

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

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WV Department of
Environmental Protection

API 47 - 051 - 01745 County Marshall District Franklin
Quad Powhatan Point Pad Name MND 06 Field/Pool Name N/A
Farm name Consolidated Coal Company Well Number MND 06 CHS
Operator (as registered with the OOG) Noble Energy, Inc.
Address 1000 Noble Energy Drive City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 39.817710 Easting 80.791624
Landing Point of Curve Northing 39.819387 Easting 80.792815
Bottom Hole Northing 39.845136 Easting 80.817015

Elevation (ft) 722' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
Synthetic Oil Based

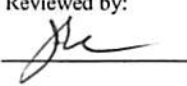
Date permit issued 05/21/2014 Date drilling commenced 09/05/2014 Date drilling ceased 11/01/2014
Date completion activities began 06/02/2017 Date completion activities ceased 06/18/2017
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 128' and 265' Open mine(s) (Y/N) depths N
Salt water depth(s) ft none noted for offsets Void(s) encountered (Y/N) depths N-drilled in pillar
Coal depth(s) ft 284' - 294' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) No

Reviewed

2/8/18

Reviewed by: 

03/02/2018

API 47-051 - 01745 Farm name Consolidated Coal Company Well number MND 06 CHS

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	26"	20"	40'	New	DH-36		Y
Surface	18"	16"	115'	New	H-40		Y
Coal	17.5"	13 3/8"	711'	New	J-55		Y
Intermediate 1	12.38"	9 5/8"	2024'	New	HCK-55		Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5 1/2"	17,890'	New	P-110		Y
Tubing							
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	CaCl 1.15					0	8
Surface	CaCl 1.15					0	8
Coal	Type 1 / Class A	479	15.6	1.39	665.81	0	8
Intermediate 1	Type 1 / Class A	690	15.6	1.18	814.2	0	8
Intermediate 2							
Intermediate 3							
Production	Type 1 / Class A	lead 700 tail 2536	14.8	Lead 1.54 tail 1.37	total 4,722.2	3028.0	8
Tubing							

Drillers TD (ft) 17,890' Loggers TD (ft) 17,895.0
 Deepest formation penetrated Marcellus Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) 4792'

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING No centralizers used on conductor.
18 Centralizers on Intermediate String (Bow string centralizers on first two joints then every third joint to 100' from surface).
 327 Centralizers on Production String (rigid bow string every joint to KOP, rigid bow spring every third joint from KOP to top of cement).

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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PRODUCING FORMATION(S)	DEPTHS		
Marcellus	5917	TVD	17731 MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas _____ Oil _____ NGL _____ Water _____
MA-trac only and water mcfpd _____ bpd _____ bpd _____ bpd
 GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	0		0		

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Please insert additional pages as applicable.

Drilling Contractor Nomac 79 Drilling
 Address 171 Locust Ave. Ext. City Mt. Morris State PA Zip 15349

Logging Company Baker Hughes
 Address 400 Technology Drive City Canonsburg State PA Zip 15317

Cementing Company Schlumberger
 Address 4600 J. Barry Ct., Suite 200 City Canonsburg State PA Zip 15317

Stimulating Company Halburton Energy Services
 Address 121 Champion Way, Suite 110 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Dee Swiger Telephone 724-820-3061
 Signature *Dee Swiger* Title Regulatory Analyst, III Date 07/18/2017

Submission of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

Well Header

API 47-051-01745	Well Name MND-6C-HS
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WR-35 - Stimulation Information Per Stage

Int Des	Start Date	Slurry Rate Avg (bbl/min)	P Treat Avg (psi)	P Breakdown (psi)	ISIP (psi)	Propan t Deliver (lb)	Vol Slurry Total (gal)
STG #1 INJ TEST	6/2/2017	23.4	8,320.0	8,176.0	6,106.0	0.0	35,721.00
STG #1	6/3/2017	85.6	8,369.0	6,087.0	3,550.0	601,835.0	637,711.20
STG #2	6/3/2017	85.4	8,200.0	6,228.0	4,001.0	598,234.0	639,718.80
STG #3	6/3/2017	82.7	8,220.0	6,329.0	3,902.0	595,803.0	635,040.00
STG #4	6/4/2017	78.5	9,671.0	5,620.0	4,270.0	600,879.0	691,975.20
STG #5	6/4/2017	83.7	9,389.0	5,861.0	4,566.0	600,147.0	553,887.60
STG #6A	6/4/2017	51.5	9,020.0	6,009.0	6,216.0	3,363.0	77,217.00
STG #6B	6/5/2017	79.2	8,268.0		4,769.0	606,818.0	633,826.20
STG #7	6/5/2017	86.1	9,114.0	6,379.0	4,576.0	603,462.0	560,131.74
STG #8	6/5/2017	81.8	7,943.0	5,775.0	4,371.0	601,788.0	686,217.00
STG #9	6/5/2017	87.3	8,413.0	5,128.0	4,481.0	603,462.0	524,134.80
STG #10	6/6/2017	90.0	8,438.0	5,815.0	4,538.0	600,000.0	603,540.00
STG #11	6/6/2017	88.0	8,455.0	8,809.0	4,702.0	604,197.0	495,952.80
STG #12	6/6/2017	93.7	8,602.0	5,532.0	4,485.0	600,684.0	488,115.60
STG #13	6/7/2017	89.3	8,151.0	4,986.0	4,667.0	601,155.0	500,753.40
STG #14	6/7/2017	88.9	8,163.0	4,913.0	4,389.0	607,652.0	500,963.40
STG #15	6/7/2017	87.4	8,277.0	5,494.0	4,544.0	604,347.0	491,227.80
STG #16	6/7/2017	86.0	8,190.0	5,740.0	4,619.0	603,414.0	484,230.60
STG #17	6/8/2017	84.3	9,305.0	5,272.0	4,554.0	604,319.0	497,834.40
STG #18	6/8/2017	88.2	8,065.0	5,055.0	4,486.0	604,117.0	521,332.98
STG #19	6/8/2017	88.3	8,220.0	5,681.0	4,609.0	601,745.0	532,560.00
STG #20	6/8/2017	86.6	7,940.0	5,925.0	4,600.0	602,922.0	480,564.00
STG #21	6/9/2017	89.0	8,374.0	5,582.0	4,546.0	600,485.0	491,190.00
STG #22	6/9/2017	88.8	8,184.0	6,030.0	4,538.0	598,458.0	511,858.20
STG #23	6/9/2017	90.1	8,626.0	5,287.0	4,535.0	599,658.0	524,433.00
STG #24	6/9/2017	86.6	8,224.0	5,356.0	4,704.0	601,130.0	467,502.00
STG #25	6/10/2017	90.5	8,051.0	5,736.0	4,527.0	602,787.0	480,303.60
STG #26	6/10/2017	89.3	8,182.0	5,477.0	4,491.0	598,943.0	475,171.20
STG #27	6/10/2017	88.0	7,777.0	5,626.0	4,782.0	598,992.0	467,061.00
STG #28	6/11/2017	87.0	8,159.0	5,196.0	4,847.0	600,510.0	475,020.00
STG #29	6/11/2017	88.4	8,165.0	5,381.0	4,475.0	601,230.0	482,500.20
STG #30	6/11/2017						0.00
STG #31A	6/12/2017	84.8	8,238.0		7,729.0	331,919.0	464,226.00
STG #31B	6/12/2017	70.0	9,017.0		4,131.0	66,192.0	281,400.00
STG #31C	6/12/2017	83.5	7,812.0		4,441.0	805,066.0	580,104.00
STG #32	6/12/2017	93.8	8,106.0		4,402.0	601,672.0	461,328.00
STG #33A	6/13/2017	70.3	10,852.0		6,518.0	33,292.0	317,058.00
STG #33B	6/13/2017	79.9	8,867.0		4,610.0	583,910.0	481,698.00
STG #34	6/13/2017	89.0	8,543.0		4,851.0	602,584.0	541,884.00
STG #35	6/14/2017	81.4	8,201.0		4,530.0	602,594.0	542,346.00
STG #36	6/14/2017	89.1	7,637.0		4,511.0	599,635.0	566,244.00
STG #37	6/14/2017	85.6	7,480.0		4,408.0	604,023.0	570,780.00
STG #38	6/14/2017	95.2	8,090.0		4,447.0	599,318.0	526,302.00
STG #39	6/15/2017	91.4	7,760.0		4,482.0	602,259.0	515,004.00
STG #40	6/15/2017	94.3	7,944.0		4,528.0	602,100.0	589,428.00
STG #41	6/15/2017	100.6	8,797.0		4,410.0	604,228.0	520,884.00
STG #42	6/15/2017	91.4	8,104.0		4,448.0	604,758.0	542,598.00
STG #43	6/15/2017	94.9	7,770.0		4,513.0	604,925.0	489,762.00
STG #44	6/16/2017	91.0	7,936.0		4,597.0	573,169.0	445,158.00
STG #45	6/16/2017	95.2	7,911.0		4,443.0	602,191.0	490,686.00
STG #46	6/16/2017	92.2	7,834.0		4,432.0	598,575.0	507,528.00
STG #47	6/16/2017	97.0	7,580.0		4,742.0	630,499.0	537,810.00
STG #48	6/16/2017	94.0	6,883.0		4,511.0	607,557.0	459,186.00
STG #49	6/17/2017	92.7	7,048.0		4,269.0	598,935.0	477,498.00
STG #50	6/17/2017	95.5	7,407.0		4,585.0	601,089.0	488,628.00
STG #51	6/17/2017	94.8	7,576.0		4,549.0	604,481.0	450,198.00
STG #52	6/17/2017	95.2	7,361.0		4,448.0	604,294.0	455,784.00
STG #53	6/17/2017	97.6	7,249.0		4,355.0	599,244.0	518,322.00
STG #54	6/18/2017	95.1	7,149.0		4,874.0	434,998.0	446,166.00

03/02/2018

WR-35 - Stimulation Information Per Stage

Int Des	Start Date	Slurry Rate Avg (bbl/min)	P Treat Avg (psi)	P Breakdown (psi)	ISIP (psi)	Propanant Deliver (lb)	Vol Slurry Total (gal)
STG #55	6/18/2017	90.5	6,709.0		4,126.0	774,978.0	598,332.00
STG #56	6/18/2017	96.0	7,222.0		4,236.0	600,274.0	507,738.00
STG #57	6/18/2017	96.1	7,023.0		4,226.0	548,969.0	489,174.00

Perforations

API	Well Name	Date	Top (ftKB)	Btm (ftKB)	Brnh/Stg	Enter ed Shot Total	Est Hole Dia (in)
47-051-01745	MND-6C-HS	6/18/2017	5,925.00	6,110.00	57	58	
47-051-01745	MND-6C-HS	6/18/2017	6,135.00	6,309.00	56	58	
47-051-01745	MND-6C-HS	6/18/2017	6,339.00	6,511.00	55	58	
47-051-01745	MND-6C-HS	6/18/2017	6,536.00	6,709.00	54	58	
47-051-01745	MND-6C-HS	6/17/2017	6,738.00	6,915.00	53	58	
47-051-01745	MND-6C-HS	6/17/2017	6,945.00	7,117.00	52	58	
47-051-01745	MND-6C-HS	6/17/2017	7,147.00	7,319.00	51	58	
47-051-01745	MND-6C-HS	6/17/2017	7,342.00	7,521.00	50	58	
47-051-01745	MND-6C-HS	6/17/2017	7,546.00	7,723.00	49	58	
47-051-01745	MND-6C-HS	6/16/2017	7,748.00	7,925.00	48	58	
47-051-01745	MND-6C-HS	6/16/2017	7,953.00	8,127.00	47	58	
47-051-01745	MND-6C-HS	6/16/2017	8,156.00	8,329.00	46	58	
47-051-01745	MND-6C-HS	6/16/2017	8,354.00	8,525.00	45	58	
47-051-01745	MND-6C-HS	6/16/2017	8,556.00	8,733.00	44	58	
47-051-01745	MND-6C-HS	6/15/2017	8,758.00	8,934.00	43	58	
47-051-01745	MND-6C-HS	6/15/2017	8,962.00	9,137.00	42	58	
47-051-01745	MND-6C-HS	6/15/2017	9,165.00	9,339.00	41	58	
47-051-01745	MND-6C-HS	6/15/2017	9,364.00	9,541.00	40	58	
47-051-01745	MND-6C-HS	6/15/2017	9,566.00	9,738.00	39	58	
47-051-01745	MND-6C-HS	6/14/2017	9,768.00	9,945.00	38	58	
47-051-01745	MND-6C-HS	6/14/2017	9,974.00	10,147.00	37	58	
47-051-01745	MND-6C-HS	6/14/2017	10,176.00	10,349.00	36	58	
47-051-01745	MND-6C-HS	6/14/2017	10,374.00	10,551.00	35	58	
47-051-01745	MND-6C-HS	6/13/2017	10,576.00	10,753.00	34	58	
47-051-01745	MND-6C-HS	6/13/2017	10,778.00	10,820.00	33B	28	
47-051-01745	MND-6C-HS	6/13/2017	10,838.00	11,011.00	33A	58	
47-051-01745	MND-6C-HS	6/12/2017	11,040.00	11,217.00	32	58	
47-051-01745	MND-6C-HS	6/12/2017	11,243.00	11,364.00	31C	58	
47-051-01745	MND-6C-HS	6/12/2017	11,379.00	11,421.00	31B	28	
47-051-01745	MND-6C-HS	6/11/2017	11,439.00	11,621.00	31A	58	
47-051-01745	MND-6C-HS	6/11/2017	11,823.00	11,646.00	30	58	
47-051-01745	MND-6C-HS	6/11/2017	11,848.00	12,022.00	29	58	
47-051-01745	MND-6C-HS	6/11/2017	12,050.00	12,227.00	28	58	
47-051-01745	MND-6C-HS	6/10/2017	12,252.00	12,426.00	27	58	
47-051-01745	MND-6C-HS	6/10/2017	12,454.00	12,631.00	26	58	
47-051-01745	MND-6C-HS	6/10/2017	12,656.00	12,833.00	25	58	
47-051-01745	MND-6C-HS	6/9/2017	12,862.00	13,029.00	24	58	
47-051-01745	MND-6C-HS	6/9/2017	13,060.00	13,237.00	23	58	
47-051-01745	MND-6C-HS	6/9/2017	13,262.00	13,436.00	22	58	
47-051-01745	MND-6C-HS	6/9/2017	13,464.00	13,641.00	21	58	
47-051-01745	MND-6C-HS	6/8/2017	13,666.00	13,837.00	20	58	
47-051-01745	MND-6C-HS	6/8/2017	13,868.00	14,045.00	19	58	
47-051-01745	MND-6C-HS	6/8/2017	14,069.00	14,247.00	18	58	
47-051-01745	MND-6C-HS	6/8/2017	14,272.00	14,449.00	17	58	
47-051-01745	MND-6C-HS	6/7/2017	14,474.00	14,651.00	16	58	
47-051-01745	MND-6C-HS	6/7/2017	14,678.00	14,853.00	15	58	
47-051-01745	MND-6C-HS	6/7/2017	14,880.00	15,055.00	14	58	
47-051-01745	MND-6C-HS	6/7/2017	15,080.00	15,257.00	13	58	
47-051-01745	MND-6C-HS	6/6/2017	15,282.00	15,459.00	12	58	
47-051-01745	MND-6C-HS	6/6/2017	15,484.00	15,659.00	11	58	
47-051-01745	MND-6C-HS	6/6/2017	15,686.00	15,863.00	10	58	
47-051-01745	MND-6C-HS	6/5/2017	15,888.00	16,063.00	9	58	
47-051-01745	MND-6C-HS	6/5/2017	16,090.00	16,267.00	8	58	
47-051-01745	MND-6C-HS	6/5/2017	16,292.00	16,459.00	7	58	
47-051-01745	MND-6C-HS	6/5/2017	16,484.00	16,526.00	6B	28	
47-051-01745	MND-6C-HS	6/4/2017	16,544.00	16,717.00	6A	58	
47-051-01745	MND-6C-HS	6/4/2017	16,746.00	16,918.00	5	58	
47-051-01745	MND-6C-HS	6/4/2017	16,943.00	17,127.00	4	58	
47-051-01745	MND-6C-HS	6/3/2017	17,152.00	17,327.00	3	58	
47-051-01745	MND-6C-HS	6/3/2017	17,352.00	17,525.00	2	58	

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Perforations

API	Well Name	Date	Top (ftKB)	Btm (ftKB)	Bnch/Stg	Enter ed Shot Total	Est Hole Dia (in)
47-051-01745	MND-6C-HS	6/3/2017	17,554.00	17,731.00	1	58	

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	6/3/2017
Job End Date:	6/27/2017
State:	West Virginia
County:	Marshall
API Number:	47-051-01745-00-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	MND 6 C
Latitude:	39.81763528
Longitude:	-80.79181306
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	5,909
Total Base Water Volume (gal):	30,006,667
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	87.09193	Density = 8.330
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.72149	

WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant					
				Listed Below			
HYDROCHLORIC ACID	Halliburton	Solvent					
				Listed Below			
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
				Listed Below			
SP BREAKER	Halliburton	Breaker					
				Listed Below			
OILPERM A	Halliburton	Non-ionic Surfactant					
				Listed Below			
FR-76	Halliburton	Friction Reducer					
				Listed Below			
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive					
				Listed Below			

SAND-COMMON WHITE-100 MESH, SSA-2, 100 LB SACK (100002158)	Halliburton	Proppant					
				Listed Below			
B-84	X-Chem	Biocide					
				Listed Below			
SC-30	X-Chem	Scale Inhibitor					
				Listed Below			

Items above are Trade Names with the exception of Base Water. Items below are the individual ingredients.

			Crystalline silica, quartz	14808-60-7	100.00000	12.14935	
			Hydrochloric acid	7647-01-0	7.50000	0.10316	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.01687	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Inorganic salt	Proprietary	30.00000	0.01687	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01687	
			Guar gum	9000-30-0	100.00000	0.00984	
			Acetic anhydride	108-24-7	100.00000	0.00314	
			Acetic acid	64-19-7	60.00000	0.00188	
			Ethanol	64-17-5	60.00000	0.00063	
			Oxyalkylated phenolic resin	Proprietary	30.00000	0.00042	
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00032	
			Methanol	67-56-1	60.00000	0.00031	
			Sodium persulfate	7775-27-1	100.00000	0.00018	

			Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1	30.00000	0.00016	
			Ethoxylated alcohols	Proprietary	30.00000	0.00016	
			Fatty acids, tall oil	Proprietary	30.00000	0.00016	
			Olefins	Proprietary	5.00000	0.00006	
			Poly(oxy-1,2-ethanedyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00000	0.00005	
			Naphthalene	91-20-3	5.00000	0.00005	
			Propargyl alcohol	107-19-7	10.00000	0.00005	
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00001	
			Sodium sulfate	7757-82-6	0.10000	0.00000	
			Ethanol	64-17-5	5.00000		
			n-Alkyl dimethyl benzyl ammonium chloride	68424-85-1	10.00000		
			Water	7732-18-5	100.00000		
			Sodium Hydroxide	1310-73-2	1.50000		
			Glutaraldehyde	111-30-8	30.00000		
			Didecyl dimethyl ammonium chloride	7173-51-5	10.00000		

* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)