquid and vapour.

## 9. Physical and chemical properties (continued)

| | |
|---|---|
| **Flash point [°C]** | : 11 |
| **Boiling point [°C]** | : 65 |
| **Initial boiling point [°C]** | : N/A |
| **Final boiling point [°C]** | : N/A |
| **Evaporation rate** | : N/A |
| **Vapour pressure [20°C]** | : 96.5 (20° C) |
| **Vapour pressure mm/Hg** | : 96.5 (20° C) |
| **Vapour density** | : N/A |
| **Density [g/cm3]** | : 0.8 |
| **Relative density, gas (air=1)** | : 1.1 |
| **Relative density, liquid (water=1)** | : N/A |
| **Solubility in water [% weight]** | : Complete. |
| **Solubility in water** | : N/A |
| **Log Pow octanol / water at 20°C** | : No data available. |
| **Solubility** | : N/A |
| **Viscosity at 40°C [mm2/s]** | : N/A |

### 9.2. Other information

| | |
|---|---|
| **Explosive properties** | : N/A |
| **Explosion limits - upper [%]** | : 36.5 |
| **Explosion limits - lower [%]** | : 5.5 |
| **Oxidising properties** | : No data available. |

## 10. Stability and reactivity

### 10.1. Reactivity

**Reactivity** : Not established.

### 10.2. Chemical stability

**Chemical stability** : Stable under recommended storage conditions.

### 10.3. Possibility of hazardous reactions

**Hazardous reactions** : Not established.

### 10.4. Conditions to avoid

**Conditions to avoid** : Direct sunlight. Extremely high or low temperatures. Open flame.

## 10. Stability and reactivity (continued)

### 10.5. Incompatible materials

**Materials to avoid** : Strong acids. Strong bases.

### 10.6. Hazardous decomposition products

**Hazardous decomposition products** : Fumes. Carbon monoxide. Carbon dioxide.
May release flammable gases.

## 11. Toxicological information

### 11.1. Information on toxicological effects

**Acute toxicity**

- **Inhalation** : Toxic if inhaled.
- **Dermal** : Toxic in contact with skin.
- **Ingestion** : Toxic if swallowed.

**Corrosion** : Based on available data, the classification criteria are not met.
**Irritation** : Based on available data, the classification criteria are not met.
**Sensitization** : Based on available data, the classification criteria are not met.
**Mutagenicity** : Based on available data, the classification criteria are not met.
**Carcinogenicity** : Based on available data, the classification criteria are not met.
**Toxic for reproduction** : Based on available data, the classification criteria are not met.
**STOT-single exposure** : Causes damage to organ.
**STOT-repeated exposure** : Based on available data, the classification criteria are not met.
**Aspiration hazard** : Based on available data, the classification criteria are not met.

## 12. Ecological information

### 12.1. Toxicity

**Toxicity information** : Not established.

### 12.2. Persistence - degradability

**Persistence - degradability** : Biodegradable.

### 12.3. Bioaccumulative potential

**Bioaccumulative potential** : Not established.

## 12. Ecological information (continued)

### 12.4. Mobility in soil

**Mobility in soil** : Not established.
**Log Pow octanol / water at 20°C** : -0.7

### 12.5. Results of PBT and vPvB assessment

**Results of PBT and vPvB assessment** : The substance does not fulfil the criteria to be identified as PBT substance or vPvB substance according to Annex XIII of Regulation REACH.

### 12.6. Other adverse effects

**Environmental precautions** : Avoid release to the environment.

## 13. Disposal considerations

### 13.1. Waste treatment methods

**General** : Avoid release to the environment. Dispose in a safe manner in accordance with local/national regulations.
Dispose of this material and its container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

**Special precautions** : Hazardous waste due to toxicity.
Handle empty containers with care because residual vapours are flammable.

## 14. Transport information

### 14.1. Land transport (ADR-RID)

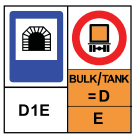
**Proper shipping name** : METHANOL
**UN N°** : 1230
**H.I. nr** : 336
**ADR - Class** : 3
**Labelling - Transport** : 3 : Flammable liquid. 6.1 : Toxic substances.

**ADR - Classification code** : FT1
**ADR - Group** : II
**ADR - Packing instructions** : P001

## 14. Transport information (continued)

**ADR - Limited Quantity** : 1 L

**ADR - Tunnel code** : D/E : Bulk or tank carriage: Passage forbidden through tunnels of category D and E. Other carriage: Passage forbidden through tunnels of category E.




### 14.2. Sea transport (IMDG) [English only]

**Proper shipping name** : METHANOL
**UN N°** : 1230
**IMO-IMDG - Class or division** : 3 : Flammable liquid. ( 6.1 : Toxic substances. )
**IMO-IMDG - Packing group** : II
**IMO- IMDG - Packing instructions** : P001
**IMO-IMDG - Limited quantities** : 1 L
**IMO-IMDG - Marine pollution** : No
**EMS-Nr** : F-E S-D

### 14.3. Air transport (ICAO-IATA) [English only]

**Proper shipping name** : METHANOL
**UN N°** : 1230
**IATA - Class or division** : 3 : Flammable liquid. ( 6.1 : Toxic substances. )
**IATA - Packing group** : II
**IATA - Passenger and Cargo Aircraft** : ALLOWED
**- Passenger and Cargo - Packing instruction** : 352
**- Passenger and Cargo - Maximum Quantity/Packing** : 1 L
**IATA - Cargo only** : ALLOWED
**- Cargo only - Packing instruction** : 364
**- Cargo only - Maximum Quantity/ Packing** : 60 L
**IATA - Limited Quantites** : 1 L
**ERG-Nr** : 3L

## 15. Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

## 15. Regulatory information (continued)

**Safety, health and environmental regulations/legislation specific for the substance or mixture** : Ensure all national/local regulations are observed.

**REACH Restrictions - Annex XVII** : The components of this product are not subject to restrictions.

**REACH Authorisation - Annex XIV** : The components of this product are not subject to authorization.

### 15.2. Chemical Safety Assessment

**Chemical Safety Assessment** : It has not been carried out.

## 16. Other information

**Revision** : Revision - See : *

**Abbreviations and acronyms** : PBT: persistent, bioaccumulative and toxic.
vPvB: very persistent and very bioaccumulative

**Sources of key data used** : REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006

**List of relevant R phrases (heading 3)** : R11 : Highly flammable.
R23/24/25 : Toxic by inhalation, in contact with skin and if swallowed.
R39/23/24/25 : Toxic : danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.

**List of full text of H-statements in section 3** : H225 : Highly flammable liquid and vapour.
H301 : Toxic if swallowed.
H311 : Toxic in contact with skin.
H331 : Toxic if inhaled.
H370 : Causes damage to organ.

**Further information** : None.

In accordance with REACH Regulation (CE) Nº 1907/2006 and with CLP Regulation (CE) Nº 1272/2008

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**End of document**

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006
Version 5.3 Revision Date 06.09.2013
Print Date 21.10.2013
GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifiers

| | | |
|---|---|---|
| Product name | : | Rhodamine B |
| Product Number | : | R6626 |
| Brand | : | Sigma |
| REACH No. | : | A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline. |
| CAS-No. | : | 81-88-9 |

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

| | | |
|---|---|---|
| Identified uses | : | Laboratory chemicals, Manufacture of substances |

### 1.3 Details of the supplier of the safety data sheet

| | | |
|---|---|---|
| Company | : | Sigma-Aldrich Pte Ltd<br>1 Science Park Road<br>#02-14 The Capricorn<br>Singapore Science Park Road II<br>SINGAPORE 117528<br>SINGAPORE |
| Telephone | : | +65 6779 1200 |
| Fax | : | +65 6779 1822 |

### 1.4 Emergency telephone number

| | | |
|---|---|---|
| Emergency Phone # | : | 1-800-262-8200 |

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

**Classification according to Regulation (EC) No 1272/2008**
Acute toxicity, Oral (Category 4), H302
Serious eye damage (Category 1), H318

For the full text of the H-Statements mentioned in this Section, see Section 16.

**Classification according to EU Directives 67/548/EEC or 1999/45/EC**

| | | |
|---|---|---|
| Xn | Harmful | R22, R41 |

For the full text of the R-phrases mentioned in this Section, see Section 16.

### 2.2 Label elements

**Labelling according Regulation (EC) No 1272/2008**

Pictogram

| | |
|---|---|
| Signal word | Danger |
| Hazard statement(s) | |
| H302 | Harmful if swallowed. |
| H318 | Causes serious eye damage. |


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| | |
|---|---|
| Precautionary statement(s) | |
| P280 | Wear protective gloves/ eye protection/ face protection. |
| P305 + P351 + P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| Supplemental Hazard Statements | none |

**2.3 Other hazards** - none

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

| | | |
|---|---|---|
| Synonyms | : | Brilliant Pink B<br>Rhodamine O<br>Basic Violet 10<br>Tetraethylrhodamine |
| Formula | : | $C_{28}H_{31}ClN_2O_3$ |
| Molecular Weight | : | 479,01 g/mol |
| CAS-No. | : | 81-88-9 |
| EC-No. | : | 201-383-9 |

**Hazardous ingredients according to Regulation (EC) No 1272/2008**

| Component | | Classification | Concentration |
|---|---|---|---|
| **9-(2-Carboxyphenyl)-3,6-bis(diethylamino)xanthylium chloride** | | | |
| CAS-No.<br>EC-No. | 81-88-9<br>201-383-9 | Acute Tox. 4; Eye Dam. 1; Aquatic Chronic 3; H302, H318, H412 | <= 100 % |

**Hazardous ingredients according to Directive 1999/45/EC**

| Component | | Classification | Concentration |
|---|---|---|---|
| **9-(2-Carboxyphenyl)-3,6-bis(diethylamino)xanthylium chloride** | | | |
| CAS-No.<br>EC-No. | 81-88-9<br>201-383-9 | Xn, R22 - R41 - R52/53 | <= 100 % |

For the full text of the H-Statements and R-Phrases mentioned in this Section, see Section 16

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

**General advice**
Consult a physician. Show this safety data sheet to the doctor in attendance.

**If inhaled**
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**
Wash off with soap and plenty of water. Consult a physician.

**In case of eye contact**
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**If swallowed**
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

### 4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

### 4.3 Indication of any immediate medical attention and special treatment needed
no data available


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## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

**Suitable extinguishing media**
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

### 5.2 Special hazards arising from the substance or mixture
Carbon oxides, nitrogen oxides (NOx)

### 5.3 Advice for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

### 5.4 Further information
no data available

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

### 6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

### 6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

### 6.4 Reference to other sections
For disposal see section 13.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.Normal measures for preventive fire protection.
For precautions see section 2.2.

### 7.2 Conditions for safe storage, including any incompatibilities
Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

### 7.3 Specific end use(s)
A part from the uses mentioned in section 1.2 no other specific uses are stipulated

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

**Components with workplace control parameters**

### 8.2 Exposure controls

**Appropriate engineering controls**
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

**Personal protective equipment**

**Eye/face protection**
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin protection**
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of


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contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0,11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0,11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Body Protection**
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory protection**
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Control of environmental exposure**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

| | | |
|---|---|---|
| a) | Appearance | Form: powder<br>Colour: red |
| b) | Odour | no data available |
| c) | Odour Threshold | no data available |
| d) | pH | no data available |
| e) | Melting point/freezing point | Melting point/range: 210 - 211 °C - dec. |
| f) | Initial boiling point and boiling range | no data available |
| g) | Flash point | no data available |
| h) | Evapouration rate | no data available |
| i) | Flammability (solid, gas) | no data available |
| j) | Upper/lower flammability or explosive limits | no data available |
| k) | Vapour pressure | no data available |


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| | | |
|---|---|---|
| l) | Vapour density | no data available |
| m) | Relative density | 0,79 g/cm3 |
| n) | Water solubility | no data available |
| o) | Partition coefficient: n-octanol/water | no data available |
| p) | Auto-ignition temperature | no data available |
| q) | Decomposition temperature | no data available |
| r) | Viscosity | no data available |
| s) | Explosive properties | no data available |
| t) | Oxidizing properties | no data available |

**9.2 Other safety information**
no data available

## SECTION 10: Stability and reactivity

**10.1 Reactivity**
no data available

**10.2 Chemical stability**
Stable under recommended storage conditions.

**10.3 Possibility of hazardous reactions**
no data available

**10.4 Conditions to avoid**
no data available

**10.5 Incompatible materials**
Strong oxidizing agents

**10.6 Hazardous decomposition products**
Other decomposition products - no data available
In the event of fire: see section 5

## SECTION 11: Toxicological information

**11.1 Information on toxicological effects**

**Acute toxicity**
LD50 Oral - mouse - 887 mg/kg

LDLO Oral - rat - 500 mg/kg

**Skin corrosion/irritation**
Skin - rabbit
Result: No skin irritation

**Serious eye damage/eye irritation**
Eyes - rabbit
Result: Severe eye irritation

**Respiratory or skin sensitisation**
**Germ cell mutagenicity**
Ames test
S. typhimurium
Histidine reversion (Ames)

Hamster
ovary
DNA damage


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Hamster
ovary
Cytogenetic analysis

**Carcinogenicity**

Carcinogenicity - rat - Subcutaneous
Tumorigenic:Equivocal tumorigenic agent by RTECS criteria.

Carcinogenicity - rat - Subcutaneous
Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Blood:Lymphomas including Hodgkin's disease. Tumorigenic:Tumors at site or application.

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (9-(2-Carboxyphenyl)-3,6-bis(diethylamino)xanthylium chloride)

**Reproductive toxicity**

Reproductive toxicity - mouse - Intraperitoneal
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

**Specific target organ toxicity - single exposure**
no data available

**Specific target organ toxicity - repeated exposure**
no data available

**Aspiration hazard**
no data available

**Additional Information**
RTECS: BP3675000

Symptoms and signs of poisoning are:, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting

## SECTION 12: Ecological information

### 12.1 Toxicity

| | |
|---|---|
| Toxicity to fish | LC50 - Cyprinodon variegatus (sheepshead minnow) - 83,9 mg/l - 96 h |
| | LC50 - Lepomis macrochirus (Bluegill) - 379 mg/l - 96 h |
| | LC50 - Oncorhynchus mykiss (rainbow trout) - 217 mg/l - 96 h |
| Toxicity to daphnia and other aquatic invertebrates | EC50 - Daphnia magna (Water flea) - 22,9 mg/l - 48 h |

### 12.2 Persistence and degradability

| | |
|---|---|
| Biodegradability | Result: 0 % - not rapidly biodegradable (OECD Test Guideline 302) |

### 12.3 Bioaccumulative potential

| | |
|---|---|
| Bioaccumulation | Cyprinus carpio (Carp) - 24 d - 0,1 mg/l |
| | Bioconcentration factor (BCF): < 0,2 |

### 12.4 Mobility in soil
no data available

### 12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

### 12.6 Other adverse effects
Harmful to aquatic life.


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no data available

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

**Product**
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

**Contaminated packaging**
Dispose of as unused product.

## SECTION 14: Transport information

### 14.1 UN number

ADR/RID: - IMDG: - IATA: -

### 14.2 UN proper shipping name

ADR/RID: Not dangerous goods
IMDG: Not dangerous goods
IATA: Not dangerous goods

### 14.3 Transport hazard class(es)

ADR/RID: - IMDG: - IATA: -

### 14.4 Packaging group

ADR/RID: - IMDG: - IATA: -

### 14.5 Environmental hazards

ADR/RID: no IMDG Marine pollutant: no IATA: no

### 14.6 Special precautions for user

no data available

## SECTION 15: Regulatory information

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

no data available

### 15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out

## SECTION 16: Other information

**Full text of H-Statements referred to under sections 2 and 3.**

| | |
|---|---|
| Acute Tox. | Acute toxicity |
| Aquatic Chronic | Chronic aquatic toxicity |
| Eye Dam. | Serious eye damage |
| H302 | Harmful if swallowed. |
| H318 | Causes serious eye damage. |
| H412 | Harmful to aquatic life with long lasting effects. |

**Full text of R-phrases referred to under sections 2 and 3**

| | |
|---|---|
| Xn | Harmful |
| R22 | Harmful if swallowed. |
| R41 | Risk of serious damage to eyes. |
| R52/53 | Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. |


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**Further information**

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# COMPLETIONS

## GR ENERGY SERVICES

04/14/2023

## COMPLETIONS

### GR Energy Services Products stored on location

### Tier II Determination

| CAS # | Chemical | Max. on Location | Units | Specific Gravity | % by Weight | Gal | Pounds /gal | Total Pounds | Reportable Quantity | Reportable on Tier II | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NA | **Dynaseal** | 275 | gallons | 0.88 | 100% | 275 | 7.3304 | 2,015.9 | NA | no | NL; wireline grease seal |
| | **Zep Brake Flush 55GL** | 5 | gallons | NA | 100% | 5 | | | 10,000 lbs | no | Category 2 flammable liquid |
| 67-64-1 | acetone | | | 0.787 | 50-70% | 3.5 | 6.55571 | 22.9 | 5,000 lbs | no | < 5,000 lbs; RCRA Code U002 |
| 64742-49-0 | Naphtha (petroleum) | | | 0.74 | 30-50% | 2.5 | 6.1642 | 15.4 | NA | no | NL |
| 67-63-0 | propan-2-ol | | | 0.788 | 1-5% | 0.25 | 6.56404 | 1.6 | NA | no | Section "313" |
| 67-56-1 | methanol | | | 0.791 | 1-5% | 0.25 | 6.58903 | 1.6 | 5,000 lbs | no | < 5,000 lbs; section "313"; RCRA Code U154 |
| 142-82-5 | heptane | | | 0.69 | 1-5% | 0.25 | 5.67273 | 1.4 | NA | no | NL |
| | **Zepreserve NC Aero DZ** | 5 | gallons | NA | 100% | 5 | | | 10,000 lbs | no | "Extreme" flammability |
| 64742-52-5 | Distillates, heavy | | | 0.91 | 20-30% | 3 | 7.5803 | 22.7 | NA | no | NL |
| 64742-49-0 | Naphtha (petroleum) | | | 0.675 | 10-20% | 2 | 5.62275 | 11.2 | NA | no | NL |
| 67472-47-8 | Distillates, light | | | 0.8 | 10-20% | 2 | 6.664 | 13.3 | NA | no | NL |
| 64-17-5 | ethanol | | | 0.785 | 5-10% | 1 | 6.539 | 6.539 | NA | no | NL |
| 104-76-7 | 2-ethylhexan-1-ol | | | 0.833 | 5-10% | 1 | 6.93889 | 6.9 | NA | no | NL |
| 95-63-6 | 1,2,4-trimethylbenzene | | | 0.88 | 5-10% | 1 | 7.3304 | 7.3 | NA | no | Section "313" |
| 108-67-8 | mesitylene | | | 0.868 | 1-5% | 0.25 | 7.23044 | 1.8 | NA | no | NL |
| 526-73-8 | 1,2,3-trimethylbenzene | | | 0.894 | 1-5% | 0.25 | 7.44702 | 1.9 | NA | no | NL |
| 64741-44-2 | Distillates, middle | | | 0.81 | 1-5% | 0.25 | 6.7473 | 1.7 | NA | no | NL |
| 112-34-5 | 2-(2-butoxyethoxy)ethanol | | | 0.955 | 1-5% | 0.25 | 7.95515 | 2.0 | NA | no | NL |
| 124-38-9 | carbon dioxide | | | 1.52 | 1-5% | 0.25 | 12.6616 | 3.2 | NA | no | NL |
| 64742-96-7 | Solvent naphtha, heavy | | | 0.8 | 1-5% | 0.25 | 6.664 | 1.7 | NA | no | NL |
| 98-82-8 | cumene | | | 0.862 | 1% | 0.05 | 7.18046 | 0.4 | 5,000 lbs | no | < 5,000 lbs; Section "313"; RCRA Code U055 |

When there is a range, maximum quantity or percentage is used in calculation

NL = Not Listed

"313" = Subject to reporting under Section 313 & 6607

Liquid-O-Ring®*

YOUR SUPER CENTER FOR OVER 1,000 TOP PERFORMANCE PRODUCTS SERVING INDUSTRIES WORLDWIDE

WWW.OILCENTER.COM

# DYNASEAL

## General Purpose Wireline Grease


GEAR OILS
MOTOR OILS
HYDRAULIC OILS
PIPE COATINGS
THREAD SEALANTS
BEARING GREASES
SPECIALTY GREASES
THREAD COMPOUNDS
SUCKER ROD COATINGS
OUTSIDE PRESERVATIVES
WIRELINE GREASE SEALS
CLEANERS & DEGREASERS
PIPE STORAGE COMPOUNDS
RUST & CORROSION INHIBITORS
THREAD LOCKING COMPOUNDS
VALVE LUBRICANTS & SEALANTS
TOOL JOINT & DRILL COLLAR COMPOUNDS


### PRODUCT DESCRIPTION

Dynaseal was developed for today's wireline conditions by industry leader Oil Center Research. With over 30 years of providing U.S. and International wireline operators with the best available products on the market, Dynaseal is the latest cost effective product to meet the industry's most demanding needs. This product is unmatched by other manufacturers in performance and protection against the corrosive effects of oilfield brines and chemicals. Available in a broad viscosity range, Dynaseal is the answer for moderate well conditions, where standard grade grease seal is required. Dynaseal meets the needs for all braided line operations including logging, perforating, and pump down operations.

### BENEFITS

- **Additive package**
- **Cost effective**
- **Adhesive and cohesive properties**
- **Available in standard ISO viscosities**

### APPLICATION

Dynaseal is recommended as a pump down grease for braided wireline, cables, and wire rope. Apply Dynaseal using grease injector control heads and cable lubricators.

### ISO GRADES AVAILABLE

| PRODUCT | KINEMATIC VISCOSITY |
|---|---|
| ISO150 | 150 |
| ISO220 | 220 |
| ISO680 | 680 |
| ISO1500 | 1,500 |
| ISO2500 | 2,500 |
| ISO5000 | 5,000 |
| ISO7500 | 7,500 |
| ISO10000 | 10,000 |

### TYPICAL OBSERVATIONS

| | |
|---|---|
| Color | Golden Yellow |
| Texture | Tacky Liquid |
| Odor | Mild |
| Density, lb/gal @ 77°F (25°C) | 7.2–7.3 |
| Specific Gravity @ 77°F (25°C) | 0.87–0.88 |
| Flash Point, ASTM D-92 | 390°F (198°C) |
| Rust Preventive Test, ASTM D-3603 @ 140°F (60°C) | Pass |
| Shelf Life (unopened container) | Two years |

### RELATED PRODUCTS

In addition to Dynaseal, Oil Center Research manufactures a complete line of wireline grease seal products and line sprays. Products for use in severe $CO_2$ service, biodegradable products, and arctic grade products are available. There are no wireline products currently on the market which approach the quality, versatility and proven performance record of *Liquid-O-Ring*®*, the industry standard.

766 $CO_2$ Resistant Wireline Grease Seal
776 Premium Wireline Lubricant and Sealant with Corrosion Package
772 Line Spray
780 Biodegradable Wireline Grease Seal
782 Biodegradable Line Spray
797B Blue Line Wireline Spray Corrosion Inhibitor
NC111 Silicone Non-Conductive Grease


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**WARRANTY** Because the conditions of use and the supervision of application are beyond our control, we assume no liability for any product failure or other damage beyond the purchase price of the material furnished by us. No agent, representative, or employee of this Company is authorized to change this provision, which relates to all goods delivered, whether sold, delivered as samples, or otherwise. Each user should independently determine the suitability of this product based on their specific application.



*Manufactured by*

**BALMAR LLC**

616 WEST PONT DES MOUTON ROAD | LAFAYETTE, LA 70507

Sales Locations:

LAFAYETTE, LA | HOUSTON, TX | LONGVIEW, TX | MIDLAND, TX | OKLAHOMA CITY, OK


*Registered trade name of Oil Center Research, Inc.

03/28/17

The product information and specifications listed in this publication are constantly being updated to keep up with government regulations and technology changes. Please visit our web site, www.oilcenter.com, or contact your Account Representative for the most current information relating to this product.

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# BALMAR, LLC
## MATERIAL SAFETY DATA SHEET

**PRODUCT IDENTIFICATION**

**Product:** 3602 Premium Heavy-Duty Cutting Fluid

**Chemical Family:** Petroleum Based with Additives

**Use:** Cutting Fluid

**Manufacturer/Supplier** BALMAR, L.L.C.

**Address:** 616 W. PONT DES MOUTON RD
LAFAYETTE, LA 70507-4002

**Fax:** (337) 234-5825

**Phone:** (337) 232-2496

**Emergency Phone:** (337)232-2496

**INGREDIENT COMPONENTS** Hazardous components indicated with asterisk * Hazardous components in a dust form only**

| CAS# | Weight % | OSHA LIMIT (PEL) | ACGIH (TLV) |
|---|---|---|---|
| Not Applicable | | | |

**HEALTH EFFECT** **Skin:** Possible irritation with repeated or prolonged contact.

**Eye:** Possible irritation with repeated or prolonged contact.

**Inhalation** Exposure to mist or spray may cause coughing, sneezing, and upper respiratory tract irritation.

**Ingestion:** Possible irritation, nausea, or diarrhea if ingested.

**FIRST AID** **Skin:** Wash with soap and water thoroughly after handling.

**Eye:** Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open. Get immediate medical attention.

**Inhalation:** Remove to fresh air. Apply artificial respiration or administer oxygen as necessary. If conscious, irrigate nasal passages with water. Get medical attention.

**Ingestion:** Do NOT induce vomiting. If conscious, drink large quantities of water. Get medical attention immediately.

**FIRE PROTECTION INFORMATION** **Auto Ignition Temperature** Not Available

**Hazardous Decomposition** Incomplete combustion can yield carbon monoxide and various hydrocarbons.

**Extinguishing Method** Carbon Dioxide, dry chemical, foam, or water fog. Streams of water may spread fire. Pressurized mist may form a

**Fire and Explosion Method** May produce toxic fumes at temperatures above 930°F. Material is combustible.

**Flammable Limits % vol in air** Estimated Value **Lower%** 0.9 **Upper%** 7.0

**HAZARDOUS POLYMERIZATION:** Will Not Occur [X] May Occur [ ] **Stability:** Stable [X] Unstable [ ]

**PersonalPrecautions** **Spills** Pick up and place in container for disposal.

**Waste Disposal:** Utilize permitted industrial waste disposal site. Comply with environmental regulations. Burning is NOT recommended.

**HANDLING AND STORAGE**

**Storage:** Do not store with strong oxidizers. Avoid exposure to extreme temperatures.

**RESPIRATORY PROTECTION (UTILIZE NIOSH-APPROVED RESPIRATORS. REFER TO MFG PROTECTION FACTORS AND OSHA STANDARD 1910.134 AS A GUIDELINE)** Not required under normal conditions of use.

**Personal Protection** **Eye:** Safety glasses to protect from unexpected splashes.

**Spcl Protect** Not required under normal conditions of use.

**Ventilation:** Local exhaust must be sufficient to keep airborne concentrations below the TLV limit.

**Skin:** For prolonged contact, use nitrile or neoprene gloves.

**PHYSICAL AND CHEMICAL PROPERTIES**

**Evaporation Point:** Not Available **Boiling Point** >600°F **Vapor Pressure:** <0.013mmHg@20° **Vapor Density:** >2 @ 101kPa

**Solubility in water:** Negligible **Auto Ignition** Not Available **Percent Volatile:** Not Available **Odor:** Mild

**Flammable Limits:** Estimated Value **Appearance:** Amber Liquid **Specific Gravity:** 0.88 **Flash Point:** >356°F

**Title III, Sec. 313 Status** **Title III Ingredient:** Not Applicable **Title III Percentage:** **Title III CAS#:**

**Shipping Information:** NOT REGULATED

**Reported as potential carcinogen or carcinogen:** [ ] American Conference of Governmental Industrial Hygienists

[✓] Not Applicable [ ] International Agency For Research On Cancer [ ] OSHA [ ] National Toxicology Program

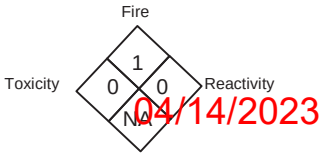
DISCLAIMER: The information contained herein is based upon data available to us and reflects our best professional judgment. Since it is impossible to anticipate the conditions under which our products may be used, we cannot guarantee that the recommendations will be adequate for all individuals and situations. Each user of this product should determine the suitability of the product for his particular purpose and should comply with all environmental regulations. Our goal is to manufacture products with zero or minimum hazards. Our products are improved daily as up-to-date information and research data is received from our suppliers in our quest to use products with less or no hazards. Please feel free to contact us for current information.

ADDITIONAL COMMENTS: Containers should be either reconditioned by CERTIFIED firms or properly disposed of by APPROVED firms. Disposal of containers should be in accordance with applicable laws and regulations. EMPTY drums should not be given to individuals. Serious accidents have resulted from the misuse of EMPTIED containers (drums, pails, etc.). Refer to Section IV and IX.

**HMIS SYMBOL**

| | |
|---|---|
| Health | 0 |
| Flammability | 1 |
| Reactivity | 0 |
| PPE | B |

**NFPA SYMBOL**

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Last Updated 12/4/2012

## SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Material name : ZEP BRAKE FLUSH 55GL

Material number : 000000000000053585

**Manufacturer or supplier's details**

Company : Zep Inc.

Address : 1310 Seaboard Industrial Blvd., NW
Atlanta, GA 30318

Telephone : 404-352-1680

**Emergency telephone numbers**

| | | |
|---|---|---|
| **For SDS Information** | : | Compliance Services 1-877-428-9937 |
| **For a Medical Emergency** | : | 877-541-2016 Toll Free - All Calls Recorded |
| **For a Transportation Emergency** | : | CHEMTREC: 800-424-9300 - All Calls Recorded.<br>In the District of Columbia 202-483-7616 |

## SECTION 2. HAZARDS IDENTIFICATION

**Emergency Overview**

| | |
|---|---|
| Appearance | liquid |
| Colour | colourless |
| Odour | hydrocarbon-like |

**GHS Classification**

Flammable liquids : Category 2
Skin irritation : Category 2
Eye irritation : Category 2A
Specific target organ toxicity - single exposure : Category 1
Specific target organ toxicity - single exposure : Category 3 (Central nervous system)
Aspiration hazard : Category 1

**GHS Label element**

Hazard pictograms :

Signal word : Danger

Hazard statements : H225 Highly flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H370 Causes damage to organs.

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Precautionary statements : **Prevention:**
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ eye protection/ face protection.
**Response:**
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P307 + P311 IF exposed: Call a POISON CENTER or doctor/ physician.
P331 Do NOT induce vomiting.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
**Storage:**
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
**Disposal:**
Dispose of contents/container in accordance with local regulation.

**Potential Health Effects**

**Carcinogenicity:**

| | |
|---|---|
| **IARC** | No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC. |
| **ACGIH** | No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. |
| **OSHA** | No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA. |

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**NTP** No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

**Hazardous components**

| Chemical Name | CAS-No. | Concentration [%] |
|---|---|---|
| acetone | 67-64-1 | >= 50 - < 70 |
| Naphtha (petroleum), hydrotreated light | 64742-49-0 | >= 30 - < 50 |
| propan-2-ol | 67-63-0 | >= 1 - < 5 |
| methanol | 67-56-1 | >= 1 - < 5 |
| heptane | 142-82-5 | >= 1 - < 5 |

## SECTION 4. FIRST AID MEASURES

General advice : Show this safety data sheet to the doctor in attendance.
Symptoms of poisoning may appear several hours later.
Do not leave the victim unattended.

If inhaled : Consult a physician after significant exposure.
If unconscious place in recovery position and seek medical advice.

In case of skin contact : In case of contact, immediately flush skin with plenty of water.
Take off contaminated clothing and shoes immediately.
Get medical attention if irritation develops and persists.
Wash contaminated clothing before re-use.

In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.

## SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Alcohol-resistant foam
Dry chemical
Carbon dioxide (CO2)

Unsuitable extinguishing media : High volume water jet

Specific hazards during : Do not allow run-off from fire fighting to enter drains or water

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| | | |
|---|---|---|
| firefighting | | courses. |
| Hazardous combustion products | : | Carbon dioxide (CO2)<br>Carbon monoxide<br>Smoke |
| Specific extinguishing methods | : | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| Further information | : | Collect contaminated fire extinguishing water separately. This must not be discharged into drains.<br>Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.<br>For safety reasons in case of fire, cans should be stored separately in closed containments.<br>Use a water spray to cool fully closed containers. |
| Special protective equipment for firefighters | : | Wear self-contained breathing apparatus for firefighting if necessary. |

## SECTION 6. ACCIDENTAL RELEASE MEASURES

| | | |
|---|---|---|
| Personal precautions, protective equipment and emergency procedures | : | Use personal protective equipment.<br>Ensure adequate ventilation.<br>Refer to protective measures listed in sections 7 and 8. |
| Environmental precautions | : | Prevent further leakage or spillage.<br>Clean contaminated floors and objects thoroughly while observing environmental regulations. |
| Methods and materials for containment and cleaning up | : | Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).<br>Sweep up or vacuum up spillage and collect in suitable container for disposal. |

## SECTION 7. HANDLING AND STORAGE

| | | |
|---|---|---|
| Advice on safe handling | : | For personal protection see section 8.<br>Smoking, eating and drinking should be prohibited in the application area. |
| Conditions for safe storage | : | No smoking.<br>Keep container tightly closed in a dry and well-ventilated place.<br>Containers which are opened must be carefully resealed and kept upright to prevent leakage.<br>Observe label precautions.<br>Electrical installations / working materials must comply with the technological safety standards. |
| Materials to avoid | : | Keep away from oxidizing agents and strongly acid or alkaline materials.<br>Do not freeze. |

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## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Components with workplace control parameters**

| Components | CAS-No. | Value type (Form of exposure) | Control parameters / Permissible concentration | Basis |
|---|---|---|---|---|
| acetone | 67-64-1 | TWA | 500 ppm | ACGIH |
| | | STEL | 750 ppm | ACGIH |
| | | TWA | 250 ppm<br>590 mg/m3 | NIOSH REL |
| | | TWA | 1,000 ppm<br>2,400 mg/m3 | OSHA Z-1 |
| | | TWA | 750 ppm<br>1,800 mg/m3 | OSHA P0 |
| | | STEL | 1,000 ppm<br>2,400 mg/m3 | OSHA P0 |
| propan-2-ol | 67-63-0 | TWA | 200 ppm | ACGIH |
| | | STEL | 400 ppm | ACGIH |
| | | TWA | 400 ppm<br>980 mg/m3 | NIOSH REL |
| | | ST | 500 ppm<br>1,225 mg/m3 | NIOSH REL |
| | | TWA | 400 ppm<br>980 mg/m3 | OSHA Z-1 |
| | | TWA | 400 ppm<br>980 mg/m3 | OSHA P0 |
| | | STEL | 500 ppm<br>1,225 mg/m3 | OSHA P0 |
| methanol | 67-56-1 | TWA | 200 ppm | ACGIH |
| | | STEL | 250 ppm | ACGIH |
| | | TWA | 200 ppm<br>260 mg/m3 | NIOSH REL |
| | | ST | 250 ppm<br>325 mg/m3 | NIOSH REL |
| | | TWA | 200 ppm<br>260 mg/m3 | OSHA Z-1 |
| | | STEL | 250 ppm<br>325 mg/m3 | OSHA P0 |
| | | TWA | 200 ppm<br>260 mg/m3 | OSHA P0 |
| heptane | 142-82-5 | TWA | 85 ppm<br>350 mg/m3 | NIOSH REL |
| | | C | 440 ppm<br>1,800 mg/m3 | NIOSH REL |
| | | TWA | 500 ppm<br>2,000 mg/m3 | OSHA Z-1 |
| | | TWA | 400 ppm<br>1,600 mg/m3 | OSHA P0 |
| | | STEL | 500 ppm<br>2,000 mg/m3 | OSHA P0 |

**Biological occupational exposure limits**

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| Component | CAS-No. | Control parameters | Biological specimen | Sampling time | Permissible concentration | Basis |
|---|---|---|---|---|---|---|
| 2-PROPANONE | 67-64-1 | Acetone | Urine | End of shift (As soon as possible after exposure ceases) | 50 mg/l | ACGIH BEI |
| PROPAN-2-OL | 67-63-0 | Acetone | Urine | End of shift at end of workwee k | 40 mg/l | ACGIH BEI |
| Methanol | 67-56-1 | Methanol | Urine | End of shift (As soon as possible after exposure ceases) | 15 mg/l | ACGIH BEI |

**Personal protective equipment**

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

Hand protection
Remarks : Skin should be washed after contact. For prolonged or repeated contact use protective gloves. The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Ensure that eyewash stations and safety showers are close to the workstation location.
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : Protective suit

Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures : When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

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| | | |
|---|---|---|
| Colour | : | colourless |
| Odour | : | hydrocarbon-like |
| Odour Threshold | : | No data available |
| pH | : | Not applicable |
| Melting point/freezing point | : | No data available |
| Boiling point | : | 55.5 °C |
| Flash point | : | < -18 °C<br>Method: closed cup |
| Evaporation rate | : | No data available |
| Upper explosion limit | : | No data available |
| Lower explosion limit | : | No data available |
| | | No data available |
| Vapour pressure | : | not determined |
| Relative vapour density | : | No data available |
| Density | : | 0.72 g/cm3 |
| Solubility(ies) | | |
| Water solubility | : | insoluble |
| Partition coefficient: n-octanol/water | : | No data available |
| | | No data available |
| Auto-ignition temperature | : | not determined |
| Thermal decomposition | : | No data available |
| Viscosity | | |
| Viscosity, dynamic | : | No data available |

## SECTION 10. STABILITY AND REACTIVITY

| | | |
|---|---|---|
| Reactivity | : | Stable |
| Chemical stability | : | Stable under normal conditions. |
| Possibility of hazardous reactions | : | Stable under recommended storage conditions.<br>No hazards to be specially mentioned. |
| Conditions to avoid | : | Heat, flames and sparks. |
| Incompatible materials | : | Oxidizing agents |
| Hazardous decomposition products | : | Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). |

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## SECTION 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

**Product:**

| | | |
|---|---|---|
| Acute oral toxicity | : | Acute toxicity estimate : > 5,000 mg/kg<br>Method: Calculation method |
| Acute inhalation toxicity | : | Acute toxicity estimate : > 40 mg/l<br>Exposure time: 4 h<br>Test atmosphere: vapour<br>Method: Calculation method |
| Acute dermal toxicity | : | Acute toxicity estimate : > 5,000 mg/kg<br>Method: Calculation method |

**Components:**

**acetone:**

| | | |
|---|---|---|
| Acute oral toxicity | : | LD50 Rat: 5,800 mg/kg |
| Acute inhalation toxicity | : | LC50 Rat: 132 mg/l<br>Exposure time: 3 h<br><br>LC50 Rat: 50.1 mg/l |
| Acute dermal toxicity | : | LD50 Guinea pig: > 7,426 mg/kg<br><br>LD50 Rabbit: > 7,426 mg/kg |

**propan-2-ol:**

| | | |
|---|---|---|
| Acute oral toxicity | : | LD50 Oral Rat: 4,396 mg/kg<br>Method: Calculation method |

**heptane:**

| | | |
|---|---|---|
| Acute inhalation toxicity | : | LC50 Rat: 103,000 mg/l<br>Exposure time: 4 h |

### Skin corrosion/irritation

**Product:**

Remarks: Irritating to skin.

### Serious eye damage/eye irritation

**Product:**

Remarks: Severe eye irritation

### Respiratory or skin sensitisation

No data available

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**Germ cell mutagenicity**

No data available

**Carcinogenicity**

No data available

**Reproductive toxicity**

No data available

**acetone:**
**Naphtha (petroleum), hydrotreated light:**
**propan-2-ol:**
**methanol:**
**heptane:**

**STOT - single exposure**

No data available

**STOT - repeated exposure**

No data available

**Aspiration toxicity**

No data available

**Further information**

**Product:**

Remarks: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting., Concentrations substantially above the TLV value may cause narcotic effects., Solvents may degrease the skin.

## SECTION 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

No data available

**Persistence and degradability**

No data available

**Bioaccumulative potential**

**Product:**

| | | |
|---|---|---|
| Partition coefficient: n-octanol/water | : | Remarks: No data available |
| | | Remarks: No data available |

**Components:**

**heptane :**

| | | |
|---|---|---|
| Partition coefficient: n-octanol/water | : | log Pow: > 3.0 |
| | | log Pow: 5 |

**Mobility in soil**

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No data available

**Other adverse effects**

No data available

**Product:**

| | |
|---|---|
| Regulation | 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances |
| Remarks | This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B). |

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Very toxic to aquatic life., May cause long lasting harmful effects to aquatic life.

## SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal methods**

Waste from residues : Dispose of in accordance with local regulations.
Do not contaminate ponds, waterways or ditches with chemical or used container.
The product should not be allowed to enter drains, water courses or the soil.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

## SECTION 14. TRANSPORT INFORMATION

Transportation Regulation: 49 CFR (USA):
UN1993, Flammable liquids, n.o.s., (ACETONE, HEPTANE), 3, II

Transportation Regulation: IMDG (Vessel):
UN1993, FLAMMABLE LIQUID, N.O.S., (ACETONE, HEPTANE), 3, II

Transportation Regulation: IATA (Cargo Air):
UN1993, Flammable liquid, n.o.s., (ACETONE, HEPTANE), 3, II

Transportation Regulation: IATA (Passenger Air):
UN1993, Flammable liquid, n.o.s., (ACETONE, HEPTANE), 3, II

Transportation Regulation: TDG (Canada):
UN1993, FLAMMABLE LIQUID, N.O.S., (ACETONE, HEPTANE), 3, II

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SECTION 15. REGULATORY INFORMATION

**EPCRA - Emergency Planning and Community Right-to-Know Act**

**CERCLA Reportable Quantity**

| Components | CAS-No. | Component RQ (lbs) | Calculated product RQ (lbs) |
|---|---|---|---|
| acetone | 67-64-1 | 5000 | * |

*: Calculated RQ exceeds reasonably attainable upper limit.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 311/312 Hazards** : Fire Hazard
Acute Health Hazard

**SARA 302** : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313** : The following components are subject to reporting levels established by SARA Title III, Section 313:
methanol 67-56-1 1.4685 %

**California Prop 65** WARNING! This product contains a chemical known to the State of California to cause cancer.
benzene 71-43-2
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
methanol 67-56-1
toluene 108-88-3
benzene 71-43-2

**The components of this product are reported in the following inventories:**

**TSCA** On TSCA Inventory
**DSL** All components of this product are on the Canadian DSL
**AICS** Not in compliance with the inventory
**NZIoC** Not in compliance with the inventory
**PICCS** Not in compliance with the inventory
**IECSC** Not in compliance with the inventory

**Inventory Acronym and Validity Area Legend:**

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

**SECTION 16. OTHER INFORMATION**

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## SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Material name : ZEPRESERVE NC AERO DZ

Material number : 000000000000031501

**Manufacturer or supplier's details**

Company : Zep Inc.

Address : 1310 Seaboard Industrial Blvd., NW
Atlanta, GA 30318

Telephone : 404-352-1680

| **Emergency telephone numbers** | | |
|---|---|---|
| **For SDS Information** | : | Compliance Services 1-877-428-9937 |
| **For a Medical Emergency** | : | 877-541-2016 Toll Free - All Calls Recorded |
| **For a Transportation Emergency** | : | CHEMTREC: 800-424-9300 - All Calls Recorded.<br>In the District of Columbia 202-483-7616 |

**Recommended use of the chemical and restrictions on use**

Recommended use : Lubricant

## SECTION 2. HAZARDS IDENTIFICATION

**Emergency Overview**

| | |
|---|---|
| Appearance | Aerosol containing a compressed gas |
| Colour | amber |
| Odour | solvent-like |

**GHS Classification**

Flammable aerosols : Category 1
Gases under pressure : Compressed gas
Skin irritation : Category 2
Eye irritation : Category 2A
Skin sensitisation : Category 1
Carcinogenicity : Category 2
Specific target organ toxicity - single exposure : Category 3 (Central nervous system)

**GHS label elements**

Hazard pictograms :

Signal word : Danger

Hazard statements : H222 Extremely flammable aerosol.
H280 Contains gas under pressure; may explode if heated.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.

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H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H351 Suspected of causing cancer.

Precautionary statements : **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P211 Do not spray on an open flame or other ignition source.
P251 Pressurized container: Do not pierce or burn, even after use.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
**Response:**
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
**Storage:**
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P410 + P412 Protect from sunlight. Do not expose to temperatures exceeding 50 °C/ 122 °F.
**Disposal:**
Dispose of contents/container in accordance with local regulation.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

**Hazardous components**

| Chemical name | CAS-No. | Concentration [%] |
|---|---|---|
| Distillates (petroleum), hydrotreated heavy naphthenic | 64742-52-5 | >= 20 - < 30 |
| Naphtha (petroleum), hydrotreated light | 64742-49-0 | >= 10 - < 20 |
| Distillates (petroleum), hydrotreated light | 64742-47-8 | >= 10 - < 20 |
| ethanol | 64-17-5 | >= 5 - < 10 |

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| | | |
|---|---|---|
| 2-ethylhexan-1-ol | 104-76-7 | >= 5 - < 10 |
| 1,2,4-trimethylbenzene | 95-63-6 | >= 5 - < 10 |
| mesitylene | 108-67-8 | >= 1 - < 5 |
| 1,2,3-trimethylbenzene | 526-73-8 | >= 1 - < 5 |
| Distillates (petroleum), straight-run middle | 64741-44-2 | >= 1 - < 5 |
| 2-(2-butoxyethoxy)ethanol | 112-34-5 | >= 1 - < 5 |
| carbon dioxide | 124-38-9 | >= 1 - < 5 |
| Solvent naphtha (petroleum), heavy aliph. | 64742-96-7 | >= 1 - < 5 |
| cumene | 98-82-8 | >= 0.1 - < 1 |

## SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled : Consult a physician after significant exposure.
If unconscious place in recovery position and seek medical advice.

In case of skin contact : If skin irritation persists, call a physician.
If on clothes, remove clothes.
Wash off immediately with plenty of water for at least 15 minutes.

In case of eye contact : Remove contact lenses.
Keep eye wide open while rinsing.
Immediately flush eyes for at least 15 minutes. Get medical attention.

If swallowed : Keep respiratory tract clear.
Take victim immediately to hospital.
DO NOT induce vomiting unless directed to do so by a physician or poison control center.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.

Most important symptoms and effects, both acute and delayed : Symptoms may include irritation, redness, pain, and rash.
Symptoms of overexposure may include disorientation; dizziness; and confusion. May progress to unconsciousness, paralysis, and convulsions.

Effects are dependent on exposure (dose, concentration, contact time).
Causes serious eye irritation.
Review section 2 of SDS to see all potential hazards.

Notes to physician : Treat symptomatically. Symptoms may be delayed.

## SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Alcohol-resistant foam
Carbon dioxide ($CO_2$)
Dry chemical

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| | | |
|---|---|---|
| Unsuitable extinguishing media | : | High volume water jet |
| Specific hazards during firefighting | : | Do not allow run-off from fire fighting to enter drains or water courses. |
| Hazardous combustion products | : | Carbon dioxide (CO2)<br>Carbon monoxide<br>Smoke |
| Specific extinguishing methods | : | Do not allow run-off from fire fighting to enter drains or water courses. |
| Further information | : | Collect contaminated fire extinguishing water separately. This must not be discharged into drains.<br>Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.<br>For safety reasons in case of fire, cans should be stored separately in closed containments.<br>Use a water spray to cool fully closed containers. |
| Special protective equipment for firefighters | : | Wear self-contained breathing apparatus for firefighting if necessary. |

## SECTION 6. ACCIDENTAL RELEASE MEASURES

| | | |
|---|---|---|
| Personal precautions, protective equipment and emergency procedures | : | Use personal protective equipment.<br>Ensure adequate ventilation.<br>Remove all sources of ignition.<br>Evacuate personnel to safe areas.<br>Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. |
| Environmental precautions | : | Prevent product from entering drains.<br>Prevent further leakage or spillage if safe to do so.<br>If the product contaminates rivers and lakes or drains inform respective authorities. |
| Methods and materials for containment and cleaning up | : | Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).<br>Sweep up or vacuum up spillage and collect in suitable container for disposal. |

## SECTION 7. HANDLING AND STORAGE

| | | |
|---|---|---|
| Advice on safe handling | : | Do not breathe vapours or spray mist.<br>Avoid exposure - obtain special instructions before use.<br>Avoid contact with skin and eyes.<br>For personal protection see section 8.<br>Smoking, eating and drinking should be prohibited in the application area.<br>Take precautionary measures against static discharges.<br>Provide sufficient air exchange and/or exhaust in work rooms.<br>Dispose of rinse water in accordance with local and national |

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regulations.
Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Always replace cap after use.

Conditions for safe storage : BEWARE: Aerosol is pressurized. Keep away from direct sun exposure and temperatures over 50 °C. Do not open by force or throw into fire even after use. Do not spray on flames or red-hot objects.
No smoking.
Keep in a dry, cool and well-ventilated place.
Observe label precautions.
Electrical installations / working materials must comply with the technological safety standards.

Materials to avoid : Strong oxidizing agents

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Components with workplace control parameters**

| Components | CAS-No. | Value type (Form of exposure) | Control parameters / Permissible concentration | Basis |
|---|---|---|---|---|
| Distillates (petroleum), hydrotreated heavy naphthenic | 64742-52-5 | TWA (Mist) | 5 mg/m3 | OSHA Z-1 |
| | | TWA (Inhalable fraction) | 5 mg/m3 | ACGIH |
| Distillates (petroleum), hydrotreated light | 64742-47-8 | TWA | 500 ppm<br>2,000 mg/m3 | OSHA Z-1 |
| | | TWA | 400 ppm<br>1,600 mg/m3 | OSHA P0 |
| | | TWA (Mist) | 5 mg/m3 | OSHA Z-1 |
| | | TWA (Mist) | 5 mg/m3 | OSHA P0 |
| | | TWA (Mist) | 5 mg/m3 | NIOSH REL |
| | | ST (Mist) | 10 mg/m3 | NIOSH REL |
| | | PEL (particulate) | 5 mg/m3 | CAL PEL |
| ethanol | 64-17-5 | TWA | 1,000 ppm | ACGIH |
| | | TWA | 1,000 ppm<br>1,900 mg/m3 | NIOSH REL |
| | | TWA | 1,000 ppm<br>1,900 mg/m3 | OSHA Z-1 |
| | | TWA | 1,000 ppm<br>1,900 mg/m3 | OSHA P0 |
| | | STEL | 1,000 ppm | ACGIH |
| | | PEL | 1,000 ppm<br>1,900 mg/m3 | CAL PEL |
| 1,2,4-trimethylbenzene | 95-63-6 | TWA | 25 ppm<br>125 mg/m3 | NIOSH REL |
| mesitylene | 108-67-8 | TWA | 25 ppm<br>125 mg/m3 | NIOSH REL |

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| | | | | |
|---|---|---|---|---|
| 1,2,3-trimethylbenzene | 526-73-8 | TWA | 25 ppm<br>125 mg/m3 | NIOSH REL |
| 2-(2-butoxyethoxy)ethanol | 112-34-5 | TWA (Inhalable fraction and vapor) | 10 ppm | ACGIH |
| carbon dioxide | 124-38-9 | TWA | 5,000 ppm | ACGIH |
| | | STEL | 30,000 ppm | ACGIH |
| | | TWA | 5,000 ppm<br>9,000 mg/m3 | NIOSH REL |
| | | ST | 30,000 ppm<br>54,000 mg/m3 | NIOSH REL |
| | | TWA | 5,000 ppm<br>9,000 mg/m3 | OSHA Z-1 |
| | | TWA | 10,000 ppm<br>18,000 mg/m3 | OSHA P0 |
| | | STEL | 30,000 ppm<br>54,000 mg/m3 | OSHA P0 |
| | | PEL | 5,000 ppm<br>9,000 mg/m3 | CAL PEL |
| | | STEL | 30,000 ppm<br>54,000 mg/m3 | CAL PEL |
| cumene | 98-82-8 | TWA | 50 ppm | ACGIH |
| | | TWA | 50 ppm<br>245 mg/m3 | NIOSH REL |
| | | TWA | 50 ppm<br>245 mg/m3 | OSHA Z-1 |
| | | TWA | 50 ppm<br>245 mg/m3 | OSHA P0 |
| | | PEL | 50 ppm<br>245 mg/m3 | CAL PEL |

**Engineering measures** : effective ventilation in all processing areas

**Personal protective equipment**

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

Hand protection
Material : Protective gloves
Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures : When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

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## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| Appearance | : | Aerosol containing a compressed gas |
| Colour | : | amber |
| Odour | : | solvent-like |
| Odour Threshold | : | No data available |
| pH | : | Not applicable |
| Melting point/freezing point | : | Not applicable |
| Boiling point | : | No data available |
| Flash point | : | No data available |
| Evaporation rate | : | < 1 |
| Flammability (solid, gas) | : | Extremely flammable aerosol. |
| Upper explosion limit | : | No data available |
| Lower explosion limit | : | No data available |
| Vapour pressure | : | No data available |
| Relative vapour density | : | No data available |
| Density | : | 0.85 g/cm3 |
| Solubility(ies) | | |
| Water solubility | : | insoluble |
| Partition coefficient: n-octanol/water | : | No data available |
| Auto-ignition temperature | : | not determined |
| Thermal decomposition | : | No data available |
| Viscosity | | |
| Viscosity, kinematic | : | No data available |
| Heat of combustion | : | > 20 kJ/g |

## SECTION 10. STABILITY AND REACTIVITY

| | | |
|---|---|---|
| Reactivity | : | Stable |
| Chemical stability | : | Stable under normal conditions. |
| Possibility of hazardous reactions | : | Vapours may form explosive mixture with air.<br>No decomposition if stored and applied as directed. |
| Conditions to avoid | : | Heat, flames and sparks. |

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Extremes of temperature and direct sunlight.

Incompatible materials : Strong oxidizing agents

Hazardous decomposition products : Carbon oxides

## SECTION 11. TOXICOLOGICAL INFORMATION

### Potential Health Effects

Aggravated Medical Condition : None known.

Symptoms of Overexposure : Symptoms may include irritation, redness, pain, and rash. Symptoms of overexposure may include disorientation; dizziness; and confusion. May progress to unconsciousness, paralysis, and convulsions.

Effects are dependent on exposure (dose, concentration, contact time).

**Carcinogenicity:**

| | | |
|---|---|---|
| **IARC** | Group 2B: Possibly carcinogenic to humans | |
| | cumene | 98-82-8 |
| **ACGIH** | Confirmed animal carcinogen with unknown relevance to humans | |
| | ethanol | 64-17-5 |
| **OSHA** | No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA. | |
| **NTP** | Reasonably anticipated to be a human carcinogen | |
| | cumene | 98-82-8 |

**Acute toxicity**

**Product:**

Acute oral toxicity : Acute toxicity estimate : > 5,000 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate : 25.9 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate : > 5,000 mg/kg
Method: Calculation method

**Components:**

**Distillates (petroleum), hydrotreated heavy naphthenic:**

Acute oral toxicity : LD50 Rat: > 5,000 mg/kg

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Acute inhalation toxicity : LC50 Rat: > 5 mg/l
Exposure time: 4 h

Acute dermal toxicity : LD50 Rabbit: > 5,000 mg/kg

**Distillates (petroleum), hydrotreated light:**
Acute oral toxicity : LD50 Rat: > 5,000 mg/kg

Acute inhalation toxicity : LC50 Rat: > 4.6 mg/l
Exposure time: 6 h

Acute dermal toxicity : LD50 Rat: > 2,000 mg/kg

**ethanol:**
Acute oral toxicity : LD50 Oral Rat: 7,060 mg/kg

Acute inhalation toxicity : LC50 Rat: 124.7 mg/l
Exposure time: 4 h

**2-ethylhexan-1-ol:**
Acute oral toxicity : LD50 Oral Rat: 3,730 mg/kg

Acute dermal toxicity : LD50 Dermal Rabbit: > 3,000 mg/kg

**Skin corrosion/irritation**

**Product:**

Remarks: May cause skin irritation and/or dermatitis.

**Serious eye damage/eye irritation**

**Product:**

Remarks: Severe eye irritation

**Respiratory or skin sensitisation**

**Product:**

Remarks: Causes sensitisation.

**Germ cell mutagenicity**

No data available

**Carcinogenicity**

No data available

**Reproductive toxicity**

No data available

**Distillates (petroleum), hydrotreated heavy naphthenic:**

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**Naphtha (petroleum), hydrotreated light:**
**Distillates (petroleum), hydrotreated light:**
**ethanol:**
**2-ethylhexan-1-ol:**
**1,2,4-trimethylbenzene:**
**mesitylene:**
**1,2,3-trimethylbenzene:**
**Distillates (petroleum), straight-run middle:**
**2-(2-butoxyethoxy)ethanol:**
**carbon dioxide:**
**Solvent naphtha (petroleum), heavy aliph.:**
**cumene:**

**STOT - single exposure**

No data available

**STOT - repeated exposure**

No data available

**Aspiration toxicity**

No data available

**Further information**

**Product:**

Remarks: No data available

Remarks: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting., Concentrations substantially above the TLV value may cause narcotic effects., Solvents may degrease the skin.

**Components:**
**Distillates (petroleum), hydrotreated light:**
Remarks: No data available

## SECTION 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

No data available

**Persistence and degradability**

No data available
**Bioaccumulative potential**

**Product:**

| | | |
|---|---|---|
| Partition coefficient: n-octanol/water | : | Remarks: No data available |

**Components:**
**2-ethylhexan-1-ol :**

| | | |
|---|---|---|
| Partition coefficient: n- | : | Pow: 2.9 |

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octanol/water
**2-(2-butoxyethoxy)ethanol :**
Partition coefficient: n-octanol/water : Pow: 1

**Mobility in soil**

No data available

**Other adverse effects**

No data available

**Product:**

| | |
|---|---|
| Regulation | 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances |
| Remarks | This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B). |

Additional ecological information : No data available

**Components:**
**Distillates (petroleum), hydrotreated light :**

Additional ecological information : No data available

## SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal methods**

Waste from residues : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

## SECTION 14. TRANSPORT INFORMATION

Transportation Regulation: 49 CFR (USA):
ORM-D, CONSUMER COMMODITY

Transportation Regulation: IMDG (Vessel):
UN1950, AEROSOLS, 2.1,

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Transportation Regulation: IATA (Cargo Air):
UN1950, Aerosols, flammable, 2.1,

Transportation Regulation: IATA (Passenger Air):
UN1950, Aerosols, flammable, 2.1,

Transportation Regulation: TDG (Canada):
UN1950, AEROSOLS, 2.1, - Limited quantity

The product as delivered to the customer conforms to packaging requirements for shipment by road under US Department of Transportation (DOT) regulations. Additional transportation classifications noted above are for reference only, and not a certification or warranty of the suitability of the packaging for shipment under these alternative transport regulations.

## SECTION 15. REGULATORY INFORMATION

**TSCA list** : No substances are subject to a Significant New Use Rule.
No substances are subject to TSCA 12(b) export notification requirements.

**EPCRA - Emergency Planning and Community Right-to-Know Act**

**CERCLA Reportable Quantity**

| Components | CAS-No. | Component RQ (lbs) | Calculated product RQ (lbs) |
|---|---|---|---|
| xylenes | 1330-20-7 | 100 | * |

*: Calculated RQ exceeds reasonably attainable upper limit.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 311/312 Hazards** : Acute Health Hazard
Sudden Release of Pressure Hazard
Fire Hazard
Chronic Health Hazard

**SARA 302** : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313** : The following components are subject to reporting levels established by SARA Title III, Section 313:
1,2,4-trimethylbenzene 95-63-6
The following components are subject to reporting levels established by SARA Title III, Section 313:
1,2,4-trimethylbenzene 95-63-6 5.7922 %

**California Prop 65** WARNING! This product contains a chemical known to the State of California to cause cancer.

cumene 98-82-8
ethylbenzene 100-41-4

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| | | |
|---|---|---|
| benzene | | 71-43-2 |
| naphthalene | | 91-20-3 |
| | WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. | |
| toluene | | 108-88-3 |
| benzene | | 71-43-2 |

**The components of this product are reported in the following inventories:**

| | |
|---|---|
| **TSCA** | On TSCA Inventory |
| **DSL** | All components of this product are on the Canadian DSL |

For information on the country notification status for other regions please contact the manufacturer's regulatory group.

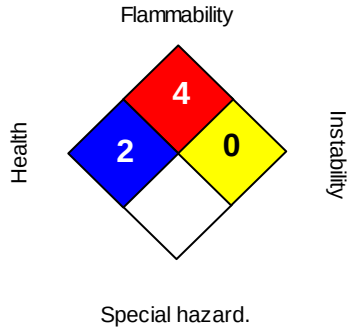
**Inventory Acronym and Validity Area Legend:**

TSCA (USA), DSL (Canada), NDSL (Canada)

## SECTION 16. OTHER INFORMATION

### Further information

**NFPA:**




**HMIS III:**

| | |
|---|---|
| HEALTH | 3* |
| FLAMMABILITY | 4 |
| PHYSICAL HAZARD | 2 |

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

### OSHA - GHS Label Information:

Hazard pictograms :

Signal word : **Danger:**

Hazard statements : Extremely flammable aerosol. Contains gas under pressure; may explode if heated. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May cause drowsiness or dizziness. Suspected of causing cancer.

Precautionary statements :

**Prevention:** Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not spray on an open flame or other ignition source. Pressurized container: Do not pierce or burn, even after use. Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. Wash skin thoroughly after handling. Use only outdoors or in a well-ventilated area. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/ protective clothing/ eye protection/ face protection.

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**Response:** IF ON SKIN: Wash with plenty of soap and water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Get medical advice/ attention. If skin irritation or rash occurs: Get medical advice/ attention. If eye irritation persists: Get medical advice/ attention. Take off contaminated clothing and wash before reuse.
**Storage:** Store in a well-ventilated place. Keep container tightly closed. Protect from sunlight. Do not expose to temperatures exceeding 50 °C/ 122 °F.
**Disposal:** Dispose of contents/container in accordance with local regulation.

| | |
|---|---|
| Version: | 3.0 |
| Revision Date: | 04/25/2017 |
| Print Date: | 08/15/2017 |

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind. The information in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. Users should make their own investigations to determine the suitability and applicability of the information for their particular purposes. This SDS has been prepared by the Compliance Services organization supporting this manufacturer, supplier or distributor.

Zep Inc. markets products under well recognized and established brand names such as Zep®, Zep Commercial®,Zep Professional®, Enforcer®, National Chemical™, Selig™, Misty®, Next Dimension™, Petro®, i-Chem®, TimeMist®, TimeWick™, MicrobeMax®, Country Vet®, Konk®, Original Bike Spirits®, Blue Coral®, Black Magic®, Rain-X®, Niagara National™, FC Forward Chemicals®,Rexodan®, Mykal™, and a number of private labeled brands.

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**COMPLETIONS**

**Halliburton Products stored on location**

**Tier II Determination**

| CAS # | Chemical | Max. on Location | Units | Specific Gravity | % by Weight | Gal | Pounds /gal | Total Pounds | Reportable Quantity | Reportable on Tier II | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7647-01-0 | **Hydrochloric Acid** | 10,000 | Gallons | 1.18 | 30-60% | 6,000 | 9.8294 | 58,976.40 | 5,000 lbs | yes | > 5,000 lbs; TRI Group 1 - 1.0% |
| | **HAI-OS** | 48 | Gallons | 0.89 | 100.00% | 48 | 7.4137 | 355.86 | NA | no | acute, chronic health & fire hazard; 313 = NL |
| 107-19-7 | Propargyl alcohol | | | 0.9485 | 5-10% | 4.8 | 7.9 | 37.90 | 1,000 lbs | no | "313", RCRA P102; < 1,000 lbs |
| 67-56-1 | Methanol | | | 0.791 | 30-60% | 28.8 | 6.58903 | 189.76 | 5,000 lbs | no | "313", RCRA U154; < 5,000 lbs |
| | **FR-76 friction reducer** | 6,000 | gallons | 1.06 | 100% | 6,000 | 8.8298 | 52,978.80 | NA | no | NL |
| Proprietary | Inorganic salt | | | NA | 30% | 1,800 | NA | NA | NA | no | NL |
| 64742-47-8 | Hydotreated lt petroleum | | | 0.8 | 30% | 1,800 | 6.664 | 11,995.20 | NA | no | NL |
| N/A | **Fight EC-1** | 6,000 | gallons | 1.10 | 60-100% | 6,000 | 9.163 | 54,978.00 | NA | no | friction reducer; no hazardous substances above cut-off |
| | **Scalecheck LP-50** | 3,300 | gallons | 1.0638 | 100% | 3,300 | 8.861454 | 29,242.80 | 10,000 lbs | yes | > 10,000 lbs; Category 4 acute oral toxicity; Category 3 flammable liquid |
| 67-56-1 | Methanol | | | 0.82 | 30% | 990 | 6.8306 | 6,762.29 | 5,000 lbs | yes | > 5,000 lbs; "313", RCRA U154 |
| Proprietary | Phosphoric Acid Salt | | | NA | 30% | 990 | 15.2 | 15,048.00 | NA | no | NL |
| 7647-14-5 | Sodium Chloride | | | 1.007 | 5% | 165 | 8.38831 | 1,384.07 | NA | no | NL |
| | **MC B-8614 biocide** | 6,600 | gallons | 1.041 | | 6,600 | 8.67153 | 57,232.10 | NA | no | NL |
| 111-30-8 | Glutareldehyde | | | 1.129 | 30% | 1,980 | 9.40457 | 18,621.05 | NA | no | NL |
| 68424-85-1 | Alkyl (C12-16) dimethylbenzylammonium chloride | | | 0.98 | 5% | 330 | 8.1634 | 2,693.92 | NA | no | NL |
| 64-174-5 | Ethyl alcohol | | | 0.8 | 1% | 66 | 6.664 | 439.82 | NA | no | NL |
| | **LCA-1 cleanup solution** | 330 | gallons | 0.806 | | | | | | | |
| Proprietary | Hydrotreated lt distillate | | | 0.806 | 100% | 330 | 6.71398 | 2,215.61 | NA | no | NL |
| **10043-52-4** | **Calcium chloride** | 4,400 | pounds | 1.85 | 100% | 284.789 | 15.4105 | 4,388.74 | NA | no | NL |
| | | | | | | | | | | | |
| 497-19-8 | **Soda ash** - Sodium Carbonate | 2,500 | pounds | 2.5 | 100% | 119.76 | 20.825 | 2,494.00 | NA | no | NL |

When there is a range, maximum quantity or percentage is used in calculation

NL = Not Listed

"313" = Subject to reporting under Section 313 & 6607

HALLIBURTON

# SAFETY DATA SHEET

**Product Trade Name:** **HYDROCHLORIC ACID**

**Revision Date:** 14-Apr-2016 **Revision Number:** 39

## 1. Identification

### 1.1. Product Identifier

**Product Trade Name:** HYDROCHLORIC ACID
**Synonyms** None
**Chemical Family:** Inorganic acid
**Internal ID Code** HM000911

### 1.2 Recommended use and restrictions on use

**Application:** Solvent
**Uses advised against** No information available

### 1.3 Manufacturer's Name and Contact Details

**Manufacturer/Supplier**
Halliburton Energy Services Inc.
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Emergency Telephone: 1-866-519-4752 (US, Canada, Mexico) or 1-760-476-3962

Halliburton Energy Services
645 - 7th Ave SW Suite 1800
Calgary, AB
T2P 4G8
Canada

**Prepared By** Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

### 1.4. Emergency telephone number

**Emergency Telephone Number:** 1-866-519-4752 or 1-760-476-3962

## 2. Hazard(s) Identification

### 2.1 Classification in accordance with paragraph (d) of §1910.1200

| | |
|---|---|
| Skin Corrosion / Irritation | Category 1 - H314 |
| Serious Eye Damage/Irritation | Category 1 - H318 |
| Specific Target Organ Toxicity - (Single Exposure) | Category 3 - H335 |
| Substances/mixtures corrosive to metal | Category 1 - H290 |

### 2.2. Label Elements

**Hazard pictograms**



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**Signal Word** Danger

**Hazard Statements**
H290 - May be corrosive to metals
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H335 - May cause respiratory irritation

**Precautionary Statements**

**Prevention**
P234 - Keep only in original container
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P264 - Wash face, hands and any exposed skin thoroughly after handling
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves/eye protection/face protection

**Response**
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P363 - Wash contaminated clothing before reuse
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P310 - Immediately call a POISON CENTER or doctor/physician
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P390 - Absorb spillage to prevent material damage

**Storage**
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P406 - Store in corrosive resistant container with a resistant inner liner.

**Disposal**
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations

### 2.3 Hazards not otherwise classified
None known

## 3. Composition/information on Ingredients

| Substances | CAS Number | PERCENT (w/w) | GHS Classification - US |
|---|---|---|---|
| Hydrochloric acid | 7647-01-0 | 30 - 60% | Skin Corr. 1B (H314)<br>Eye Corr. 1 (H318)<br>STOT SE 3 (H335)<br>Met. Corr. 1 (H290) |

The exact percentage (concentration) of the composition has been withheld as proprietary.

## 4. First-Aid Measures

### 4.1. Description of first aid measures
**Inhalation** If inhaled, move victim to fresh air and seek medical attention.



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| | |
|---|---|
| **Eyes** | In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing. |
| **Skin** | In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse. |
| **Ingestion** | Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention. |

### 4.2 Most important symptoms/effects, acute and delayed

Causes severe eye irritation which may damage tissue. Causes severe skin irritation with tissue destruction. May cause respiratory irritation.

### 4.3. Indication of any immediate medical attention and special treatment needed

**Notes to Physician** Treat symptomatically.

## 5. Fire-fighting measures

### 5.1. Extinguishing media

**Suitable Extinguishing Media**

Water fog, carbon dioxide, foam, dry chemical.

**Extinguishing media which must not be used for safety reasons**

None known.

### 5.2 Specific hazards arising from the substance or mixture

**Special exposure hazards in a fire**

May form explosive mixtures with strong alkalis. Decomposition in fire may produce harmful gases. Reaction with steel and certain other metals generates flammable hydrogen gas. Do not allow runoff to enter waterways.

### 5.3 Special protective equipment and precautions for fire-fighters

**Special protective equipment for firefighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

## 6. Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Avoid breathing vapors. Evacuate all persons from the area.

See Section 8 for additional information

### 6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas. Consult local authorities.

### 6.3. Methods and material for containment and cleaning up

Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Neutralize to pH of 6-8. Scoop up and remove.

## 7. Handling and storage

### 7.1. Precautions for safe handling

**Handling Precautions**

Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

**Hygiene Measures**

Handle in accordance with good industrial hygiene and safety practice.

### 7.2. Conditions for safe storage, including any incompatibilities



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**Storage Information**
Store away from alkalis. Store in a cool well ventilated area. Keep container closed when not in use. Store locked up. Product has a shelf life of 24 months.

## 8. Exposure Controls/Personal Protection

### 8.1 Occupational Exposure Limits

| Substances | CAS Number | OSHA PEL-TWA | ACGIH TLV-TWA |
|---|---|---|---|
| Hydrochloric acid | 7647-01-0 | TWA: 5 ppm (Ceiling) | TWA: 2 ppm (Ceiling) |

### 8.2 Appropriate engineering controls

**Engineering Controls** Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

### 8.3 Individual protection measures, such as personal protective equipment

**Personal Protective Equipment** If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

**Respiratory Protection** If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional.
Acid gas respirator.

**Hand Protection** Chemical-resistant protective gloves (EN 374) Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374): Butyl rubber gloves. (>= 0.7 mm thickness) This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced. Manufacturer's directions for use should be observed because of great diversity of types.

**Skin Protection** Full protective chemical resistant clothing. Rubber boots

**Eye Protection** Chemical goggles; also wear a face shield if splashing hazard exists.

**Other Precautions** Eyewash fountains and safety showers must be easily accessible.

## 9. Physical and Chemical Properties

### 9.1. Information on basic physical and chemical properties

**Physical State:** Liquid **Color** Clear colorless
**Odor:** Pungent acrid **Odor Threshold:** No information available

| Property<br>Remarks/ - Method | Values |
|---|---|
| **pH:** | 0.8 |
| **Freezing Point / Range** | -46 °C / -50 °F |
| **Melting Point / Range** | No data available |
| **Boiling Point / Range** | 110 °C / 230 °F |
| **Flash Point** | No data available |
| **Flammability (solid, gas)** | No data available |


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| | |
|---|---|
| **Upper flammability limit** | No data available |
| **Lower flammability limit** | No data available |
| **Evaporation rate** | No data available |
| **Vapor Pressure** | 26 |
| **Vapor Density** | No data available |
| **Specific Gravity** | 1.18 |
| **Water Solubility** | Soluble in water |
| **Solubility in other solvents** | No data available |
| **Partition coefficient: n-octanol/water** | No data available |
| **Autoignition Temperature** | No data available |
| **Decomposition Temperature** | No data available |
| **Viscosity** | No data available |
| **Explosive Properties** | No information available |
| **Oxidizing Properties** | No information available |

**9.2. Other information**

| | |
|---|---|
| **Molecular Weight** | 36.5 |
| **VOC Content (%)** | No data available |

## 10. Stability and Reactivity

**10.1. Reactivity**
Not expected to be reactive.

**10.2. Chemical stability**
Stable

**10.3. Possibility of hazardous reactions**
Will Not Occur

**10.4. Conditions to avoid**
None anticipated

**10.5. Incompatible materials**
Strong alkalis.

**10.6. Hazardous decomposition products**
Flammable hydrogen gas. Chlorine. Hydrogen sulfide.

## 11. Toxicological Information

**11.1 Information on likely routes of exposure**

| | |
|---|---|
| **Principle Route of Exposure** | Eye or skin contact, inhalation. |

**11.2 Symptoms related to the physical, chemical and toxicological characteristics**

**Acute Toxicity**

| | |
|---|---|
| **Inhalation** | Causes severe respiratory irritation. |
| **Eye Contact** | Causes eye burns |
| **Skin Contact** | Causes severe burns. Did not cause sensitization on laboratory animals (guinea pig) |
| **Ingestion** | Causes burns of the mouth, throat and stomach. |

**Chronic Effects/Carcinogenicity** Prolonged, excessive exposure may cause erosion of the teeth.

**11.3 Toxicity data**

**Toxicology data for the components**



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| Substances | CAS Number | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|---|
| Hydrochloric acid | 7647-01-0 | No data available | 5010 mg/kg (Rabbit)<br>> 5010 mg/kg (Rabbit)<br>1449 mg/kg (Mouse) | 3124 mg/L (Rat) 1h<br>3.2 mg/L (Mouse)<br>8.3 mg/L (Rat)<br>1405 mg/L (Rat)<br>554 mg/L (Mouse) |

| Substances | CAS Number | Skin corrosion/irritation |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | Causes severe burns |

| Substances | CAS Number | Serious eye damage/irritation |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | Causes severe burns |

| Substances | CAS Number | Skin Sensitization |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | Did not cause sensitization on laboratory animals (guinea pig) |

| Substances | CAS Number | Respiratory Sensitization |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | No information available |

| Substances | CAS Number | Mutagenic Effects |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | Not regarded as mutagenic. |

| Substances | CAS Number | Carcinogenic Effects |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | No data of sufficient quality are available. |

| Substances | CAS Number | Reproductive toxicity |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | Embryo and fetotoxicity has been observed in female rats exposed to maternally toxic levels of hydrogen chloride (450 mg/m$^3$, 1hr.). |

| Substances | CAS Number | STOT - single exposure |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | May cause respiratory irritation. |

| Substances | CAS Number | STOT - repeated exposure |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | No significant toxicity observed in animal studies at concentration requiring classification. |

| Substances | CAS Number | Aspiration hazard |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | Not applicable |

## 12. Ecological Information

### 12.1. Toxicity

**Ecotoxicity effects**

Product is not classified as hazardous to the environment.

**Product Ecotoxicity Data**

No data available

**Substance Ecotoxicity Data**

| Substances | CAS Number | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Toxicity to Invertebrates |
|---|---|---|---|---|---|
| Hydrochloric acid | 7647-01-0 | No information available | LC50 282 mg/L (Gambusia affinis)<br>LC50 20.5 mg/L (Lepomis macrochirus)<br>LC50 (96h) 3.25 – 3.5 (pH) (Lepomis macrochirus) | EC50 (3h) >= 5 and <= 5.5 (pH) (Activated sludge, domestic) | EC50 (48h) 4.9 (pH) (Daphnia magna) |

### 12.2. Persistence and degradability

The methods for determining biodegradability are not applicable to inorganic substances.

| Substances | CAS Number | Persistence and Degradability |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | The methods for determining biodegradability are not applicable to inorganic substances. |

### 12.3. Bioaccumulative potential

Does not bioaccumulate.

| Substances | CAS Number | Log Pow |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | 0.25 |

### 12.4. Mobility in soil

| Substances | CAS Number | Mobility |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | No information available |

### 12.5 Other adverse effects

No information available

## 13. Disposal Considerations

### 13.1. Waste treatment methods

**Disposal methods** Disposal should be made in accordance with federal, state, and local regulations. Substance should NOT be deposited into a sewage facility.

**Contaminated Packaging** Follow all applicable national or local regulations.

## 14. Transport Information

### US DOT

**UN Number** UN1789
**UN proper shipping name:** Hydrochloric Acid Solution
**Transport Hazard Class(es):** 8
**Packing Group:** II
**Environmental Hazards** Not applicable
**Reportable Quantity:** RQ (Hydrochloric Acid - 2273 kg.)
**NAERG:** NAERG 157

### Canadian TDG

**UN Number** UN1789
**UN proper shipping name:** Hydrochloric Acid Solution
**Transport Hazard Class(es):** 8
**Packing Group:** II
**Environmental Hazards** Not applicable

### IMDG/IMO

**UN Number** UN1789
**UN proper shipping name:** Hydrochloric Acid Solution
**Transport Hazard Class(es):** 8
**Packing Group:** II
**Environmental Hazards** Not applicable
**Reportable Quantity:** RQ (Hydrochloric Acid - 2273 kg.)
**EMS:** EmS F-A, S-B

### IATA/ICAO

**UN Number** UN1789
**UN proper shipping name:** Hydrochloric Acid Solution
**Transport Hazard Class(es):** 8
**Packing Group:** II
**Environmental Hazards** Not applicable
**Reportable Quantity:** RQ (Hydrochloric Acid - 2273 kg.)

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not applicable



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**Special Precautions for User** None

## 15. Regulatory Information

### US Regulations

**US TSCA Inventory** All components listed on inventory or are exempt.

**TSCA Significant New Use Rules - S5A2**

| Substances | CAS Number | TSCA Significant New Use Rules - S5A2 |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | Not applicable |

**EPA SARA Title III Extremely Hazardous Substances**

| Substances | CAS Number | EPA SARA Title III Extremely Hazardous Substances |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | 5000 lb |

**EPA SARA (311,312) Hazard Class**
Acute Health Hazard

**EPA SARA (313) Chemicals**

| Substances | CAS Number | Toxic Release Inventory (TRI) - Group I | Toxic Release Inventory (TRI) - Group II |
|---|---|---|---|
| Hydrochloric acid | 7647-01-0 | 1.0% | Not applicable |

**EPA CERCLA/Superfund Reportable Spill Quantity**

| Substances | CAS Number | CERCLA RQ |
|---|---|---|
| Hydrochloric acid | 7647-01-0 | 5000 lb<br>2270 kg |

**EPA RCRA Hazardous Waste Classification**
If product becomes a waste, it does meet the criteria of a hazardous waste as defined by the US EPA, because of:

Corrosivity D002

**California Proposition 65** All components listed do not apply to the California Proposition 65 Regulation.

**MA Right-to-Know Law** One or more components listed.

**NJ Right-to-Know Law** One or more components listed.

**PA Right-to-Know Law** One or more components listed.

**NFPA Ratings:** Health 3, Flammability 0, Reactivity 1
**HMIS Ratings:** Health 3, Flammability 0, Physical Hazard 1 , PPE: Joq

### Canadian Regulations

**Canadian Domestic Substances List (DSL)** All components listed on inventory or are exempt.

## 16. Other information

**Preparation Information**
**Prepared By** Chemical Stewardship
Telephone: 1-281-871-6107



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e-mail: fdunexchem@halliburton.com

**Revision Date:** 14-Apr-2016

**Reason for Revision** SDS sections updated:
2

**Additional information**
For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

**Key or legend to abbreviations and acronyms used in the safety data sheet**
bw – body weight
CAS – Chemical Abstracts Service
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
h - hour
$mg/m^3$ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
w/w - weight/weight
d - day

**Key literature references and sources for data**
www.ChemADVISOR.com/
NZ CCID

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**End of Safety Data Sheet**

HALLIBURTON

# MATERIAL SAFETY DATA SHEET

**Product Trade Name:** **HAI-OS ACID INHIBITOR**

**Revision Date:** 04-Jan-2011

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Trade Name:** HAI-OS ACID INHIBITOR
**Synonyms:** None
**Chemical Family:** Blend
**Application:** Corrosion Inhibitor

**Manufacturer/Supplier**
Halliburton Energy Services
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Emergency Telephone: (281) 575-5000

**Prepared By**
Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

| Substances | CAS Number | PERCENT | ACGIH TLV-TWA | OSHA PEL-TWA |
|---|---|---|---|---|
| Propargyl alcohol | 107-19-7 | 5 - 10% | 1 ppm S | Not applicable |
| Methanol | 67-56-1 | 30 - 60% | 200 ppm (S) | 200 ppm |

## 3. HAZARDS IDENTIFICATION

**Hazard Overview**
May cause eye, skin, and respiratory irritation. May cause headache, dizziness, and other central nervous system effects. May be absorbed through the skin. May be fatal if swallowed. May cause blindness. Flammable.

## 4. FIRST AID MEASURES

**Inhalation**
If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

**Skin**
In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse.

**Eyes**
In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

**Ingestion**
Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

**Notes to Physician**
Probable mucosal damage may contraindicate the use of gastric lavage.



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## 5. FIRE FIGHTING MEASURES

| | |
|---|---|
| **Flash Point/Range (F):** | Not Determined**Max:** < 52 |
| **Flash Point/Range (C):** | Not Determined**Max:** < 11 |
| **Flash Point Method:** | Not Determined |
| **Autoignition Temperature (F):** | Not Determined |
| **Autoignition Temperature (C):** | Not Determined |
| **Flammability Limits in Air - Lower (%):** | Not Determined |
| **Flammability Limits in Air - Upper (%):** | Not Determined |

**Fire Extinguishing Media** Water fog, carbon dioxide, foam, dry chemical.

**Special Exposure Hazards** May be ignited by heat, sparks or flames. Decomposition in fire may produce toxic gases. Use water spray to cool fire exposed surfaces. Closed containers may explode in fire. Avoid spraying water directly into storage containers due to danger of boilover. Vapors are heavier than air and may accumulate in low areas. Vapors may travel along the ground to be ignited at distant locations.

**Special Protective Equipment for Fire-Fighters** Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

**NFPA Ratings:** Health 2, Flammability 3, Reactivity 0
**HMIS Ratings:** Health 2, Flammability 3, Reactivity 0

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautionary Measures** Use appropriate protective equipment. Wear self-contained breathing apparatus in enclosed areas.

**Environmental Precautionary Measures** Prevent from entering sewers, waterways, or low areas.

**Procedure for Cleaning / Absorption** Isolate spill and stop leak where safe. Remove ignition sources and work with non-sparking tools. Contain spill with sand or other inert materials. Scoop up and remove.

## 7. HANDLING AND STORAGE

**Handling Precautions** Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse. Ground and bond containers when transferring from one container to another.

**Storage Information** Store away from oxidizers. Keep from heat, sparks, and open flames. Keep container closed when not in use. Product has a shelf life of 24 months.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Engineering Controls** Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

**Respiratory Protection** Positive pressure self-contained breathing apparatus if methanol is released.

**Hand Protection** Impervious rubber gloves.

**Skin Protection** Full protective chemical resistant clothing.

**Eye Protection** Chemical goggles; also wear a face shield if splashing hazard exists.

**Other Precautions** Eyewash fountains and safety showers must be easily accessible.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Physical State:** | Liquid |
| **Color:** | Clear amber |
| **Odor:** | Alcohol |
| **pH:** | 3.15 |
| **Specific Gravity @ 20 C (Water=1):** | 0.89 |
| **Density @ 20 C (lbs./gallon):** | 7.41 |
| **Bulk Density @ 20 C (lbs/ft3):** | Not Determined |
| **Boiling Point/Range (F):** | Not Determined |
| **Boiling Point/Range (C):** | Not Determined |
| **Freezing Point/Range (F):** | -20 |
| **Freezing Point/Range (C):** | -29 |
| **Vapor Pressure @ 20 C (mmHg):** | Not Determined |
| **Vapor Density (Air=1):** | >1 |
| **Percent Volatiles:** | Not Determined |
| **Evaporation Rate (Butyl Acetate=1):** | Not Determined |
| **Solubility in Water (g/100ml):** | Disperses |
| **Solubility in Solvents (g/100ml):** | Not Determined |
| **VOCs (lbs./gallon):** | Not Determined |
| **Viscosity, Dynamic @ 20 C (centipoise):** | Not Determined |
| **Viscosity, Kinematic @ 20 C (centistrokes):** | Not Determined |
| **Partition Coefficient/n-Octanol/Water:** | Not Determined |
| **Molecular Weight (g/mole):** | Not Determined |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **Stability Data:** | Stable |
| **Hazardous Polymerization:** | Will Not Occur |
| **Conditions to Avoid** | Keep away from heat, sparks and flame. Avoid contact with acids. Avoid contact with oxidizers. |
| **Incompatibility (Materials to Avoid)** | Strong oxidizers. Strong acids. Strong alkalis. |
| **Hazardous Decomposition Products** | Oxides of sulfur. Carbon monoxide and carbon dioxide. |
| **Additional Guidelines** | Not Applicable |

## 11. TOXICOLOGICAL INFORMATION

| | |
|---|---|
| **Principle Route of Exposure** | Eye or skin contact, inhalation. |
| **Inhalation** | Causes severe respiratory irritation. May cause chemical pneumonia. May cause central nervous system depression including headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness. |
| **Skin Contact** | May cause severe skin irritation. May be absorbed through the skin and produce effects similar to those caused by inhalation and/or ingestion. |
| **Eye Contact** | Causes severe eye irritation which may damage tissue. |

| | |
|---|---|
| **Ingestion** | May be fatal or cause blindness if swallowed. Causes burns of the mouth, throat and stomach. May cause central nervous system depression including headache, dizziness, drowsiness, muscular weakness, incoordination, slowed reaction time, fatigue blurred vision, slurred speech, giddiness, tremors and convulsions. |
| **Aggravated Medical Conditions** | Skin disorders. |
| **Chronic Effects/Carcinogenicity** | Prolonged or repeated exposure may cause eye, blood, lung, liver, kidney, heart, central nervous system and spleen damage. |
| **Other Information** | None known. |

**Toxicity Tests**

| | |
|---|---|
| **Oral Toxicity:** | Not determined |
| **Dermal Toxicity:** | Not determined |
| **Inhalation Toxicity:** | Not determined |
| **Primary Irritation Effect:** | Not determined |
| **Carcinogenicity** | Not determined |
| **Genotoxicity:** | Not determined |
| **Reproductive / Developmental Toxicity:** | Not determined |

## 12. ECOLOGICAL INFORMATION

| | |
|---|---|
| **Mobility (Water/Soil/Air)** | Not determined |
| **Persistence/Degradability** | Not determined |
| **Bio-accumulation** | Not determined |

### Ecotoxicological Information

| | |
|---|---|
| **Acute Fish Toxicity:** | TLM96: 8132 mg/l (Cyprinodon variegatus) |
| **Acute Crustaceans Toxicity:** | Not determined |
| **Acute Algae Toxicity:** | Not determined |
| **Chemical Fate Information** | Not determined |
| **Other Information** | Not applicable |

## 13. DISPOSAL CONSIDERATIONS

| | |
|---|---|
| **Disposal Method** | Disposal should be made in accordance with federal, state, and local regulations. |
| **Contaminated Packaging** | Follow all applicable national or local regulations. |

## 14. TRANSPORT INFORMATION

### Land Transportation

**DOT**

UN1993,Flammable Liquid, N.O.S.(Contains Methanol, Propargyl Alcohol), 3, II, (11.1 C)
NAERG 128

**Canadian TDG**
Flammable Liquid, N.O.S.(Contains Methanol, Propargyl Alcohol), 3, UN1993, II, (11.1 C)

**ADR**

UN1993,Flammable Liquid, N.O.S.(Contains Methanol, Propargyl Alcohol), 3, II

## Air Transportation

**ICAO/IATA**

UN1993,Flammable Liquid, N.O.S., 3, II
(Contains Methanol, Propargyl Alcohol Solution)

## Sea Transportation

**IMDG**

UN1993,Flammable Liquid, N.O.S.(Contains Methanol, Propargyl Alcohol), 3, II, (11.1 C)
EmS F-E, S-E

## Other Shipping Information

**Labels:** Flammable Liquid

# 15. REGULATORY INFORMATION

## US Regulations

| | |
|---|---|
| **US TSCA Inventory** | All components listed on inventory or are exempt. |
| **EPA SARA Title III Extremely Hazardous Substances** | Not applicable |
| **EPA SARA (311,312) Hazard Class** | Acute Health Hazard<br>Chronic Health Hazard<br>Fire Hazard |
| **EPA SARA (313) Chemicals** | This product contains toxic chemical(s) listed below which is(are) subject to the reporting requirements of Section 313 of Title III of SARA and 40 CFR Part 372:<br>Methanol//67-56-1<br>Propargyl Alcohol//107-19-7 |
| **EPA CERCLA/Superfund Reportable Spill Quantity** | EPA Reportable Spill Quantity is 1435 Gallons based on Methanol (CAS: 67-56-1). |
| **EPA RCRA Hazardous Waste Classification** | If product becomes a waste, it does meet the criteria of a hazardous waste as defined by the US EPA, because of:<br><br>Ignitability D001 |
| **California Proposition 65** | All components listed do not apply to the California Proposition 65 Regulation. |

| | |
|---|---|
| **MA Right-to-Know Law** | One or more components listed. |
| **NJ Right-to-Know Law** | One or more components listed. |
| **PA Right-to-Know Law** | One or more components listed. |

## Canadian Regulations

| | |
|---|---|
| **Canadian DSL Inventory** | All components listed on inventory. |
| **WHMIS Hazard Class** | B2 Flammable Liquids<br>E Corrosive Material<br>D1A Very Toxic Materials<br>D1B Toxic Materials |

## 16. OTHER INFORMATION

**The following sections have been revised since the last issue of this MSDS**
Not applicable

**Additional Information**

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

**Disclaimer Statement**

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

HALLIBURTON

# SAFETY DATA SHEET

**Product Trade Name:** **FR-76**

**Revision Date:** 04-Jun-2015 **Revision Number:** 6

## 1. Identification

### 1.1. Product Identifier

**Product Trade Name:** FR-76
**Synonyms:** None
**Chemical Family:** Anionic Polymer Emulsion
**Internal ID Code** HM007764

### 1.2 Recommended use and restrictions on use

**Application:** Friction Reducer
**Uses Advised Against** No information available

### 1.3 Manufacturer's Name and Contact Details

**Manufacturer/Supplier**
Halliburton Energy Services, Inc.
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Emergency Telephone: (1-866-519-4752 (US, Canada, Mexico) or 1-760-476-3962

Halliburton Energy Services
645 - 7th Ave SW Suite 2200
Calgary, AB
T2P 4G8
Canada

**Prepared By** Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

### 1.4. Emergency telephone number

**Emergency Telephone Number** 1-866-519-4752 or 1-760-476-3962

## 2. Hazard(s) Identification

### 2.1 Classification in accordance with paragraph (d) of §1910.1200

| | |
|---|---|
| Serious Eye Damage / Eye Irritation | Category 2B - H320 |

### 2.2. Label Elements

**Hazard Pictograms**

**Signal Word** Warning

**Hazard Statements** H320 - Causes mild eye irritation

**Precautionary Statements**



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| | |
|---|---|
| **Prevention** | P264 - Wash face, hands and any exposed skin thoroughly after handling |
| **Response** | P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing<br>P337 + P313 - If eye irritation persists: Get medical advice/attention |
| **Storage** | None |
| **Disposal** | None |

### 2.3 Hazards not otherwise classified
None known

## 3. Composition/information on Ingredients

| Substances | CAS Number | PERCENT (w/w) | GHS Classification - US |
|---|---|---|---|
| Inorganic salt | Proprietary | 10 - 30% | Eye Irrit. 2B (H320) |
| Hydrotreated light petroleum distillate | 64742-47-8 | 10 - 30% | Asp. Tox. 1 (H304)<br>STOT SE 3 (H336) |

The specific chemical identity of the composition has been withheld as proprietary. The exact percentage (concentration) of the composition has been withheld as proprietary.

## 4. First-Aid Measures

### 4.1. Description of first aid measures

| | |
|---|---|
| **Inhalation** | If inhaled, move victim to fresh air and seek medical attention. |
| **Eyes** | In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists. |
| **Skin** | Wash with soap and water. Get medical attention if irritation persists. Remove contaminated clothing and launder before reuse. |
| **Ingestion** | Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration. Rinse mouth. Never give anything by mouth to an unconscious person. |

### 4.2 Most important symptoms/effects, acute and delayed
Causes mild eye irritation. May cause mild eye irritation.

### 4.3. Indication of any immediate medical attention and special treatment needed
**Notes to Physician** Treat symptomatically.

## 5. Fire-fighting measures

### 5.1. Extinguishing media
**Suitable Extinguishing Media**
Water fog, carbon dioxide, foam, dry chemical.
**Extinguishing media which must not be used for safety reasons**
None known.

### 5.2 Specific hazards arising from the substance or mixture
**Special Exposure Hazards**
Decomposition in fire may produce harmful gases. Use water spray to cool fire exposed surfaces.

### 5.3 Special protective equipment and precautions for fire-fighters
**Special Protective Equipment for Fire-Fighters**
Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.


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## 6. Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures
Use appropriate protective equipment.
See Section 8 for additional information

### 6.2. Environmental precautions
Prevent from entering sewers, waterways, or low areas.

### 6.3. Methods and material for containment and cleaning up
Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

## 7. Handling and storage

### 7.1. Precautions for Safe Handling
**Handling Precautions**
Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse. Material is slippery underfoot. Avoid breathing mist.
**Hygiene Measures**
Handle in accordance with good industrial hygiene and safety practice.

### 7.2. Conditions for safe storage, including any incompatibilities
**Storage Information**
Store away from oxidizers. Keep container closed when not in use. Store in a cool, dry location. Store in a well ventilated area. Product has a shelf life of 6 months.

## 8. Exposure Controls/Personal Protection

### 8.1 Occupational Exposure Limits

| Substances | CAS Number | OSHA PEL-TWA | ACGIH TLV-TWA |
|---|---|---|---|
| Inorganic salt | Proprietary | Not applicable | Not applicable |
| Hydrotreated light petroleum distillate | 64742-47-8 | Not applicable | Not applicable |

### 8.2 Appropriate engineering controls
**Engineering Controls** Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

### 8.3 Individual protection measures, such as personal protective equipment
**Personal Protective Equipment** If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.
**Respiratory Protection** Not normally needed. But if significant exposures are possible then the following respirator is recommended:
Organic vapor respirator.

**Hand Protection** Impervious rubber gloves.
**Skin Protection** Rubber apron.
**Eye Protection** Chemical goggles; also wear a face shield if splashing hazard exists.
**Other Precautions** None known.

## 9. Physical and Chemical Properties


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**9.1. Information on basic physical and chemical properties**

| | | | |
|---|---|---|---|
| **Physical State:** | Liquid | **Color:** | White |
| **Odor:** | Sweet hydrocarbon | **Odor Threshold:** | No information available |

| Property<br>Remarks/ - Method | Values |
|---|---|
| **pH:** | No data available |
| **Freezing Point/Range** | < -29 °C / < -20 °F |
| **Melting Point/Range** | No data available |
| **Boiling Point/Range** | No data available |
| **Flash Point** | > 100 °C / > 212 °F PMCC |
| **Flammability (solid, gas)** | No data available |
| **upper flammability limit** | No data available |
| **lower flammability limit** | No data available |
| **Evaporation rate** | No data available |
| **Vapor Pressure** | No data available |
| **Vapor Density** | No data available |
| **Specific Gravity** | 1.06 |
| **Water Solubility** | Partly soluble |
| **Solubility in other solvents** | No data available |
| **Partition coefficient: n-octanol/water** | No data available |
| **Autoignition Temperature** | > 215 °C / > 419 °F |
| **Decomposition Temperature** | No data available |
| **Viscosity** | No data available |
| **Explosive Properties** | No information available |
| **Oxidizing Properties** | No information available |

**9.2. Other information**

**VOC Content (%)** 50

## 10. Stability and Reactivity

**10.1. Reactivity**

Not expected to be reactive.

**10.2. Chemical Stability**

Stable

**10.3. Possibility of Hazardous Reactions**

Will Not Occur

**10.4. Conditions to Avoid**

None anticipated

**10.5. Incompatible Materials**

Strong oxidizers.

**10.6. Hazardous Decomposition Products**

Oxides of nitrogen. Carbon monoxide and carbon dioxide. Chlorine.

## 11. Toxicological Information

**11.1 Information on likely routes of exposure**

**Principle Route of Exposure** Eye or skin contact, inhalation.

## 11.2 Symptoms related to the physical, chemical and toxicological characteristics

**Acute Toxicity**

**Inhalation** Inhalation of mist or heated vapors may cause respiratory irritation.

**Eye Contact** Causes mild eye irritation.

**Skin Contact** May cause skin defatting with prolonged exposure.

**Ingestion** Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal.

**Chronic Effects/Carcinogenicity** No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

## 11.3 Toxicity data

### Toxicology data for the components

| Substances | CAS Number | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|---|
| Inorganic salt | Proprietary | 3000 mg/kg (Rat)<br>3550 mg/kg (Rat) | >10000 mg/kg (Rabbit) | 42 mg/L (Rat) 1h |
| Hydrotreated light petroleum distillate | 64742-47-8 | > 5000 mg/kg (Rat) (similar substance) | > 2000 mg/kg (Rabbit) (similar substance) | > 5.28 mg/L (Rat) 4h (similar substance) |

| Substances | CAS Number | Skin corrosion/irritation |
|---|---|---|
| Inorganic salt | | Non-irritating to the skin (Rabbit) |
| Hydrotreated light petroleum distillate | 64742-47-8 | Non-irritating to the skin (similar substances) |

| Substances | CAS Number | Eye damage/irritation |
|---|---|---|
| Inorganic salt | | May cause mild eye irritation. (Rabbit) |
| Hydrotreated light petroleum distillate | 64742-47-8 | Non-irritating to rabbit's eye |

| Substances | CAS Number | Skin Sensitization |
|---|---|---|
| Inorganic salt | | No information available |
| Hydrotreated light petroleum distillate | 64742-47-8 | Did not cause sensitization on laboratory animals (guinea pig) (similar substances) |

| Substances | CAS Number | Respiratory Sensitization |
|---|---|---|
| Inorganic salt | | No information available |
| Hydrotreated light petroleum distillate | 64742-47-8 | No information available |

| Substances | CAS Number | Mutagenic Effects |
|---|---|---|
| Inorganic salt | | No information available |
| Hydrotreated light petroleum distillate | 64742-47-8 | In vitro tests did not show mutagenic effects. In vivo tests did not show mutagenic effects. (similar substances) |

| Substances | CAS Number | Carcinogenic Effects |
|---|---|---|
| Inorganic salt | | Did not show carcinogenic effects in animal experiments |
| Hydrotreated light petroleum distillate | 64742-47-8 | Did not show carcinogenic effects in animal experiments |

| Substances | CAS Number | Reproductive toxicity |
|---|---|---|
| Inorganic salt | | Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. |
| Hydrotreated light petroleum distillate | 64742-47-8 | Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. (similar substances) |

| Substances | CAS Number | STOT - single exposure |
|---|---|---|
| Inorganic salt | | No information available |
| Hydrotreated light petroleum distillate | 64742-47-8 | May cause disorder and damage to the Central Nervous System (CNS) (similar substances) |

| Substances | CAS Number | STOT - repeated exposure |
|---|---|---|



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| | | |
|---|---|---|
| Inorganic salt | | No significant toxicity observed in animal studies at concentration requiring classification. |
| Hydrotreated light petroleum distillate | 64742-47-8 | No significant toxicity observed in animal studies at concentration requiring classification. (similar substances) |

| Substances | CAS Number | Aspiration hazard |
|---|---|---|
| Inorganic salt | | Not applicable |
| Hydrotreated light petroleum distillate | 64742-47-8 | Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal. |

## 12. Ecological Information

### 12.1. Toxicity

**Ecotoxicity Effects**

**Product Ecotoxicity Data**

No data available

**Substance Ecotoxicity Data**

| Substances | CAS Number | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Toxicity to Invertebrates |
|---|---|---|---|---|---|
| Inorganic salt | Proprietary | EC50 (120h) 2430 mg/L (Nitzschia sp.) | TLM96 > 1000 mg/L (Oncorhynchus mykiss) LC50 (96h) 5840 mg/L (Lepomis macrochirus) NOEC (33d) 252 mg/L (Pimephales promelas) | NOEC 5000 – 8000 mg/L (activated sludge) NOEC 292-584 mg/L (Escherichia coli) | TLM96 > 1,000,000 ppm (Mysidopsis bahia) LC50 (48h) 874-4136 mg/L (Daphnia magna) NOEC (21d) 314 mg/L (Daphnia pulex) |
| Hydrotreated light petroleum distillate | 64742-47-8 | EC50 (72h) > 1,000 mg/L (Skeletonema costatum) ErL50 (72h) > 1000 mg/L (Pseudokirchneriella subcapitata) EbL50 (72h) > 1000 mg/L (Pseudokirchneriella subcapitata) NOELR (72h) 1000 mg/L (Pseudokirchneriella subcapitata) | LC50 (96h) > 10,000 mg/L (Scophthalmus maximus) LL50 (96h) > 1000 mg/L (Oncorhynchus mykiss) | No information available | LC50 (48h) > 10,000 mg/L (Acartia tonsa) EC50 (48h) 1100 mg/L (Daphnia pulex) LC50 (48h) 0.12 mg/L (Daphnia magna) EL50 (48h) > 1000 mg/L (Daphnia magna) |

### 12.2. Persistence and degradability

| Substances | CAS Number | Persistence and Degradability |
|---|---|---|
| Inorganic salt | Proprietary | No information available |
| Hydrotreated light petroleum distillate | 64742-47-8 | Readily biodegradable (40% @ 28d) |

### 12.3. Bioaccumulative potential

| Substances | CAS Number | Log Pow |
|---|---|---|
| Inorganic salt | Proprietary | No information available |
| Hydrotreated light petroleum distillate | 64742-47-8 | No information available |

### 12.4. Mobility in soil

| Substances | CAS Number | Mobility |
|---|---|---|
| Inorganic salt | Proprietary | No information available |
| Hydrotreated light petroleum distillate | 64742-47-8 | No information available |

### 12.5 Other adverse effects

No information available

## 13. Disposal Considerations



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**13.1. Waste treatment methods**

**Disposal Method** Disposal should be made in accordance with federal, state, and local regulations.
**Contaminated Packaging** Follow all applicable national or local regulations.

## 14. Transport Information

**US DOT**

**UN Number:** Not restricted
**UN Proper Shipping Name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

**US DOT Bulk**

**DOT (Bulk)** Not applicable

**Canadian TDG**

**UN Number:** Not restricted
**UN Proper Shipping Name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

**IMDG/IMO**

**UN Number:** Not restricted
**UN Proper Shipping Name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

**IATA/ICAO**

**UN Number:** Not restricted
**UN Proper Shipping Name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:** Not applicable
**Special Precautions for User:** None

## 15. Regulatory Information

### US Regulations

**US TSCA Inventory** All components listed on inventory or are exempt.

**TSCA Significant New Use Rules - S5A2**

| Substances | CAS Number | TSCA Significant New Use Rules - S5A2 |
|---|---|---|
| Inorganic salt | Proprietary | Not applicable |
| Hydrotreated light petroleum distillate | 64742-47-8 | Not applicable |

**EPA SARA Title III Extremely Hazardous Substances**

| Substances | CAS Number | EPA SARA Title III Extremely Hazardous Substances |
|---|---|---|
| Inorganic salt | Proprietary | Not applicable |
| Hydrotreated light petroleum distillate | 64742-47-8 | Not applicable |



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**EPA SARA (311,312) Hazard Class**
Acute Health Hazard

**EPA SARA (313) Chemicals**

| Substances | CAS Number | Toxic Release Inventory (TRI) - Group I | Toxic Release Inventory (TRI) - Group II |
|---|---|---|---|
| Inorganic salt | Proprietary | Not applicable | Not applicable |
| Hydrotreated light petroleum distillate | 64742-47-8 | Not applicable | Not applicable |

**EPA CERCLA/Superfund Reportable Spill Quantity**

| Substances | CAS Number | CERCLA RQ |
|---|---|---|
| Inorganic salt | Proprietary | Not applicable |
| Hydrotreated light petroleum distillate | 64742-47-8 | Not applicable |

**EPA RCRA Hazardous Waste Classification**
If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

**California Proposition 65** All components listed do not apply to the California Proposition 65 Regulation.

**MA Right-to-Know Law** Does not apply.

**NJ Right-to-Know Law** Does not apply.

**PA Right-to-Know Law** Does not apply.

**NFPA Ratings:** Health 1, Flammability 0, Reactivity 0
**HMIS Ratings:** Health 1, Flammability 0, Physical Hazard 0 , PPE: C

## Canadian Regulations

**Canadian DSL Inventory** All components listed on inventory or are exempt.

## 16. Other information

**Preparation Information**

**Prepared By** Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

**Revision Date:** 04-Jun-2015

**Reason for Revision** SDS sections updated:
2

**Additional information**
For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

**Key or legend to abbreviations and acronyms**
bw – body weight
CAS – Chemical Abstracts Service
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%


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mg/kg – milligram/kilogram
mg/L – milligram/liter
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
h - hour
$mg/m^3$ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
w/w - weight/weight
d - day

**Key literature references and sources for data**
www.ChemADVISOR.com/

**Disclaimer Statement**
This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

**End of Safety Data Sheet**

HALLIBURTON

# SAFETY DATA SHEET

**Product Trade Name:** **FightR EC-1**

**Revision Date:** 14-Dec-2016 **Revision Number:** 1

## 1. Identification

### 1.1. Product Identifier

**Product Trade Name:** FightR EC-1
**Synonyms** None
**Chemical Family:** Polymer Blend
**Internal ID Code** HM008491

### 1.2 Recommended use and restrictions on use

**Application:** Friction Reducer
**Uses advised against** Consumer use

### 1.3 Manufacturer's Name and Contact Details

**Manufacturer/Supplier**
Halliburton Energy Services, Inc.
P.O. Box 1431
Duncan, Oklahoma 73536-0431

Halliburton Energy Services
645 - 7th Ave SW Suite 1800
Calgary, AB
T2P 4G8
Canada

**Prepared By** Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

### 1.4. Emergency telephone number

**Emergency Telephone Number:** 1-866-519-4752 or 1-760-476-3962
Global Incident Response Access Code: 334305
Contract Number: 14012

## 2. Hazard(s) Identification

### 2.1 Classification in accordance with paragraph (d) of §1910.1200

**As adopted by the competent authority, this product does not require an SDS or hazard warning label.**

Not classified

### 2.2. Label Elements

**Hazard Pictograms**

**Signal Word:** Not Classified

**Hazard Statements** Not Hazardous

**Precautionary Statements**



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| | |
|---|---|
| **Prevention** | None |
| **Response** | None |
| **Storage** | None |
| **Disposal** | None |

### 2.3 Hazards not otherwise classified
None known

## 3. Composition/information on Ingredients

| Substances | CAS Number | PERCENT (w/w) | GHS Classification - US |
|---|---|---|---|
| Contains no hazardous substances in concentrations above cut-off values according to the competent authority | NA | 60 - 100% | Not classified |

The specific chemical identity of the composition has been withheld as proprietary.

The exact percentage (concentration) of the composition has been withheld as proprietary.

## 4. First-Aid Measures

### 4.1. Description of first aid measures

| | |
|---|---|
| **Inhalation** | If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult. |
| **Eyes** | In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists. |
| **Skin** | Wash with soap and water. Get medical attention if irritation persists. |
| **Ingestion** | Do NOT induce vomiting. Rinse mouth with water many times. Get medical attention if symptoms occur |

### 4.2 Most important symptoms/effects, acute and delayed
No significant hazards expected.

### 4.3. Indication of any immediate medical attention and special treatment needed
**Notes to Physician** Treat symptomatically.

## 5. Fire-fighting measures

### 5.1. Extinguishing media
**Suitable Extinguishing Media**
Water fog, carbon dioxide, foam, dry chemical.
**Extinguishing media which must not be used for safety reasons**
None known.

### 5.2 Specific hazards arising from the substance or mixture
**Special exposure hazards in a fire**
Product is not expected to burn unless all the water is boiled away. Decomposition in fire may produce harmful gases. Use water spray to cool fire exposed surfaces.

### 5.3 Special protective equipment and precautions for fire-fighters
**Special protective equipment for firefighters**
Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

## 6. Accidental release measures


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### 6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Ensure adequate ventilation. Avoid breathing vapors. Avoid contact with skin, eyes and clothing. Spills of this product are very slippery.
See Section 8 for additional information

### 6.2. Environmental precautions

None known.

### 6.3. Methods and material for containment and cleaning up

Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove. Do NOT spread spilled product with water.

## 7. Handling and storage

### 7.1. Precautions for safe handling

**Handling Precautions**
Use appropriate protective equipment. Ensure adequate ventilation. Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Avoid breathing mist.
**Hygiene Measures**
Handle in accordance with good industrial hygiene and safety practice.

### 7.2. Conditions for safe storage, including any incompatibilities

**Storage Information**
Store away from oxidizers. Store in a cool well ventilated area. Keep container closed when not in use. Store at temperatures between 40 and 90 F (5 and 35 C). Keep from freezing. Product has a shelf life of 6 months.

## 8. Exposure Controls/Personal Protection

### 8.1 Occupational Exposure Limits

| Substances | CAS Number | OSHA PEL-TWA | ACGIH TLV-TWA |
|---|---|---|---|
| Contains no hazardous substances in concentrations above cut-off values according to the competent authority | NA | Not applicable | Not applicable |

### 8.2 Appropriate engineering controls

**Engineering Controls** Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits. Ensure adequate ventilation, especially in confined areas

### 8.3 Individual protection measures, such as personal protective equipment

**Personal Protective Equipment** If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

**Respiratory Protection** Not normally needed. But if significant exposures are possible then the following respirator is recommended:
Organic vapor respirator with a dust/mist filter. (A2P2/P3)

**Hand Protection** Use gloves which are suitable for the chemicals present in this product as well as other environmental factors in the workplace.

**Skin Protection** Wear protective clothing appropriate for the work environment.

**Eye Protection** Safety glasses with side-shields. If splashes are likely to occur, wear: Goggles, Face-shield.

**Other Precautions** None known.



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## 9. Physical and Chemical Properties

### 9.1. Information on basic physical and chemical properties

| | | | |
|---|---|---|---|
| **Physical State:** | Liquid | **Color** | Off white |
| **Odor:** | Hydrocarbon | **Odor Threshold:** | No information available |

| Property<br>Remarks/ - Method | Values |
|---|---|
| **pH:** | 5 - 8 |
| **Freezing Point / Range** | No data available |
| **Melting Point / Range** | < 5 °C / < 41 °F |
| **Boiling Point / Range** | > 100 °C / 212 °F |
| **Flash Point** | No data available |
| **Flammability (solid, gas)** | No data available |
| **Upper flammability limit** | No data available |
| **Lower flammability limit** | No data available |
| **Evaporation rate** | No data available |
| **Vapor Pressure** | 17.25 mmHg |
| **Vapor Density** | No data available |
| **Specific Gravity** | 1.0 - 1.1 |
| **Water Solubility** | Miscible with water |
| **Solubility in other solvents** | No data available |
| **Partition coefficient: n-octanol/water** | No data available |
| **Autoignition Temperature** | No data available |
| **Decomposition Temperature** | No data available |
| **Viscosity** | > 20.5 mm2/s |
| **Explosive Properties** | No information available |
| **Oxidizing Properties** | No information available |

### 9.2. Other information

| | |
|---|---|
| **VOC Content (%)** | No data available |

## 10. Stability and Reactivity

### 10.1. Reactivity

Not expected to be reactive.

### 10.2. Chemical stability

Stable

### 10.3. Possibility of hazardous reactions

Will Not Occur

### 10.4. Conditions to avoid

Freezing conditions.
Extremes of temperature and direct sunlight

### 10.5. Incompatible materials

Strong oxidizers.

### 10.6. Hazardous decomposition products

Carbon monoxide and carbon dioxide. Oxides of nitrogen. Hydrogen cyanide.

## 11. Toxicological Information

### 11.1 Information on likely routes of exposure



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**Principle Route of Exposure** Eye or skin contact, inhalation. Ingestion.

### 11.2 Symptoms related to the physical, chemical and toxicological characteristics

**Acute Toxicity**

**Inhalation** May cause mild respiratory irritation.
**Eye Contact** In vitro tests indicate that the product is not an eye irritant.
**Skin Contact** May cause mild skin irritation.
**Ingestion** May cause abdominal pain, vomiting, nausea, and diarrhea.

**Chronic Effects/Carcinogenicity** No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

### 11.3 Toxicity data

**Toxicology data for the components**

| Substances | CAS Number | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|---|
| Contains no hazardous substances in concentrations above cut-off values according to the competent authority | NA | No data available | No data available | No data available |

## 12. Ecological Information

### 12.1. Toxicity

**Ecotoxicity effects**

Product is not classified as hazardous to the environment.

**Substance Ecotoxicity Data**

| Substances | CAS Number | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Toxicity to Invertebrates |
|---|---|---|---|---|---|
| Contains no hazardous substances in concentrations above cut-off values according to the competent authority | NA | No information available | No information available | No information available | No information available |

### 12.2. Persistence and degradability

| Substances | CAS Number | Persistence and Degradability |
|---|---|---|
| Contains no hazardous substances in concentrations above cut-off values according to the competent authority | NA | No information available |

### 12.3. Bioaccumulative potential

Bioaccumulation is unlikely

| Substances | CAS Number | Log Pow |
|---|---|---|
| Contains no hazardous substances in | NA | No information available |



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| | | |
|---|---|---|
| concentrations above cut-off values according to the competent authority | | |

### 12.4. Mobility in soil

| Substances | CAS Number | Mobility |
|---|---|---|
| Contains no hazardous substances in concentrations above cut-off values according to the competent authority | NA | No information available |

### 12.5 Other adverse effects

No information available

## 13. Disposal Considerations

### 13.1. Waste treatment methods

**Disposal methods** Follow all applicable community, national or regional regulations regarding waste management methods.

**Contaminated Packaging** Follow all applicable national or local regulations.

## 14. Transport Information

### US DOT

**UN Number** Not restricted
**UN proper shipping name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

### Canadian TDG

**UN Number** Not restricted
**UN proper shipping name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

### IMDG/IMO

**UN Number** Not restricted
**UN proper shipping name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

### IATA/ICAO

**UN Number** Not restricted
**UN proper shipping name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not applicable
**Special Precautions for User** None

## 15. Regulatory Information



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## US Regulations

**US TSCA Inventory** All components listed on inventory or are exempt.

**TSCA Significant New Use Rules - S5A2**

| Substances | CAS Number | TSCA Significant New Use Rules - S5A2 |
|---|---|---|
| Contains no hazardous substances in concentrations above cut-off values according to the competent authority | NA | Not applicable |

**EPA SARA Title III Extremely Hazardous Substances**

| Substances | CAS Number | EPA SARA Title III Extremely Hazardous Substances |
|---|---|---|
| Contains no hazardous substances in concentrations above cut-off values according to the competent authority | NA | Not applicable |

**EPA SARA (311,312) Hazard Class**

None

**EPA SARA (313) Chemicals**

| Substances | CAS Number | Toxic Release Inventory (TRI) - Group I | Toxic Release Inventory (TRI) - Group II |
|---|---|---|---|
| Contains no hazardous substances in concentrations above cut-off values according to the competent authority | NA | Not applicable | Not applicable |

**EPA CERCLA/Superfund Reportable Spill Quantity**

| Substances | CAS Number | CERCLA RQ |
|---|---|---|
| Contains no hazardous substances in concentrations above cut-off values according to the competent authority | NA | Not applicable |

**EPA RCRA Hazardous Waste Classification**

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

**California Proposition 65** The California Proposition 65 regulations apply to this product.

**MA Right-to-Know Law** One or more components listed.

**NJ Right-to-Know Law** One or more components listed.

**PA Right-to-Know Law** One or more components listed.

**NFPA Ratings:** Health 1, Flammability 1, Reactivity 0
**HMIS Ratings:** Health 1, Flammability 1, Physical Hazard 0 , PPE: X

## Canadian Regulations

**Canadian Domestic Substances List (DSL)** All components listed on inventory or are exempt.

## 16. Other information

**Preparation Information**

**Prepared By** Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

**Revision Date:** 14-Dec-2016



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**Reason for Revision** Initial Release

**Additional information**
For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

**Key or legend to abbreviations and acronyms used in the safety data sheet**
bw – body weight
CAS – Chemical Abstracts Service
d - day
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
h - hour
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
$mg/m^3$ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
w/w - weight/weight

**Key literature references and sources for data**
www.ChemADVISOR.com/
OSHA
ECHA C&L

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**End of Safety Data Sheet**



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HALLIBURTON

# SAFETY DATA SHEET

**Product Trade Name:** **SCALECHEK LP-50**

**Revision Date:** 19-May-2017 **Revision Number:** 4

## 1. Identification

### 1.1. Product Identifier

**Product Trade Name:** SCALECHEK LP-50
**Synonyms** None
**Chemical Family:** Blend
**Internal ID Code** HM008183

### 1.2 Recommended use and restrictions on use

**Application:** Scale Inhibitor
**Uses advised against** No information available

### 1.3 Manufacturer's Name and Contact Details

**Manufacturer/Supplier**
Halliburton Energy Services, Inc.
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Telephone: 1-281-871-6107

Halliburton Energy Services, Inc.
645 - 7th Ave SW Suite 1800
Calgary, AB
T2P 4G8
Canada

**Prepared By** Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

### 1.4. Emergency telephone number

**Emergency Telephone Number:** 1-866-519-4752 or 1-760-476-3962
Global Incident Response Access Code: 334305
Contract Number: 14012

## 2. Hazards Identification

### 2.1 Classification in accordance with paragraph (d) of §1910.1200

| | |
|---|---|
| Acute Oral Toxicity | Category 4 - H302 |
| Skin Corrosion / Irritation | Category 2 - H315 |
| Serious Eye Damage/Irritation | Category 2 - H319 |
| Reproductive Toxicity | Category 1B - H360 |
| Specific Target Organ Toxicity - (Single Exposure) | Category 1 - H370 |
| Flammable liquids. | Category 3 - H226 |

### 2.2. Label Elements

**Hazard Pictograms**



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**Signal Word:** Danger

**Hazard Statements**

H226 - Flammable liquid and vapor
H302 - Harmful if swallowed
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H360 - May damage fertility or the unborn child
H370 - Causes damage to organs

**Precautionary Statements**

**Prevention**

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P233 - Keep container tightly closed
P240 - Ground/Bond container and receiving equipment
P241 - Use explosion-proof electrical/ventilating/lighting/equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P280 - Wear protective gloves/protective clothing/eye protection/face protection

**Response**

P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P330 - Rinse mouth
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P332 + P313 - If skin irritation occurs: Get medical advice/attention
P362 + P364 - Take off contaminated clothing and wash before reuse
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical advice/attention
P370 + P378 - In case of fire: Use water spray for extinction

**Storage**

P403 + P235 - Store in a well-ventilated place. Keep cool
P405 - Store locked up

**Disposal**

P501 - Dispose of contents/container in accordance with local/regional/national/international regulations

**2.3 Hazards not otherwise classified**

None known

## 3. Composition/information on Ingredients



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| Substances | CAS Number | PERCENT (w/w) | GHS Classification - US |
|---|---|---|---|
| Methanol | 67-56-1 | 10 - 30% | Acute Tox. 3 (H301)<br>Acute Tox. 3 (H311)<br>Acute Tox. 3 (H331)<br>Repr. 1B (H360)<br>STOT SE 1 (H370)<br>Flam. Liq. 2 (H225) |
| Phosphonic Acid Salt | Proprietary | 10 - 30% | Skin Irrit. 2 (H315)<br>Eye Irrit. 2A (H319)<br>STOT SE 3 (H335) |
| Sodium chloride | 7647-14-5 | 1 - 5% | Eye Irrit. 2B (H320) |

The specific chemical identity of the composition has been withheld as proprietary.

The exact percentage (concentration) of the composition has been withheld as proprietary.

## 4. First Aid Measures

### 4.1. Description of first aid measures

**Inhalation** If inhaled, move victim to fresh air and seek medical attention.

**Eyes** In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

**Skin** Remove contaminated clothing and launder before reuse. In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention.

**Ingestion** Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention. Following ingestion, onset of symptoms may be delayed by 12 to 24 hours. Admission to hospital should be the first priority even if symptoms are absent.

### 4.2 Most important symptoms/effects, acute and delayed

Causes eye irritation. Causes skin irritation. Harmful if swallowed. Potential reproductive hazard. May damage fertility or the unborn child. Causes damage to organs.

### 4.3. Indication of any immediate medical attention and special treatment needed

**Notes to Physician** Gastric lavage or emesis should be performed as soon as possible to minimize absorption, and is recommended within 4 hours of ingestion. Ethanol may be given intravenously to prevent build-up of toxic effects of methanol metabolites. Visual disturbances and metabolic acidosis may occur and dialysis, preferably hemodialysis may be employed to treat these complications.

## 5. Fire-fighting measures

### 5.1. Extinguishing media

**Suitable Extinguishing Media**

Water fog, carbon dioxide, foam, dry chemical.

**Extinguishing media which must not be used for safety reasons**

Do NOT spray pool fires directly with water. A solid stream of water directed into hot burning liquid can cause splattering.

### 5.2 Specific hazards arising from the substance or mixture

**Special exposure hazards in a fire**

Vapors are heavier than air and may accumulate in low areas. Vapors may travel along the ground to be ignited at distant locations.

### 5.3 Special protective equipment and precautions for fire-fighters



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**Special protective equipment for firefighters**
Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

## 6. Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures
Use appropriate protective equipment. Ensure adequate ventilation. Remove sources of ignition. All equipment used when handling the product must be grounded Avoid contact with skin, eyes and clothing. Avoid breathing vapors. See Section 8 for additional information

### 6.2. Environmental precautions
None known.

### 6.3. Methods and material for containment and cleaning up
Remove ignition sources and work with non-sparking tools. Dike far ahead of liquid spill for later disposal. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

## 7. Handling and storage

### 7.1. Precautions for safe handling
**Handling Precautions**
Use appropriate protective equipment. Ensure adequate ventilation. Ground and bond containers when transferring from one container to another. Remove sources of ignition. Avoid contact with eyes, skin, or clothing. Launder contaminated clothing before reuse. Avoid breathing vapors. Avoid breathing mist.
**Hygiene Measures**
Handle in accordance with good industrial hygiene and safety practice.

### 7.2. Conditions for safe storage, including any incompatibilities
**Storage Information**
Store away from oxidizers. Keep from heat, sparks, and open flames. Keep container closed when not in use.

## 8. Exposure Controls/Personal Protection

### 8.1 Occupational Exposure Limits

| Substances | CAS Number | OSHA PEL-TWA | ACGIH TLV-TWA |
|---|---|---|---|
| Methanol | 67-56-1 | TWA: 200 ppm<br>TWA: 260 mg/m$^3$ | TWA: 200 ppm<br>STEL: 250 ppm |
| Phosphonic Acid Salt | Proprietary | Not applicable | Not applicable |
| Sodium chloride | 7647-14-5 | Not applicable | Not applicable |

### 8.2 Appropriate engineering controls
**Engineering Controls** Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits. Ensure adequate ventilation, especially in confined areas

### 8.3 Individual protection measures, such as personal protective equipment
**Personal Protective Equipment** If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

**Respiratory Protection** If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional.


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| | |
|---|---|
| **Hand Protection** | Use gloves which are suitable for the chemicals present in this product as well as other environmental factors in the workplace. |
| **Skin Protection** | Wear impervious protective clothing, including boots, gloves, lab coat, apron, rain jacket, pants or coverall, as appropriate, to prevent skin contact. |
| **Eye Protection** | Chemical goggles; also wear a face shield if splashing hazard exists. |
| **Other Precautions** | None known. |

## 9. Physical and Chemical Properties

### 9.1. Information on basic physical and chemical properties

| | | | |
|---|---|---|---|
| **Physical State:** | Liquid | **Color** | Clear to Slightly Hazy , Light Amber to Dark Amber |
| **Odor:** | Mild | **Odor Threshold:** | No information available |

| Property<br>Remarks/ - Method | Values |
|---|---|
| **pH:** | 4.3 - 5.8 |
| **Freezing Point / Range** | -34.4 °C / -30 °F |
| **Melting Point / Range** | No data available |
| **Boiling Point / Range** | No data available |
| **Flash Point** | 28 °C / 82.4 °F ASTM D7094 - Modified Continuously Closed Cup |
| **Flammability (solid, gas)** | No data available |
| **Upper flammability limit** | No data available |
| **Lower flammability limit** | No data available |
| **Evaporation rate** | No data available |
| **Vapor Pressure** | No data available |
| **Vapor Density** | No data available |
| **Specific Gravity** | 1.0388 - 1.0638 |
| **Water Solubility** | Soluble in water |
| **Solubility in other solvents** | No data available |
| **Partition coefficient: n-octanol/water** | No data available |
| **Autoignition Temperature** | No data available |
| **Decomposition Temperature** | No data available |
| **Viscosity** | No data available |
| **Explosive Properties** | No information available |
| **Oxidizing Properties** | No information available |

### 9.2. Other information

| | |
|---|---|
| **VOC Content (%)** | No data available |

## 10. Stability and Reactivity

### 10.1. Reactivity
Not expected to be reactive.

### 10.2. Chemical stability
Stable

### 10.3. Possibility of hazardous reactions
Will Not Occur

### 10.4. Conditions to avoid
Keep away from heat, sparks and flame.



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### 10.5. Incompatible materials
Strong oxidizers. Strong acids. Strong alkalis.

### 10.6. Hazardous decomposition products
Carbon monoxide and carbon dioxide. Oxides of nitrogen. Oxides of phosphorus. Hydrogen cyanide.

## 11. Toxicological Information

### 11.1 Information on likely routes of exposure
**Principle Route of Exposure** Eye or skin contact, inhalation.

### 11.2 Symptoms related to the physical, chemical and toxicological characteristics
**Acute Toxicity**

**Inhalation** May cause central nervous system depression including headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.

**Eye Contact** Causes eye irritation.

**Skin Contact** Causes skin irritation. Will cause skin defatting.

**Ingestion** Harmful if swallowed. Ingestion may result in blindness. May cause central nervous system depression including headache, dizziness, drowsiness, muscular weakness, incoordination, slowed reaction time, fatigue blurred vision, slurred speech, giddiness, tremors and convulsions.

**Chronic Effects/Carcinogenicity** Suspected of damaging fertility or the unborn child.

### 11.3 Toxicity data

**Toxicology data for the components**

| Substances | CAS Number | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|---|
| Methanol | 67-56-1 | 300 mg/kg-bw (human)<br>< 790 to 13,000 mg/kg (rat) | 1000 mg/kg-bw (human)<br>17,100 mg/kg (rabbit) | 10 mg/L (human, 4h, vapor) |
| Phosphonic Acid Salt | Proprietary | No data available | No data available | No data available |
| Sodium chloride | 7647-14-5 | 3000 mg/kg-bw (rat) | No data available | No data available |

| Substances | CAS Number | Skin corrosion/irritation |
|---|---|---|
| Methanol | 67-56-1 | Non-irritating to the skin (Rabbit) |
| Phosphonic Acid Salt | | May cause irritation. |
| Sodium chloride | 7647-14-5 | Not a dermal irritant |

| Substances | CAS Number | Serious eye damage/irritation |
|---|---|---|
| Methanol | 67-56-1 | Non-irritating to the eye (Rabbit) |
| Phosphonic Acid Salt | | May cause eye irritation |
| Sodium chloride | 7647-14-5 | May cause mild eye irritation. |

| Substances | CAS Number | Skin Sensitization |
|---|---|---|
| Methanol | 67-56-1 | Did not cause sensitization on laboratory animals (guinea pig) |
| Phosphonic Acid Salt | | No data of sufficient quality are available. |
| Sodium chloride | 7647-14-5 | Not confirmed to cause skin or respiratory sensitization. |

| Substances | CAS Number | Respiratory Sensitization |
|---|---|---|
| Methanol | 67-56-1 | No information available |
| Phosphonic Acid Salt | | No data of sufficient quality are available. |
| Sodium chloride | 7647-14-5 | Not confirmed to cause skin or respiratory sensitization. |

| Substances | CAS Number | Mutagenic Effects |
|---|---|---|
| Methanol | 67-56-1 | The weight of evidence from available in vitro and in vivo studies indicates that this substance is not expected to be mutagenic. |
| Phosphonic Acid Salt | | No information available |
| Sodium chloride | 7647-14-5 | No information available |



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| Substances | CAS Number | Carcinogenic Effects |
|---|---|---|
| Methanol | 67-56-1 | No data of sufficient quality are available. |
| Phosphonic Acid Salt | | No information available |
| Sodium chloride | 7647-14-5 | No information available |

| Substances | CAS Number | Reproductive toxicity |
|---|---|---|
| Methanol | 67-56-1 | Experiments have shown reproductive toxicity effects on laboratory animals |
| Phosphonic Acid Salt | | No data of sufficient quality are available. |
| Sodium chloride | 7647-14-5 | Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. |

| Substances | CAS Number | STOT - single exposure |
|---|---|---|
| Methanol | 67-56-1 | May cause disorder and damage to the Central Nervous System (CNS) |
| Phosphonic Acid Salt | | May cause respiratory irritation. |
| Sodium chloride | 7647-14-5 | No information available |

| Substances | CAS Number | STOT - repeated exposure |
|---|---|---|
| Methanol | 67-56-1 | No data of sufficient quality are available. |
| Phosphonic Acid Salt | | No information available |
| Sodium chloride | 7647-14-5 | No significant toxicity observed in animal studies at concentration requiring classification. |

| Substances | CAS Number | Aspiration hazard |
|---|---|---|
| Methanol | 67-56-1 | Not applicable |
| Phosphonic Acid Salt | | Not applicable |
| Sodium chloride | 7647-14-5 | Not applicable |

## 12. Ecological Information

### 12.1. Toxicity

**Ecotoxicity effects**

Product is not classified as hazardous to the environment.

### Substance Ecotoxicity Data

| Substances | CAS Number | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Toxicity to Invertebrates |
|---|---|---|---|---|---|
| Methanol | 67-56-1 | EC50 (96 h) =22000 mg/L (Pseudokirchnerella subcapitata) NOEC (8 d) =8000 mg/L (Scenedesmus quadricauda) | LC50 (96 h) =15400 mg/L (Lepomis macrochirus) EC50 (200 h) =14536 mg/L (Oryzias latipes) | IC50 (3h) > 1000 mg/L (activated sludge) | EC50 (96 h) =18260 mg/L (Dapnia magna) NOEC (21 d) =208 mg/L (Dapnia magna) |
| Phosphonic Acid Salt | Proprietary | No information available | No information available | No information available | No information available |
| Sodium chloride | 7647-14-5 | No information available | LC50 (96h) 9675 mg/L | No information available | No information available |

### 12.2. Persistence and degradability

| Substances | CAS Number | Persistence and Degradability |
|---|---|---|
| Methanol | 67-56-1 | (95-97% @ 20d) |
| Phosphonic Acid Salt | Proprietary | No information available |
| Sodium chloride | 7647-14-5 | Readily biodegradable |

### 12.3. Bioaccumulative potential

| Substances | CAS Number | Log Pow |
|---|---|---|
| Methanol | 67-56-1 | -0.77<br>BCF = 1.0 – 4.5 (Cyprinus carpio)<br>BCF < 10 (Leuciscus idus melanotus) |
| Phosphonic Acid Salt | Proprietary | No information available |
| Sodium chloride | 7647-14-5 | No information available |

### 12.4. Mobility in soil



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| Substances | CAS Number | Mobility |
|---|---|---|
| Methanol | 67-56-1 | No information available |
| Phosphonic Acid Salt | Proprietary | No information available |
| Sodium chloride | 7647-14-5 | No information available |

**12.5 Other adverse effects**
No information available

## 13. Disposal Considerations

**13.1. Waste treatment methods**

**Disposal methods** Disposal should be made in accordance with federal, state, and local regulations.
**Contaminated Packaging** Follow all applicable national or local regulations.

## 14. Transport Information

**US DOT**

**UN Number** UN1993
**UN proper shipping name:** Flammable Liquid, N.O.S. (Contains Methanol)
**Transport Hazard Class(es):** 3
**Packing Group:** III
**Environmental Hazards:** Not applicable
**NAERG:** NAERG 128

**Canadian TDG**

**UN Number** UN1993
**UN proper shipping name:** Flammable Liquid, N.O.S. (Contains Methanol)
**Transport Hazard Class(es):** 3
**Packing Group:** III
**Environmental Hazards:** Not applicable

**IMDG/IMO**

**UN Number** UN1993
**UN proper shipping name:** Flammable Liquid, N.O.S. (Contains Methanol)
**Transport Hazard Class(es):** 3
**Packing Group:** III
**Environmental Hazards:** Not applicable
**EMS:** EmS F-E, S-E

**IATA/ICAO**

**UN Number** UN1993
**UN proper shipping name:** Flammable Liquid, N.O.S. (Contains Methanol)
**Transport Hazard Class(es):** 3
**Packing Group:** III
**Environmental Hazards:** Not applicable

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not applicable
**Special Precautions for User** None

## 15. Regulatory Information

### US Regulations

**US TSCA Inventory** All components listed on inventory or are exempt.



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## TSCA Significant New Use Rules - S5A2

| Substances | CAS Number | TSCA Significant New Use Rules - S5A2 |
|---|---|---|
| Methanol | 67-56-1 | Not applicable |
| Phosphonic Acid Salt | Proprietary | Not applicable |
| Sodium chloride | 7647-14-5 | Not applicable |

## EPA SARA Title III Extremely Hazardous Substances

| Substances | CAS Number | EPA SARA Title III Extremely Hazardous Substances |
|---|---|---|
| Methanol | 67-56-1 | Not applicable |
| Phosphonic Acid Salt | Proprietary | Not applicable |
| Sodium chloride | 7647-14-5 | Not applicable |

## EPA SARA (311,312) Hazard Class

Acute Health Hazard
Chronic Health Hazard
Fire Hazard

## EPA SARA (313) Chemicals

| Substances | CAS Number | Toxic Release Inventory (TRI) - Group I | Toxic Release Inventory (TRI) - Group II |
|---|---|---|---|
| Methanol | 67-56-1 | 1.0% | Not applicable |
| Phosphonic Acid Salt | Proprietary | Not applicable | Not applicable |
| Sodium chloride | 7647-14-5 | Not applicable | Not applicable |

## EPA CERCLA/Superfund Reportable Spill Quantity

| Substances | CAS Number | CERCLA RQ |
|---|---|---|
| Methanol | 67-56-1 | 5000 lb<br>2270 kg |
| Phosphonic Acid Salt | Proprietary | Not applicable |
| Sodium chloride | 7647-14-5 | Not applicable |

## EPA RCRA Hazardous Waste Classification

If product becomes a waste, it does meet the criteria of a hazardous waste as defined by the US EPA, because of:

Ignitability D001

## California Proposition 65

| Substances | CAS Number | California Proposition 65 |
|---|---|---|
| Methanol | 67-56-1 | developmental toxicity |
| Phosphonic Acid Salt | Proprietary | Not applicable |
| Sodium chloride | 7647-14-5 | Not applicable |

## U.S. State Right-to-Know Regulations

| Substances | CAS Number | MA Right-to-Know Law | NJ Right-to-Know Law | PA Right-to-Know Law |
|---|---|---|---|---|
| Methanol | 67-56-1 | Present | 1222 | Environmental hazard |
| Phosphonic Acid Salt | Proprietary | Not applicable | Not applicable | Not applicable |
| Sodium chloride | 7647-14-5 | Not applicable | Not applicable | Not applicable |

**NFPA Ratings:** Health 2, Flammability 3, Reactivity 0
**HMIS Ratings:** Health 2, Flammability 3, Physical Hazard 0 , PPE: X

## Canadian Regulations

**Canadian Domestic Substances List (DSL)** All components listed on inventory or are exempt.



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## 16. Other information

**Preparation Information**

| | |
|---|---|
| **Prepared By** | Chemical Stewardship<br>Telephone: 1-281-871-6107<br>e-mail: fdunexchem@halliburton.com |
| **Revision Date:** | 19-May-2017 |
| **Reason for Revision** | SDS sections updated:<br>1 |

**Additional information**
For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

**Key or legend to abbreviations and acronyms used in the safety data sheet**
bw – body weight
CAS – Chemical Abstracts Service
d - day
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
h - hour
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
$mg/m^3$ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
w/w - weight/weight

**Key literature references and sources for data**
www.ChemADVISOR.com/
OSHA
ECHA C&L

**Disclaimer Statement**
This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

**End of Safety Data Sheet**



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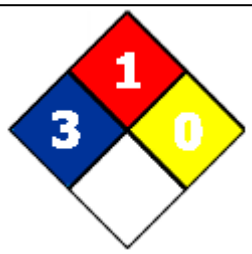
# Material Safety Data Sheet

| NFPA | HMIS |
|---|---|
|  | |



| | | | | | |
|---|---|---|---|---|---|
| **Issuing Date** | 17-Sep-2010 | **Revision Date** | 20-Jul-2011 | **Revision Number** | 3 |

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name** **MC B-8614**

**Product Code** MC B-8614

**Recommended Use** Biocidal product.

**Manufactured by:**
Multi-Chem Group LLC
2905 Southwest Blvd
San Angelo, TX 76904
Phone: 1 325 223 6200

**Emergency Telephone Number**
1 800 535 5053
+1 352 323 3500 (Outside United States)

## 2. HAZARDS IDENTIFICATION

### Emergency Overview

May cause burns of eyes, skin and mucous membranes
Harmful by inhalation, in contact with skin and if swallowed
Repeated contact may cause allergic reactions in susceptible persons
Harmful: may cause lung damage if swallowed
Contains a known or suspected carcinogen

| | | | | | |
|---|---|---|---|---|---|
| **Appearance** | Clear to Slightly Hazy, Colorless to Light Amber | **Physical State** | Liquid | **Odor** | Fruity |

**Potential Health Effects**

**Principle Routes of Exposure** Eye contact, Skin contact, Inhalation, Ingestion.

**Acute Toxicity**

**Eyes** Irritating to eyes. May cause burns.

**Skin** Irritating to skin. May cause burns. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.



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**Inhalation** Irritating to respiratory system. Prolonged inhalation overexposure may cause coughing, shortness of breath, dizziness, and intoxication. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

**Ingestion** Harmful if swallowed. Can burn mouth, throat, and stomach. Potential for aspiration if swallowed. May cause lung damage if swallowed. May cause drowsiness and dizziness.

**Chronic Effects** Repeated skin contact may result in absorption of amounts which could cause death. Ethanol has been shown to be carcinogenic in long-term studies only when consumed as alcoholic beverage.

**Aggravated Medical Conditions** Skin disorders. Neurological disorders. Preexisting eye disorders. Respiratory disorders. Liver disorders. Kidney disorders.

**Environmental Hazard** See Section 12 for additional Ecological Information.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Formula** Mixture

| Chemical Name | CAS-No | Weight % |
|---|---|---|
| Glutaraldehyde | 111-30-8 | 10-30 |
| Alkyl (C12-16) dimethylbenzylammonium chloride | 68424-85-1 | 1-5 |
| Ethyl alcohol | 64-17-5 | 0.1-1 |

## 4. FIRST AID MEASURES

**General Advice** Get medical attention immediately if symptoms occur.

**Eye Contact** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek immediate medical attention/advice.

**Skin Contact** Wash off immediately with soap and plenty of water. Remove and wash contaminated clothing before re-use. Seek immediate medical attention/advice.

**Inhalation** Move to fresh air in case of accidental inhalation of vapors. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention immediately if symptoms occur.

**Ingestion** Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention. Do not give liquids following exposure. This can increase the toxicity of glutaraldehyde.

**Notes to Physician** Glutaraldehyde may cause burns that require extended irrigation. May cause asthma-like (reactive airways) symptoms. Bronchodilators, expectorants and antitussives may be of help. Glutaraldehyde may transiently worsen reversible airways obstruction including asthma or reactive airways disease. Treat bronchospasm with inhaled beta-2 agonist and oral or parenteral corticosteroids. Inhalation of vapors may result in skin sensitization. In sensitized individuals, reexposure to very small amounts of vapor, mist, or liquid may cause a severe allergic skin reaction. If burn is present, treat as any thermal burn, after decontamination. If ingested, material may be aspirated into the lungs and cause chemical pneumonitis.

## 5. FIRE-FIGHTING MEASURES

**Flammable Properties** Non-combustible, substance itself does not burn but may decompose upon heating to produce toxic and/or irritating byproducts. Residues of this product may burn.



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**Flash Point** > 93.3 °C / > 200 °F

**Suitable Extinguishing Media** Water spray. Carbon dioxide ($CO_2$). Foam. Dry powder.

**Unsuitable Extinguishing Media** Do not use a solid water stream as it may scatter and spread fire.

**Hazardous Combustion Products** Carbon oxides.

**Explosion Data**

**Sensitivity to Mechanical Impact** Not sensitive.

**Sensitivity to Static Discharge** Not sensitive.

**Protective Equipment and Precautions for Firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

| NFPA | Health Hazard | 3 | Flammability | 1 | Stability | 0 | Physical and Chemical Hazards | - |
|---|---|---|---|---|---|---|---|---|

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions** Use personal protective equipment. Avoid contact with the skin and the eyes. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Only trained and properly protected personnel must be involved in clean-up operations.

**Methods for Containment** Dike far ahead of liquid spill for later disposal.

**Methods for Cleaning Up** Small spills can be flushed with large quantities of water. Collect large spills for disposal. It may also be possible to decontaminate spilled material by careful application of aqueous sodium hydroxide or sodium bisulfite. Depending on conditions, considerable heat and fumes can be liberated by the decontamination reaction.

**Other Information** Avoid discharge to environment as material may be harmful to the aquatic environment.

## 7. HANDLING AND STORAGE

**Handling** Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid breathing vapors or mists. Ensure adequate ventilation.

**Storage** Keep containers tightly closed in a cool, well-ventilated place.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Exposure Guidelines**

| Chemical Name | ACGIH TLV | OSHA PEL | NIOSH IDLH |
|---|---|---|---|
| Glutaraldehyde<br>111-30-8 | | (vacated) Ceiling: 0.2 ppm<br>(vacated) Ceiling: 0.8 mg/m³ | Ceiling: 0.2 ppm<br>Ceiling: 0.8 mg/m³ |
| Ethyl alcohol<br>64-17-5 | TWA: 1000 ppm | TWA: 1000 ppm<br>TWA: 1900 mg/m³<br>(vacated) TWA: 1000 ppm<br>(vacated) TWA: 1900 mg/m³ | IDLH: 3300 ppm<br>TWA: 1000 ppm<br>TWA: 1900 mg/m³ |

| Chemical Name | Alberta | British Columbia | Saskatchewan |
|---|---|---|---|
| Glutaraldehyde<br>111-30-8 | Ceiling: 0.05 ppm<br>Ceiling: 0.2 mg/m³ | Ceiling: 0.05 ppm | Ceiling: 0.2 ppm<br>Ceiling: 0.82 mg/m³ |



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| | | | |
|---|---|---|---|
| Ethyl alcohol<br>64-17-5 | TWA: 1000 ppm<br>TWA: 1880 mg/m³ | TWA: 1000 ppm | TWA: 1000 ppm<br>TWA: 1880 mg/m³<br>STEL: 1250 ppm<br>STEL: 2350 mg/m³ |

**Engineering Measures** Ensure adequate ventilation, especially in confined areas.

**Personal Protective Equipment**

**Eye/Face Protection** Safety glasses with side-shields. If splashes are likely to occur, wear:. Goggles. Face-shield.

**Skin and Body Protection** Wear protective gloves/clothing.

**Respiratory Protection** If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

**Hygiene Measures** Remove and wash contaminated clothing before re-use. Wash hands before breaks and immediately after handling the product.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|---|---|---|---|
| **Appearance** | Clear to Slightly Hazy Colorless to Light Amber | **Odor** | Fruity |
| **Physical State** | Liquid | **pH** | 3.1-4.5 |
| **Flash Point** | > 93.3 °C / > 200 °F | **Autoignition Temperature** | No data available |
| **Boiling Point/Range** | 100.5 °C / 213 °F | **Pour Point** | -3 °C / 27 °F |
| | | **Flammability Limits in Air** | No data available |
| **Explosion Limits** | No data available | | |
| **Specific Gravity** | 1.0290-1.0410 | **Solubility** | Soluble in water |
| **Evaporation Rate** | 0.8 (BuAc = 1) | **Vapor Pressure** | 0.20 |
| **Vapor Density** | 0.7 (air = 1) | **Density** | 8.58-8.68 lbs/gal |
| **Partition Coefficient (n-octanol/water)** | -0.333-measured | **Viscosity** | No data available |

## 10. STABILITY AND REACTIVITY

**Stability** Stable under recommended storage conditions.

**Incompatible Products** Strong acids. Strong bases.

**Conditions to Avoid** Excessive heat.

**Hazardous Decomposition Products** Carbon oxides.

**Hazardous Polymerization** None under normal processing.

## 11. TOXICOLOGICAL INFORMATION

**Acute Toxicity**

**Product Information** The product itself has not been tested. Information listed below is based on similar products.

**LD50 Oral:** > 900 mg/kg
**LD50 Dermal:** > 16000 mg/kg

**Component Information**

| Chemical Name | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|



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| | | | |
|---|---|---|---|
| Glutaraldehyde | 66 mg/kg (Rat) | 560 µL/kg (Rabbit)<br>2000 mg/kg (Rat) | 0.1 mg/L (Rat) 4 h |
| Alkyl (C12-16) dimethylbenzylammonium chloride | 426 mg/kg (Rat) | | |
| Ethyl alcohol | 1501 mg/kg (Rat) | | 124.7 mg/L (Rat) 4 h |

**Chronic Toxicity**

**Chronic Toxicity** Repeated skin contact may result in absorption of amounts which could cause death. Ethanol has been shown to be carcinogenic in long-term studies only when consumed as alcoholic beverage.

**Carcinogenicity** Contains no ingredient listed as a carcinogen.

| Chemical Name | ACGIH | IARC | NTP | OSHA |
|---|---|---|---|---|
| Ethyl alcohol | | | Known | X |

**Sensitization** Caused sensitization in laboratory animals.

**Mutagenic Effects** In vitro tests have shown mutagenic effects.

**Reproductive Toxicity** None known.

**Developmental Toxicity** None known.

**Target Organ Effects** Respiratory system, Eyes, Skin, Central nervous system (CNS).

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

Toxic to aquatic organisms.

| Chemical Name | Toxicity to Algae | Toxicity to Fish | Microtox | Daphnia Magna (Water Flea) |
|---|---|---|---|---|
| Glutaraldehyde | EC50 = 0.61 mg/L 72 h<br>EC50 = 0.84 mg/L 96 h | LC50= 13 mg/L Lepomis macrochirus 96 h | EC50 = 13.3 mg/L 17 h<br>EC50 = 76.0 mg/L 5 min | EC50 = 14 mg/L 48 h |
| Ethyl alcohol | | LC50= 12900 mg/L Oncorhynchus mykiss 96 h<br>LC50= 14.2 mg/L Pimephales promelas 96 h | EC50 = 34634 mg/L 30 min<br>EC50 = 35470 mg/L 5 min | EC50 = 10800 mg/L 24 h<br>EC50 = 9268 mg/L 48 h |

**Persistence and Degradability** Product is expected to be biodegradable.

**Bioaccumulation/Accumulation** Product is not expected to bioaccumulate.

**Mobility** Will likely be mobile in the environment due to its water solubility.

| Chemical Name | Log Pow |
|---|---|
| Glutaraldehyde | = 0.22 25 °C OECD Guideline 107 |
| Ethyl alcohol | = -0.32 |

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Method** Dispose of in accordance with local regulations.

**Contaminated Packaging** Dispose of in accordance with local regulations.

This product contains one or more substances that are listed with the State of California as a hazardous waste.

| Chemical Name | California Hazardous Waste Status |
|---|---|



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| | |
|---|---|
| Glutaraldehyde | Toxic |
| Ethyl alcohol | Toxic; Ignitable |

## 14. TRANSPORT INFORMATION

**DOT** Not regulated

**IATA**

**UN-No** 3334
**Proper Shipping Name** Aviation Regulated Liquid, N.O.S, (Glutaraldehyde)
**Hazard Class** 9
**Description** Cargo Packing Instruction: 906, Passenger Packing Instruction: 906

**IMDG/IMO** Not regulated

**TDG** Not approved for transport in Canada

## 15. REGULATORY INFORMATION

### International Inventories

| Component | TSCA | DSL | EINECS/ELINCS | ENCS | IECSC | KECL | PICCS | AICS |
|---|---|---|---|---|---|---|---|---|
| Glutaraldehyde 111-30-8 ( 10-30 ) | Present | X | X | 2-509 | X | KE-27969 | X | X |
| Alkyl (C12-16) dimethylbenzylammonium chloride 68424-85-1 ( 1-5 ) | Present | X | X | - | X | KE-29999 | X | X |
| Ethyl alcohol 64-17-5 ( 0.1-1 ) | Present | X | X | 2-202 | X | KE-13217 | X | X |

### U.S. Federal Regulations

**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

**SARA 311/312 Hazard Categories**

**Acute Health Hazard** Yes
**Chronic Health Hazard** Yes
**Fire Hazard** No
**Sudden Release of Pressure Hazard** No
**Reactive Hazard** No

**Clean Water Act**

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

**Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)**

This product contains the following substances which are listed hazardous air pollutants (HAPS) under Section 112 of the Clean Air Act:.

| Chemical Name | CAS-No | Weight % | HAPS data | VOC Chemicals | Class 1 Ozone Depletors | Class 2 Ozone Depletors |
|---|---|---|---|---|---|---|
| Glutaraldehyde | 111-30-8 | 10-30 | | Group IV | | |

**CERCLA**

### U.S. State Regulations

**California Proposition 65**

This product contains the following Proposition 65 chemicals:

| Chemical Name | CAS-No | California Prop. 65 |
|---|---|---|
| Ethyl alcohol | 64-17-5 | Developmental |

| Chemical Name | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island |
|---|---|---|---|---|---|
| Glutaraldehyde | X | X | X | | X |



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| | | | | | |
|---|---|---|---|---|---|
| Ethyl alcohol | X | X | X | | X |

## International Regulations

**Mexico - Grade** No information available

| Chemical Name | Carcinogen Status | Exposure Limits |
|---|---|---|
| Ethyl alcohol | | Mexico: TWA= 1000 ppm<br>Mexico: TWA= 1900 mg/m$^3$ |

**Canada**

**WHMIS Hazard Class**
Not determined

## 16. OTHER INFORMATION

**Prepared By** Amanda Burwell

**Issuing Date** 9/17/2010

**Revision Date** 20-Jul-2011

**Reason for Revision** (M)SDS sections updated. 9. 14.

**Disclaimer**
**The information provided on this SDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.**

**End of MSDS**



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HALLIBURTON

# SAFETY DATA SHEET

**Product Trade Name:** **LCA-1**

**Revision Date:** 20-Oct-2015 **Revision Number:** 19

## 1. Identification

### 1.1. Product Identifier

**Product Trade Name:** LCA-1
**Synonyms:** None
**Chemical Family:** Organic hydrocarbon
**Internal ID Code** HM006885

### 1.2 Recommended use and restrictions on use

**Application:** Solvent
**Uses Advised Against** No information available

### 1.3 Manufacturer's Name and Contact Details

**Manufacturer/Supplier**
Halliburton Energy Services Inc.
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Emergency Telephone: 1-866-519-4752 (US, Canada, Mexico) or 1-760-476-3962

Halliburton Energy Services
645 - 7th Ave SW Suite 2200
Calgary, AB
T2P 4G8
Canada

**Prepared By** Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

### 1.4. Emergency telephone number

**Emergency Telephone Number** 1-866-519-4752 or 1-760-476-3962

## 2. Hazard(s) Identification

### 2.1 Classification in accordance with paragraph (d) of §1910.1200

| | |
|---|---|
| Aspiration Category | Category 1 - H304 |
| Specific Target Organ Toxicity - (Single Exposure) | Category 3 - H336 |
| Flammable liquids. | Category 4 - H227 |

### 2.2. Label Elements

**Hazard Pictograms**



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**Signal Word** Danger

**Hazard Statements**
H227 - Combustible liquid
H304 - May be fatal if swallowed and enters airways
H336 - May cause drowsiness or dizziness

**Precautionary Statements**

**Prevention**
P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves/protective clothing/eye protection/face protection

**Response**
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P331 - Do NOT induce vomiting
P370 + P378 - In case of fire: Use water spray for extinction
P312 - Call a POISON CENTER/doctor/physician if you feel unwell

**Storage**
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P403 + P235 - Store in a well-ventilated place. Keep cool

**Disposal**
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations

**Contains**

| **Substances** | **CAS Number** |
|---|---|
| Hydrotreated light petroleum distillate | Proprietary |

**2.3 Hazards not otherwise classified**
None known

## 3. Composition/information on Ingredients

| Substances | CAS Number | PERCENT (w/w) | GHS Classification - US |
|---|---|---|---|
| Hydrotreated light petroleum distillate | Proprietary | 60 - 100% | STOT SE 3 (H336)<br>Asp. Tox. 1 (H304) |

The exact percentage (concentration) of the composition has been withheld as proprietary.

## 4. First-Aid Measures

**4.1. Description of first aid measures**

**Inhalation** If inhaled, move victim to fresh air and seek medical attention.



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| | |
|---|---|
| **Eyes** | In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists. |
| **Skin** | Wash with soap and water. Get medical attention if irritation persists. Remove contaminated clothing and launder before reuse. |
| **Ingestion** | Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration. Rinse mouth. Never give anything by mouth to an unconscious person. |

### 4.2 Most important symptoms/effects, acute and delayed

Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal. May cause headache, dizziness, and other central nervous system effects.

### 4.3. Indication of any immediate medical attention and special treatment needed

**Notes to Physician** Treat symptomatically.

## 5. Fire-fighting measures

### 5.1. Extinguishing media

**Suitable Extinguishing Media**

Carbon dioxide, dry chemical, foam.

**Extinguishing media which must not be used for safety reasons**

None known.

### 5.2 Specific hazards arising from the substance or mixture

**Special Exposure Hazards**

Use water spray to cool fire exposed surfaces. Decomposition in fire may produce harmful gases. Vapors are heavier than air and may accumulate in low areas. Vapors may travel along the ground to be ignited at distant locations.

### 5.3 Special protective equipment and precautions for fire-fighters

**Special Protective Equipment for Fire-Fighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

## 6. Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Wear self-contained breathing apparatus in enclosed areas.
See Section 8 for additional information

### 6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

### 6.3. Methods and material for containment and cleaning up

Isolate spill and stop leak where safe. Remove ignition sources and work with non-sparking tools. Contain spill with sand or other inert materials. Scoop up and remove.

## 7. Handling and storage

### 7.1. Precautions for Safe Handling

**Handling Precautions**

Avoid contact with eyes, skin, or clothing. Launder contaminated clothing before reuse. Wash hands after use. Ground and bond containers when transferring from one container to another.

**Handling**

Do not breathing vapors or spray mist.

**Hygiene Measures**

Handle in accordance with good industrial hygiene and safety practice.



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### 7.2. Conditions for safe storage, including any incompatibilities

**Storage Information**

Store away from oxidizers. Store in a cool well ventilated area. Keep from heat, sparks, and open flames. Keep container closed when not in use. Product has a shelf life of 24 months.

## 8. Exposure Controls/Personal Protection

### 8.1 Occupational Exposure Limits

| Substances | CAS Number | OSHA PEL-TWA | ACGIH TLV-TWA |
|---|---|---|---|
| Hydrotreated light petroleum distillate | Proprietary | Not applicable | Not applicable |

### 8.2 Appropriate engineering controls

**Engineering Controls** Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

### 8.3 Individual protection measures, such as personal protective equipment

**Personal Protective Equipment** If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

**Respiratory Protection** Not normally needed. But if significant exposures are possible then the following respirator is recommended:
Organic vapor respirator.

**Hand Protection** Impervious rubber gloves.
**Skin Protection** Rubber apron.
**Eye Protection** Chemical goggles; also wear a face shield if splashing hazard exists.
**Other Precautions** Eyewash fountains and safety showers must be easily accessible.

## 9. Physical and Chemical Properties

### 9.1. Information on basic physical and chemical properties

**Physical State:** Liquid
**Odor:** Mild
**Color:** Translucent
**Odor Threshold:** No information available

| Property<br>Remarks/ - Method | Values |
|---|---|
| **pH:** | No data available |
| **Freezing Point/Range** | - 60 °C / - 76 °F |
| **Melting Point/Range** | -68 °C / -90 °F |
| **Boiling Point/Range** | 186-264 °C / 366.8-507.2 °F |
| **Flash Point** | 79 °C / 174 °F PMCC |
| **Flammability (solid, gas)** | No data available |
| **upper flammability limit** | 7.0% |
| **lower flammability limit** | 0.6% |
| **Evaporation rate** | No data available |
| **Vapor Pressure** | 0.16 mmHg |
| **Vapor Density** | 5.7 (air = 1) |
| **Specific Gravity** | 0.806 |
| **Water Solubility** | Insoluble in water |
| **Solubility in other solvents** | No data available |
| **Partition coefficient: n-octanol/water** | No data available |
| **Autoignition Temperature** | 223 °C / 434 °F |
| **Decomposition Temperature** | No data available |



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| | |
|---|---|
| **Viscosity** | 2.2 cSt @ 20C, ASTM D445 |
| **Explosive Properties** | No information available |
| **Oxidizing Properties** | No information available |

**9.2. Other information**

| | |
|---|---|
| **VOC Content (%)** | No data available |

## 10. Stability and Reactivity

**10.1. Reactivity**
Not expected to be reactive.

**10.2. Chemical Stability**
Stable

**10.3. Possibility of Hazardous Reactions**
Will Not Occur

**10.4. Conditions to Avoid**
Keep away from heat, sparks and flame.
Extremes of temperature and direct sunlight

**10.5. Incompatible Materials**
Strong oxidizers. Strong acids. Strong bases.

**10.6. Hazardous Decomposition Products**
Carbon monoxide and carbon dioxide.

## 11. Toxicological Information

**11.1 Information on likely routes of exposure**

| | |
|---|---|
| **Principle Route of Exposure** | Eye or skin contact, inhalation. |

**11.2 Symptoms related to the physical, chemical and toxicological characteristics**

**Acute Toxicity**

| | |
|---|---|
| **Inhalation** | May cause central nervous system depression including headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.<br>May cause respiratory irritation. |
| **Eye Contact** | May cause eye irritation. |
| **Skin Contact** | May cause skin defatting with prolonged exposure. Can dry skin. |
| **Ingestion** | Irritation of the mouth, throat, and stomach. Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal. |

**Chronic Effects/Carcinogenicity** No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

**11.3 Toxicity data**

**Toxicology data for the components**

| Substances | CAS Number | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|---|
| Hydrotreated light petroleum distillate | Proprietary | > 5000 mg/kg (Rat) (similar substance) | > 2000 mg/kg (Rabbit) (similar substance) | > 5.28 mg/L (Rat) 4h (similar substance) |

| Substances | CAS Number | Skin corrosion/irritation |
|---|---|---|
| Hydrotreated light petroleum | | Non-irritating to the skin (similar substances) |



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| | | |
|---|---|---|
| distillate | | |

| Substances | CAS Number | Eye damage/irritation |
|---|---|---|
| Hydrotreated light petroleum distillate | | Non-irritating to rabbit's eye |

| Substances | CAS Number | Skin Sensitization |
|---|---|---|
| Hydrotreated light petroleum distillate | | Did not cause sensitization on laboratory animals (guinea pig) (similar substances) |

| Substances | CAS Number | Respiratory Sensitization |
|---|---|---|
| Hydrotreated light petroleum distillate | | No information available |

| Substances | CAS Number | Mutagenic Effects |
|---|---|---|
| Hydrotreated light petroleum distillate | | In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects. (similar substances) |

| Substances | CAS Number | Carcinogenic Effects |
|---|---|---|
| Hydrotreated light petroleum distillate | | Did not show carcinogenic effects in animal experiments |

| Substances | CAS Number | Reproductive toxicity |
|---|---|---|
| Hydrotreated light petroleum distillate | | Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. (similar substances) |

| Substances | CAS Number | STOT - single exposure |
|---|---|---|
| Hydrotreated light petroleum distillate | | May cause disorder and damage to the Central Nervous System (CNS) (similar substances) |

| Substances | CAS Number | STOT - repeated exposure |
|---|---|---|
| Hydrotreated light petroleum distillate | | No significant toxicity observed in animal studies at concentration requiring classification. (similar substances) |

| Substances | CAS Number | Aspiration hazard |
|---|---|---|
| Hydrotreated light petroleum distillate | | Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal. |

## 12. Ecological Information

### 12.1. Toxicity

**Ecotoxicity Effects**

**Product Ecotoxicity Data**

No data available

**Substance Ecotoxicity Data**

| Substances | CAS Number | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Toxicity to Invertebrates |
|---|---|---|---|---|---|
| Hydrotreated light petroleum distillate | Proprietary | EC50 (72h) > 1,000 mg/L (Skeletonema costatum)<br>ErL50 (72h) > 1000 mg/L (Pseudokirchneriella subcapitata)<br>EbL50 (72h) > 1000 mg/L (Pseudokirchneriella subcapitata)<br>NOELR (72h) 1000 mg/L (Pseudokirchneriella subcapitata) | LC50 (96h) > 10,000 mg/L (Scophthalmus maximus)<br>LL50 (96h) > 1000 mg/L (Oncorhynchus mykiss) | No information available | LC50 (48h) > 10,000 mg/L (Acartia tonsa)<br>EC50 (48h) 1100 mg/L (Daphnia pulex)<br>LC50 (48h) 0.12 mg/L (Daphnia magna)<br>EL50 (48h) > 1000 mg/L (Daphnia magna) |

### 12.2. Persistence and degradability



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| Substances | CAS Number | Persistence and Degradability |
|---|---|---|
| Hydrotreated light petroleum distillate | Proprietary | Readily biodegradable (40% @ 28d) |

### 12.3. Bioaccumulative potential

| Substances | CAS Number | Log Pow |
|---|---|---|
| Hydrotreated light petroleum distillate | Proprietary | No information available |

### 12.4. Mobility in soil

| Substances | CAS Number | Mobility |
|---|---|---|
| Hydrotreated light petroleum distillate | Proprietary | No information available |

### 12.5 Other adverse effects

No information available

## 13. Disposal Considerations

### 13.1. Waste treatment methods

**Disposal Method** Disposal should be made in accordance with federal, state, and local regulations.
**Contaminated Packaging** Follow all applicable national or local regulations.

## 14. Transport Information

### US DOT

**UN Number:** Not restricted
**UN Proper Shipping Name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

### US DOT Bulk

**DOT (Bulk)** Not restricted in accordance with the terms and conditions of 49 CFR 173.120(b)(3).

### Canadian TDG

**UN Number:** Not restricted
**UN Proper Shipping Name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

### IMDG/IMO

**UN Number:** Not restricted
**UN Proper Shipping Name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

### IATA/ICAO

**UN Number:** Not restricted
**UN Proper Shipping Name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:** Not applicable



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**Special Precautions for User:** None

## 15. Regulatory Information

### US Regulations

**US TSCA Inventory** All components listed on inventory or are exempt.

**TSCA Significant New Use Rules - S5A2**

| Substances | CAS Number | TSCA Significant New Use Rules - S5A2 |
|---|---|---|
| Hydrotreated light petroleum distillate | Proprietary | Not applicable |

**EPA SARA Title III Extremely Hazardous Substances**

| Substances | CAS Number | EPA SARA Title III Extremely Hazardous Substances |
|---|---|---|
| Hydrotreated light petroleum distillate | Proprietary | Not applicable |

**EPA SARA (311,312) Hazard Class**
Fire Hazard
Acute Health Hazard

**EPA SARA (313) Chemicals**

| Substances | CAS Number | Toxic Release Inventory (TRI) - Group I | Toxic Release Inventory (TRI) - Group II |
|---|---|---|---|
| Hydrotreated light petroleum distillate | Proprietary | Not applicable | Not applicable |

**EPA CERCLA/Superfund Reportable Spill Quantity**

| Substances | CAS Number | CERCLA RQ |
|---|---|---|
| Hydrotreated light petroleum distillate | Proprietary | Not applicable |

**EPA RCRA Hazardous Waste Classification**
If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

**California Proposition 65** All components listed do not apply to the California Proposition 65 Regulation.

**MA Right-to-Know Law** Does not apply.

**NJ Right-to-Know Law** Does not apply.

**PA Right-to-Know Law** Does not apply.

**NFPA Ratings:** Health 1, Flammability 2, Reactivity 0
**HMIS Ratings:** Health 1, Flammability 2, Reactivity 0

### Canadian Regulations

**Canadian DSL Inventory** All components listed on inventory or are exempt.

## 16. Other information

**Preparation Information**

**Prepared By** Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

**Revision Date:** 20-Oct-2015



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| | |
|---|---|
| **Reason for Revision** | Update to Format<br>SECTION:<br>2 |

**Additional information**
For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

**Key or legend to abbreviations and acronyms**
bw – body weight
CAS – Chemical Abstracts Service
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
h - hour
$mg/m^3$ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
w/w - weight/weight
d - day

**Key literature references and sources for data**
www.ChemADVISOR.com/

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**End of Safety Data Sheet**


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HALLIBURTON

# SAFETY DATA SHEET

# CALCIUM CHLORIDE - FLAKE

**Revision Date:** 21-Jun-2016 **Revision Number:** 18

## 1. Product Identifier & Identity for the Chemical

**Statement of Hazardous Nature** Hazardous according to the criteria of the 3rd Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Non-Dangerous Goods according to the criteria of ADG.

**1.1. Product Identifier**

**Product Name** CALCIUM CHLORIDE - FLAKE

**Other means of Identification**

**Synonyms** None

**Hazardous Material Number:** HM000142

**Recommended use of the chemical and restrictions on use**

**Recommended Use** Additive

**Uses advised against** No information available

**Supplier's name, address and phone number**

**Manufacturer/Supplier** Halliburton/Baroid Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

**Product Emergency Telephone**
Australia: + 61 1 800 686 951
Papua New Guinea: + 61 1 800 686 951
NewZealand: +64 800 451719

**Fire, Police & Ambulance - Emergency Telephone**
Australia: 000
Papua New Guinea: 000
New Zealand: 111

**E-mail Address** fdunexchem@halliburton.com

**Emergency phone number**
+ 61 1 800 686 951

**Australian Poisons Information Centre**
24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

## 2. Hazard Identification

**Statement of Hazardous Nature** Hazardous according to the criteria of the 3rd Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Non-Dangerous Goods according to the criteria of ADG.



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**Classification of the hazardous chemical**

| | |
|---|---|
| Serious Eye Damage/Irritation | Category 2 - H319 |

**Label elements, including precautionary statements**

**Hazard pictograms**

**Signal Word** Warning

**Hazard Statements:** H319 - Causes serious eye irritation

**Precautionary Statements**

**Prevention** P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear eye protection/face protection

**Response** P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical advice/attention

**Storage** None

**Disposal** None

**Contains**

| **Substances** | **CAS Number** |
|---|---|
| Calcium chloride | 10043-52-4 |

**Other hazards which do not result in classification**

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).
This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

*For the full text of the H-phrases mentioned in this Section, see Section 16*

## 3. Composition/information on Ingredients

| Substances | CAS Number | PERCENT (w/w) | GHS Classification - Australia |
|---|---|---|---|
| Calcium chloride | 10043-52-4 | 60 - 100% | Eye Irrit. 2A (H319) |

## 4. First aid measures

**Description of necessary first aid measures**

**Inhalation** If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

**Eyes** In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

**Skin** Wash with soap and water. Get medical attention if irritation persists. Remove contaminated clothing and launder before reuse.

**Ingestion** Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.



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**Symptoms caused by exposure**
Causes eye irritation

**Medical Attention and Special Treatment**
**Notes to Physician** Treat symptomatically

## 5. Fire Fighting Measures

**Suitable extinguishing equipment**
**Suitable Extinguishing Media**
All standard fire fighting media
**Extinguishing media which must not be used for safety reasons**
None known.

**Specific hazards arising from the chemical**
**Special exposure hazards in a fire**
None anticipated

**Special protective equipment and precautions for fire fighters**
**Special protective equipment for firefighters**
Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

## 6. Accidental release measures

**6.1. Personal precautions, protective equipment and emergency procedures**
Use appropriate protective equipment. Avoid creating and breathing dust. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation.

**6.2. Environmental precautions**
Prevent from entering sewers, waterways, or low areas.

**6.3. Methods and material for containment and cleaning up**
Scoop up and remove.

## 7. Handling and storage

**7.1. Precautions for safe handling**
**Handling Precautions**
Use appropriate protective equipment. Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse.
**Hygiene Measures**
Handle in accordance with good industrial hygiene and safety practice.

**7.2. Conditions for safe storage, including any incompatibilities**
**Storage Information**
Store in a cool, dry location.
**Other Guidelines**
No information available

## 8. Exposure Controls/Personal Protection

**Control parameters - exposure standards, biological monitoring**
**Exposure Limits**

| Substances | CAS Number | Australia NOHSC | ACGIH TLV-TWA |
|---|---|---|---|
| Calcium chloride | 10043-52-4 | Not applicable | Not applicable |

**Appropriate engineering controls**
**Engineering Controls** Use in a well ventilated area.



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**Personal protective equipment (PPE)**

| | |
|---|---|
| **Personal Protective Equipment** | If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product. |
| **Respiratory Protection** | Dust/mist respirator. (N95, P2/P3) |
| **Hand Protection** | Normal work gloves. |
| **Skin Protection** | Normal work coveralls. |
| **Eye Protection** | Wear safety glasses or goggles to protect against exposure. |
| **Other Precautions** | None known. |
| **Environmental Exposure Controls** | Do not allow material to contaminate ground water system |

## 9. Physical and Chemical Properties

**9.1. Information on basic physical and chemical properties**

| | | | |
|---|---|---|---|
| **Physical State:** | Solid | **Color** | White |
| **Odor:** | Odorless | **Odor Threshold:** | No information available |

| Property<br>Remarks/ - Method | Values |
|---|---|
| **pH:** | 10 |
| **Freezing Point / Range** | No data available |
| **Melting Point / Range** | No data available |
| **Boiling Point / Range** | No data available |
| **Flash Point** | No data available |
| **Evaporation rate** | No data available |
| **Vapor Pressure** | 1 mmHg |
| **Vapor Density** | No data available |
| **Specific Gravity** | 1.85 |
| **Water Solubility** | Soluble in water |
| **Solubility in other solvents** | No data available |
| **Partition coefficient: n-octanol/water** | No data available |
| **Autoignition Temperature** | No data available |
| **Decomposition Temperature** | No data available |
| **Viscosity** | No data available |
| **Explosive Properties** | No information available |
| **Oxidizing Properties** | No information available |

**9.2. Other information**

| | |
|---|---|
| **Molecular Weight** | 111 |
| **VOC Content (%)** | No data available |

## 10. Stability and Reactivity

**10.1. Reactivity**
Not expected to be reactive.
**10.2. Chemical stability**
Stable
**10.3. Possibility of hazardous reactions**
Will Not Occur
**10.4. Conditions to avoid**
None anticipated
**10.5. Incompatible materials**
None known.
**10.6. Hazardous decomposition products**
None known.

## 11. Toxicological Information

**Information on routes of exposure**



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**Principle Route of Exposure** Eye or skin contact, inhalation.

**Symptoms related to exposure**

**Most Important Symptoms/Effects**

Causes eye irritation

**Numerical measures of toxicity**

**Toxicology data for the components**

| Substances | CAS Number | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|---|
| Calcium chloride | 10043-52-4 | > 1000 mg/kg (Rat)<br>2301 mg/kg (Rat)<br>> 2000 mg/kg (Rat)<br>2240 mg/kg (Rat) | 5000 mg/kg (Rabbit) | No data available |

**Immediate, delayed and chronic health effects from exposure**

**Inhalation** May cause mild respiratory irritation.
**Eye Contact** Causes eye irritation.
**Skin Contact** May cause mild skin irritation.
**Ingestion** Irritation of the mouth, throat, and stomach.

**Chronic Effects/Carcinogenicity** No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

**Exposure Levels**

No data available

**Interactive effects**

Skin disorders.

**Data limitations**

No data available

| Substances | CAS Number | Skin corrosion/irritation |
|---|---|---|
| Calcium chloride | 10043-52-4 | Causes mild skin irritation (Rabbit) |

| Substances | CAS Number | Serious eye damage/irritation |
|---|---|---|
| Calcium chloride | 10043-52-4 | Causes moderate eye irritation (Rabbit) |

| Substances | CAS Number | Skin Sensitization |
|---|---|---|
| Calcium chloride | 10043-52-4 | No information available |

| Substances | CAS Number | Respiratory Sensitization |
|---|---|---|
| Calcium chloride | 10043-52-4 | No information available |

| Substances | CAS Number | Mutagenic Effects |
|---|---|---|
| Calcium chloride | 10043-52-4 | Did not show mutagenic effects in animal experiments |

| Substances | CAS Number | Carcinogenic Effects |
|---|---|---|
| Calcium chloride | 10043-52-4 | No information available |

| Substances | CAS Number | Reproductive toxicity |
|---|---|---|
| Calcium chloride | 10043-52-4 | Animal testing did not show any effects on fertility. |

| Substances | CAS Number | STOT - single exposure |
|---|---|---|
| Calcium chloride | 10043-52-4 | No significant toxicity observed in animal studies at concentration requiring classification. |

| Substances | CAS Number | STOT - repeated exposure |
|---|---|---|
| Calcium chloride | 10043-52-4 | No information available. |

| Substances | CAS Number | Aspiration hazard |
|---|---|---|



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| | | |
|---|---|---|
| Calcium chloride | 10043-52-4 | Not applicable |

## 12. Ecological Information

**Ecotoxicity**

**Product Ecotoxicity Data**

No data available

**Substance Ecotoxicity Data**

| Substances | CAS Number | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Toxicity to Invertebrates |
|---|---|---|---|---|---|
| Calcium chloride | 10043-52-4 | ErC50 (72h) 2900 mg/L (Pseudokirchnerella subcapitata)<br>ErC50 (72h) 4000 mg/L (Pseudokirchnerella subcapitata) | LC50 (96h) 4630 mg/L (Pimephales promelas)<br>LC50 (48h) >6560 mg/L (Pimephales promelas)<br>LC50 (24h) >6660 mg/L (Pimephales promelas) | No information available | EC50 (48h) 2400 mg/L (Daphnia magna)<br>EC50 (21d) 610 mg/L (reproduction) (Daphnia magna) |

**12.2. Persistence and degradability**

| Substances | CAS Number | Persistence and Degradability |
|---|---|---|
| Calcium chloride | 10043-52-4 | The methods for determining biodegradability are not applicable to inorganic substances. |

**12.3. Bioaccumulative potential**

| Substances | CAS Number | Log Pow |
|---|---|---|
| Calcium chloride | 10043-52-4 | No information available |

**12.4. Mobility in soil**

| Substances | CAS Number | Mobility |
|---|---|---|
| Calcium chloride | 10043-52-4 | No information available |

**12.6. Other adverse effects**

**Endocrine Disruptor Information**

This product does not contain any known or suspected endocrine disruptors

## 13. Disposal Considerations

**Safe handling and disposal methods**

Bury in a licensed landfill according to federal, state, and local regulations.

**Disposal of any contaminated packaging**

Follow all applicable national or local regulations.

**Environmental regulations**

Not applicable

## 14. Transport Information

**Transportation Information**

| | |
|---|---|
| **UN Number** | Not restricted |
| **UN proper shipping name:** | Not restricted |
| **Transport Hazard Class(es):** | Not applicable |
| **Packing Group:** | Not applicable |
| **Environmental Hazards:** | Not applicable |

**Special precautions during transport**

None

**HazChem Code**
None Allocated

## 15. Regulatory Information

**Safety, health and environmental regulations specific for the product**

**International Inventories**

| | |
|---|---|
| **Australian AICS Inventory** | All components are listed on the AICS or are subject to a relevant exemption, permit, or assessment certificate. |
| **New Zealand Inventory of Chemicals** | All components are listed on the NZIoC or are subject to a relevant exemption, permit, or assessment certificate. |
| **EINECS (European Inventory of Existing Chemical Substances)** | This product, and all its components, complies with EINECS |
| **US TSCA Inventory** | All components listed on inventory or are exempt. |
| **Canadian Domestic Substances List (DSL)** | All components listed on inventory or are exempt. |

**Poisons Schedule number**
None Allocated

**International Agreements**

| | |
|---|---|
| **Montreal Protocol - Ozone Depleting Substances:** | Does not apply |
| **Stolkhom Convention - Persistent Organic Pollutants:** | Does not apply |
| **Rotterdam Convention - Prior Informed Consent:** | Does not apply |
| **Basel Convention - Hazardous Waste:** | Does not apply |

## 16. Other information

**Date of preparation or review**

**Revision Date:** 21-Jun-2016

**Revision Note**
SDS sections updated: 2

**Full text of H-Statements referred to under sections 2 and 3**
H319 - Causes serious eye irritation

**Additional information** For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

**Key abreviations or acronyms used**
bw – body weight
CAS – Chemical Abstracts Service
EC50 – Effective Concentration 50%
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
NOEC – No Observed Effect Concentration
OEL – Occupational Exposure Limit
PBT – Persistent Bioaccumulative and Toxic
ppm – parts per million
STEL – Short Term Exposure Limit



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TWA – Time-Weighted Average
vPvB – very Persistent and very Bioaccumulative
h - hour
$mg/m^3$ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
w/w - weight/weight
d - day

**Key literature references and sources for data**
www.ChemADVISOR.com/
NZ CCID
OSHA
ECHA C&L

**Disclaimer Statement**
This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

**End of Safety Data Sheet**

HALLIBURTON

# SAFETY DATA SHEET

# SODA ASH

**Revision Date:** 24-Apr-2017 **Revision Number:** 42

## 1. Product Identifier & Identity for the Chemical

**Statement of Hazardous Nature** Hazardous according to the criteria of the 3rd Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Non-Dangerous Goods according to the criteria of ADG.

**1.1. Product Identifier**

**Product Name** SODA ASH

**Other means of Identification**

**Synonyms** None

**Hazardous Material Number:** HM001822

**Recommended use of the chemical and restrictions on use**

**Recommended Use** Buffer

**Uses advised against** No information available

**Supplier's name, address and phone number**

**Manufacturer/Supplier** Halliburton Australia Pty. Ltd.
15 Marriott Road, Jandakot, WA 6164
Australia
ACN Number: 009 000 775
Telephone Number: + 61 1 800 686 951
Fax Number: 61 (08) 9455 5300

**E-mail Address** fdunexchem@halliburton.com

**Emergency phone number**

+ 61 1 800 686 951
Global Incident Response Access Code: 334305
Contract Number: 14012

**Australian Poisons Information Centre**

24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

## 2. Hazard Identification

**Statement of Hazardous Nature** Hazardous according to the criteria of the 3rd Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Non-Dangerous Goods according to the criteria of ADG.

**Classification of the hazardous chemical**

| | |
|---|---|
| Serious Eye Damage/Irritation | Category 2 - H319 |

**Label elements, including precautionary statements**

**Hazard Pictograms**



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**Signal Word** WARNING

**Hazard Statements:** H319 - Causes serious eye irritation

**Precautionary Statements**

**Prevention** P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear eye protection/face protection

**Response** P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical advice/attention

**Storage** None

**Disposal** None

**Contains**

| **Substances** | **CAS Number** |
|---|---|
| Sodium carbonate | 497-19-8 |

**Other hazards which do not result in classification**

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).
This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

*For the full text of the H-phrases mentioned in this Section, see Section 16*

## 3. Composition/information on Ingredients

| Substances | CAS Number | PERCENT (w/w) | GHS Classification - Australia |
|---|---|---|---|
| Sodium carbonate | 497-19-8 | 60 - 100% | Eye Irrit. 2 (H319) |

## 4. First aid measures

**Description of necessary first aid measures**

**Inhalation** If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

**Eyes** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

**Skin** Wash with soap and water. Get medical attention if irritation persists.

**Ingestion** Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

**Symptoms caused by exposure**

Causes eye irritation

**Medical Attention and Special Treatment**

**Notes to Physician** Treat symptomatically

## 5. Fire Fighting Measures



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**Suitable extinguishing equipment**

**Suitable Extinguishing Media**

Water fog, carbon dioxide, foam, dry chemical.

**Extinguishing media which must not be used for safety reasons**

None known.

**Specific hazards arising from the chemical**

**Special exposure hazards in a fire**

Decomposition in fire may produce harmful gases.

**Special protective equipment and precautions for fire fighters**

**Special protective equipment for firefighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

## 6. Accidental release measures

**6.1. Personal precautions, protective equipment and emergency procedures**

Use appropriate protective equipment. Avoid creating and breathing dust. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation.

**6.2. Environmental precautions**

Prevent from entering sewers, waterways, or low areas.

**6.3. Methods and material for containment and cleaning up**

Scoop up and remove.

## 7. Handling and storage

**7.1. Precautions for safe handling**

**Handling Precautions**

Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

**Hygiene Measures**

Handle in accordance with good industrial hygiene and safety practice.

**7.2. Conditions for safe storage, including any incompatibilities**

**Storage Information**

Store away from acids. Store in a cool, dry location. Product has a shelf life of 60 months.

**Other Guidelines**

No information available

## 8. Exposure Controls/Personal Protection

**Control parameters - exposure standards, biological monitoring**

**Exposure Limits**

| Substances | CAS Number | Australia NOHSC | ACGIH TLV-TWA |
|---|---|---|---|
| Sodium carbonate | 497-19-8 | Not applicable | Not applicable |

**Appropriate engineering controls**

**Engineering Controls** Use in a well ventilated area. Localized ventilation should be used to control dust levels.

**Personal protective equipment (PPE)**

**Personal Protective Equipment** If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

**Respiratory Protection** If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be

performed by an Industrial Hygienist or other qualified professional.

| | |
|---|---|
| **Hand Protection** | Normal work gloves. |
| **Skin Protection** | Normal work coveralls. |
| **Eye Protection** | Dust proof goggles. |
| **Other Precautions** | None known. |
| **Environmental Exposure Controls** | Do not allow material to contaminate ground water system |

## 9. Physical and Chemical Properties

**9.1. Information on basic physical and chemical properties**

| | | | |
|---|---|---|---|
| **Physical State:** | Powder | **Color** | White |
| **Odor:** | Odorless | **Odor Threshold:** | No information available |

| Property<br>Remarks/ - Method | Values |
|---|---|
| **pH:** | 11.5 |
| **Freezing Point / Range** | No data available |
| **Melting Point / Range** | 851 °C |
| **Boiling Point / Range** | No data available |
| **Flash Point** | No data available |
| **Evaporation rate** | No data available |
| **Vapor Pressure** | No data available |
| **Vapor Density** | No data available |
| **Specific Gravity** | 2.5 |
| **Water Solubility** | Partly soluble |
| **Solubility in other solvents** | No data available |
| **Partition coefficient: n-octanol/water** | No data available |
| **Autoignition Temperature** | No data available |
| **Decomposition Temperature** | No data available |
| **Viscosity** | No data available |
| **Explosive Properties** | No information available |
| **Oxidizing Properties** | No information available |

**9.2. Other information**

| | |
|---|---|
| **Molecular Weight** | 105.99 g/mole |
| **VOC Content (%)** | No data available |

## 10. Stability and Reactivity

**10.1. Reactivity**
Not expected to be reactive.
**10.2. Chemical stability**
Stable
**10.3. Possibility of hazardous reactions**
Will Not Occur
**10.4. Conditions to avoid**
None anticipated
**10.5. Incompatible materials**
Strong acids.
**10.6. Hazardous decomposition products**
Carbon monoxide and carbon dioxide.

## 11. Toxicological Information

**Information on routes of exposure**
**Principle Route of Exposure** Eye or skin contact, inhalation.

**Symptoms related to exposure**
**Most Important Symptoms/Effects**
Causes eye irritation



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## Numerical measures of toxicity

## Toxicology data for the components

| Substances | CAS Number | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|---|
| Sodium carbonate | 497-19-8 | 4090 mg/kg (Rat)<br>2800 mg/kg (Rat) | 2210 mg/kg (Mouse)<br>> 2000 mg/kg (Rabbit) | 2.3 mg/L (Rat) 2h |

**Immediate, delayed and chronic health effects from exposure**

**Inhalation** May cause mild respiratory irritation.
**Eye Contact** Causes eye irritation.
**Skin Contact** Not irritating to skin in rabbits.
**Ingestion** Irritation of the mouth, throat, and stomach.

**Chronic Effects/Carcinogenicity** No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

**Exposure Levels**
No data available

**Interactive effects**
None known.

**Data limitations**
No data available

| Substances | CAS Number | Skin corrosion/irritation |
|---|---|---|
| Sodium carbonate | 497-19-8 | Non-irritating to the skin |

| Substances | CAS Number | Serious eye damage/irritation |
|---|---|---|
| Sodium carbonate | 497-19-8 | Irritating to eyes |

| Substances | CAS Number | Skin Sensitization |
|---|---|---|
| Sodium carbonate | 497-19-8 | Not classified |

| Substances | CAS Number | Respiratory Sensitization |
|---|---|---|
| Sodium carbonate | 497-19-8 | No information available |

| Substances | CAS Number | Mutagenic Effects |
|---|---|---|
| Sodium carbonate | 497-19-8 | In vivo tests did not show mutagenic effects. |

| Substances | CAS Number | Carcinogenic Effects |
|---|---|---|
| Sodium carbonate | 497-19-8 | No information available |

| Substances | CAS Number | Reproductive toxicity |
|---|---|---|
| Sodium carbonate | 497-19-8 | Did not show teratogenic effects in animal experiments. |

| Substances | CAS Number | STOT - single exposure |
|---|---|---|
| Sodium carbonate | 497-19-8 | No significant toxicity observed in animal studies at concentration requiring classification. |

| Substances | CAS Number | STOT - repeated exposure |
|---|---|---|
| Sodium carbonate | 497-19-8 | No significant toxicity observed in animal studies at concentration requiring classification. |

| Substances | CAS Number | Aspiration hazard |
|---|---|---|
| Sodium carbonate | 497-19-8 | Not applicable |

# 12. Ecological Information

**Ecotoxicity**



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**Substance Ecotoxicity Data**

| Substances | CAS Number | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Toxicity to Invertebrates |
|---|---|---|---|---|---|
| Sodium carbonate | 497-19-8 | EC50 242 mg/L (Nitzschia) | TLM24 385 mg/L (Lepomis macrochirus) LC50 310-1220 mg/L (Pimephales promelas) LC50 (96h) 300 mg/L (Lepomis macrochirus) | No information available | EC50 265 mg/L (Daphnia magna) EC50 (48h) 200 – 227 mg/L (Ceriodaphnia sp.) |

**12.2. Persistence and degradability**

| Substances | CAS Number | Persistence and Degradability |
|---|---|---|
| Sodium carbonate | 497-19-8 | The methods for determining biodegradability are not applicable to inorganic substances. |

**12.3. Bioaccumulative potential**

| Substances | CAS Number | Log Pow |
|---|---|---|
| Sodium carbonate | 497-19-8 | No information available |

**12.4. Mobility in soil**

| Substances | CAS Number | Mobility |
|---|---|---|
| Sodium carbonate | 497-19-8 | No information available |

**12.6. Other adverse effects**

**Endocrine Disruptor Information**

This product does not contain any known or suspected endocrine disruptors

## 13. Disposal Considerations

**Safe handling and disposal methods**

Bury in a licensed landfill according to federal, state, and local regulations.

**Disposal of any contaminated packaging**

Follow all applicable national or local regulations.

**Environmental regulations**

Not applicable

## 14. Transport Information

**Transportation Information**

**Australia ADG**

**UN Number** Not restricted
**UN proper shipping name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

**IMDG/IMO**

**UN Number** Not restricted
**UN proper shipping name:** Not restricted
**Transport Hazard Class(es):** Not applicable
**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

**IATA/ICAO**

**UN Number** Not restricted
**UN proper shipping name:** Not restricted
**Transport Hazard Class(es):** Not applicable



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**Packing Group:** Not applicable
**Environmental Hazards:** Not applicable

**Special precautions during transport**
None

**HazChem Code**
None Allocated

## 15. Regulatory Information

**Safety, health and environmental regulations specific for the product**

**International Inventories**

| | |
|---|---|
| **Australian AICS Inventory** | All components are listed on the AICS or are subject to a relevant exemption, permit, or assessment certificate. |
| **New Zealand Inventory of Chemicals** | All components are listed on the NZIoC or are subject to a relevant exemption, permit, or assessment certificate. |
| **EINECS (European Inventory of Existing Chemical Substances)** | This product, and all its components, complies with EINECS |
| **US TSCA Inventory** | All components listed on inventory or are exempt. |
| **Canadian Domestic Substances List (DSL)** | All components listed on inventory or are exempt. |

**Poisons Schedule number**
None Allocated

**International Agreements**

| | |
|---|---|
| **Montreal Protocol - Ozone Depleting Substances:** | Does not apply |
| **Stockholm Convention - Persistent Organic Pollutants:** | Does not apply |
| **Rotterdam Convention - Prior Informed Consent:** | Does not apply |
| **Basel Convention - Hazardous Waste:** | Does not apply |

## 16. Other information

**Date of preparation or review**

**Revision Date:** 24-Apr-2017

**Revision Note**
SDS sections updated: 2

**Full text of H-Statements referred to under sections 2 and 3**
H319 - Causes serious eye irritation

**Additional information** For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

**Key abreviations or acronyms used**
bw – body weight
CAS – Chemical Abstracts Service
EC50 – Effective Concentration 50%
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter



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NOEC – No Observed Effect Concentration
OEL – Occupational Exposure Limit
PBT – Persistent Bioaccumulative and Toxic
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
vPvB – very Persistent and very Bioaccumulative
h - hour
$mg/m^3$ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
w/w - weight/weight
d - day

**Key literature references and sources for data**
www.ChemADVISOR.com/

**Disclaimer Statement**
This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

**End of Safety Data Sheet**



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**TETRA TECH**

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**COMPLETIONS**

**Tetra Technologies Inc Products stored on location**

**Tier II Determination**

| CAS # | Chemical | Max. on Location | Units | Specific Gravity | % by Weight | Gal | Pounds /gal | Total Pounds | Reportable Quantity | Reportable on Tier II | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Marathon Petroleum No. 2** | 460 | gallons | 0.865 | | 460 | 7.2 | 3,314.50 | 10,000 lbs | no | < 10,000 lbs |
| 68476-34-6 | No. 2 Diesel Fuel | | | 0.865 | 50-100% | 460 | 7.9135 | 3,640.21 | 10,000 lbs | no | 313=NL; 311/312=acute health, fire hazard |
| 8008-20-6 | Kerosene, Petroleum | | | 0.82 | 0-50% | 230 | 6.8306 | 1,571.04 | NA | no | NL |
| 928771-01-1 | Alkanes, C10-C20 | | | 0.79 | 0-5% | 23 | 6.5807 | 151.36 | NA | no | NL |
| 91-20-3 | Naphthalene | | | 1.162 | 0.3-2.6 | 11.96 | 9.67946 | 99.627 | 100 lbs | yes | RCRA U165; "313" |

When there is a range, maximum quantity or percentage is used in calculation

NL = Not Listed

"313" = Subject to reporting under Section 313 & 6607

# SAFETY DATA SHEET

**SDS ID NO.:** 0290MAR019
**Revision Date:** 06/01/2016

## 1. IDENTIFICATION

**Product Name:** Marathon Petroleum No. 2 Ultra Low Sulfur Diesel

**Synonym:** #2 Diesel; No. 2 Ultra Low Sulfur Diesel 15 ppm Sulfur Max; Ultra Low Sulfur Diesel No. 2 15 ppm Sulfur Max; Ultra Low Sulfur Diesel No. 2 15 ppm Sulfur Max with Polar Plus; No. 2 Diesel, Motor Vehicle Use, Undyed; No. 2 Diesel, Motor Vehicle Use, Undyed, with Polar Plus; ULSD No. 2 Diesel 15 ppm Sulfur Max; ULSD No. 2 Diesel 15 ppm Sulfur Max with Polar Plus; No. 2 MV 15 Diesel; No. 2 MV 15 Diesel with Polar Plus; No. 2 Ultra Low Sulfur Diesel Dyed 15 ppm Sulfur Max; Ultra Low Sulfur Diesel No. 2 Dyed 15 ppm Sulfur Max; Ultra Low Sulfur Diesel No. 2 Dyed 15 ppm Sulfur Max with Polar Plus; No. 2 Diesel, Tax Exempt-Motor Vehicle Use, Dyed; No. 2 Diesel, Tax Exempt-Motor Vehicle Use, Dyed, with Polar Plus; ULSD No. 2 Diesel Dyed 15 ppm Sulfur Max; ULSD No. 2 Diesel Dyed 15 ppm Sulfur Max, with Polar Plus; No. 2 MV 15 Diesel Dyed; #2 MV 15 CFI Diesel; #2 MV 15 CFI Diesel Dyed; No. 2 Low Sulfur Diesel (TxLED); No. 2 MV 15 Diesel Dyed, with Polar Plus; No. 2 NRLM 15 Diesel Dyed; No.2 NRLM Diesel Dyed; No. 2 MV 500 ppm TxLED; No.2 Low Emission Low Sulfur Diesel; No. 2 Low Sulfur Diesel (TxLED) 500 ppm Sulfur Max; No. 2 Heating Oil 5000 NMA Unmarked; NEMA No. 2 Heating Oil; Heating Oil, No. 2 Low Sulfur 5000 ppm; No. 2 Ultra Low Sulfur Diesel Dyed with <6% Renewable Diesel Fuel; Ultra Low Sulfur No. 2 Diesel Dyed with <6% Renewable Diesel Fuel; No. 2 Diesel Dyed with <6% Renewable Diesel Fuel 15 ppm Sulfur Max; No. 2 Ultra Low Sulfur Diesel with <6% Renewable Diesel Fuel; Ultra Low Sulfur No. 2 Diesel with <6% Renewable Diesel Fuel; No. 2 Diesel with <6% Renewable Diesel Fuel 15 ppm Sulfur Max; Garyville Export Diesel; Export Diesel, Garyville; Diesel Fuel, Export Garyville; #2 Motor Vehicle ULSD 15 ppm with 0-5% Renewable Diesel; Marathon No. 2 ULSD with 0-5% Renewable Fuel with R100; Marathon No. 2 ULSD with 0-5% Renewable Fuel with R99; No. 2 Heating Oil 2000 ppm Sulfur Max, Clear (Undyed) Unmarked;Ultra Low Sulfur Heating Oil 15 ppm Sulfur Max, Clear (Undyed) Unmarked; ULS Heating Oil 15 ppm Clear (Undyed) Unmarked; ULS HO 15 ppm CLR; Ultra-Low Sulfur Heating Oil (<= 15ppm, Undyed); No. 2 Heating Oil 2000 ppm Sulfur Max, Dyed Unmarked; No. 2 Heating Oil 2000 ppm Sulfur Max, Dyed Marked; Ultra Low Sulfur Heating Oil 15 ppm Sulfur Max, Dyed Unmarked; Ultra Low Sulfur Heating Oil 15 ppm Sulfur Max, Dyed Marked;15 ppm Sulfur Heating Oil Grade 67; 15 PPM Heating Oil; 15 PPM Dyed Heating Oil; 0291MAR019; 0306MAR019; 0308MAR019; 0334MAR019; 0335MAR019; 0336MAR019; 0337MAR019; 0340MAR019;

**Chemical Family:** Complex Hydrocarbon Substance

**Recommended Use:** Fuel.
**Restrictions on Use:** All others.

**Manufacturer, Importer, or Responsible Party Name and Address:**

**MARATHON PETROLEUM COMPANY LP**
**539 South Main Street**
**Findlay, OH 45840**

**SDS information:** 1-419-421-3070

**Emergency Telephone:** 1-877-627-5463



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# 2. HAZARD IDENTIFICATION

## Classification

**OSHA Regulatory Status**
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

| | |
|---|---|
| Flammable liquids | Category 3 |
| Acute toxicity - Inhalation (Dusts/Mists) | Category 4 |
| Skin corrosion/irritation | Category 2 |
| Carcinogenicity | Category 2 |
| Specific target organ toxicity (single exposure) | Category 3 |
| Specific target organ toxicity (repeated exposure) | Category 2 |
| Aspiration toxicity | Category 1 |
| Acute aquatic toxicity | Category 2 |
| Chronic aquatic toxicity | Category 2 |

**Hazards Not Otherwise Classified (HNOC)**
Static accumulating flammable liquid

## Label elements

**EMERGENCY OVERVIEW**

**Danger**

FLAMMABLE LIQUID AND VAPOR
May accumulate electrostatic charge and ignite or explode
May be fatal if swallowed and enters airways
Harmful if inhaled
Causes skin irritation
May cause respiratory irritation
May cause drowsiness or dizziness
Suspected of causing cancer
May cause damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure
Toxic to aquatic life with long lasting effects

**Appearance** Yellow to Red Liquid **Physical State** Liquid **Odor** Hydrocarbon

**Precautionary Statements - Prevention**
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use only non-sparking tools.
Use explosion-proof electrical/ventilating/lighting/equipment
Take precautionary measures against static discharge
Do not breathe mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection



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Wash hands and any possibly exposed skin thoroughly after handling
Avoid release to the environment

**Precautionary Statements - Response**
IF exposed or concerned: Get medical attention
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
If skin irritation occurs: Get medical attention
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor if you feel unwell
IF SWALLOWED: Immediately call a POISON CENTER or doctor
Do NOT induce vomiting
In case of fire: Use water spray, fog or regular foam for extinction
Collect spillage

**Precautionary Statements - Storage**
Store in a well-ventilated place. Keep container tightly closed
Keep cool
Store locked up

**Precautionary Statements - Disposal**
Dispose of contents/container at an approved waste disposal plant

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

No. 2 Ultra Low Sulfur Diesel is a complex mixture of paraffins, cycloparaffins, olefins and aromatic hydrocarbon chain lengths predominantly in the range of eleven to twenty carbons. May contain up to 5% Renewable Diesel. May contain small amounts of dye and other additives (<0.15%) which are not considered hazardous at the concentration(s) used. May contain a trace amount of benzene (<0.01%). Contains a trace amount of sulfur (<0.0015%)

**Composition Information:**

| Name | CAS Number | % Concentration |
|---|---|---|
| No. 2 Diesel Fuel | 68476-34-6 | 50-100 |
| Kerosine, Petroleum | 8008-20-6 | 0-50 |
| Alkanes, C10-C20 branched and linear | 928771-01-1 | 0-5 |
| Naphthalene | 91-20-3 | 0.3-2.6 |

All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

## 4. FIRST AID MEASURES

**First Aid Measures**

**General Advice:** In case of accident or if you feel unwell, seek medical advice immediately (show directions for use or safety data sheet if possible).

**Inhalation:** Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear, give oxygen and continue to monitor. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

**Skin Contact:** Immediately wash exposed skin with plenty of soap and water while removing contaminated clothing and shoes. May be absorbed through the skin in harmful amounts. Get medical attention if irritation persists. Any injection injury from high pressure equipment should be evaluated immediately by a physician as potentially serious (See NOTES TO PHYSICIAN).

Place contaminated clothing in closed container until cleaned or discarded. If clothing is to be laundered, inform the person performing the operation of contaminant's hazardous properties. Destroy contaminated, non-chemical resistant footwear.

**Eye Contact:** Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Gently remove contacts while flushing. Get medical attention if irritation persists.

**Ingestion:** Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs, keep head below hips, or if patient is lying down, turn body and head to side to prevent aspiration and monitor for breathing difficulty. Never give anything by mouth to an unconscious person. Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

**Most important signs and symptoms, both short-term and delayed with overexposure**

**Adverse Effects:** Irritating to the skin and mucous membranes. Symptoms may include redness, itching, and inflammation. May cause nausea, vomiting, diarrhea, and signs of nervous system depression: headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Aspiration hazard. May cause coughing, chest pains, shortness of breath, pulmonary edema and/or chemical pneumonitis. Repeated or prolonged skin contact may cause drying, reddening, itching and cracking. Prolonged or repeated exposure may cause adverse effects to the thymus, liver, and bone marrow.

**Indication of any immediate medical attention and special treatment needed**

**Notes To Physician:** INHALATION: This material (or a component) sensitizes the myocardium to the effects of sympathomimetic amines. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in individuals exposed to this material. Administration of sympathomimetic drugs should be avoided.

SKIN: Leaks or accidents involving high-pressure equipment may inject a stream of material through the skin and initially produce an injury that may not appear serious. Only a small puncture wound may appear on the skin surface but, without proper treatment and depending on the nature, original pressure, volume, and location of the injected material, can compromise blood supply to an affected body part. Prompt surgical debridement of the wound may be necessary to prevent irreversible loss of function and/or the affected body part. High pressure injection injuries may be SERIOUS SURGICAL EMERGENCIES.

INGESTION: This material represents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended.

## 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media**
For small fires, Class B fire extinguishing media such as CO2, dry chemical, foam (AFFF/ATC) or water spray can be used. For large fires, water spray, fog or foam (AFFF/ATC) can be used. Firefighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

**Unsuitable extinguishing media**
Do not use straight water streams to avoid spreading fire.

**Specific hazards arising from the chemical**
This product has been determined to be a flammable liquid per the OSHA Hazard Communication Standard and should be handled accordingly. May accumulate electrostatic charge and ignite or explode. Vapors may travel along the ground or be moved by ventilation and ignited by many sources such as pilot lights, sparks, electric motors, static discharge, or other ignition sources at locations distant from material handling. Flashback can occur along vapor trail. For additional fire related information, see NFPA 30 or the Emergency Response Guidebook 128.

**Hazardous combustion products**
Smoke, carbon monoxide, and other products of incomplete combustion.

**Explosion data**
**Sensitivity to Mechanical Impact** No.



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**Sensitivity to Static Discharge** Yes.

**Special protective equipment and precautions for firefighters**
Firefighters should wear full protective clothing and positive-pressure self-contained breathing apparatus (SCBA) with a full face-piece, as appropriate. Avoid using straight water streams. Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and from as far a distance as possible. Avoid excessive water spray application. Keep surrounding area cool with water spray from a distance and prevent further ignition of combustible material. Keep run-off water out of sewers and water sources.

**Additional firefighting tactics**
FIRES INVOLVING TANKS OR CAR/TRAILER LOADS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after the fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles: if this is impossible, withdraw from area and let fire burn.

EVACUATION: Consider initial downwind evacuation for at least 1000 feet. If tank, rail car or tank truck is involved in a fire, ISOLATE for 5280 feet (1 mile) in all directions; also, consider initial evacuation of 5280 feet (1 mile) in all directions.

| NFPA | Health 1 | Flammability 2 | Instability 0 | Special Hazard - |
|---|---|---|---|---|

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Eliminate all ignition sources. All contaminated surfaces will be slippery.

**Protective equipment:** Use personal protection measures as recommended in Section 8.

**Emergency procedures:** Advise authorities and National Response Center (800-424-8802) if the product has entered a water course or sewer. Notify local health and pollution control agencies, if appropriate.

**Environmental precautions:** Avoid release to the environment. Avoid subsoil penetration.

**Methods and materials for containment:** Contain liquid with sand or soil. Prevent spilled material from entering storm drains, sewers, and open waterways.

**Methods and materials for cleaning up:** Use suitable absorbent materials such as vermiculite, sand, or clay to clean up residual liquids. Recover and return free product to proper containers. When recovering free liquids ensure all equipment is grounded and bonded. Use only non-sparking tools.

## 7. HANDLING AND STORAGE

**Safe Handling Precautions:** NEVER SIPHON THIS PRODUCT BY MOUTH. Use appropriate grounding and bonding practices. Static accumulating flammable liquid. Bonding and grounding may be insufficient to eliminate the hazard from static electricity. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. Vapors may travel along the ground or be moved by ventilation. Flashback may occur along vapor trails. No smoking. Use only non-sparking tools. Avoid breathing fumes, gas, or vapors. Use only with adequate ventilation. Avoid repeated and prolonged skin contact. Use personal protection measures as recommended in Section 8. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water. Do not cut, drill, grind or weld on empty containers since explosive residues may remain. Refer to applicable EPA, OSHA, NFPA and consistent state and local requirements.

Hydrocarbons are basically non-conductors of electricity and can become electrostatically charged during mixing, filtering, pumping at high flow rates or loading and transfer operations. If this charge reaches a sufficiently high level, sparks can form that may ignite the vapors of flammable liquids. Sudden release of hot organic chemical vapors or mists


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from process equipment operating under elevated temperature and pressure, or sudden ingress of air into vacuum equipment may result in ignition of vapors or mists without the presence of obvious ignition sources. Nozzle spouts must be kept in contact with the containers or tank during the entire filling operation.

Portable containers should never be filled while in or on a motor vehicle or marine craft. Containers should be placed on the ground. Static electric discharge can ignite fuel vapors when filling non-grounded containers or vehicles on trailers. The nozzle spout must be kept in contact with the container before and during the entire filling operation. Use only approved containers.

A buildup of static electricity can occur upon re-entry into a vehicle during fueling especially in cold or dry climate conditions. The charge is generated by the action of dissimilar fabrics (i.e., clothing and upholstery) rubbing across each other as a person enters/exits the vehicle. A flash fire can result from this discharge if sufficient flammable vapors are present. Therefore, do not get back in your vehicle while refueling.

Cellular phones and other electronic devices may have the potential to emit electrical charges (sparks). Sparks in potentially explosive atmospheres (including fueling areas such as gas stations) could cause an explosion if sufficient flammable vapors are present. Therefore, turn off cellular phones and other electronic devices when working in potentially explosive atmospheres or keep devices inside your vehicle during refueling.

High-pressure injection of any material through the skin is a serious medical emergency even though the small entrance wound at the injection site may not initially appear serious. These injection injuries can occur from high-pressure equipment such as paint spray or grease or guns, fuel injectors, or pinhole leaks in hoses or hydraulic lines and should all be considered serious. High pressure injection injuries may be SERIOUS SURGICAL EMERGENCIES (See First Aid Section 4).

**Storage Conditions:** Store in properly closed containers that are appropriately labeled and in a cool, well-ventilated area. Do not store near an open flame, heat or other sources of ignition.

**Incompatible Materials** Strong oxidizing agents.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

| Name | ACGIH TLV | OSHA PELS: | OSHA - Vacated PELs | NIOSH IDLH |
|---|---|---|---|---|
| No. 2 Diesel Fuel<br>68476-34-6 | 100 mg/m³ TWA<br>Skin - potential significant contribution to overall exposure by the cutaneous route | - | - | - |
| Kerosine, Petroleum<br>8008-20-6 | 200 mg/m³ TWA<br>Skin - potential significant contribution to overall exposure by the cutaneous route | - | - | - |
| Alkanes, C10-C20 branched and linear<br>928771-01-1 | - | - | - | - |
| Naphthalene<br>91-20-3 | 10 ppm TWA<br>Skin - potential significant contribution to overall exposure by the cutaneous route | TWA: 10 ppm<br>TWA: 50 mg/m³ | 10 ppm TWA<br>50 mg/m³ TWA<br>15 ppm STEL<br>75 mg/m³ STEL | 250 ppm |

**Notes:** The manufacturer has voluntarily elected to provide exposure limits contained in OSHA's 1989 air contaminants standard in its SDSs, even though certain of those exposure limits were vacated in 1992.

**Engineering measures:** Local or general exhaust required in an enclosed area or with inadequate ventilation. Use mechanical ventilation equipment that is explosion-proof.



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Personal protective equipment

| | |
|---|---|
| **Eye protection:** | Use goggles or face-shield if the potential for splashing exists. |
| **Skin and body protection:** | Wear neoprene, nitrile or PVA gloves to prevent skin contact. Glove suitability is based on workplace conditions and usage. Contact the glove manufacturer for specific advice on glove selection and breakthrough times. |
| **Respiratory protection:** | Use a NIOSH approved organic vapor chemical cartridge or supplied air respirators when there is the potential for airborne exposures to exceed permissible exposure limits or if excessive vapors are generated. Observe respirator assigned protection factors (APFs) criteria cited in federal OSHA 29 CFR 1910.134. Self-contained breathing apparatus should be used for fire fighting. |
| **Hygiene measures:** | Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

| | |
|---|---|
| **Physical State** | Liquid |
| **Appearance** | Yellow to Red Liquid |
| **Color** | Yellow to Red |
| **Odor** | Hydrocarbon |
| **Odor Threshold** | No data available. |

| Property | Values (Method) |
|---|---|
| **Melting Point / Freezing Point** | No data available. |
| **Initial Boiling Point / Boiling Range** | 154-366 °C / 310-691 °F (ASTM D86) |
| **Flash Point** | 58-76 °C / 136-168 °F (ASTM D93) |
| **Evaporation Rate** | No data available. |
| **Flammability (solid, gas)** | Not applicable. |
| **Flammability Limit in Air (%):** | |
| **Upper Flammability Limit:** | No data available. |
| **Lower Flammability Limit:** | No data available. |
| **Explosion limits:** | No data available. |
| **Vapor Pressure** | No data available. |
| **Vapor Density** | No data available. |
| **Specific Gravity / Relative Density** | 0.82-0.86 (ASTM D4052) |
| **Water Solubility** | No data available. |
| **Solubility in other solvents** | No data available. |
| **Partition Coefficient** | No data available. |
| **Decomposition temperature** | No data available. |
| **pH:** | Not applicable |
| **Autoignition Temperature** | No data available. |
| **Kinematic Viscosity** | 1.90-3.32 cSt @ 40°C (ASTM D445) |
| **Dynamic Viscosity** | No data available. |
| **Explosive Properties** | No data available. |
| **VOC Content (%)** | No data available. |
| **Density** | No data available. |
| **Bulk Density** | Not applicable. |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| Reactivity | The product is non-reactive under normal conditions. |
| Chemical stability | The material is stable at 70°F, 760 mmHg pressure. |



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| | |
|---|---|
| Possibility of hazardous reactions | None under normal processing. |
| Hazardous polymerization | Will not occur. |
| Conditions to avoid | Excessive heat, sources of ignition, open flame. |
| Incompatible Materials | Strong oxidizing agents. |
| Hazardous decomposition products | None known under normal conditions of use. |

## 11. TOXICOLOGICAL INFORMATION

### Potential short-term adverse effects from overexposures

**Inhalation** Harmful if inhaled. May cause irritation of respiratory tract. May cause drowsiness or dizziness. Breathing high concentrations of this material in a confined space or by intentional abuse can cause irregular heartbeats which can cause death.

**Eye contact** Exposure to vapor or contact with liquid may cause mild eye irritation, including tearing, stinging, and redness.

**Skin contact** Causes skin irritation. Effects may become more serious with repeated or prolonged contact. May be absorbed through the skin in harmful amounts.

**Ingestion** May be fatal if swallowed or vomited and enters airways. May cause irritation of the mouth, throat and gastrointestinal tract.

### Acute toxicological data

| Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|---|---|---|---|
| No. 2 Diesel Fuel<br>68476-34-6 | > 5000 mg/kg (Rat) | > 2000 mg/kg (Rabbit) | >1 - <5 mg/L (Rat) 4 h |
| Kerosine, Petroleum<br>8008-20-6 | > 5000 mg/kg (Rat) | > 2000 mg/kg (Rabbit) | > 5.28 mg/L (Rat) 4 h |
| Alkanes, C10-C20 branched and linear<br>928771-01-1 | - | - | >1 - <5 mg/l (Rat) 4 h |
| Naphthalene<br>91-20-3 | 490 mg/kg (Rat) | > 2000 mg/kg (Rabbit) | > 340 mg/m$^3$ (Rat) 1 h |

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

MIDDLE DISTILLATES, PETROLEUM: Long-term repeated (lifetime) skin exposure to similar materials has been reported to result in an increase in skin tumors in laboratory rodents. The relevance of these findings to humans is not clear at this time. Altered mental state, drowsiness, peripheral motor neuropathy, irreversible brain damage (so-called Petrol Sniffer's Encephalopathy), delirium, seizures, and sudden death have been reported from repeated overexposure to some hydrocarbon solvents, naphthas, and gasoline.

MIDDLE DISTILLATES WITH CRACKED STOCKS: Light cracked distillates have been shown to be carcinogenic in animal tests and have tested positive with in vitro genotoxicity tests. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and reduction in lung function.

ISOPARAFFINS: Studies in laboratory animals have shown that long-term exposure to similar materials (isoparaffins) can cause kidney damage and kidney cancer in male laboratory rats. However, in-depth research indicates that these findings are unique to the male rat, and that these effects are not relevant to humans.



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NAPHTHALENE: Severe jaundice, neurotoxicity (kernicterus) and fatalities have been reported in young children and infants as a result of hemolytic anemia from overexposure to naphthalene. Persons with glucose 6-phosphate dehydrogenase (G6PD) deficiency are more prone to the hemolytic effects of naphthalene. Adverse effects on the kidney have been reported in persons overexposed to naphthalene but these effects are believed to be a consequence of hemolytic anemia, and not a direct effect. Hemolytic anemia has been observed in laboratory animals exposed to naphthalene. Laboratory rodents exposed to naphthalene vapor for 2 years (lifetime studies) developed non-neoplastic and neoplastic tumors and inflammatory lesions of the nasal and respiratory tract. Cataracts and other adverse effects on the eye have been observed in laboratory animals exposed to high levels of naphthalene. Findings from a large number of bacterial and mammalian cell mutation assays have been negative. A few studies have shown chromosomal effects (elevated levels of Sister Chromatid Exchange or chromosomal aberrations) in vitro. Naphthalene has been classified as Possibly Carcinogenic to Humans (2B) by IARC, based on findings from studies in laboratory animals.

DIESEL EXHAUST: The combustion of diesel fuels produces gases including carbon monoxide, carbon dioxide, oxides of nitrogen and/or sulfur, and hydrocarbons that can be irritating and hazardous with overexposure. Long-term occupational overexposure to diesel exhaust and diesel exhaust particulate matter has been associated with an increased risk of respiratory disease, including lung cancer, and is characterized as a "known human carcinogen" by the International Agency for Research on Cancer (IARC), as "a reasonably anticipated human carcinogen" by the National Toxicology Program, and as "likely to be carcinogenic to humans" by the EPA, based upon animal and occupational exposure studies. However, uncertainty exists with these classifications because of deficiencies in the supporting occupational exposure/epidemiology studies, including reliable exposure estimates. Lifetime animal inhalation studies with pulmonary overloading exposure concentrations of diesel exhaust emissions have produced tumors and other adverse health effects. However, in more recent long-term animal inhalation studies of diesel exhaust emissions, no increase in tumor incidence and in fact a substantial reduction in adverse health effects along with significant reductions in the levels of hazardous material emissions were observed and are associated with fuel composition alterations coupled with new technology diesel engines.

**Adverse effects related to the physical, chemical and toxicological characteristics**

**Signs and Symptoms** Irritating to the skin and mucous membranes. Symptoms may include redness, itching, and inflammation. May cause nausea, vomiting, diarrhea, and signs of nervous system depression: headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Aspiration hazard. May cause coughing, chest pains, shortness of breath, pulmonary edema and/or chemical pneumonitis. Repeated or prolonged skin contact may cause drying, reddening, itching and cracking. Prolonged or repeated exposure may cause damage to organs.

**Sensitization** Not expected to be a skin or respiratory sensitizer.

**Mutagenic effects** None known.

**Carcinogenicity** Suspected of causing cancer.

Cancer designations are listed in the table below

| Name | ACGIH (Class) | IARC (Class) | NTP | OSHA |
|---|---|---|---|---|
| No. 2 Diesel Fuel 68476-34-6 | Confirmed animal carcinogen (A3) | Not Classifiable (3) | Not Listed | Not Listed |
| Kerosine, Petroleum 8008-20-6 | Confirmed animal carcinogen (A3) | Not Classifiable (3) | Not Listed | Not Listed |
| Alkanes, C10-C20 branched and linear 928771-01-1 | Not Listed | Not Listed | Not Listed | Not Listed |
| Naphthalene | Confirmed animal | Possible human carcinogen | Reasonably anticipated to | Not Listed |



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| | | | | |
|---|---|---|---|---|
| 91-20-3 | carcinogen (A3) | (2B) | be a human carcinogen | |

**Reproductive toxicity** None known.

**Specific Target Organ Toxicity (STOT) - single exposure** Respiratory system. Central nervous system.

**Specific Target Organ Toxicity (STOT) - repeated exposure** Thymus. Liver. Bone marrow.

**Aspiration hazard** May be fatal if swallowed or vomited and enters airways.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity** This product should be considered toxic to aquatic organisms, with the potential to cause long lasting adverse effects in the aquatic environment.

| Name | Algae/aquatic plants | Fish | Toxicity to Microorganisms | Crustacea |
|---|---|---|---|---|
| No. 2 Diesel Fuel 68476-34-6 | - | 96-hr LC50 = 35 mg/l Fathead minnow (flow-through) | - | 48-hr EL50 = 6.4 mg/l Daphnia magna |
| Kerosine, Petroleum 8008-20-6 | 72-hr EL50 = 5.0-11 mg/l Algae | 96-hr LL50 = 18-25 mg/l Fish | - | 48-hr EL50 = 1.4-21 mg/l Invertebrates |
| Alkanes, C10-C20 branched and linear 928771-01-1 | - | - | - | - |
| Naphthalene 91-20-3 | - | 96-hr LC50 = 0.91-2.82 mg/l Rainbow trout (static) 96-hr LC50 = 1.99 mg/l Fathead minnow (static) | - | 48-hr LC50 = 1.6 mg/l Daphnia magna |

**Persistence and degradability** Expected to be inherently biodegradable.

**Bioaccumulation** Has the potential to bioaccumulate.

**Mobility in soil** May partition into air, soil and water.

**Other adverse effects** No information available.

## 13. DISPOSAL CONSIDERATIONS

**Description of Waste Residues**
This material may be a flammable liquid waste.

**Safe Handling of Wastes**
Handle in accordance with applicable local, state, and federal regulations. Use personal protection measures as required. Use appropriate grounding and bonding practices. Use only non-sparking tools. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. No smoking.

**Disposal of Wastes / Methods of Disposal**
The user is responsible for determining if any discarded material is a hazardous waste (40 CFR 262.11). Dispose of in accordance with federal, state and local regulations.

**Methods of Contaminated Packaging Disposal**
Empty containers should be completely drained and then discarded or recycled, if possible. Do not cut, drill, grind or weld on empty containers since explosive residues may be present. Dispose of in accordance with federal, state and local regulations.

## 14. TRANSPORT INFORMATION



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**DOT (49 CFR 172.101):**

| | |
|---|---|
| **UN Proper Shipping Name:** | Fuel Oil, No. 2 |
| **UN/Identification No:** | NA 1993 |
| **Transport Hazard Class(es):** | 3 |
| **Packing Group:** | III |

**TDG (Canada):**

| | |
|---|---|
| **UN Proper Shipping Name:** | Diesel Fuel |
| **UN/Identification No:** | UN 1202 |
| **Transport Hazard Class(es):** | 3 |
| **Packing Group:** | III |

## 15. REGULATORY INFORMATION

**US Federal Regulatory Information:**

US TSCA Chemical Inventory Section 8(b): This product and/or its components are listed on the TSCA Chemical Inventory.

**EPA Superfund Amendment & Reauthorization Act (SARA):**

**SARA Section 302:** This product does not contain any component(s) included on EPA's Extremely Hazardous Substance (EHS) List.

| Name | CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs |
|---|---|
| No. 2 Diesel Fuel | NA |
| Kerosine, Petroleum | NA |
| Alkanes, C10-C20 branched and linear | NA |
| Naphthalene | NA |

**SARA Section 304:** This product may contain component(s) identified either as an EHS or a CERCLA Hazardous substance which in case of a spill or release may be subject to SARA reporting requirements:

| Name | Hazardous Substances RQs |
|---|---|
| No. 2 Diesel Fuel | NA |
| Kerosine, Petroleum | NA |
| Alkanes, C10-C20 branched and linear | NA |
| Naphthalene | 100 lb final RQ<br>45.4 kg final RQ |

**SARA:** The following EPA hazard categories apply to this product:

Acute Health Hazard
Fire Hazard
Chronic Health Hazard

**SARA Section 313:** This product may contain component(s), which if in exceedance of the de minimus threshold, may be subject to the reporting requirements of SARA Title III Section 313 Toxic Release Reporting (Form R).

| Name | CERCLA/SARA 313 Emission reporting: |
|---|---|
| No. 2 Diesel Fuel | None |
| Kerosine, Petroleum | None |
| Alkanes, C10-C20 branched and linear | None |
| Naphthalene | 0.1 % de minimis concentration |

**State and Community Right-To-Know Regulations:**
The following component(s) of this material are identified on the regulatory lists below:

No. 2 Diesel Fuel



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| | |
|---|---|
| Louisiana Right-To-Know: | Not Listed |
| California Proposition 65: | Not Listed |
| New Jersey Right-To-Know: | SN 2444 |
| Pennsylvania Right-To-Know: | Not Listed |
| Massachusetts Right-To Know: | Not Listed |
| Florida Substance List: | Not Listed |
| Rhode Island Right-To-Know: | Not Listed |
| Michigan Critical Materials Register List: | Not Listed |
| Massachusetts Extraordinarily Hazardous Substances: | Not Listed |
| California - Regulated Carcinogens: | Not Listed |
| Pennsylvania RTK - Special Hazardous Substances: | Not Listed |
| New Jersey - Special Hazardous Substances: | Not Listed |
| New Jersey - Environmental Hazardous Substances List: | SN 2444 TPQ: 10000 lb (Under N.J.A.C. 7:1G, environmental hazardous substances in mixtures such as gasoline or new and used petroleum oil may be reported under these categories) |
| Illinois - Toxic Air Contaminants: | Not Listed |
| New York - Reporting of Releases Part 597 - List of Hazardous Substances: | Not Listed |

Kerosine, Petroleum

| | |
|---|---|
| Louisiana Right-To-Know: | Not Listed |
| California Proposition 65: | Not Listed |
| New Jersey Right-To-Know: | SN 1091 |
| Pennsylvania Right-To-Know: | Present |
| Massachusetts Right-To Know: | Present |
| Florida Substance List: | Not Listed |
| Rhode Island Right-To-Know: | Not Listed |
| Michigan Critical Materials Register List: | Not Listed |
| Massachusetts Extraordinarily Hazardous Substances: | Not Listed |
| California - Regulated Carcinogens: | Not Listed |
| Pennsylvania RTK - Special Hazardous Substances: | Not Listed |
| New Jersey - Special Hazardous Substances: | Not Listed |
| New Jersey - Environmental Hazardous Substances List: | SN 1091 TPQ: 10000 lb (Under N.J.A.C. 7:1G, environmental hazardous substances in mixtures such as gasoline or new and used petroleum oil may be reported under these categories) |
| Illinois - Toxic Air Contaminants: | Not Listed |
| New York - Reporting of Releases Part 597 - List of Hazardous Substances: | Not Listed |

Alkanes, C10-C20 branched and linear

| | |
|---|---|
| Louisiana Right-To-Know: | Not Listed |
| California Proposition 65: | Not Listed |
| New Jersey Right-To-Know: | Not Listed |
| Pennsylvania Right-To-Know: | Not Listed |
| Massachusetts Right-To Know: | Not Listed |
| Florida Substance List: | Not Listed |
| Rhode Island Right-To-Know: | Not Listed |
| Michigan Critical Materials Register List: | Not Listed |
| Massachusetts Extraordinarily Hazardous Substances: | Not Listed |
| California - Regulated Carcinogens: | Not Listed |
| Pennsylvania RTK - Special Hazardous Substances: | Not Listed |
| New Jersey - Special Hazardous Substances: | Not Listed |
| New Jersey - Environmental Hazardous Substances List: | Not Listed |
| Illinois - Toxic Air Contaminants: | Not Listed |
| New York - Reporting of Releases Part 597 - List of Hazardous Substances: | Not Listed |

Naphthalene

| | |
|---|---|
| Louisiana Right-To-Know: | Not Listed |
| California Proposition 65: | Carcinogen, initial date 4/19/02 |



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| | |
|---|---|
| New Jersey Right-To-Know: | SN 1322 SN 3758 |
| Pennsylvania Right-To-Know: | Environmental hazard Present (particulate) |
| Massachusetts Right-To Know: | Present |
| Florida Substance List: | Not Listed |
| Rhode Island Right-To-Know: | Toxic; Flammable |
| Michigan Critical Materials Register List: | Not Listed |
| Massachusetts Extraordinarily Hazardous Substances: | Not Listed |
| California - Regulated Carcinogens: | Not Listed |
| Pennsylvania RTK - Special Hazardous Substances: | Not Listed |
| New Jersey - Special Hazardous Substances: | Carcinogen |
| New Jersey - Environmental Hazardous Substances List: | SN 1322 TPQ: 500 lb (Reportable at the de minimis quantity of >0.1%) |
| Illinois - Toxic Air Contaminants: | Present |
| New York - Reporting of Releases Part 597 - List of Hazardous Substances: | 100 lb RQ (air); 1 lb RQ (land/water) |

**Canada DSL/NDSL Inventory:** This product and/or its components are listed either on the Domestic Substances List (DSL) or are exempt.

**Canadian Regulatory Information:** This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the (M)SDS contains all the information required by the Controlled Products Regulations.

| Name | Canada - WHMIS: Classifications of Substances: | Canada - WHMIS: Ingredient Disclosure: |
|---|---|---|
| No. 2 Diesel Fuel | B3,D2A,D2B | 0.1% |
| Kerosine, Petroleum | B3,D2B | 1% |
| Alkanes, C10-C20 branched and linear | B3,D2A,D2B | 0.1% |
| Naphthalene | B4,D2A | 0.1% |

**Note:** Not applicable.

## 16. OTHER INFORMATION

**Prepared By** Toxicology and Product Safety

**Revision Date:** 06/01/2016

**Revision Note:**

**Disclaimer**

**The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is intended as guidance for safe handling, use, processing, storage, transportation, accidental release, clean-up and disposal and is not considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.**



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# PRODUCTION

## STRIKE USA

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**PRODUCTION**

**Strike USA Products stored on location**

**Tier II Determination**

| CAS # | Chemical | Max. on Location | Units | Specific Gravity | % by Weight | Gal | Pounds /gal | Total Pounds | Reportable Quantity | Reportable on Tier II | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **ABC Dry Chemical Fire Extinguishant** | 90 | pounds | | | | | 90.0 | NA | no | No hazardous substances; HIMIS - Health 1 |
| | **Acetylene, dissolved** | 150 | pounds | | | | | 150.0 | | | |
| 7782-44-7 | Oxygen, compressed gas | | | 0.9 | 100.0% | | 7.497 | 150.0 | 10,000 lbs | no | 313=NL; 311/312=Acute health, fire, pressure, reactive |
| | **Chevron and Texaco Regular Unleaded Gasoline** | 30 | gallons | 0.7 | 100.0% | 30 | 5.831 | 174.9 | | | Flammable; 311/312=acute, chronic health hazard |
| 86290-81-5 | Gasoline | | | 0.78 | 100.0% | 30 | 6.497 | 194.94 | 100 lbs | yes | Section 302: 100 lbs component, 107 lbs product RQ |
| 71-43-2 | Benzene | | | 0.8787 | 0.1-4.9% | 1.47 | 7.319 | 10.759 | 10 lbs | yes | "313"; RCRA P013; Section 302: 10 lbs, 186 lbs |
| 108-88-3 | Toluene (methylbenzene) | | | 0.8636 | 1-25.0% | 7.5 | 7.2 | 54.0 | 1,000 lbs | no | CERCLA 1,000, "313", RCRA U22O; Section 302: 1,000 lbs, 3,678 lbs |
| 100-41-4 | Ethylbenzene | | | 0.867 | 0.1-3.0% | 0.9 | 7.2 | 6.48 | 1,000 lbs | no | "313"; Section 302: 1,000 lbs, 34,964 lbs |
| 1330-20-7 | Xylene | | | 0.864 | 1-15.0% | 4.5 | 7.2 | 32.4 | 100 lbs | no | "313"; RCRA U239; Section 302: 100 lbs, 649 lbs |
| 106-97-8 | Butane | | | NA | 1-12.0% | | | | NA | no | Section 302: 100 lbs, 725 lbs |
| 142-82-5 | Heptane | | | 0.69 | 1-4.0% | | | | NA | no | Section 302: 100 lbs, 3,442 lbs |
| 110-54-3 | Hexane | | | 0.659 | 1-5.0% | 1.5 | 5.49 | 8.2 | 5,000 lbs | no | Section 313: X; Section 302: 5,000 lbs, 129,149 lbs |
| 110-82-7 | Cyclohexane | | | 0.77 | 1-3.0% | 0.9 | 6.414 | 5.773 | 1,000 lbs | no | "313"; RCRA U056; Section 302: 1,000 lbs, 34,188 lbs |
| 108-87-2 | Methylcyclohexane | | | 0.774 | 1-2.0% | 0.6 | 6.447 | 3.868 | 100 lbs | no | Section 302: 100 lbs, 4,278 lbs |
| 540-84-1 | Pentane, 2,2,4-trimethyl- (Isooctane) | | | 0.69 | 1-13.0% | 3.9 | 5.747 | 22.416 | 1,000 lbs | no | Section 302: 1,000 lbs, 6,270 lbs |
| 91-20-3 | Naphthalene | | | 1.162 | 0.1-2.0% | 0.6 | 9.679 | 0.58 | 100 lbs | no | RCRA U165; "313"; Section 302: 100 lbs, 4,000 lbs |
| 64-17-5 | Ethanol | | | 0.785 | 0-10.0% | 3 | 6.539 | 19.617 | 100 lbs | no | Section 302: 100 lbs, 1,934 lbs |
| 1634-04-4 | Methyl tert-butyl ether (MTBE) | | | 0.7405 | ≤ 0.1% | 0.03 | 6.168 | 0.185 | 1,000 lbs | no | "313"; Section 302: 1,000 lbs, 1,080,351 lbs |
| | **Delo 400 LE SAE 15W-40** | 2 | gallons | 0.9 | 100.0% | 2 | 7.497 | 15.0 | 10,000 lbs | no | NL |
| mixture | Highly refined mineral oil (C15-C50) | | | NA | 60-100.0% | 2 | | NA | NA | no | NL |
| 68649-42-3 | Zinc alkyl dithiophosphate | | | 1.12 | 1-5.0% | 0.1 | 9.33 | 0.933 | 10,000 lbs | no | "313" at 1%; 311/312 = immediate health hazard |
| | **Diesel Fuel No. 2** | 300 | gallons | 0.88 | 100.0% | 300 | 7.33 | 2,199.12 | 10,000 lbs | no | |
| 68476-34-6 | Diesel Fuel No. 2 | | | 0.865 | 95-100.0% | 300 | 7.2 | 2,161.64 | 10,000 lbs | no | NL; 311/312=acute, chronic health, fire hazard |
| mixture | Fatty acid methyl esters (FAME) | | | NA | 0-5.0% | | | | NA | no | NL |
| mixture | Total sulfur | | | NA | 0-0.5% | | | | NA | no | NL |
| 91-20-3 | Naphthalene | | | 1.162 | 0.02-0.2% | 0.6 | 9.679 | 11.247 | 100 lbs | no | RCRA U165; "313"; Section 302: 100 lbs, 4,000 lbs |
| | **WD-40 Multi-Use Product Aerosol** | 9 | pounds | 0.82 | 100.0% | | | 9.0 | 10,000 lbs | no | 313=NL; 311/312=acute health, fire hazard |
| 64742-47-8 | Aliphatic hydrocarbon | | | 0.8 | 45-50.0% | | 6.664 | 4.5 | NA | no | NL |
| 64742-56-9 | Petroleum base oil | | | NA | < 25% | | | 2.3 | NA | no | NL |
| 64742-47-8 | LVP Aliphatic hydrocarbon | | | 0.8 | 12-18.0% | | 6.664 | 1.62 | NA | no | NL |
| 124-38-9 | Carbon dioxide | | | 1.52 | 2-3.0% | | 12.6616 | 0.27 | NA | no | NL |
| mixture | Non-hazardous ingredients | | | NA | < 10% | | | | NA | no | NL |

NL = 313 Not Listed

"313" = Subject to reporting under Section 313 & 6607

# SAFETY DATA SHEET
## ABC DRY CHEMICAL

| | |
|---|---|
| Product Name: | ABC Dry Chemical Fire Extinguishant |
| Synonym: | Multi-Purpose Dry Chemical |
| Manufacturer: | Buckeye Fire Equipment Company<br>110 Kings Road<br>Kings Mountain, NC 28086 |
| Telephone: | 704.739.7415 |
| Web Address: | www.buckeyefire.com |
| Email Address: | bfec@buckeyef.com |
| Recommended Use: | Fire suppression, not for human or animal drug use. |
| Emergency: | CHEMTREC 1.800.424.9300 |
| Revision Date: | 04/2015 |

*GHS – Classification:*

| | |
|---|---|
| Eye Irritation: | Class 2B |
| Skin Irritation: | Class 3 |
| Inhalation: | Class 5 |

*GHS Label Elements:*

Hazard Symbols: !

Signal Word: WARNING

*Hazard Statements:*

| | |
|---|---|
| H313 | May be harmful in contact with skin. |
| H320 | Causes eye irritation |
| H333 | May be harmful if inhaled. |

*Precautionary Statements:*

| | |
|---|---|
| P101 | If medical advice is needed, have product container or label at hand. |
| P102 | Keep out of reach of children. |
| P234 | Keep in original container. |
| P251 | Pressurized container; do not pierce or burn, even after use |
| P261 | Avoid breathing dust |
| P264 | Wash hands and face thoroughly after handling |
| P270 | Do not eat, drink, or smoke when using this product |
| P281 | Use personal protective equipment as required |
| P285 | In case of inadequate ventilation, wear respiratory protection |
| P301+322+331 | If swallowed, drink 2-3 glasses of water and do not induce vomiting |
| 302+352 | If on skin, wash with soap and water |
| 304+313+341 | If inhaled, and if distress occurs, remove victim to fresh air and keep at rest in a position comfortable for breathing. Seek medical advice/attention. |
| 305+351+338 | If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and east to do, and continue to rinse. |
| 337+313 | If eye irritation persists, get medical advice/attention. |
| P401+402+403 | Store in original container or extinguisher in a dry, well ventilated place. |



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| | |
|---|---|
| Florida | Substance list- Mica dust |
| Illinois | Toxic Substance List- None |
| Kansas | Section 302/303 List- None |
| Massachusetts | Substance list- Mica dust |
| Minnesota | List of Hazardous Substances- None |
| Missouri | Employer Information/Toxic Substance List- None |
| New Jersey | Right to Know Hazardous Substance List- None |
| North Dakota | List of Hazardous Chemicals, Reportable Quantities- None |
| Pennsylvania | Hazardous Substance List- None |
| Rhode Island | Hazardous Substance List- Mica dust |
| Texas | Hazardous Substance List- No |
| West Virginia | Hazardous Substance List- None |
| Wisconsin | Toxic and Hazardous Substances- None |

California Proposition 65- No component is listed on the California Proposition 65 List

This Safety Data Sheet prepared in accordance with OSHA's Hazard Communication Standard (29 CFR 1910.1200) and the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

HMIS RATINGS:

| | |
|---|---|
| Health | 1 |
| Flammability | 0 |
| Reactivity | 0 |

Personal Protective Equipment: use N-95 dust mask (See Section 8)

WHMIS (Canadian Workplace Hazardous Materials Identification)
D2B- May irritate eyes, mucous membranes, and/or skin

The information contained herein is given in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is hereby made.



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MATHESON TRI•GAS
ask. . .The Gas Professionals™

# Safety Data Sheet

**Material Name: ACETYLENE, DISSOLVED** **SDS ID: MAT00280**

## * * * Section 1 - PRODUCT AND COMPANY IDENTIFICATION * * *

## Material Name: ACETYLENE, DISSOLVED

### Manufacturer Information

MATHESON TRI-GAS, INC.

150 Allen Road, Suite 302

Basking Ridge, NJ 07920

General Information: 1-800-416-2505

Emergency#: 1-800-424-9300 (CHEMTREC)

Outside the US: 703-527-3887 (Call collect)

### Chemical Family

hydrocarbons, aliphatic

### Synonyms

MTG MSDS 1; ACETYLENE; ETHYNE; WELDING GAS; ACETYLEN; ETHINE; NARCYLEN; VINYLENE; UN 1001; C2H2; RTECS: AO9600000

## * * * Section 2 - HAZARDS IDENTIFICATION * * *

### EMERGENCY OVERVIEW

**Color:** colorless

**Physical Form:** gas

**Odor:** sweet odor

**Health Hazards:** central nervous system depression, difficulty breathing

**Physical Hazards:** May explode when heated. Flammable gas. May cause flash fire. Electrostatic charges may be generated by flow, agitation, etc. May polymerize. Containers may rupture or explode.

### POTENTIAL HEALTH EFFECTS

#### Inhalation

**Short Term:** nausea, vomiting, chest pain, wheezing, headache, drowsiness, dizziness, loss of coordination, bluish skin color, suffocation, lung congestion, coma

**Long Term:** no information on significant adverse effects



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**Skin**

**Short Term:** frostbite, blisters

**Long Term:** no information on significant adverse effects

**Eye**

**Short Term:** irritation, frostbite, blurred vision

**Long Term:** no information on significant adverse effects

**Ingestion**

**Short Term:** ingestion of a gas is unlikely

**Long Term:** ingestion of a gas is unlikely

## * * * Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS * * *

| CAS | Component | Percent |
|---|---|---|
| 7782-44-7 | OXYGEN, COMPRESSED GAS | 100 |

## * * * Section 4 - FIRST AID MEASURES * * *

### Inhalation

If adverse effects occur, remove to uncontaminated area. Get medical attention.

### Skin

If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

### Eyes

Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

### Ingestion

If a large amount is swallowed, get medical attention.



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## * * * Section 5 - FIRE FIGHTING MEASURES * * *

See Section 9 for Flammability Properties

**NFPA Ratings: Health:** 1 **Fire:** 4 **Reactivity:** 3

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

### Flammable Properties

Severe explosion hazard. Vapor/air mixtures are explosive. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

### Extinguishing Media

carbon dioxide, regular dry chemical

Large fires: Use regular foam or flood with fine water spray.

### Fire Fighting Measures

Move container from fire area if it can be done without risk. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Evacuate if fire gets out of control or containers are directly exposed to fire. Evacuation radi us: 500 meters (1/3 mile). Consider downwind evacuation if material is leaking. Stop flow of gas.

## * * * Section 6 - ACCIDENTAL RELEASE MEASURES * * *

### Occupational spill/release

Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering.



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## * * * Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION * * *

### Component Analysis

ACGIH, OSHA and NIOSH have not developed exposure limits for any of this product's components.

### Component Biological Limit Values

There are no biological limit values for any of this product's components.

### Ventilation

Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

### PERSONAL PROTECTIVE EQUIPMENT

### Eyes/Face

For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

### Protective Clothing

For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

### Glove Recommendations

Wear insulated gloves.

### Respiratory Protection

Under conditions of frequent use or heavy exposure, respiratory protection may be needed.

Respiratory protection is ranked in order from minimum to maximum.

Consider warning properties before use.

**For Unknown Concentrations or Immediately Dangerous to Life or Health -**

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.



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Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

## * * * Section 9 - PHYSICAL AND CHEMICAL PROPERTIES * * *

| | | | |
|---|---|---|---|
| **Physical State:** | Gas | **Appearance:** | Not available |
| **Color:** | colorless | **Physical Form:** | gas |
| **Odor:** | sweet odor | **Odor Threshold:** | Not available |
| **Melting/Freezing Point:** | Not available | **Boiling Point:** | Not available |
| **Decomposition:** | Not available | **LEL:** | 2.5 % |
| **UEL:** | 100 % | **Vapor Pressure:** | 760 mmHg @ -84 °C |
| **Henry's Law Constant:** | 0.00277024 atm-m3/mol | **Vapor Density (air = 1):** | 0.90 |
| **Density:** | 1.1747 g/L @ 0 °C | **Water Solubility:** | 0.94 % @ 25 °C |
| **KOW:** | 2691.53 (estimated from water solubility, estimated from water solubility) | **KOC:** | 4508.17 (estimated from water solubility, estimated from water solubility) |
| **Auto Ignition:** | 305 °C | **Viscosity:** | 0.010 cP @ 20 °C |
| **Sublimation Point:** | -84 °C | **Molecular Weight:** | 26.04 |
| **Molecular Formula:** | H-C-C-H | | |

**Solvent Solubility**

**Soluble:** acetone, benzene, chloroform, ether

## * * * Section 10 - STABILITY AND REACTIVITY * * *

### Chemical Stability

May decompose violently on heating. May explode when heated.



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### Possibility of Hazardous Reactions

Will not polymerize.

## * * * Section 11 - TOXICOLOGICAL INFORMATION * * *

### Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and no selected endpoints have been identified.

### Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, NTP, OSHA or DFG.

## * * * Section 12 - ECOLOGICAL INFORMATION * * *

### Component Analysis - Aquatic Toxicity

No LOLI ecotoxicity data are available for this product's components.

## * * * Section 13 - DISPOSAL CONSIDERATIONS * * *

### Disposal Methods

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

### Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components.

## * * * Section 14 - TRANSPORT INFORMATION * * *

### US DOT Information

**Shipping Name:** Oxygen, compressed

**UN/NA #:** UN1072 **Hazard Class:** 2.2

**Required Label(s):** 2.2, 5.1

### TDG Information

**Shipping Name:** Oxygen, compressed



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## * * * Section 13 - DISPOSAL CONSIDERATIONS * * *

### Disposal Methods

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. D003.

### Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components.

## * * * Section 14 - TRANSPORT INFORMATION * * *

### US DOT Information

**Shipping Name:** Acetylene, dissolved

**UN/NA #:** UN1001 **Hazard Class:** 2.1

**Required Label(s):** 2.1

### TDG Information

**Shipping Name:** Acetylene, dissolved

**UN #:** UN1001 **Hazard Class:** 2.1

**Required Label(s):** 2.1

## * * * Section 15 - REGULATORY INFORMATION * * *

### U.S. Federal Regulations

None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

**SARA 311/312**

**Acute Health:** Yes **Chronic Health:** No **Fire:** Yes **Pressure:** Yes **Reactive:** Yes



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## *** Section 16 - OTHER INFORMATION ***

### Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

### Other Information

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End of Sheet MAT00280



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# Material Safety Data Sheet

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

## CHEVRON and TEXACO REGULAR UNLEADED GASOLINES

**Product Use:** Fuel
**Product Number(s):** CPS201000 [See Section 16 for Additional Product Numbers]
**Synonyms:** Calco Regular Unleaded Gasoline, Chevron Regular Unleaded Gasoline, Chevron UL/CQ Gasoline, Gasolines, Automotive, Texaco Unleaded Gasoline
**Company Identification**
Chevron Products Company
Marketing, MSDS Coordinator
6001 Bollinger Canyon Road
San Ramon, CA 94583
United States of America

**Transportation Emergency Response**
CHEMTREC: (800) 424-9300 or (703) 527-3887
**Health Emergency**
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
**Product Information**
MSDS Requests: http://www.chevron.com/contact
Technical Information: (510) 242-5357

SPECIAL NOTES: This MSDS applies to: all motor gasoline.

## SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

| COMPONENTS | CAS NUMBER | AMOUNT |
|---|---|---|
| Gasoline | 86290-81-5 | 100 %vol/vol |
| Benzene | 71-43-2 | 0.1 - 4.9 %vol/vol |
| Toluene (methylbenzene) | 108-88-3 | 1 - 25 %vol/vol |
| Ethyl benzene | 100-41-4 | 0.1 - 3 %vol/vol |
| Xylene (contains o-, m-, & p- xylene isomers in varying amounts) | 1330-20-7 | 1 - 15 %vol/vol |
| Butane | 106-97-8 | 1 - 12 %vol/vol |
| Heptane | 142-82-5 | 1 - 4 %vol/vol |
| Hexane | 110-54-3 | 1 - 5 %vol/vol |
| Cyclohexane | 110-82-7 | 1 - 3 %vol/vol |
| Methylcyclohexane | 108-87-2 | 1 - 2 %vol/vol |
| Pentane, 2,2,4-trimethyl- (Isooctane) | 540-84-1 | 1 - 13 %vol/vol |
| Naphthalene | 91-20-3 | 0.1 - 2 %vol/vol |
| Ethanol | 64-17-5 | 0 - 10 %vol/vol |
| Methyl tert-butyl ether (MTBE) | 1634-04-4 | <= 0.1 %vol/vol |



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Motor gasoline is considered a mixture by EPA under the Toxic Substances Control Act (TSCA). The refinery streams used to blend motor gasoline are all on the TSCA Chemical Substances Inventory. The appropriate CAS number for refinery blended motor gasoline is 86290-81-5. The product specifications of motor gasoline sold in your area will depend on applicable Federal and State regulations.

## SECTION 3 HAZARDS IDENTIFICATION

**********

***EMERGENCY OVERVIEW***

- EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE
- CAUSES SKIN IRRITATION
- HARMFUL OR FATAL IF SWALLOWED - MAY CAUSE LUNG DAMAGE IF SWALLOWED
- MAY CAUSE DIZZINESS, DROWSINESS AND REDUCED ALERTNESS
- VAPOR HARMFUL
- MAY CAUSE CANCER BASED ON ANIMAL DATA
- KEEP OUT OF REACH OF CHILDREN
- MAY CAUSE RESPIRATORY TRACT IRRITATION IF INHALED
- TOXIC TO AQUATIC ORGANISMS. MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT

**********

**IMMEDIATE HEALTH EFFECTS**

**Eye:** Not expected to cause prolonged or significant eye irritation.

**Skin:** Contact with the skin causes irritation. Skin contact may cause drying or defatting of the skin. Symptoms may include pain, itching, discoloration, swelling, and blistering. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.

**Ingestion:** Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.

**Inhalation:** The vapor or fumes from this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Excessive or prolonged breathing of this material may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

**DELAYED OR OTHER HEALTH EFFECTS:**

**Reproduction and Birth Defects:** This material is not expected to cause birth defects or other harm to the developing fetus based on animal data.

**Cancer:** Prolonged or repeated exposure to this material may cause cancer. Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Gasoline has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP) and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer

(IARC).
Contains ethylbenzene which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).
Whole gasoline exhaust has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

See Section 11 for additional information. Risk depends on duration and level of exposure.

## SECTION 4 FIRST AID MEASURES

**Eye:** No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
**Skin:** Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
**Ingestion:** If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.
**Inhalation:** Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue or if any other symptoms develop.
**Note to Physicians:** Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

## SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

**FIRE CLASSIFICATION:**
OSHA Classification (29 CFR 1910.1200): Flammable liquid.

**NFPA RATINGS:** Health: 1 Flammability: 3 Reactivity: 0

**FLAMMABLE PROPERTIES:**
**Flashpoint:** (Tagliabue Closed Cup ASTM D56) < -45 °C (< -49 °F)
**Autoignition:** > 280 °C (> 536 °F)
**Flammability (Explosive) Limits (% by volume in air):** Lower: 1.4 Upper: 7.6 (Typical)

**EXTINGUISHING MEDIA:** Dry Chemical, CO2, AFFF Foam or alcohol resistant foam if >15% volume polar solvents (oxygenates).

**PROTECTION OF FIRE FIGHTERS:**
**Fire Fighting Instructions:** Use water spray to cool fire-exposed containers and to protect personnel. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
**Combustion Products:** Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

**Protective Measures:** Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this



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material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.

**Spill Management:** Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

**Reporting:** Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required. This material is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Petroleum Exclusion. Therefore, releases to the environment may not be reportable under CERCLA.

## SECTION 7 HANDLING AND STORAGE

**Precautionary Measures:** This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Never siphon gasoline by mouth.

Do not store in open or unlabeled containers. READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. Do not get in eyes, on skin, or on clothing. Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling. Keep out of the reach of children.

**Unusual Handling Hazards:** WARNING! Do not use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

**General Handling Information:** Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

**Static Hazard:** Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'. Improper filling of portable gasoline containers creates danger of fire. Only dispense gasoline into approved and properly labeled gasoline containers. Always place portable containers on the ground. Be sure pump nozzle is in contact with the container while filling. Do not use a nozzle's lock-open device. Do not fill portable containers that are inside a vehicle or truck/trailer bed.

**General Storage Information:** DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces . USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

**Container Warnings:** Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

## SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

**GENERAL CONSIDERATIONS:**
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

**ENGINEERING CONTROLS:**
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT**
**Eye/Face Protection:** No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
**Skin Protection:** Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Nitrile Rubber, Polyurethane, Viton.
**Respiratory Protection:** Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors.
When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon monoxide. If not, wear an approved positive-pressure air-supplying respirator.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

**Occupational Exposure Limits:**

| Component | Agency | TWA | STEL | Ceiling | Notation |
|---|---|---|---|---|---|
| Benzene | ACGIH | .5 ppm (weight) | 2.5 ppm (weight) | -- | Skin A1 Skin |
| Benzene | CVX | 1 ppm (weight) | 5 ppm (weight) | -- | -- |
| Benzene | OSHA SRS | 1 ppm (weight) | 5 ppm (weight) | -- | -- |
| Benzene | OSHA Z-2 | 10 ppm (weight) | -- | 25 ppm (weight) | -- |
| Butane | ACGIH | 1000 ppm (weight) | -- | -- | -- |
| Cyclohexane | ACGIH | 100 ppm (weight) | -- | -- | -- |
| Cyclohexane | OSHA Z-1 | 1050 mg/m3 | -- | -- | -- |
| Ethanol | ACGIH | 1000 ppm (weight) | -- | -- | A4 |
| Ethanol | OSHA Z-1 | 1900 mg/m3 | -- | -- | -- |
| Ethyl benzene | ACGIH | 100 ppm (weight) | 125 ppm (weight) | -- | A3 |
| Ethyl benzene | OSHA Z-1 | 435 mg/m3 | -- | -- | -- |



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| | | | | | |
|---|---|---|---|---|---|
| Gasoline | ACGIH | 300 ppm (weight) | 500 ppm (weight) | -- | A3 |
| Heptane | ACGIH | 400 ppm (weight) | 500 ppm (weight) | -- | -- |
| Heptane | OSHA Z-1 | 2000 mg/m3 | -- | -- | -- |
| Hexane | ACGIH | 50 ppm (weight) | -- | -- | Skin |
| Hexane | OSHA Z-1 | 1800 mg/m3 | -- | -- | -- |
| Methyl tert-butyl ether (MTBE) | ACGIH | 50 ppm (weight) | -- | -- | A3 |
| Methyl tert-butyl ether (MTBE) | CVX | -- | 50 ppm | -- | -- |
| Methylcyclohexane | ACGIH | 400 ppm (weight) | -- | -- | -- |
| Methylcyclohexane | OSHA Z-1 | 2000 mg/m3 | -- | -- | -- |
| Naphthalene | ACGIH | 10 ppm (weight) | 15 ppm (weight) | -- | Skin |
| Naphthalene | OSHA Z-1 | 50 mg/m3 | -- | -- | -- |
| Pentane, 2,2,4-trimethyl- (Isooctane) | ACGIH | 300 ppm (weight) | -- | -- | -- |
| Pentane, 2,2,4-trimethyl- (Isooctane) | OSHA Z-1 | 2350 mg/m3 | -- | -- | -- |
| Toluene (methylbenzene) | ACGIH | 50 ppm (weight) | -- | -- | Skin A4 |
| Toluene (methylbenzene) | OSHA Z-2 | 200 ppm (weight) | -- | 300 ppm (weight) | -- |
| Xylene (contains o-, m-, & p- xylene isomers in varying amounts) | ACGIH | 100 ppm (weight) | 150 ppm (weight) | -- | A4 |
| Xylene (contains o-, m-, & p- xylene isomers in varying amounts) | OSHA Z-1 | 435 mg/m3 | -- | -- | -- |

Refer to the OSHA Benzene Standard (29 CFR 1910.1028) and Table Z-2 for detailed training, exposure monitoring, respiratory protection and medical surveillance requirements before using this product. Consult local authorities for appropriate values.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

**Color:** Colorless to yellow
**Physical State:** Liquid
**Odor:** Petroleum odor
**pH:** Not Applicable
**Vapor Pressure:** 5 psi - 15 psi (Typical) @ 37.8 °C (100 °F)
**Vapor Density (Air = 1):** 3 - 4 (Typical)
**Boiling Point:** 37.8°C (100°F) - 204.4°C (400°F) (Typical)
**Solubility:** Insoluble in water; miscible with most organic solvents.
**Freezing Point:** Not Applicable
**Melting Point:** Not Applicable
**Specific Gravity:** 0.7 g/ml - 0.8 g/ml @ 15.6°C (60.1°F) (Typical)
**Viscosity:** <1 SUS @ 37.8°C (100°F)
**Evaporation Rate:** No data available

## SECTION 10 STABILITY AND REACTIVITY

**Chemical Stability:** This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
**Incompatibility With Other Materials:** May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
**Hazardous Decomposition Products:** None known (None expected)
**Hazardous Polymerization:** Hazardous polymerization will not occur.

## SECTION 11 TOXICOLOGICAL INFORMATION

**IMMEDIATE HEALTH EFFECTS**
**Eye Irritation:** The eye irritation hazard is based on evaluation of data for similar materials or product components.
**Skin Irritation:** For a 4-hour exposure, the Primary Irritation Index (PII) in rabbits is: 4.8/8.0.
**Skin Sensitization:** This material did not cause skin sensitization reactions in a Buehler guinea pig test.
**Acute Dermal Toxicity:** LD50: >3.75g/kg (rabbit).

**Acute Oral Toxicity:** LD50: >5 ml/kg (rat)

**Acute Inhalation Toxicity:** 4 hour(s) LD50: >20000mg/m3 (rat).
**Subchronic Effects:** Exposure of rats for 13 weeks (6 hr/day for 5 days/week) to the light ends of gasoline (up to 20,000 mg/m3) resulted in minimal responses of toxicity. There were no indications of neurotoxicity based morphological, functional and biochemical indices. There was also no evidence of immunotoxicity in the rats. However, when rats were exposed to gasoline vapor containing ethanol up to 20,000 mg/m3 there was evidence of both humoral immune suppression and mild astrogliosis.
**Reproduction and Birth Defects:** Exposure of rats to the light ends of gasoline at up to 20,000 mg/m3 had generally no impact upon reproductive abilities and did not cause birth defects. **Genetic Toxicity:** Gasoline was not mutagenic, with or without activation, in the Ames assay (Salmonella typhimurium), Saccharamyces cerevisesae, or mouse lymphoma assays. In addition, point mutations were not induced in human lymphocytes. Gasoline was not mutagenic when tested in the mouse dominant lethal assay. Administration of gasoline to rats did not cause chromosomal aberrations in their bone marrow cells. Inhalation exposure of rats to the light ends of gasoline caused increased sister chromatid exchange in their peripheral white blood cells but did not cause an increase in micronucleated red blood cells in their bone marrow.
**ADDITIONAL TOXICOLOGY INFORMATION:**
Gasolines are highly volatile and can produce significant concentrations of vapor at ambient temperatures. Gasoline vapor is heavier than air and at high concentrations may accumulate in confined spaces to present both safety and health hazards. When vapor exposures are low, or short duration and infrequent, such as during refueling and tanker loading/unloading, neither total hydrocarbon nor components such as benzene are likely to result in any adverse health effects. In situations such as accidents or spills where exposure to gasoline vapor is potentially high, attention should be paid to potential toxic effects of specific components. Information about specific components in gasoline can be found in Sections 2/3, 8 and 15 of this MSDS. More detailed information on the health hazard of specific gasoline components can be obtained calling the Chevron Emergency Information Center (see Section 1 for phone numbers).
Pathological misuse of solvents and gasoline, involving repeated and prolonged exposure to high concentrations of vapor is a significant exposure on which there are many reports in the medical literature. As with other solvents, persistent abuse involving repeated and prolonged exposures to high concentrations of vapor has been reported to result in central nervous system damage and eventually, death. In a study in which ten human volunteers were exposed for 30 minutes to approximately 200, 500 or 1000 ppm concentrations of gasoline vapor, irritation of the eyes was the only significant effect observed, based on both subjective and objective assessments.
Lifetime inhalation of wholly vaporized unleaded gasoline at 2056 ppm has caused increased liver tumors

in female mice and kidney cancer in male rats. In their 1988 review of carcinogenic risk from gasoline, The International Agency for Research on Cancer (IARC) noted that, because published epidemiology studies did not include any exposure data, only occupations where gasoline exposure may have occurred were reviewed. These included gasoline service station attendants and automobile mechanics. IARC also noted that there was no opportunity to separate effects of combustion products from those of gasoline itself. Although IARC allocated gasoline a final overall classification of Group 2B, i.e. possibly carcinogenic to humans, this was based on limited evidence in experimental animals plus supporting evidence including the presence in gasoline of benzene. The actual evidence for carcinogenicity in humans was considered inadequate.
To explore the health effects of workers potentially exposed to gasoline vapors in the marketing and distribution sectors of the petroleum industry, the American Petroleum Institute sponsored a cohort mortality study (Publication 4555), a nested case-control study (Publication 4551), and an exposure assessment study (Publication 4552). Histories of exposure to gasoline were reconstructed for cohort of more than 18,000 employees from four companies for the time period between 1946 and 1985. The results of the cohort mortality study indicated that there was no increased mortality from either kidney cancer or leukemia among marketing and marine distribution employees who were exposed to gasoline in the petroleum industry, when compared to the general population. More importantly, based on internal comparisons, there was no association between mortality from kidney cancer or leukemia and various indices of gasoline exposure. In particular, neither duration of employment, duration of exposure, age at first exposure, year of first exposure, job category, cumulative exposure, frequency of peak exposure, nor average intensity of exposure had any effect on kidney cancer or leukemia mortality. The results of the nested case-control study confirmed the findings of the original cohort study. That is, exposure to gasoline at the levels experienced by this cohort of distribution workers is not a significant risk factor for leukemia (all cell types), acute myeloid leukemia, kidney cancer or multiple myeloma.

## SECTION 12 ECOLOGICAL INFORMATION

### ECOTOXICITY

96 hour(s) LC50: 2.7 mg/l (Oncorhynchus mykiss)
48 hour(s) LC50: 3.0 mg/l (Daphnia magna)
96 hour(s) LC50: 8.3 mg/l (Cyprinodon variegatus)
96 hour(s) LC50: 1.8 mg/l (Mysidopsis bahia)
This material is expected to be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment. Gasoline studies have been conducted in the laboratory under a variety of test conditions with a range of fish and invertebrate species. An even more extensive database is available on the aquatic toxicity of individual aromatic constituents. The majority of published studies do not identify the type of gasoline evaluated, or even provide distinguishing characteristics such as aromatic content or presence of lead alkyls. As a result, comparison of results among studies using open and closed vessels, different ages and species of test animals and different gasoline types, is difficult.

The bulk of the available literature on gasoline relates to the environmental impact of monoaromatic (BTEX) and diaromatic (naphthalene, methylnaphthalenes) constituents. In general, non-oxygenated gasoline exhibits some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components which are the most prominent in the water soluble fraction and cause aquatic toxicity, are also highly volatile and can be readily biodegraded by microorganisms.

### ENVIRONMENTAL FATE

**Ready Biodegradability:** This material is expected to be readily biodegradable. Following spillage, the more volatile components of gasoline will be rapidly lost, with concurrent dissolution of these and other

constituents into the water. Factors such as local environmental conditions (temperature, wind, mixing or wave action, soil type, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, can contribute to the weathering of spilled gasoline.

The aqueous solubility of non-oxygenated unleaded gasoline, based on analysis of benzene, toluene, ethylbenzene+xylenes and naphthalene, is reported to be 112 mg/l. Solubility data on individual gasoline constituents also available.

## SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

## SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

**DOT Shipping Description:** UN1203, GASOLINE, 3, II

**IMO/IMDG Shipping Description:** UN1203, GASOLINE, 3, II, FLASH POINT SEE SECTION 5

**ICAO/IATA Shipping Description:** UN1203, GASOLINE, 3, II

## SECTION 15 REGULATORY INFORMATION

**EPCRA 311/312 CATEGORIES:**

| | | |
|---|---|---|
| 1. | Immediate (Acute) Health Effects: | YES |
| 2. | Delayed (Chronic) Health Effects: | YES |
| 3. | Fire Hazard: | YES |
| 4. | Sudden Release of Pressure Hazard: | NO |
| 5. | Reactivity Hazard: | NO |

REGULATORY LISTS SEARCHED:

| | |
|---|---|
| 01-1=IARC Group 1 | 03=EPCRA 313 |
| 01-2A=IARC Group 2A | 04=CA Proposition 65 |
| 01-2B=IARC Group 2B | 05=MA RTK |
| 02=NTP Carcinogen | 06=NJ RTK |
| | 07=PA RTK |

The following components of this material are found on the regulatory lists indicated.

| | |
|---|---|
| Benzene | 01-1, 02, 04, 05, 06, 07 |
| Butane | 05, 06, 07 |
| Cyclohexane | 03, 05, 06, 07 |
| Ethanol | 01-1, 02, 04, 05, 06, 07 |
| Ethyl benzene | 01-2B, 04, 05, 06, 07 |

| | |
|---|---|
| Gasoline | 01-2B, 06, 07 |
| Heptane | 05, 06, 07 |
| Hexane | 03, 05, 06, 07 |
| Methyl tert-butyl ether (MTBE) | 03, 05, 06, 07 |
| Methylcyclohexane | 05, 06, 07 |
| Naphthalene | 01-2B, 02, 03, 04, 05, 06, 07 |
| Pentane, 2,2,4-trimethyl- (Isooctane) | 05, 06, 07 |
| Toluene (methylbenzene) | 03, 04, 05, 06, 07 |
| Xylene (contains o-, m-, & p- xylene isomers in varying amounts) | 05, 06, 07 |

**CERCLA REPORTABLE QUANTITIES(RQ)/EPCRA 302 THRESHOLD PLANNING QUANTITIES(TPQ):**

| Component | Component RQ | Component TPQ | Product RQ |
|---|---|---|---|
| Benzene | 10 lbs | None | 186 lbs |
| Butane | 100 lbs | None | 725 lbs |
| Cyclohexane | 1000 lbs | None | 34188 lbs |
| Ethanol | 100 lbs | None | 1934 lbs |
| Ethyl benzene | 1000 lbs | None | 34964 lbs |
| Gasoline | 100 lbs | None | 107 lbs |
| Heptane | 100 lbs | None | 3442 lbs |
| Hexane | 5000 lbs | None | 129149 lbs |
| Methyl tert-butyl ether (MTBE) | 1000 lbs | None | 1080351 lbs |
| Methylcyclohexane | 100 lbs | None | 4278 lbs |
| Naphthalene | 100 lbs | None | 4000 lbs |
| Pentane, 2,2,4-trimethyl- (Isooctane) | 1000 lbs | None | 6270 lbs |
| Toluene (methylbenzene) | 1000 lbs | None | 3678 lbs |
| Xylene (contains o-, m-, & p- xylene isomers in varying amounts) | 100 lbs | None | 649 lbs |

**WHMIS CLASSIFICATION:**
Class B, Division 2: Flammable Liquids
Class D, Division 2, Subdivision A: Very Toxic Material - Carcinogenicity
Class D, Division 2, Subdivision B: Toxic Material - Skin or Eye Irritation
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations. (See Hazardous Products Act (HPA), R.S.C. 1985, c.H-3,s.2).

MSDS PREPARATION:

This Material Safety Data Sheet has been prepared by the Toxicology and Health Risk Assessment Unit, ERTC, P.O. Box 1627, Richmond, CA 94804, (888)676-6183.

## SECTION 16 OTHER INFORMATION

**NFPA RATINGS:** Health: 1 Flammability: 3 Reactivity: 0

**HMIS RATINGS:** Health: 2* Flammability: 3 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

**Additional Product Number(s):** CPS201023, CPS201054, CPS201055, CPS201075, CPS201090, CPS201105, CPS201106, CPS201120, CPS201121, CPS201122, CPS201126, CPS201128, CPS201131, CPS201136, CPS201141, CPS201142, CPS201148, CPS201153, CPS201158, CPS201161, CPS201162, CPS201168, CPS201175, CPS201181, CPS201185, CPS201186, CPS201188, CPS201216, CPS201217, CPS201218, CPS201236, CPS201237, CPS201238, CPS201266, CPS201267, CPS201268, CPS201277, CPS201278, CPS201279, CPS201286, CPS201287, CPS201289, CPS201296, CPS201297, CPS201298, CPS201849, CPS201850, CPS201855, CPS201856, CPS201857, CPS204000, CPS204001, CPS204002, CPS204003, CPS204010, CPS204011, CPS204022, CPS204023, CPS204046, CPS204047, CPS204070, CPS204071, CPS204088, CPS204089, CPS204104, CPS204105, CPS204116, CPS204117, CPS204140, CPS204141, CPS204164, CPS204165, CPS204188, CPS204189, CPS204200, CPS204201, CPS204207, CPS204212, CPS204213, CPS204224, CPS204225, CPS204248, CPS204249, CPS204272, CPS204273, CPS204290, CPS204291, CPS204322, CPS204323, CPS204324, CPS204350, CPS204352, CPS204354, CPS204356, CPS204358, CPS204359, CPS204364, CPS204365, CPS204370, CPS204371, CPS204376, CPS204377, CPS204382, CPS204383, CPS204388, CPS204389, CPS204394, CPS204395, CPS204400, CPS204401, CPS204406, CPS204407, CPS204412, CPS204413, CPS204418, CPS204419, CPS204424, CPS204425, CPS204430, CPS204431, CPS204436, CPS204437, CPS204442, CPS204446, CPS204450, CPS204454, CPS204458, CPS204462, CPS204466, CPS204467, CPS204484, CPS204485, CPS204502, CPS204503, CPS204520, CPS204521, CPS204538, CPS204539, CPS204556, CPS204557, CPS204574, CPS204575, CPS204592, CPS204593, CPS204610, CPS204611, CPS204628, CPS204629, CPS204646, CPS204647, CPS204664, CPS204665, CPS204682, CPS204690, CPS204691, CPS204696, CPS204697, CPS204702, CPS204703, CPS204708, CPS204709, CPS204721, CPS204722, CPS204727, CPS204728, CPS204739, CPS241765

**REVISION STATEMENT:** This revision updates the following sections of this Material Safety Data Sheet: 2, 3, 4, 8, 11, 15

**Revision Date:** MAY 10, 2011

**ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:**

| | |
|---|---|
| TLV - Threshold Limit Value | TWA - Time Weighted Average |
| STEL - Short-term Exposure Limit | PEL - Permissible Exposure Limit |
| | CAS - Chemical Abstract Service Number |
| ACGIH - American Conference of Government Industrial Hygienists | IMO/IMDG - International Maritime Dangerous Goods Code |
| API - American Petroleum Institute | MSDS - Material Safety Data Sheet |
| CVX - Chevron | NFPA - National Fire Protection Association (USA) |
| DOT - Department of Transportation (USA) | NTP - National Toxicology Program (USA) |
| IARC - International Agency for Research on Cancer | OSHA - Occupational Safety and Health Administration |

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

**The above information is based on the data of which we are aware and is believed to be correct**



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**as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.**

# Material Safety Data Sheet

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### Delo® 400 LE SAE 15W-40

**Product Use:** Engine Oil
**Product Number(s):** CPS222220
**Company Identification**
Chevron Products Company
a division of Chevron U.S.A. Inc.
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevronlubricants.com

**Transportation Emergency Response**
CHEMTREC: (800) 424-9300 or (703) 527-3887
**Health Emergency**
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
**Product Information**
email : lubemsds@chevron.com
Product Information: (800) LUBE TEK
MSDS Requests: (800) 414-6737

## SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

| COMPONENTS | CAS NUMBER | AMOUNT |
|---|---|---|
| Highly refined mineral oil (C15 - C50) | Mixture | 60 - 100 %weight |
| Zinc alkyl dithiophosphate | 68649-42-3 | 1 - 5 %weight |

## SECTION 3 HAZARDS IDENTIFICATION

**IMMEDIATE HEALTH EFFECTS**
**Eye:** Not expected to cause prolonged or significant eye irritation.
**Skin:** Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.
**Ingestion:** Not expected to be harmful if swallowed.
**Inhalation:** Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.



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## SECTION 4 FIRST AID MEASURES

**Eye:** No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
**Skin:** No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
**Ingestion:** No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
**Inhalation:** No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

## SECTION 5 FIRE FIGHTING MEASURES

**FIRE CLASSIFICATION:**
OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

**NFPA RATINGS:** Health: 0 Flammability: 1 Reactivity: 0

**FLAMMABLE PROPERTIES:**
**Flashpoint:** (Cleveland Open Cup) 204 °C (399 °F) Minimum
**Autoignition:** No Data Available
**Flammability (Explosive) Limits (% by volume in air):** Lower: Not Applicable Upper: Not Applicable

**EXTINGUISHING MEDIA:** Use water fog, foam, dry chemical or carbon dioxide ($CO_2$) to extinguish flames.

**PROTECTION OF FIRE FIGHTERS:**
**Fire Fighting Instructions:** This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
**Combustion Products:** Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

**Protective Measures:** Eliminate all sources of ignition in vicinity of spilled material.
**Spill Management:** Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
**Reporting:** Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

## SECTION 7 HANDLING AND STORAGE

**Precautionary Measures:** Keep out of the reach of children.
**General Handling Information:** Avoid contaminating soil or releasing this material into sewage and



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drainage systems and bodies of water.
**Static Hazard:** Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
**Container Warnings:** Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

## SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

**GENERAL CONSIDERATIONS:**
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

**ENGINEERING CONTROLS:**
Use in a well-ventilated area.

**PERSONAL PROTECTIVE EQUIPMENT**
**Eye/Face Protection:** No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
**Skin Protection:** No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.
**Respiratory Protection:** No respiratory protection is normally required.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
**Occupational Exposure Limits:**

| Component | Agency | TWA | STEL | Ceiling | Notation |
|---|---|---|---|---|---|
| Highly refined mineral oil (C15 - C50) | ACGIH | 5 mg/m3 | 10 mg/m3 | -- | -- |
| Highly refined mineral oil (C15 - C50) | OSHA Z-1 | 5 mg/m3 | -- | -- | -- |



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## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

**Color:** Brown
**Physical State:** Liquid
**Odor:** Petroleum odor
**pH:** Not Applicable
**Vapor Pressure:** <0.01 mmHg @ 37.8 °C (100 °F)
**Vapor Density (Air = 1):** >1
**Boiling Point:** >315°C (599°F)
**Solubility:** Soluble in hydrocarbons; insoluble in water
**Freezing Point:** Not Applicable
**Melting Point:** Not Applicable
**Specific Gravity:** 0.87 - 0.9 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)
**Density:** 0.8806 kg/l @ 15°C (59°F) (Typical)
**Viscosity:** 15.3 mm2/s @ 100°C (212°F) (Min)
**Evaporation Rate:** No Data Available

## SECTION 10 STABILITY AND REACTIVITY

**Chemical Stability:** This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
**Incompatibility With Other Materials:** May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
**Hazardous Decomposition Products:** None known (None expected)
**Hazardous Polymerization:** Hazardous polymerization will not occur.

## SECTION 11 TOXICOLOGICAL INFORMATION

**IMMEDIATE HEALTH EFFECTS**
**Eye Irritation:** The eye irritation hazard is based on evaluation of data for similar materials or product components.
**Skin Irritation:** The skin irritation hazard is based on evaluation of data for similar materials or product components.
**Skin Sensitization:** The skin sensitization hazard is based on evaluation of data for similar materials or product components.
**Acute Dermal Toxicity:** The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.
**Acute Oral Toxicity:** The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.
**Acute Inhalation Toxicity:** The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

**ADDITIONAL TOXICOLOGY INFORMATION:**
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen



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with unknown relevance to humans (A3). During use in engines, contamination of oil with low levels of cancer-causing combustion products occurs. Used motor oils have been shown to cause skin cancer in mice following repeated application and continuous exposure. Brief or intermittent skin contact with used motor oil is not expected to have serious effects in humans if the oil is thoroughly removed by washing with soap and water.

## SECTION 12 ECOLOGICAL INFORMATION

**ECOTOXICITY**
This material is not expected to be harmful to aquatic organisms. The ecotoxicity hazard is based on an evaluation of data for the components or a similar material.

**ENVIRONMENTAL FATE**
**Ready Biodegradability:** This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.

## SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

## SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

**DOT Shipping Description:** PETROLEUM LUBRICATING OIL, NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR
**Additional Information:**NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

**IMO/IMDG Shipping Description:** PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE (AMENDMENT 34-08)

**ICAO/IATA Shipping Description:** PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO TI OR IATA DGR

## SECTION 15 REGULATORY INFORMATION

| | | | |
|---|---|---|---|
| **EPCRA 311/312 CATEGORIES:** | 1. | Immediate (Acute) Health Effects: | NO |
| | 2. | Delayed (Chronic) Health Effects: | NO |
| | 3. | Fire Hazard: | NO |
| | 4. | Sudden Release of Pressure Hazard: | NO |
| | 5. | Reactivity Hazard: | NO |

REGULATORY LISTS SEARCHED:
01-1=IARC Group 1 03=EPCRA 313



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01-2A=IARC Group 2A
01-2B=IARC Group 2B
02=NTP Carcinogen

04=CA Proposition 65
05=MA RTK
06=NJ RTK
07=PA RTK

The following components of this material are found on the regulatory lists indicated.
Zinc alkyl dithiophosphate 03, 06

**CHEMICAL INVENTORIES:**
All components comply with the following chemical inventory requirements: DSL (Canada), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

One or more components is listed on ELINCS (European Union). Secondary notification by the importer may be required. All other components are listed or exempted from listing on EINECS.

One or more components does not comply with the following chemical inventory requirements: AICS (Australia), ENCS (Japan).

**NEW JERSEY RTK CLASSIFICATION:**
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Motor oil)

**WHMIS CLASSIFICATION:**
This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

## SECTION 16 OTHER INFORMATION

**NFPA RATINGS:** Health: 0 Flammability: 1 Reactivity: 0

**HMIS RATINGS:** Health: 1 Flammability: 1 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

**LABEL RECOMMENDATION:**
Label Category : ENGINE OIL 1 - ENG1

**REVISION STATEMENT:** This revision updates the following sections of this Material Safety Data Sheet: 2,5,9,11,12,14,15,16.
**Revision Date:** July 15, 2009

**ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:**

| | |
|---|---|
| TLV - Threshold Limit Value | TWA - Time Weighted Average |
| STEL - Short-term Exposure Limit | PEL - Permissible Exposure Limit |
| | CAS - Chemical Abstract Service Number |
| ACGIH - American Conference of Government Industrial Hygienists | IMO/IMDG - International Maritime Dangerous Goods Code |



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| | |
|---|---|
| API - American Petroleum Institute | MSDS - Material Safety Data Sheet |
| CVX - Chevron | NFPA - National Fire Protection Association (USA) |
| DOT - Department of Transportation (USA) | NTP - National Toxicology Program (USA) |
| IARC - International Agency for Research on Cancer | OSHA - Occupational Safety and Health Administration |

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

**The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.**



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# Material Safety Data Sheet

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

## DIESEL FUEL No. 2

**Product Use:** Fuel [See Section 16 for Additional Product Numbers]
**Synonyms:** 15 S Diesel Fuel 2, Alternative Low Aromatic Diesel (ALAD), Calco LS Diesel 2, Calco ULS DF2, Calco ULS Diesel 2, CALCO ULS S-B0-B5 DF2 DYED, Calco ULS S-B5 DF2, Calco ULS S-B5 DF2 DYED, CALCO ULS TX-B2 DF2, CALCO ULS TX-B2 DF2 DYED, CALCO ULS TX-B5 DF2, CALCO ULS TX-B5 DF2 DYED, Chevron LS Diesel 2, Chevron ULS Diesel 2, CT ULS S-B0-B5 DF2 DYED, CT ULS S-B5 DF2, CT ULS S-B5 DF2 DYED, CT ULS S-BO-B5 DF2, CT ULS TX-B2 DF2, CT ULS TX-B5 DF2, Diesel Fuel Oil, Diesel Grade No. 2, Diesel No. 2-D S15, Diesel No. 2-D S500, Diesel No. 2-D S5000, Distillates, straight run, Gas Oil, HS Diesel 2, HS Heating Fuel 2, Light Diesel Oil Grade No. 2-D, LS Diesel 2, LS Heating Fuel 2, Marine Diesel, RR Diesel Fuel, Texaco Diesel, Texaco Diesel No. 2, ULS S-B0-B5 DF2 DYED, ULS S-B5 DF2, ULS S-BO-B5 DF2, ULS TX-B5 DF2, ULS TX-B5 DF2 DYED, Ultra Low Sulfur Diesel 2

**Company Identification**
Chevron Products Company
Marketing, MSDS Coordinator
6001 Bollinger Canyon Road
San Ramon, CA 94583
United States of America

**Transportation Emergency Response**
CHEMTREC: (800) 424-9300 or (703) 527-3887
**Health Emergency**
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
**Product Information**
MSDS Requests: http://www.chevron.com/contact/
Technical Information: (510) 242-5357

SPECIAL NOTES: This MSDS covers all Chevron, Texaco and Calco CARB & non-CARB Diesel No. 2 Fuels. The sulfur content is less than 0.5% (mass). Red dye is added to non-taxable fuel. (MSDS 6894)
SPECIAL NOTES: This MSDS covers all Chevron and Calco CARB Low Sulfur Diesel No. 2 Fuels. Red dye is added to non-taxable fuel. (MSDS 7098)

## SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

| COMPONENTS | CAS NUMBER | AMOUNT |
|---|---|---|
| Diesel Fuel No. 2 | 68476-34-6 | 95 - 100 %wt/wt |
| Fatty Acid Methyl Esters (FAME) | Mixture | 0 - 5 %wt/wt |
| Total sulfur | Mixture | 0 - 0.5 %wt/wt |
| Naphthalene | 91-20-3 | 0.02 - 0.2 %wt/wt |



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## SECTION 3 HAZARDS IDENTIFICATION

**********

***EMERGENCY OVERVIEW***

- COMBUSTIBLE LIQUID AND VAPOR
- HARMFUL OR FATAL IF SWALLOWED - MAY CAUSE LUNG DAMAGE IF SWALLOWED
- MAY CAUSE RESPIRATORY TRACT IRRITATION IF INHALED
- MAY CAUSE DIZZINESS, DROWSINESS AND REDUCED ALERTNESS
- CAUSES SKIN IRRITATION
- MAY CAUSE CANCER BASED ON ANIMAL DATA
- CONTAINS MATERIAL THAT MAY CAUSE DAMAGE TO:
- LIVER
- BLOOD/BLOOD FORMING ORGANS
- THYMUS
- TOXIC TO AQUATIC ORGANISMS. MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT

**********

**IMMEDIATE HEALTH EFFECTS**

**Eye:** Not expected to cause prolonged or significant eye irritation.

**Skin:** Contact with the skin causes irritation. Contact with the skin is not expected to cause an allergic skin response. Symptoms may include pain, itching, discoloration, swelling, and blistering. Not expected to be harmful to internal organs if absorbed through the skin.

**Ingestion:** Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death. May be irritating to mouth, throat, and stomach. Symptoms may include pain, nausea, vomiting, and diarrhea.

**Inhalation:** The vapor or fumes from this material may cause respiratory irritation. Mists of this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Excessive or prolonged breathing of this material may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

**DELAYED OR OTHER HEALTH EFFECTS:**

**Cancer:** Whole diesel engine exhaust has been classified as a Group 2A carcinogen (probably carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Prolonged or repeated exposure to this material may cause cancer. Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Diesel exhaust particulate has been classified as reasonably anticipated to be a human carcinogen in the National Toxicology Program's Ninth Report on Carcinogens. The National Institute of Occupational Safety and Health (NIOSH) has recommended that whole diesel exhaust be regarded as potentially causing cancer. Diesel engine exhaust is known to the State of California to cause cancer.

**Target Organs:** Contains material that may cause damage to the following organ(s) following repeated skin contact based on animal data: Liver Blood/Blood Forming Organs Thymus

See Section 11 for additional information. Risk depends on duration and level of exposure.

## SECTION 4 FIRST AID MEASURES

**Eye:** No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

**Skin:** Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
**Ingestion:** If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.
**Inhalation:** Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue or if any other symptoms develop.
**Note to Physicians:** Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

## SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

**FIRE CLASSIFICATION:**
OSHA Classification (29 CFR 1910.1200): Combustible liquid.

**NFPA RATINGS:** Health: 1 Flammability: 2 Reactivity: 0

**FLAMMABLE PROPERTIES:**
**Flashpoint:** (Pensky-Martens Closed Cup) 52 °C (125 °F) Minimum
**Autoignition:** 257 °C (494 °F)
**Flammability (Explosive) Limits (% by volume in air):** Lower: 0.6 Upper: 4.7

**EXTINGUISHING MEDIA:** Use water fog, foam, dry chemical or carbon dioxide ($CO_2$) to extinguish flames.

**PROTECTION OF FIRE FIGHTERS:**
**Fire Fighting Instructions:** For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
**Combustion Products:** Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

**Protective Measures:** Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.
**Spill Management:** Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
**Reporting:** Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

## SECTION 7 HANDLING AND STORAGE

**Precautionary Measures:** Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive force. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 29C (85F).
Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Do not breathe mist. Wash thoroughly after handling. Keep out of the reach of children.
**Unusual Handling Hazards:** WARNING! Do not use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death. Slow heat generation may occur with oil-soaked rags, spent filter aids and spent absorbent material and may cause spontaneous combustion if stored near combustibles and not handled properly. Store biodiesel soaked rags, filter aids, and spill absorbent material in approved safety disposal containers and dispose of properly. Biodiesel soaked rags may be washed with soap and water and allowed to dry in well ventilated area.
**General Handling Information:** Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
**Static Hazard:** Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
**General Storage Information:** DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces . USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.
**Container Warnings:** Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

## SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

### GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

### ENGINEERING CONTROLS:
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

### PERSONAL PROTECTIVE EQUIPMENT
**Eye/Face Protection:** No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
**Skin Protection:** Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated

Polyethylene), Nitrile Rubber, Polyurethane, Viton.
**Respiratory Protection:** Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors.
When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon monoxide. If not, wear an approved positive-pressure air-supplying respirator.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

**Occupational Exposure Limits:**

| Component | Agency | TWA | STEL | Ceiling | Notation |
|---|---|---|---|---|---|
| Diesel Fuel No. 2 | ACGIH | 100 mg/m3 | – | – | Skin A3 total hydrocarbon |
| Diesel Fuel No. 2 | CVX | – | 1000 mg/m3 | – | – |
| Naphthalene | ACGIH | 10 ppm (weight) | 15 ppm (weight) | – | Skin |
| Naphthalene | OSHA Z-1 | 50 mg/m3 | – | – | – |

Consult local authorities for appropriate values.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

**Color:** Varies depending on specification
**Physical State:** Liquid
**Odor:** Petroleum odor
**pH:** Not Applicable
**Vapor Pressure:** 0.04 kPa (Approximate) @ 40 °C (104 °F)
**Vapor Density (Air = 1):** >1
**Boiling Point:** 175.6°C (348°F) - 370°C (698°F)
**Solubility:** Soluble in hydrocarbons; insoluble in water
**Freezing Point:** Not Applicable
**Melting Point:** Not Applicable
**Specific Gravity:** 0.8 - 0.88 @ 15.6°C (60.1°F) (Typical)
**Viscosity:** 1.9 cSt - 4.1 cSt @ 40°C (104°F)

## SECTION 10 STABILITY AND REACTIVITY

**Chemical Stability:** This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
**Incompatibility With Other Materials:** May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
**Hazardous Decomposition Products:** None known (None expected)
**Hazardous Polymerization:** Hazardous polymerization will not occur.

## SECTION 11 TOXICOLOGICAL INFORMATION

**IMMEDIATE HEALTH EFFECTS**
**Eye Irritation:** The eye irritation hazard is based on evaluation of data for similar materials or product



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components.
**Skin Irritation:** The skin irritation hazard is based on evaluation of data for similar materials or product components.
**Skin Sensitization:** This material did not cause skin sensitization reactions in a Buehler guinea pig test.
**Acute Dermal Toxicity:** LD50: >5ml/kg (rabbit).

**Acute Oral Toxicity:** LD50: > 5 ml/kg (rat)

**Acute Inhalation Toxicity:** 4 hour(s) LC50: > 5mg/l (rat).

**ADDITIONAL TOXICOLOGY INFORMATION:**
This product contains naphthalene. GENERAL TOXICITY: Exposure to naphthalene has been reported to cause methemoglobinemia and/or hemolytic anemia, especially in humans deficient in the enzyme glucose-6-phosphate dehydrogenase. Laboratory animals given repeated oral doses of naphthalene have developed cataracts. REPRODUCTIVE TOXICITY AND BIRTH DEFECTS: Naphthalene did not cause birth defects when administered orally to rabbits, rats, and mice during pregnancy, but slightly reduced litter size in mice at dose levels that were lethal to the pregnant females. Naphthalene has been reported to cross the human placenta. GENETIC TOXICITY: Naphthalene caused chromosome aberrations and sister chromatid exchanges in Chinese hamster ovary cells, but was not a mutagen in several other in-vitro tests.CARCINOGENICITY: In a study conducted by the National Toxicology Program (NTP), mice exposed to 10 or 30 ppm of naphthalene by inhalation daily for two years had chronic inflammation of the nose and lungs and increased incidences of metaplasia in those tissues. The incidence of benign lung tumors (alveolar/bronchiolar adenomas) was significantly increased in the high-dose female group but not in the male groups. In another two-year inhalation study conducted by NTP, exposure of rats to 10, 30, and 60 ppm naphthalene caused increases in the incidences of a variety of nonneoplastic lesions in the nose. Increases in nasal tumors were seen in both sexes, including olfactory neuroblastomas in females at 60 ppm and adenomas of the respiratory epithelium in males at all exposure levels. The relevance of these effects to humans has not been established. No carcinogenic effect was reported in a 2-year feeding study in rats receiving naphthalene at 41 mg/kg/day. This product contains gas oils. CONCAWE (product dossier 95/107) has summarized current health, safety and environmental data available for a number of gas oils, typically hydrodesulfurized middle distillates, CAS 64742-80-9, straight-run middle distillates, CAS 64741-44-2, and/or light cat-cracked distillate CAS 64741-59-9. CARCINOGENICITY: All materials tested have caused the development of skin tumors in mice, but all featured severe skin irritation and sometimes a long latency period before tumors developed. Straight-run and cracked gas oil samples were studied to determine the influence of dermal irritation on the carcinogenic activity of middle distillates. At non-irritant doses the straight-run gas oil was not carcinogenic, but at irritant doses, weak activity was demonstrated. Cracked gas oils, when diluted with mineral oil, demonstrated carcinogenic activity irrespective of the occurrence of skin irritation. Gas oils were tested on male mice to study tumor initiating/promoting activity. The results demonstrated that while a straight-run gas oil sample was neither an initiator or promotor, a blend of straight-run and FCC stock was both a tumor initiator and a promoter.
GENOTOXICITY: Hydrotreated & hydrodesulfurized gas oils range in activity from inactive to weakly positive in in-vitro bacterial mutagenicity assays. Mouse lymphoma assays on straight-run gas oils without subsequent hydrodesulphurization gave positive results in the presence of S9 metabolic activation.
In-vivo bone marrow cytogenetics and sister chromatic exchange assay exhibited no activity for straight-run components with or without hydrodesulphurization. Thermally or catalytically cracked gas oils tested with in-vitro bacterial mutagenicity assays in the presence of S9 metabolic activation were shown to be mutagenic. In-vitro sister chromatic exchange assays on cracked gas oil gave equivocal results both with and without S9 metabolic activation. In-vivo bone marrow cytogenetics assay was inactive for two cracked gas oil samples. Three hydrocracked gas oils were tested with in-vitro bacterial mutagenicity assays with S9, and one of the three gave positive results. Twelve distillate fuel samples were tested with in-vitro bacterial mutagenicity assays & with S9 metabolic activation and showed negative to weakly positive results. In one series, activity was shown to be related to the PCA content of samples tested. Two in-vivo studies were also conducted. A mouse dominant lethal assay was negative for a sample of diesel



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fuel. In the other study, 9 samples of No 2 heating oil containing 50% cracked stocks caused a slight increase in the number of chromosomal aberrations in bone marrow cytogenetics assays.
DEVELOPMENTAL TOXICITY: Diesel fuel vapor did not cause fetotoxic or teratogenic effects when pregnant rats were exposed on days 6-15 of pregnancy. Gas oils were applied to the skin of pregnant rats daily on days 0-19 of gestation. All but one (coker light gas oil) caused fetotoxicity (increased resorptions, reduced litter weight, reduced litter size) at dose levels that were also maternally toxic.

This product may contain significant amounts of Polynuclear Aromatic Hydrocarbons (PAH's) which have been shown to cause skin cancer after prolonged and frequent contact with the skin of test animals. Brief or intermittent skin contact with this product is not expected to have serious effects if it is washed from the skin. While skin cancer is unlikely to occur in human beings following use of this product, skin contact and breathing, of mists, vapors or dusts should be reduced to a minimum.

## SECTION 12 ECOLOGICAL INFORMATION

**ECOTOXICITY**
48 hour(s) EC50: 20-210 mg/l (Daphnia magna)
96 hour(s) LC50: 21-210 mg/l (Salmo gairdneri)
72 hour(s) EC50: 2.6-25 mg/l (Raphidocellus subcapitata)
This material is expected to be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

**ENVIRONMENTAL FATE**
**Ready Biodegradability:** This material is not expected to be readily biodegradable. On release to the environment the lighter components of diesel fuel will generally evaporate but depending on local environmental conditions (temperature, wind, mixing or wave action, soil type, etc.) the remainder may become dispersed in the water column or absorbed to soil or sediment. Diesel fuel would not be expected to be readily biodegradable. In a modified Strum test (OECD method 301B) approximately 40% biodegradation was recorded over 28 days. However, it has been shown that most hydrocarbon components of diesel fuel are degraded in soil in the presence of oxygen. Under anaerobic conditions, such as in anoxic sediments, rates of biodegradation are negligible. The biodegradability of this material is based on an evaluation of data for the components or a similar material.

## SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

## SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

**DOT Shipping Description:** UN1202, GAS OIL, COMBUSTIBLE LIQUID, III ADDITIONAL INFORMATION: NON-BULK PACKAGES ARE NOT REGULATED IN THE U.S.A. SEE 49 CFR 173.150 (F) FOR SPECIAL PROVISIONS FOR VESSEL AND AIRCRAFT.



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**IMO/IMDG Shipping Description:** UN1268, PETROLEUM DISTILLATES, N.O.S. (DIESEL FUEL, GASOIL), 3, III, FLASH POINT SEE SECTION 5 OR 9, MARINE POLLUTANT (DIESEL FUEL, GASOIL)

**ICAO/IATA Shipping Description:** UN1202, GAS OIL, 3, III

## SECTION 15 REGULATORY INFORMATION

**EPCRA 311/312 CATEGORIES:**

1. Immediate (Acute) Health Effects: YES
2. Delayed (Chronic) Health Effects: YES
3. Fire Hazard: YES
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

| | |
|---|---|
| 01-1=IARC Group 1 | 03=EPCRA 313 |
| 01-2A=IARC Group 2A | 04=CA Proposition 65 |
| 01-2B=IARC Group 2B | 05=MA RTK |
| 02=NTP Carcinogen | 06=NJ RTK |
| | 07=PA RTK |

The following components of this material are found on the regulatory lists indicated.

| | |
|---|---|
| Diesel Fuel No. 2 | 07 |
| Naphthalene | 01-2B, 02, 03, 04, 05, 06, 07 |

**CERCLA REPORTABLE QUANTITIES(RQ)/EPCRA 302 THRESHOLD PLANNING QUANTITIES(TPQ):**

| Component | Component RQ | Component TPQ | Product RQ |
|---|---|---|---|
| Naphthalene | 100 lbs | None | 44444 lbs |

**NEW JERSEY RTK CLASSIFICATION:**
Refer to components listed in Section 2. Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: DIESEL FUEL

**WHMIS CLASSIFICATION:**
Class B, Division 3: Combustible Liquids
Class D, Division 2, Subdivision A: Very Toxic Material -
Chronic Toxic Effects
Carcinogenicity
Class D, Division 2, Subdivision B: Toxic Material -
Skin or Eye Irritation

## SECTION 16 OTHER INFORMATION

**NFPA RATINGS:** Health: 1 Flammability: 2 Reactivity: 0

**HMIS RATINGS:** Health: 2* Flammability: 2 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index

recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

**Additional Product Number(s):** CPS203410, CPS203413, CPS203417, CPS203431, CPS203436, CPS203437, CPS203441, CPS203443, CPS203447, CPS203449, CPS203450, CPS220122, CPS225114, CPS225115, CPS225150, CPS266176, CPS270000, CPS270005, CPS270040, CPS270041, CPS270042, CPS270043, CPS270044, CPS270045, CPS270046, CPS270047, CPS270048, CPS270049, CPS270094, CPS270095, CPS270096, CPS271006, CPS272006, CPS272007, CPS272008, CPS272009, CPS272010, CPS272011, CPS272012, CPS272013, CPS272093, CPS272102, CPS272126, CPS272129, CPS272130, CPS272131, CPS272152, CPS272185, CPS272190, CPS272195, CPS272593, CPS272601, CPS272602, CPS272693, CPS272793, CPS273003, CPS273030, CPS273053, CPS275000

**REVISION STATEMENT:** This revision updates the following sections of this Material Safety Data Sheet: 1, 16

**Revision Date:** JANUARY 05, 2012

**ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:**

| | |
|---|---|
| TLV - Threshold Limit Value | TWA - Time Weighted Average |
| STEL - Short-term Exposure Limit | PEL - Permissible Exposure Limit |
| | CAS - Chemical Abstract Service Number |
| ACGIH - American Conference of Governmental Industrial Hygienists | IMO/IMDG - International Maritime Dangerous Goods Code |
| API - American Petroleum Institute | MSDS - Material Safety Data Sheet |
| CVX - Chevron | NFPA - National Fire Protection Association (USA) |
| DOT - Department of Transportation (USA) | NTP - National Toxicology Program (USA) |
| IARC - International Agency for Research on Cancer | OSHA - Occupational Safety and Health Administration |

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

**The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.**



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# Safety Data Sheet

## 1 - Identification

| | |
|---|---|
| **Product Name: WD-40 Multi-Use Product Aerosol** *NOT FOR SALE IN CALIFORNIA*<br><br>**Product Use: Lubricant, Penetrant, Drives Out Moisture, Removes and Protects Surfaces From Corrosion**<br><br>**Restrictions on Use: None identified**<br><br>**SDS Date Of Preparation: 07/20/2014** | **Manufacturer: WD-40 Company**<br>**Address: 1061 Cudahy Place (92110)**<br>**P.O. Box 80607**<br>**San Diego, California, USA**<br>**92138 –0607**<br>**Telephone:**<br>**Emergency only: 1-888-324-7596 (PROSAR)**<br>**Information: 1-888-324-7596**<br>**Chemical Spills: 1-800-424-9300 (Chemtrec)**<br>**1-703-527-3887 (International Calls)** |

## 2 – Hazards Identification

**Hazcom 2012/GHS Classification:**
Flammable Aerosol Category 1
Gas Under Pressure: Compressed Gas
Aspiration Toxicity Category 1

Note: This product is a consumer product and is labeled in accordance with the US Consumer Product Safety Commission regulations which take precedence over OSHA Hazard Communication labeling. The actual container label will not include the label elements below. The labeling below applies to industrial/professional products.

**Label Elements:**

**DANGER!**
Extremely Flammable Aerosol.
Contains gas under pressure; may explode if heated.
May be fatal if swallowed and enters airways.
**Prevention**
Keep away from heat, sparks, open flames, hot surfaces – No smoking.
Do not spray on an open flame or other ignition source.
Pressurized container: Do not pierce or burn, even after use.
**Response**
IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.
**Storage**
Store locked up.
Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F. Store in a well-ventilated place.
**Disposal**
Dispose of contents and container in accordance with local and national regulations.

## 3 - Composition/Information on Ingredients

| Ingredient | CAS # | Weight Percent | US Hazcom 2012/ GHS Classification |
|---|---|---|---|
| Aliphatic Hydrocarbon | 64742-47-8 | 45-50 | Flammable Liquid Category 3 |



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| | | | |
|---|---|---|---|
| | | | Aspiration Toxicity Category 1 |
| Petroleum Base Oil | 64742-56-9<br>64742-65-0<br>64742-53-6<br>64742-54-7<br>64742-71-8 | <25 | Not Hazardous |
| LVP Aliphatic Hydrocarbon | 64742-47-8 | 12-18 | Aspiration Toxicity Category 1 |
| Carbon Dioxide | 124-38-9 | 2-3 | Simple Asphyxiant<br>Gas Under Pressure,<br>Compressed Gas |
| Non-Hazardous Ingredients | Mixture | <10 | Not Hazardous |

Note: The exact percentages are a trade secret.

**4 – First Aid Measures**

**Ingestion (Swallowed):** Aspiration Hazard. DO NOT induce vomiting. Call physician, poison control center or the WD-40 Safety Hotline at 1-888-324-7596 immediately.
**Eye Contact:** Flush thoroughly with water. Remove contact lenses if present after the first 5 minutes and continue flushing for several more minutes. Get medical attention if irritation persists.
**Skin Contact:** Wash with soap and water. If irritation develops and persists, get medical attention.
**Inhalation (Breathing):** If irritation is experienced, move to fresh air. Get medical attention if irritation or other symptoms develop and persist.
**Signs and Symptoms of Exposure**: May cause eye and respiratory irritation. Inhalation may cause coughing, headache and dizziness. Skin contact may cause drying of the skin.
**Indication of Immediate Medical Attention/Special Treatment Needed**: Immediate medical attention is needed for ingestion.

**5 – Fire Fighting Measures**

**Suitable (and unsuitable) Extinguishing Media:** Use water fog, dry chemical, carbon dioxide or foam. Do not use water jet or flooding amounts of water. Burning product will float on the surface and spread fire.
**Specific Hazards Arising from the Chemical**: Contents under pressure. Keep away from ignition sources and open flames. Exposure of containers to extreme heat and flames can cause them to rupture often with violent force. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back. Combustion will produce oxides of carbon and hydrocarbons.
**Special Protective Equipment and Precautions for Fire-Fighters**: Firefighters should always wear positive pressure self-contained breathing apparatus and full protective clothing. Cool fire-exposed containers with water. Use shielding to protect against bursting containers.

**6 – Accidental Release Measures**

**Personal Precautions, Protective Equipment and Emergency Procedures:** Wear appropriate protective clothing (see Section 8). Eliminate all sources of ignition and ventilate area.
**Methods and Materials for Containment/Cleanup:** Leaking cans should be placed in a plastic bag or open pail until the pressure has dissipated. Contain and collect liquid with an inert absorbent and place in a container for disposal. Clean spill area thoroughly. Report spills to authorities as required.

**7 – Handling and Storage**

**Precautions for Safe Handling:** Avoid contact with eyes. Avoid prolonged contact with skin. Avoid breathing vapors or aerosols. Use only with adequate ventilation. Keep away from heat, sparks, pilot lights, hot surfaces and open flames. Unplug electrical tools, motors and appliances before spraying or bringing the can near any source of electricity. Electricity can burn a hole in the can and cause contents to burst into flames. To avoid serious burn injury, do not let the can touch battery terminals, electrical connections on motors or appliances or any other source of electricity. Wash thoroughly with soap and water after handling. Keep containers closed when not in use. Keep out of the reach of children. Do not puncture, crush or incinerate containers, even when empty.



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**Conditions for Safe Storage:** Store in a cool, well-ventilated area, away from incompatible materials Do not store above 120°F or in direct sunlight. U.F.C (NFPA 30B) Level 3 Aerosol. Store away from oxidizers.

## 8 – Exposure Controls/Personal Protection

| Chemical | Occupational Exposure Limits |
|---|---|
| Aliphatic Hydrocarbon | 1200 mg/m3 TWA (manufacturer recommended) |
| Petroleum Base Oil | 5 mg/m3 TWA, 10 mg/m3 STEL ACGIH TLV<br>5 mg/m3 TWA OSHA PEL |
| LVP Aliphatic Hydrocarbon | 1200 mg/m3 TWA (manufacturer recommended) |
| Carbon Dioxide | 5000 ppm TWA (OSHA/ACGIH), 30,000 ppm STEL (ACGIH) |
| Non-Hazardous Ingredients | None Established |

**The Following Controls are Recommended for Normal Consumer Use of this Product**
**Appropriate Engineering Controls:** Use in a well-ventilated area.
**Personal Protection:**
**Eye Protection:** Avoid eye contact. Always spray away from your face.
**Skin Protection:** Avoid prolonged skin contact. Chemical resistant gloves recommended for operations where skin contact is likely.
**Respiratory Protection:** None needed for normal use with adequate ventilation.

**For Bulk Processing or Workplace Use the Following Controls are Recommended**
**Appropriate Engineering Controls:** Use adequate general and local exhaust ventilation to maintain exposure levels below that occupational exposure limits.
**Personal Protection:**
**Eye Protection:** Safety goggles recommended where eye contact is possible.
**Skin Protection:** Wear chemical resistant gloves.
**Respiratory Protection:** None required if ventilation is adequate. If the occupational exposure limits are exceeded, wear a NIOSH approved respirator. Respirator selection and use should be based on contaminant type, form and concentration. Follow OSHA 1910.134, ANSI Z88.2 and good Industrial Hygiene practice.
**Work/Hygiene Practices:** Wash with soap and water after handling.

## 9 – Physical and Chemical Properties

| | | | |
|---|---|---|---|
| Appearance: | Light amber liquid | Flammable Limits: (Solvent Portion) | LEL: 0.6% UEL: 8% |
| Odor: | Mild petroleum odor | Vapor Pressure: | 95-115 PSI @ 70°F |
| Odor Threshold: | Not established | Vapor Density: | Greater than 1 (air=1) |
| pH: | Not Applicable | Relative Density: | 0.8 – 0.82 @ 60°F |
| Melting/Freezing Point | Not established | Solubilities: | Insoluble in water |
| Boiling Point/Range: | 361 - 369°F (183 - 187°C) | Partition Coefficient; n-octanol/water: | Not established |
| Flash Point: | 122°F (49°C) Tag Closed Cup (concentrate) | Autoignition Temperature: | Not established |
| Evaporation Rate: | Not established | Decomposition Temperature: | Not established |
| Flammability (solid, gas) | Flammable Aerosol | Viscosity: | 2.79-2.96 cSt @ 100°F |
| VOC: | 412 grams/liter (49.5%) | Pour Point: | -63°C (-81.4°F ) ASTM D-97 |

## 10 – Stability and Reactivity

**Reactivity:** Not reactive under normal conditions
**Chemical Stability:** Stable



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**Possibility of Hazardous Reactions:** May react with strong oxidizers generating heat.
**Conditions to Avoid:** Avoid heat, sparks, flames and other sources of ignition. Do not puncture or incinerate containers.
**Incompatible Materials:** Strong oxidizing agents.
**Hazardous Decomposition Products:** Carbon monoxide and carbon dioxide.

## 11 – Toxicological Information

**Symptoms of Overexposure:**
**Inhalation:** High concentrations may cause nasal and respiratory irritation and central nervous system effects such as headache, dizziness and nausea. Intentional abuse may be harmful or fatal.
**Skin Contact:** Prolonged and/or repeated contact may produce mild irritation and defatting with possible dermatitis.
**Eye Contact:** Contact may be irritating to eyes. May cause redness and tearing.
**Ingestion:** This product has low oral toxicity. Swallowing may cause gastrointestinal irritation, nausea, vomiting and diarrhea. This product is an aspiration hazard. If swallowed, can enter the lungs and may cause chemical pneumonitis, severe lung damage and death.
**Chronic Effects:** None expected.
**Carcinogen Status:** None of the components are listed as a carcinogen or suspect carcinogen by IARC, NTP, ACGIH or OSHA.
**Reproductive Toxicity**: None of the components is considered a reproductive hazard.

**Numerical Measures of Toxicity**:
The oral toxicity of this product is estimated to be greater than 5,000 mg/kg and the dermal toxicity greater than 2,000 mg/kg based on an assessment of the ingredients. This product is not classified as toxic by established criteria. It is an aspiration hazard.

## 12 – Ecological Information

**Ecotoxicity:** No specific aquatic toxicity data is currently available, however components of this product are not expected to be harmful to aquatic organisms
**Persistence and Degradability:** Component are readily biodegradable.
**Bioaccumulative Potential:** Bioaccumulation is not expected based on an assessment of the ingredients.
**Mobility in Soil:** No data available
**Other Adverse Effects:** None known

## 13 - Disposal Considerations

If this product becomes a waste, it would be expected to meet the criteria of a RCRA ignitable hazardous waste (D001). However, it is the responsibility of the generator to determine at the time of disposal the proper classification and method of disposal. Do not puncture or incinerate containers, even empty. Dispose in accordance with federal, state, and local regulations.

## 14 – Transportation Information

DOT Surface Shipping Description:
UN1950, Aerosols, 2.1 Ltd. Qty (Note: Shipping Papers are not required for Limited Quantities unless transported by air or vessel – each package must be marked with the Limited Quantity Mark)
IMDG Shipping Description: Un1950, Aerosols, 2.1, LTD QTY
ICAO Shipping Description: UN1950, Aerosols, flammable, 2.1 NOTE: WD-40 does not test aerosol cans to assure that they meet the pressure and other requirements for transport by air. We do not recommend that our aerosol products be transported by air.

## 15 – Regulatory Information

**U.S. Federal Regulations**:
**CERCLA 103 Reportable Quantity:** This product is not subject to CERCLA reporting requirements, however, oil spills are reportable to the National Response Center under the Clean Water Act and many

states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.
**SARA TITLE III**:
**Hazard Category For Section 311/312:** Acute Health, Fire Hazard, Sudden Release of Pressure
**Section 313 Toxic Chemicals**: This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements: None
Section 302 Extremely Hazardous Substances (TPQ): None
**EPA Toxic Substances Control Act (TSCA) Status**: All of the components of this product are listed on the TSCA inventory.
**VOC Regulations**: This product complies with the consumer product VOC limits of the US EPA and states adopting the OTC VOC rules but does not comply with CARB.
**California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)**: This product does not contain chemicals regulated under California Proposition 65.
**Canadian Environmental Protection Act**: One of the components is listed on the NDSL. All of the other ingredients are listed on the Canadian Domestic Substances List or exempt from notification.
**Canadian WHMIS Classification**: Class A (Compressed gas), Class B-5 (Flammable Aerosol)
This MSDS has been prepared according to the criteria of the Controlled Products Regulation (CPR) and the MSDS contains all of the information required by the CPR.

**16 – Other Information:**

**HMIS Hazard Rating:**
**Health – 1 (slight hazard), Fire Hazard – 4 (severe hazard), Reactivity – 0 (minimal hazard)**

Revision Date: July 20, 2014 Supersedes: May 23, 2014

Revision Summary: Convert to Hazcom 2012. Changes in all sections.

Prepared by: Industrial Health & Safety Consultants, Inc. Shelton, CT, USA

APPROVED By: I. Kowalski Regulatory Affairs Dept.

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