



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

API 47-085-10005 County Ritchie District Union
Quad Pullman 7.5' Pad Name Ness Pad Field/Pool Name --
Farm name Ness, Ashley E., Jr. Well Number Ireland Unit 1H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop St. City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing _____ Easting _____
Landing Point of Curve Northing 4338227.45m Easting 508131.45m
Bottom Hole Northing 4336024.85m Easting 509094.94m

Elevation (ft) 1075' 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)
Air- Foam & 4% KCL

Mud- Polymer

Date permit issued 1/31/2013 Date drilling commenced 4/15/2013 Date drilling ceased 4/3/2014
Date completion activities began 4/12/2014 Date completion activities ceased 7/23/2014
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

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

Freshwater depth(s) ft 62' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1620', 1838' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 456' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

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API 47-085 - 10005 Farm name Ness, Ashley E., Jr. Well number Ireland Unit 1H

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	28"	20"	40'	New	94# H-40	N/A	Y
Surface	17- 1/2"	13- 3/8"	392'	New	48# H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2535'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5-1/2"	15017'	New	23# P-110	N/A	Y
Tubing		2-3/8"	6506'		4.7# N-80	N/A	
Packer type and depth set		N/A					

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Shurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	203 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	499 sx	15.6	1.18	297	0'	8 Hrs.
Coal							
Intermediate 1	Class A	997 sx	15.6	1.18	805	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	1001 sx (Lead) 1284 sx (Tail)	14.5 Lead 15.2 Tail	1.30 Lead 1.86 Tail	2966	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15017' MD, 6620' TVD Loggers TD (ft) 14968'
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 6326'

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Rufus Unit 1H API #47-085-10046). Please reference the wireline logs submitted with Form WR-35 for Rufus Unit 1H. A Cement Bond Log has been included with this submittal.

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

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

Conductor- 0
 Surface- 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface
 Intermediates- 1 above float joint, 1 above float collar, 1 every 4th joint to surface
 Production- 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

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WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
*PLEASE SEE EXHIBIT 1					

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
*PLEASE SEE EXHIBIT 2								

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Please insert additional pages as applicable.

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
	<u>6418' (TOP) TVD</u>	<u>6818' (TOP) MD</u>
<u>Marcellus</u>		

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3000 psi Bottom Hole psi DURATION OF TEST hrs

OPEN FLOW Gas Oil NGL Water GAS MEASURED BY
10117 mcfpd 47 bpd bpd bpd 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)
	<u>0</u>		<u>0</u>		

***PLEASE SEE EXHIBIT 3**

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Please insert additional pages as applicable.

Drilling Contractor Patterson - UTI Drilling Company LLC
Address 207 Carolton Dr. City Eighty Four State PA Zip 15330

Logging Company Casedhole Solutions
Address 100 Arentzen Blvd. City Chareloi State PA Zip 15022

Cementing Company Nabors Completion & Production Services, Co.
Address 1850 Hackers Creek City Jane Low State WV Zip 26378

Stimulating Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233
Signature Kara Quackenbush Title Permitting Agent Date 1/20/2015

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

API 47-085-10005 Farm Name Ness, Ashley E., Jr. Well Number Ireland Unit 1H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	12-Apr-14	14,801	14,927	60	Marcellus
2	26-May-14	14,653	14,778	60	Marcellus
3	27-May-14	14,504	14,630	60	Marcellus
4	27-May-14	14,355	14,481	60	Marcellus
5	27-May-14	14,207	14,333	60	Marcellus
6	27-May-14	14,058	14,184	60	Marcellus
7	28-May-14	13,910	14,036	60	Marcellus
8	28-May-14	13,761	13,887	60	Marcellus
9	28-May-14	13,613	13,739	60	Marcellus
10	29-May-14	13,464	13,590	60	Marcellus
11	30-May-14	13,316	13,442	60	Marcellus
12	30-May-14	13,167	13,293	60	Marcellus
13	30-May-14	13,019	13,146	60	Marcellus
14	30-May-14	12,870	12,996	60	Marcellus
15	31-May-14	12,722	12,848	60	Marcellus
16	31-May-14	12,573	12,699	60	Marcellus
17	31-May-14	12,425	12,551	60	Marcellus
18	1-Jun-14	12,276	12,402	60	Marcellus
19	1-Jun-14	12,128	12,253	60	Marcellus
20	1-Jun-14	11,979	12,105	60	Marcellus
21	1-Jun-14	11,831	11,956	60	Marcellus
22	2-Jun-14	11,682	11,808	60	Marcellus
23	2-Jun-14	11,534	11,659	60	Marcellus
24	3-Jun-14	11,385	11,511	60	Marcellus
25	3-Jun-14	11,237	11,362	60	Marcellus
26	3-Jun-14	11,088	11,214	60	Marcellus
27	3-Jun-14	10,940	11,065	60	Marcellus
28	4-Jun-14	10,791	10,917	60	Marcellus
29	4-Jun-14	10,643	10,765	60	Marcellus
30	4-Jun-14	10,494	10,620	60	Marcellus
31	5-Jun-14	10,345	10,471	60	Marcellus
32	5-Jun-14	10,197	10,323	60	Marcellus
33	5-Jun-14	10,048	10,174	60	Marcellus
34	6-Jun-14	9,900	10,026	60	Marcellus
35	6-Jun-14	9,751	9,877	60	Marcellus
36	6-Jun-14	9,603	9,729	60	Marcellus
37	6-Jun-14	9,454	9,580	60	Marcellus
38	6-Jun-14	9,306	9,432	60	Marcellus
39	7-Jun-14	9,157	9,283	60	Marcellus
40	7-Jun-14	9,009	9,135	60	Marcellus
41	7-Jun-14	8,860	8,986	60	Marcellus
42	8-Jun-14	8,712	8,838	60	Marcellus
43	8-Jun-14	8,563	8,689	60	Marcellus
44	8-Jun-14	8,415	8,541	60	Marcellus
45	8-Jun-14	8,266	8,392	60	Marcellus
46	8-Jun-14	8,118	8,243	60	Marcellus
47	9-Jun-14	7,969	8,095	60	Marcellus
48	9-Jun-14	7,821	7,946	60	Marcellus
49	10-Jun-14	7,672	7,798	60	Marcellus
50	10-Jun-14	7,524	7,649	60	Marcellus
51	10-Jun-14	7,375	7,501	60	Marcellus
52	10-Jun-14	7,227	7,352	60	Marcellus
53	10-Jun-14	7,078	7,204	60	Marcellus
54	10-Jun-14	6,930	7,055	60	Marcellus

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API 47-085-10005 Farm Name Ness, Ashley E., Jr. Mary F. Well Number Ireland Unit 1H

EXHIBIT 2

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	26-May-14	31.0	8,726	N/A	7,422	2,079	5,739	N/A
2	26-May-14	75.0	8,250	5,785	6,203	199,556	5,587	N/A
3	27-May-14	78.0	7,284	5,610	5,593	199,233	6,413	N/A
4	27-May-14	78.0	7,498	5,655	4,858	183,544	6,105	N/A
5	27-May-14	75.0	7,654	5,313	5,003	221,133	5,953	N/A
6	27-May-14	74.0	7,484	5,831	5,498	229,076	5,912	N/A
7	28-May-14	78.0	7,384	5,536	4,130	220,995	5,893	N/A
8	28-May-14	77.0	7,401	5,158	3,464	224,863	5,872	N/A
9	28-May-14	76.0	7,619	6,130	5,267	224,928	5,910	N/A
10	29-May-14	71.0	7,938	5,531	6,995	134,574	6,079	N/A
11	30-May-14	76.0	7,616	5,654	6,280	185,646	6,356	N/A
12	30-May-14	76.0	7,650	5,605	6,207	225,009	5,766	N/A
13	30-May-14	75.0	7,224	5,605	5,434	219,182	5,686	N/A
14	30-May-14	75.0	7,805	5,442	5,358	221,242	5,757	N/A
15	31-May-14	78.0	7,007	5,544	5,518	227,579	5,779	N/A
16	31-May-14	75.0	7,518	5,703	6,280	222,374	5,727	N/A
17	31-May-14	76.0	7,534	5,247	4,892	169,553	6,085	N/A
18	1-Jun-14	77.0	7,455	5,282	6,425	177,963	6,161	N/A
19	1-Jun-14	78.0	7,540	5,512	5,887	202,607	5,494	N/A
20	1-Jun-14	74.0	7,780	5,741	5,148	222,856	5,724	N/A
21	1-Jun-14	73.0	7,489	5,956	2,938	224,376	5,730	N/A
22	2-Jun-14	68.0	7,524	6,711	5,082	179,728	6,480	N/A
23	2-Jun-14	52.0	7,949	6,066	6,316	36,903	6,009	N/A
24	3-Jun-14	84.0	6,970	5,585	5,219	103,564	5,981	N/A
25	3-Jun-14	73.0	7,146	5,617	4,796	218,047	5,750	N/A
26	3-Jun-14	73.0	7,238	5,482	4,668	223,317	5,860	N/A
27	3-Jun-14	74.0	7,169	5,402	2,963	228,124	5,730	N/A
28	4-Jun-14	78.0	7,107	5,666	4,900	225,253	5,786	N/A
29	4-Jun-14	76.0	7,191	6,028	4,500	220,225	5,699	N/A
30	4-Jun-14	75.0	7,291	5,562	4,174	214,554	5,522	N/A
31	5-Jun-14	76.0	7,150	5,760	2,920	222,306	5,663	N/A
32	5-Jun-14	78.0	7,170	5,500	5,105	198,949	5,303	N/A
33	5-Jun-14	72.0	7,353	5,666	4,963	195,274	5,418	N/A
34	6-Jun-14	73.0	7,663	5,578	5,342	212,061	5,518	N/A
35	6-Jun-14	79.0	7,002	5,211	4,237	221,615	5,543	N/A
36	6-Jun-14	78.0	6,847	5,574	3,543	219,435	5,566	N/A
37	6-Jun-14	72.0	6,662	5,402	4,818	219,643	5,505	N/A
38	6-Jun-14	73.0	6,879	5,385	4,797	224,323	5,358	N/A
39	7-Jun-14	73.0	6,651	5,512	4,377	218,769	5,294	N/A
40	7-Jun-14	78.6	6,818	5,345	5,307	222,257	5,290	N/A
41	7-Jun-14	72.0	6,787	5,462	4,745	204,938	5,450	N/A
42	8-Jun-14	79.8	6,921	5,533	5,191	224,191	5,340	N/A
43	8-Jun-14	78.5	7,046	5,226	4,617	227,694	5,500	N/A
44	8-Jun-14	79.4	6,939	5,425	4,007	225,656	5,453	N/A
45	8-Jun-14	78.7	6,751	5,225	4,968	228,056	5,343	N/A
46	8-Jun-14	79.7	6,925	5,590	3,621	222,605	5,245	N/A
47	9-Jun-14	79.7	6,925	5,590	3,621	217,100	5,431	N/A
48	9-Jun-14	72.0	6,908	5,590	5,945	217,100	5,231	N/A
49	10-Jun-14	72.0	6,580	5,675	4,459	218,327	5,494	N/A
50	10-Jun-14	80.2	6,605	5,782	4,053	223,907	5,495	N/A
51	10-Jun-14	82.4	6,390	5,594	5,247	224,484	5,265	N/A
52	10-Jun-14	81.4	6,628	5,356	5,204	220,732	5,431	N/A
53	10-Jun-14	73.0	6,295	5,371	5,223	228,881	5,493	N/A
54	10-Jun-14	72.0	6,490	5,396	4,700	206,226	5,129	N/A
	AVG=	74	7,219	5,579	4,971	11,032,612	306,303	TOTAL

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EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Siltstone	0	456	0	456
Coal	est 456	486	est 456	486
Sand	est 486	516	est 486	516
Shale	est 516	1,266	est 516	1,266
Sandstone	est 1266	1,296	est 1266	1,296
Shale	est 1296	1,356	est 1296	1,356
Sandstone	est 1356	1,386	est 1356	1,386
Shale	est 1386	1,506	est 1386	1,506
Sandstone	est 1506	1,906	est 1506	1,906
Limestone	est 1906	2004	est 1906	2,004
Big Lime	2,004	2,004	2,004	2,004
Big Injun	2,004	2,336	2,004	2,336
Gantz Sand	2,336	2,518	2,336	2,518
Fifty Foot Sandstone	2,518	2,709	2,518	2,709
Gordon	2,709	2,994	2,709	2,994
Fifth Sandstone	2,994	3,091	2,994	3,091
Bayard	3,091	3,450	3,091	3,457
Warren	3,450	3,830	3,457	3,866
Speechley	3,830	4,039	3,866	4,095
Baltown	4,039	4,517	4,095	4,618
Bradford	4,517	4,910	4,618	5,048
Benson	4,910	5,144	5,048	5,304
Alexander	5,144	5,361	5,304	5,543
Elk	5,361	5,744	5,543	5,957
Rhinestreet	5,744	6,099	5,957	6,347
Sycamore	6,099	6,264	6,347	6,549
Middlesex	6,264	6,368	6,549	6,707
Burkett	6,368	6,398	6,707	6,767
Tully	6,398	6,418	6,767	6,818
Marcellus	6,418	NA	6,818	7,993

*Please note Antero determines formation tops based on wireline logs that are only run on one well on a multi-well pad (Please reference Rufus Unit 1H API# 47-085-10046). The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

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Hydraulic Fracturing Fluid Product Component Information Disclosure



Job Start Date:	5/27/2014
Job End Date:	6/11/2014
State:	West Virginia
County:	Ritchie
API Number:	47-085-10005-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Ireland Unit 1H
Longitude:	-80.90126700
Latitude:	39.19535600
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,520
Total Base Water Volume (gal):	13,741,602
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
Water	Operator	Carrier	Water	7732-18-5	100.00000	90.77043	
Sand, White, 40/70	Baker Hughes	Proppant	MSDS and Non-MSDS Ingredients Listed Below	N/A		5.27130	
Sand, White, 20/40	Baker Hughes	Proppant	MSDS and Non-MSDS Ingredients Listed Below	N/A		3.00487	
Sand, White, 100 mesh	Baker Hughes	Proppant	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.46894	
HCl, 10.1 - 15%	Baker Hughes	Acidizing	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.22175	SmartCare Product
GW-3LDF	Baker Hughes	Gelling Agent	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.08874	SmartCare Product
FRW-18	Baker Hughes	Friction Reducer	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.05891	SmartCare Product
Scaletrol 720	Baker Hughes	Scale inhibitor	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.01555	SmartCare Product

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Enzyme G-NE	Baker Hughes	Breaker	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.012885 SmartCare Product
Alpha 1427	Baker Hughes	Biocide	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.012655 SmartCare Product
Ferrotrol 300L	Baker Hughes	Iron Control	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.001653 SmartCare Product
CI-14	Baker Hughes	Corrosion Inhibitor	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.000365 SmartCare Product
Ingredients shown above are subject to 29 CFR 1910.120(RR) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.						
Ingredients in Additive (s) (MSDS and non-MSDS)	Baker Hughes	See Trade Name(s) List				
			Crystalline Silica (Quartz)	14808-60-7	100.00000	8.73818
			Water	7732-18-5	95.00000	0.24028
			Mineral Oil	8042-47-5	70.00000	0.06207
			Guar Gum	9060-30-0	60.00000	0.05320
			Hydrochloric Acid	7647-01-0	15.00000	0.03324
			Paraffinic Petroleum Distillate	64742-55-8	30.00000	0.02660
			Poly (acrylamide-co-acrylic acid) partial sodium salt	62648-23-4	30.00000	0.01766
			Hydroreated Light Distillate	64742-47-8	30.00000	0.01766
			Ethylene Glycol	107-21-1	45.00000	0.00701
			Crystalline Silica: Quartz	14808-60-7	5.00000	0.00443
			Isotridecanol, ethoxylated	9043-30-5	5.00000	0.00443
			1-butoxy-2-propanol	5131-66-8	5.00000	0.00443
			Glutaraldehyde	111-30-8	30.00000	0.00378
			2-Propanoic, Polymer with Sodium Phosphinate, Sodium Salt	71050-62-9	20.00000	0.00311
			Sodium Chloride	7647-14-5	5.00000	0.00310
			Ammonium Chloride	12125-02-9	3.00000	0.00177
			Didecyl Dimethyl Ammonium Chloride	7173-51-5	10.00000	0.00126
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00118
			Oleamide DEA	93-83-4	2.00000	0.00118
			Citric Acid	77-92-9	60.00000	0.00092
			Calcium Chloride	10043-52-4	5.00000	0.00078
			Hemicellulase Enzyme Concentrate	9025-56-3	5.00000	0.00064
			Quaternary Ammonium Compound	68424-85-1	5.00000	0.00063
			Ethanol	64-17-5	5.00000	0.00063
			Methanol	67-56-1	100.00000	0.00036
			Polyoxyethylene Sorbitan Monooleate	9005-65-6	0.50000	0.00029
			Sorbitan Monooleate	1338-43-8	0.50000	0.00029
			Potassium Chloride	7447-40-7	1.00000	0.00016

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85.10005

					68951-67-7	30.00000	0.00011
					15821-83-7	0.10000	0.00003
					51780-12-3	10.00000	0.00004
					58527-49-1	7.00000	0.00002
					54743-02-8	5.00000	0.00002
					107-19-7	5.00000	0.00002
					50-00-0	1.00000	0.00000

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

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

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)

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