

**K35 CDP Pipeline Release (Form 27)
(REM 10527)**

This Form 27 (Site Investigation and Remediation Workplan) was prepared for the purpose of presenting site assessment data and a proposed interim remediation plan associated with hydrocarbon impacts discovered at the K35 CDP Pipeline in Caerus Oil and Gas Inc. (Caerus's) North Parachute Mountain area of operation in Garfield County (Figure 1).

REMEDATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document)

Refer to Form 19 document numbers 401401658, 401410645 and 401414135.

On September 11, 2017, Caerus personnel conducted excavation activities around the release point. Soil was excavated to a depth of 7 feet (ft.) below ground surface (bgs.) to 15 ft. bgs. Soil samples were collected from the excavation and submitted to ALS Environmental in Holland, Michigan (ALS) for laboratory analysis of constituents identified in Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1. Laboratory analytical results of excavation soil samples indicated hydrocarbon impacts to soil.

From October 9 through 25, 2017, LTE installed 22 soil borings in the project area advanced to depths ranging from 15 to 63.5 ft. bgs. (Figure 1). The soil borings were logged by an LTE geologist who inspected the soil for the presence or absence of petroleum hydrocarbon odor and/or staining. The soil was characterized by visually inspecting the soil samples and field screening the soil headspace using a photo-ionization detector (PID) to monitor for the presence of volatile organic vapors. Soil samples were collected from each soil boring and submitted to ALS for laboratory analysis of constituents identified in COGCC Table 910-1. Monitoring wells were constructed in 21 boreholes by installing screened casing across the groundwater interface and solid casing to surface. Each well was protected by installing a solid steel riser over the well to approximately 3 feet above ground surface. Soil boring logs are included as an attachment. A summary of soil laboratory analytical data is included as Table 1.

Following well construction, each groundwater monitoring well was developed using a foot valve pump and surge block. During well development, ten well casing volumes of groundwater were removed from each well. Depth to water and product thickness were measured in all wells during this sampling event utilizing an oil water interface probe. Product had been observed in monitoring wells MW-01, MW-02, MW-04, MW-05 and MW-08 with product thicknesses ranging from droplets (MW-04) to 0.26 ft. (MW-01). Additionally, groundwater samples were collected from a domestic water well (permit #290931) approximately 1,500 feet downgradient of MW-06. This well is owned by Caerus and provides water for the hunting cabins nearby and livestock during grazing month. The hunting cabins are also owned by Caerus and only used by Caerus employees and is not used for drinking water purposes. Groundwater samples were submitted to ALS for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX). A summary of groundwater laboratory analytical data is included as Table 2.

Weather permitting, assessment activities are planned to continue through 11/3/2017.

Describe how source is to be removed:

The segment of pipeline that failed has been identified, removed and replaced. See below for interim remediation plans.

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Describe how remediation of existing impact is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

Caerus plans to use a combination of product recovery near the point of release and dissolved phase remediation at the downgradient extent of the hydrocarbon plume. It is believed that the combination of the two methods will deter further downgradient migration of the hydrocarbon plume in the interim.

One pilot test air sparge (AS) well will be installed near MW-14. The pilot test data collected from this well will be used to determine the effectiveness of a potential AS curtain in the area. The proposed AS curtain would transect the drainage, remediating any dissolved phase hydrocarbons that it encounters. Additionally, a product recovery sump will be installed in the area of MW-01. The sump will be regularly monitored to determine a schedule for product removal. Data collected from the ongoing assessment activities and interim remediation strategy will be used to propose a well-designed, more permanent remedial strategy for spring 2018. Figure 1 shows proposed additional well and sump locations.

If groundwater has been impacted, described proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Groundwater data indicates hydrocarbon impacts in the project area. Following the completion of site assessment activities and interim remediation system installation, a groundwater sampling schedule will be proposed.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

Any disturbances will be backfilled to match preexisting grade. Site reclamation will be carried out when appropriate, based on productivity and plans for future development.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing. Is further site investigation required? If yes, describe:

All laboratory analytical reports received up to October 25, 2017 are included as an attachment and summarized in the attached tables. Figures 2 and 3 depict soil and groundwater data associated with each sample location.

Final disposition of E&P waste (land treated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

Final disposition of E&P waste will be detailed following the completion of this project.

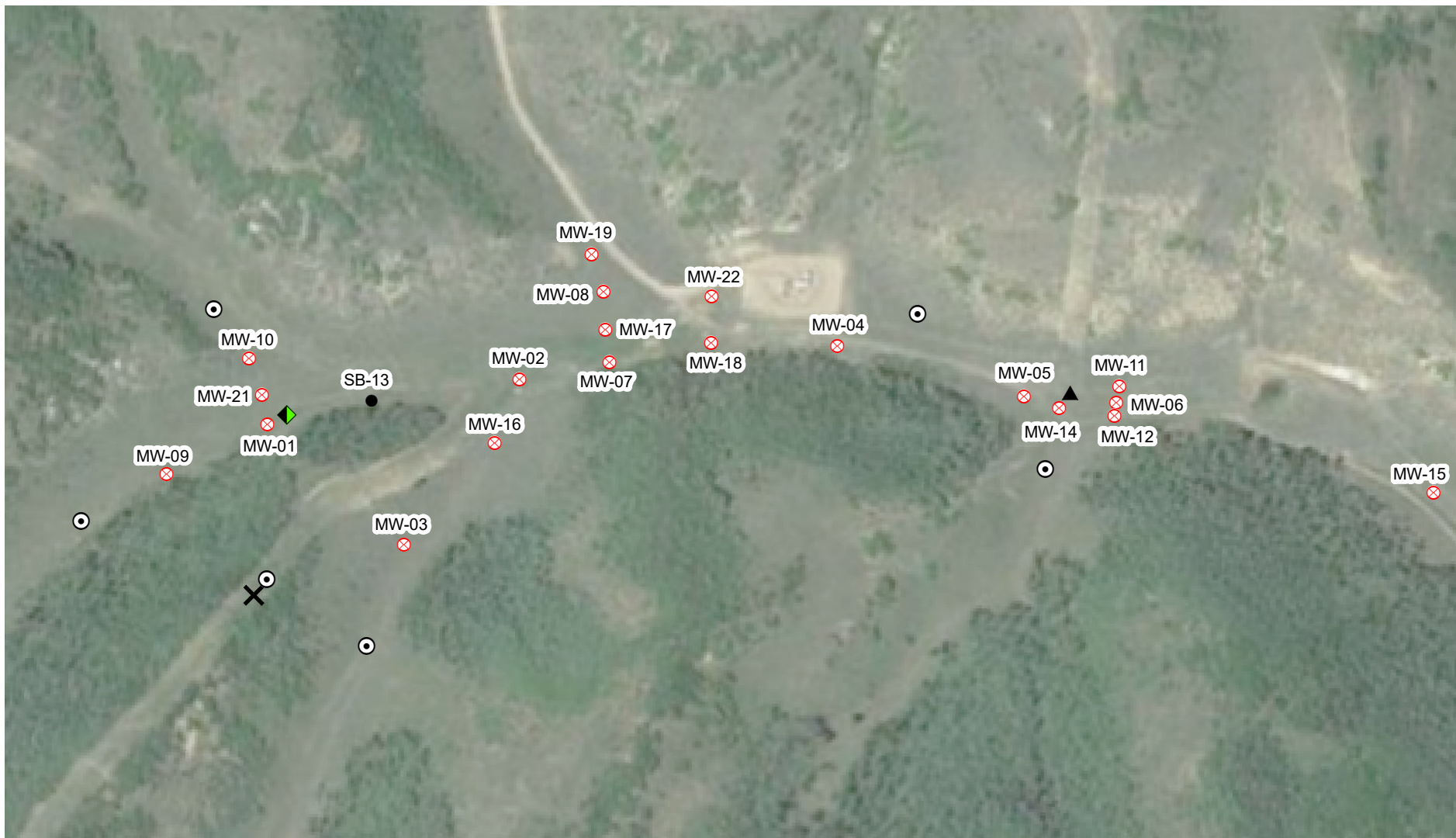


IMAGE COURTESY OF GOOGLE EARTH 2016

LEGEND

- | | | | |
|---|----------------------------|---|------------------------|
|  | MONITORING WELL |  | PROPOSED SOIL BORING |
|  | SOIL BORING |  | PROPOSED SUMP LOCATION |
|  | PROPOSED AIR SPARGING WELL |  | RELEASE LOCATION |

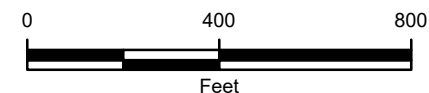
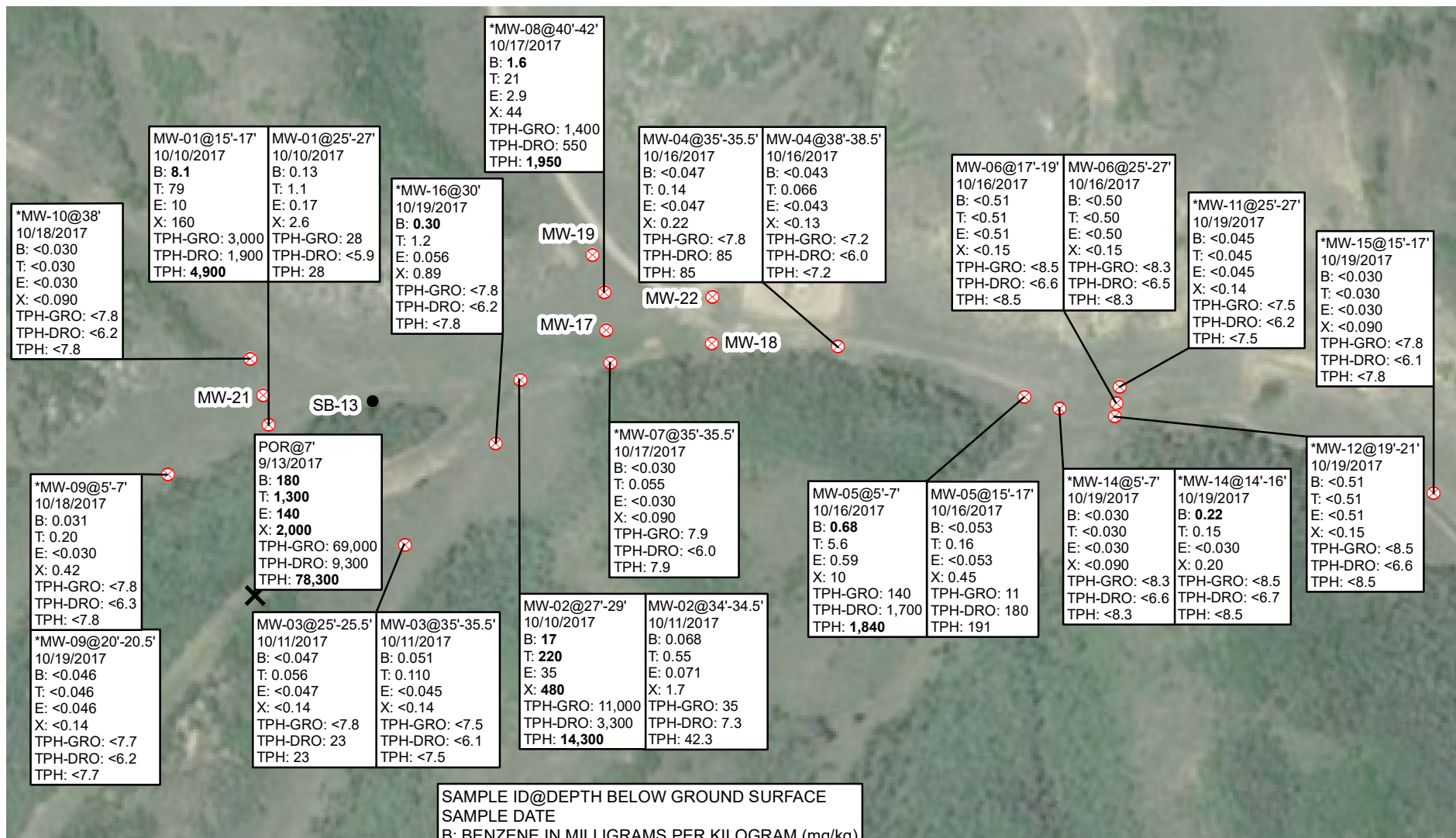


FIGURE 1
SITE MAP
K35 CDP PIPELINE
GARFIELD COUNTY, COLORADO

CAERUS OIL AND GAS, LLC





LEGEND

- ⊗ MONITORING WELL
- SOIL BORING
- ✕ RELEASE LOCATION

SAMPLE ID@DEPTH BELOW GROUND SURFACE
SAMPLE DATE
B: BENZENE IN MILLIGRAMS PER KILOGRAM (mg/kg)
T: TOLUENE (mg/kg)
E: ETHYLBENZENE (mg/kg)
X: TOTAL XYLENES (mg/kg)
TPH-GRO: TOTAL PETROLEUM HYDROCARBONS - GASOLINE RANGE ORGANICS (mg/kg)
TPH-DRO: TOTAL PETROLEUM HYDROCARBONS - DIESEL RANGE ORGANICS (mg/kg)
TPH: TOTAL PETROLEUM HYDROCARBONS (mg/kg)
<: INDICATES RESULT IS LESS THAN THE LABORATORY REPORTING LIMIT
BOLD: INDICATES RESULT EXCEEDS THE COGCC CONCENTRATION
*INDICATES PRELIMINARY RESULTS

IMAGE COURTESY OF GOOGLE EARTH 2016

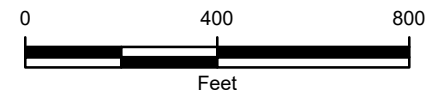


FIGURE 2
SOIL ANALYTICAL RESULTS
K35 CDP PIPELINE
GARFIELD COUNTY, COLORADO

CAERUS OIL AND GAS, LLC



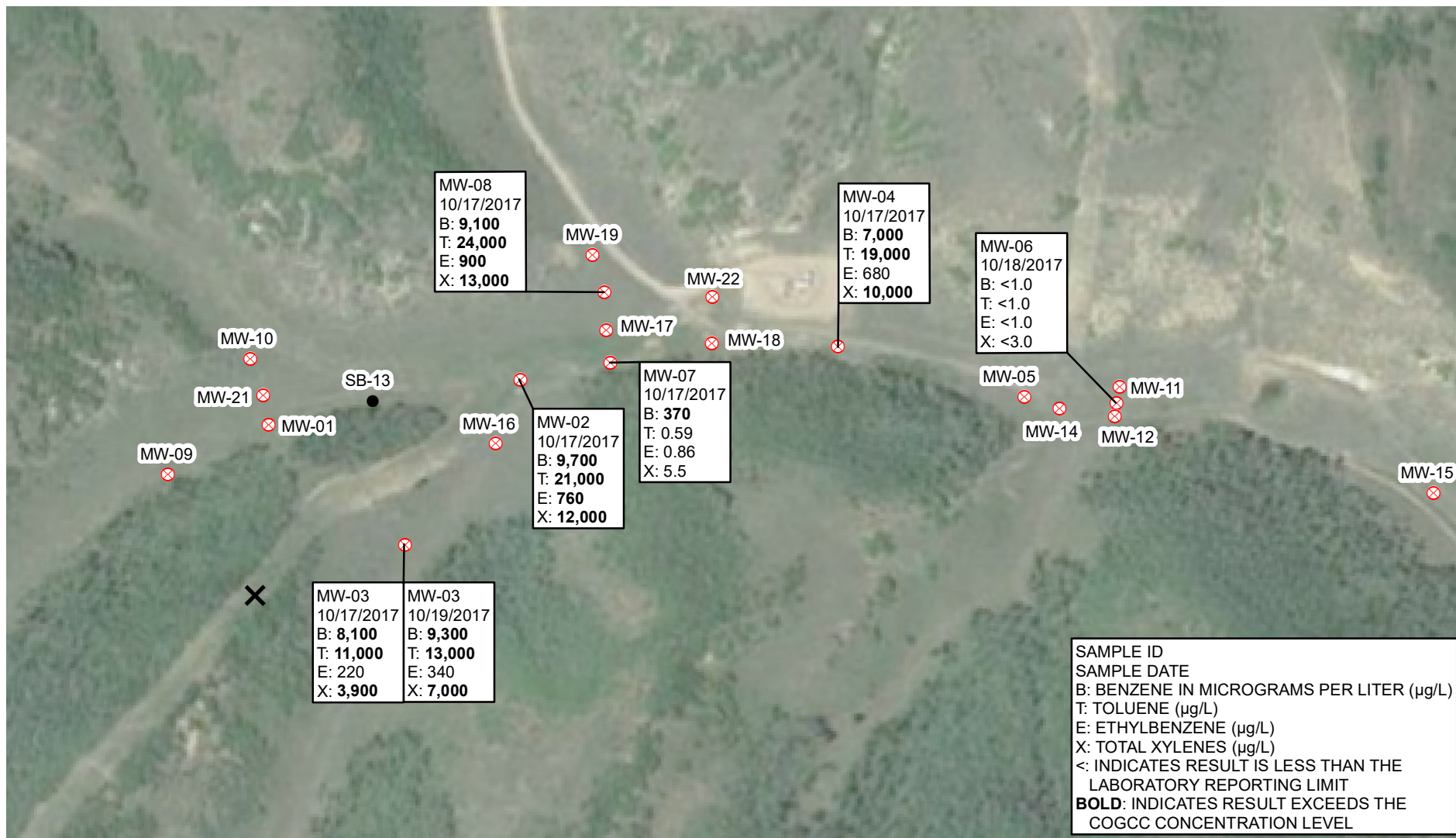


IMAGE COURTESY OF GOOGLE EARTH 2016

LEGEND

- MONITORING WELL
- SOIL BORING
- X RELEASE LOCATION

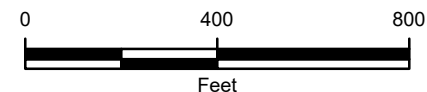


FIGURE 3
 GROUNDWATER ANALYTICAL RESULTS
 K35 CDP PIPELINE
 GARFIELD COUNTY, COLORADO

CAERUS OIL AND GAS, LLC



TABLE 1
SOIL LABORATORY RESULTS SUMMARY TABLE
K35 CDP PIPELINE RELEASE
GARFIELD, COLORADO
CAERUS OIL AND GAS LLC

PARAMETER	COGCC CONCENTRATION LEVELS	UNITS	POR	POR	E	E	E	MW-01	MW-01	MW-02	MW-02	MW-03
Sample Date			9/11/2017	9/13/2017	9/11/2017	9/13/2017	9/13/2017	10/10/2017	10/10/2017	10/10/2017	10/11/2017	10/11/2017
Sample Depth		FEET	0.5	7	0.5	7	15	15-17	25-27	27-29	34-34.5	25-25.5
Sample Type			SURFACE	EXCAVATION	SURFACE	EXCAVATION	EXCAVATION	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING
Arsenic	0.39	mg/kg	8.5	11	8.7	8.0	9.7	13	NA	13	12	11
Barium	15,000	mg/kg	200	880	520	220	210	250	NA	360	320	290
Cadmium	70	mg/kg	<0.74	<1.0	<0.96	<0.92	<0.83	<0.91	NA	<0.99	<1.0	<0.84
Chromium (III)	120,000	mg/kg	32	38	31	34	36	40	NA	39	25	25
Chromium (VI)	23	mg/kg	<1.1	<1.3	<1.2	<1.2	<1.2	<1.3	NA	<1.3	<1.3	<1.3
Copper	3,100	mg/kg	11	9.8	10	8.7	9.0	16	NA	23	25	20
Lead	400	mg/kg	15	12	14	12	12	13	NA	15	16	6.8
Mercury	23	mg/kg	3.3	3.4	1.1	0.36	0.15	<0.023	NA	0.031	<0.022	<0.024
Nickel	1,600	mg/kg	18	18	17	16	16	27	NA	34	26	16
Selenium	390	mg/kg	2.1	2.3	2.2	2.0	1.8	2.2	NA	2.7	2.3	1.8
Silver	390	mg/kg	<0.37	<0.51	<0.48	<0.046	<0.41	<0.46	NA	<0.49	<0.50	<0.42
Zinc	23,000	mg/kg	58	53	53	35	73	71	NA	97	74	55
EC	4.0	mmhos/cm	3.6	7.2	5.2	6.1	9.4	1.1	NA	0.92	0.98	1.5
pH	6 - 9	SU	7.28	7.17	7.54	8.64	8.52	7.49	NA	8.42	8.51	8.52
SAR	12	unitless	5.0	48	30	40	47	1.4	NA	1.7	2.2	2.2
TPH-GRO		mg/kg	22,000	69,000	30,000	8,900	8,200	3,000	28	11,000	35	<7.8
TPH-DRO		mg/kg	260	9,300	3,800	3,400	1,200	1,900	<5.9	3,300	7.3	23
TPH	500	mg/kg	22,260	78,300	33,800	12,300	9,400	4,900	28	14,300	42.3	23
Benzene	0.17	mg/kg	38	180	42	9.9	15	8.1	0.13	17	0.068	<0.047
Toluene	85	mg/kg	470	1,300	580	140	180	79	1.1	220	0.55	0.056
Ethylbenzene	100	mg/kg	58	140	67	20	20	10	0.17	35	0.071	<0.047
Total Xylenes	175	mg/kg	920	2,000	1,200	320	330	160	2.6	480	1.7	<0.14
Acenaphthene	1000	mg/kg	<0.047	<2.8	3.1	<0.047	<0.049	<0.054	NA	<0.054	<0.054	<0.051
Anthracene	1000	mg/kg	<0.047	<2.8	0.077	<0.047	<0.049	<0.054	NA	<0.054	<0.054	<0.051
Benzo(A)anthracene	0.22	mg/kg	<0.047	<2.8	<0.050	<0.047	<0.049	<0.054	NA	<0.054	<0.054	<0.051
Benzo(B)fluoranthene	0.22	mg/kg	<0.047	<2.8	<0.050	<0.047	<0.049	<0.054	NA	<0.054	<0.054	<0.051
Benzo(K)fluoranthene	2.2	mg/kg	<0.047	<2.8	<0.050	<0.047	<0.049	<0.054	NA	<0.054	<0.054	<0.051
Benzo(A)pyrene	0.022	mg/kg	<0.047	<2.8	<0.050	<0.047	<0.049	<0.054	NA	<0.054	<0.054	<0.051
Chrysene	22	mg/kg	<0.047	<2.8	<0.050	<0.047	<0.049	<0.054	NA	<0.054	<0.054	<0.051
Dibenzo(A,H)anthracene	0.022	mg/kg	<0.047	<2.8	<0.050	<0.047	<0.049	<0.054	NA	<0.054	<0.054	<0.051
Fluoranthene	1000	mg/kg	<0.047	<2.8	<0.050	<0.047	<0.049	<0.054	NA	<0.054	<0.054	<0.051
Fluorene	1000	mg/kg	0.45	<2.8	0.85	0.40	0.18	0.27	NA	0.54	<0.054	<0.051
Indeno(1,2,3,C,D)pyrene	0.22	mg/kg	<0.047	<2.8	<0.050	<0.047	<0.049	<0.054	NA	<0.054	<0.054	<0.051
Naphthalene	23	mg/kg	5.3	62	18	5.4	2.9	3.9	NA	6.3	<0.054	<0.051
Pyrene	1000	mg/kg	<0.047	<2.8	<0.050	<0.047	<0.049	<0.054	NA	<0.054	<0.054	<0.051

NOTES:
ND - analyte not detected above the stated reporting limit
BOLD - indicates result exceeds the COGCC concentration level
SU - standard unit
COGCC - Colorado Oil and Gas Conservation Commission
EC- electrical conductivity
SAR - sodium adsorption ratio
mmhos/cm - millimhos per centimeter
NA - not analyzed
mg/kg - milligrams per kilogram
-- - Data pending
Preliminary data



TABLE 1
SOIL LABORATORY RESULTS SUMMARY TABLE
K35 CDP PIPELINE RELEASE
GARFIELD, COLORADO
CAERUS OIL AND GAS LLC

PARAMETER	COGCC CONCENTRATION LEVELS	UNITS	MW-03	MW-04	MW-04	MW-05	MW-05	MW-06	MW-06	MW-07	MW-08	MW-09
Sample Date			10/11/2017	10/16/2017	10/16/2017	10/16/2017	10/16/2017	10/16/2017	10/16/2017	10/17/2017	10/17/2017	10/18/2017
Sample Depth		FEET	35-35.5	35-35.5	38-38.5	5-7	15-17	17-19	25-27	35-35.5	40-42	5-7
Sample Type			SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING
Arsenic	0.39	mg/kg	9.5	20	13	11	9.9	13	11	--	--	--
Barium	15,000	mg/kg	95	330	160	250	280	320	410	--	--	--
Cadmium	70	mg/kg	<0.87	<0.91	<0.90	<1.1	<1.1	<1.1	0.98	--	--	--
Chromium (III)	120,000	mg/kg	33	58	32	38	43	44	35	--	--	--
Chromium (VI)	23	mg/kg	<1.2	<1.3	<1.2	<1.4	1.4	<1.3	<1.3	--	--	--
Copper	3,100	mg/kg	16	33	29	20	29	12	20	--	--	--
Lead	400	mg/kg	10	30	10	14	13	13	11	--	--	--
Mercury	23	mg/kg	<0.020	0.099	0.024	<0.024	<0.025	<0.021	<0.023	--	--	--
Nickel	1,600	mg/kg	21	43	20	25	20	17	29	--	--	--
Selenium	390	mg/kg	2.0	2.7	2.2	2.8	2.6	2.3	2.1	--	--	--
Silver	390	mg/kg	<0.44	<0.45	<0.45	<0.54	<0.57	<0.54	<0.46	--	--	--
Zinc	23,000	mg/kg	51	100	88	75	71	70	66	--	--	--
EC	4.0	mmhos/cm	1.8	0.82	0.67	1.5	2.4	1.1	1.7	--	--	--
pH	6 - 9	SU	8.57	8.22	8.66	7.95	8.11	8.03	8.45	--	--	--
SAR	12	unitless	1.4	2.1	3.0	1.2	2.7	1.5	3.2	--	--	--
TPH-GRO		mg/kg	<7.5	<7.8	<7.2	140	11	<8.5	<8.3	7.9	1,400	<7.8
TPH-DRO		mg/kg	<6.1	85	<6.0	1,700	180	<6.6	<6.5	<6.0	550	<6.3
TPH	500	mg/kg	<7.5	85	<7.2	1,840	191	<8.5	<8.3	7.9	1,950	<7.8
Benzene	0.17	mg/kg	0.051	<0.047	<0.043	0.68	<0.053	<0.51	<0.50	<0.030	1.6	0.031
Toluene	85	mg/kg	0.11	0.14	0.066	5.6	0.16	<0.51	<0.50	0.055	21	0.20
Ethylbenzene	100	mg/kg	<0.045	<0.047	<0.043	0.59	<0.053	<0.51	<0.50	<0.030	2.9	<0.030
Total Xylenes	175	mg/kg	<0.14	0.22	<0.13	10	0.45	<0.15	<0.15	<0.090	44	0.42
Acenaphthene	1000	mg/kg	<0.051	<0.053	<0.050	<0.055	<0.057	<0.055	<0.054	--	--	--
Anthracene	1000	mg/kg	<0.051	<0.053	<0.050	<0.055	<0.057	<0.055	<0.054	--	--	--
Benzo(A)anthracene	0.22	mg/kg	<0.051	<0.053	<0.050	<0.055	<0.057	<0.055	<0.054	--	--	--
Benzo(B)fluoranthene	0.22	mg/kg	<0.051	<0.053	<0.050	<0.055	<0.057	<0.055	<0.054	--	--	--
Benzo(K)fluoranthene	2.2	mg/kg	<0.051	<0.053	<0.050	<0.055	<0.057	<0.055	<0.054	--	--	--
Benzo(A)pyrene	0.022	mg/kg	<0.051	<0.053	<0.050	<0.055	<0.057	<0.055	<0.054	--	--	--
Chrysene	22	mg/kg	<0.051	<0.053	<0.050	<0.055	<0.057	<0.055	<0.054	--	--	--
Dibenzo(A,H)anthracene	0.022	mg/kg	<0.051	<0.053	<0.050	<0.055	<0.057	<0.055	<0.054	--	--	--
Fluoranthene	1000	mg/kg	<0.051	<0.053	<0.050	<0.055	<0.057	<0.055	<0.054	--	--	--
Fluorene	1000	mg/kg	<0.051	<0.053	<0.050	0.30	<0.057	<0.055	<0.054	--	--	--
Indeno(1,2,3,C,D)pyrene	0.22	mg/kg	<0.051	<0.053	<0.050	<0.055	<0.057	<0.055	<0.054	--	--	--
Naphthalene	23	mg/kg	<0.051	<0.053	<0.050	4.1	<0.057	<0.055	<0.054	--	--	--
Pyrene	1000	mg/kg	<0.051	<0.053	<0.050	<0.055	<0.057	<0.055	<0.054	--	--	--

NOTES:
ND - analyte not detected above the stated reporting limit
BOLD - indicates result exceeds the COGCC concentration level
SU - standard unit
COGCC - Colorado Oil and Gas Conservation Commission
EC- electrical conductivity
SAR - sodium adsorption ratio
mmhos/cm - millimhos per centimeter
NA - not analyzed
mg/kg - milligrams per kilogram
-- - Data pending
Preliminary data



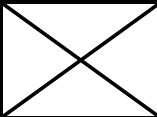
TABLE 1
SOIL LABORATORY RESULTS SUMMARY TABLE
K35 CDP PIPELINE RELEASE
GARFIELD, COLORADO
CAERUS OIL AND GAS LLC

PARAMETER	COGCC CONCENTRATION LEVELS	UNITS	MW-09	MW-09	MW-10	MW-11	MW-12	MW-14	MW-14	MW-15	MW-16
Sample Date			10/19/2017	10/20/2017	10/18/2017	10/19/2017	10/19/2017	10/19/2017	10/19/2017	10/19/2017	10/20/2017
Sample Depth		FEET	10-10.5	20-20.5	38	25-27	19-21	5-7	14-16	15-17	30
Sample Type			SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING	SOIL BORING
Arsenic	0.39	mg/kg	--	--	--	--	--	--	--	--	--
Barium	15,000	mg/kg	--	--	--	--	--	--	--	--	--
Cadmium	70	mg/kg	--	--	--	--	--	--	--	--	--
Chromium (III)	120,000	mg/kg	--	--	--	--	--	--	--	--	--
Chromium (VI)	23	mg/kg	--	--	--	--	--	--	--	--	--
Copper	3,100	mg/kg	--	--	--	--	--	--	--	--	--
Lead	400	mg/kg	--	--	--	--	--	--	--	--	--
Mercury	23	mg/kg	--	--	--	--	--	--	--	--	--
Nickel	1,600	mg/kg	--	--	--	--	--	--	--	--	--
Selenium	390	mg/kg	--	--	--	--	--	--	--	--	--
Silver	390	mg/kg	--	--	--	--	--	--	--	--	--
Zinc	23,000	mg/kg	--	--	--	--	--	--	--	--	--
EC	4.0	mmhos/cm	--	--	--	--	--	--	--	--	--
pH	6 - 9	SU	--	--	--	--	--	--	--	--	--
SAR	12	unitless	--	--	--	--	--	--	--	--	--
TPH-GRO		mg/kg	<6.9	<7.7	<7.8	<7.5	<8.5	<8.3	<8.5	<7.8	<7.8
TPH-DRO		mg/kg	<5.9	<6.3	<6.2	<6.2	<6.6	<6.6	<6.7	<6.1	<6.2
TPH	500	mg/kg	<6.9	<7.7	<7.8	<7.5	<8.5	<8.3	<8.5	<7.8	<7.8
Benzene	0.17	mg/kg	<0.041	<0.046	<0.030	<0.045	<0.051	<0.030	0.22	<0.030	0.30
Toluene	85	mg/kg	0.099	<0.046	<0.030	<0.045	<0.051	<0.030	0.15	<0.030	1.2
Ethylbenzene	100	mg/kg	<0.041	<0.046	<0.030	<0.045	<0.051	<0.030	<0.030	<0.030	0.056
Total Xylenes	175	mg/kg	0.28	<0.14	<0.090	<0.14	<0.15	<0.090	0.20	<0.090	0.89
Acenaphthene	1000	mg/kg	--	--	--	--	--	--	--	--	--
Anthracene	1000	mg/kg	--	--	--	--	--	--	--	--	--
Benzo(A)anthracene	0.22	mg/kg	--	--	--	--	--	--	--	--	--
Benzo(B)fluoranthene	0.22	mg/kg	--	--	--	--	--	--	--	--	--
Benzo(K)fluoranthene	2.2	mg/kg	--	--	--	--	--	--	--	--	--
Benzo(A)pyrene	0.022	mg/kg	--	--	--	--	--	--	--	--	--
Chrysene	22	mg/kg	--	--	--	--	--	--	--	--	--
Dibenzo(A,H)anthracene	0.022	mg/kg	--	--	--	--	--	--	--	--	--
Fluoranthene	1000	mg/kg	--	--	--	--	--	--	--	--	--
Fluorene	1000	mg/kg	--	--	--	--	--	--	--	--	--
Indeno(1,2,3,C,D)pyrene	0.22	mg/kg	--	--	--	--	--	--	--	--	--
Naphthalene	23	mg/kg	--	--	--	--	--	--	--	--	--
Pyrene	1000	mg/kg	--	--	--	--	--	--	--	--	--

NOTES:
ND - analyte not detected above the stated reporting limit
BOLD - indicates result exceeds the COGCC concentration level
SU - standard unit
COGCC - Colorado Oil and Gas Conservation Commission
EC- electrical conductivity
SAR - sodium adsorption ratio
mmhos/cm - millimhos per centimeter
NA - not analyzed
mg/kg - milligrams per kilogram
-- - Data pending
Preliminary data



TABLE 2
GROUNDWATER LABORATORY RESULTS SUMMARY TABLE
K35 CDP PIPELINE RELEASE
GARFIELD, COLORADO
CAERUS OIL AND GAS LLC

Sample ID	Date	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L
ENPR5WW	10/17/17	<1.0	<1.0	<1.0	<3.0
ENPR30SP	10/17/17	<1.0	<1.0	<1.0	<3.0
MW-02	10/17/17	9,700	21,000	760	12,000
MW-03	10/17/17	8,100	11,000	220	3,900
	10/19/17	9,300	13,000	340	7,000
MW-04	10/17/17	7,000	19,000	680	10,000
MW-06	10/18/17	<1.0	<1.0	<1.0	<3.0
MW-07	10/18/17	370	0.59	0.86	5.5
MW-08	10/18/17	9,100	24,000	900	13,000
COGCC CONCENTRATION LEVELS		5	560	700	1,400

Notes:

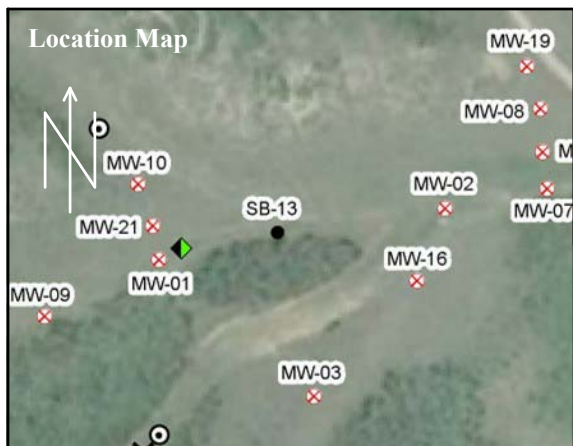
< - less than the stated reporting limit

BOLD - indicates result exceeds the COGCC concentration level

COGCC - Colorado Oil and Gas Conservation Commission

µg/L - micrograms per liter

SU - standard unit



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 8"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

BORING/WELL ID: MW-01

COMPLETION DATE: 10/10/17

TD (ft bgs): 25'

DTW (ft bgs): 14'

SCREEN SLOT: 0.010"

CASING LENGTH: 5'

SCREEN LENGTH: 20'

LOGGED BY: Dustin Held

SAMPLE METHOD: 2' Split-Spoon

DRILL METHOD: Hollow Stem Auger

DRILLED BY: Dakota Drilling, Inc.

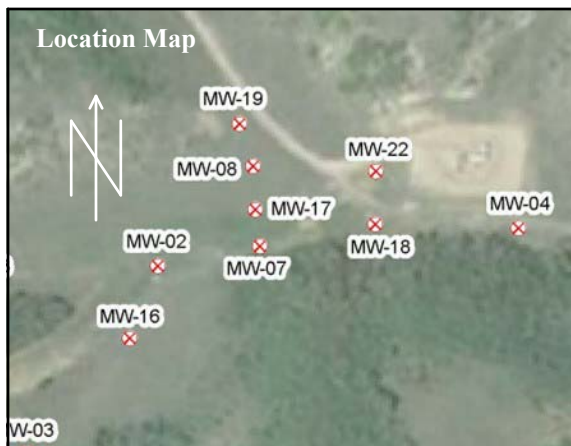
DETECTOR: MiniRAE 3000 PID

FILTER PACK: 10-20 Silica Sand

ANNULUS SEAL: Bentonite Chips

SURFACE SEAL: Sackrete

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
7.6		moist		2/2	5	CL		SILTY CLAY - 5.0' - 9.0' - dark brown, sandy, medium plasticity, moist, no odor, no staining	
32.0				2/2					
63.5				2/2	10	CL		SILTY CLAY - 10.0' - 12.0' - dark brown, sandy, low plasticity, moist, no odor, no staining	
710				2/2		SC		SANDY CLAY - 12.0' - 14.0' - brown, moist, no odor, no staining	
								14.5' - 15.0' - LNAPL present	
1526		wet	MW-01 @15'-17'	2/2	15	CL		SILTY CLAY - 15.0' - 19.0' - brown, fractured shales, sandy, wet, LNAPL present, hydrocarbon odor, no staining	
1400				1.8/2					
224				2/2	20	ML/SM		SILTY SAND - 20.0' - 22.0' - brown, few gravels, (fractured mudstone), wet, hydrocarbon odor, no staining	
47.0									
205			MW-01 @25'-27'	0.2/1	25	ML/SM		SILTY SAND - 26.0' - 26.5' - brown, (fractured mudstones), wet, no odor, no staining, poor recovery, competent bedrock, auger refusal at 26.5' bgs	



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 8"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

BORING/WELL ID: MW-02

COMPLETION DATE: 10/10/17

TD (ft bgs): 34.5'

DTW (ft bgs): 27'

SCREEN SLOT: 0.010"

CASING LENGTH: 20.5'

SCREEN LENGTH: 15'

LOGGED BY: Dustin Held

SAMPLE METHOD: 2' Split-Spoon

DRILL METHOD: Hollow Stem Auger

DRILLED BY: Dakota Drilling, Inc.

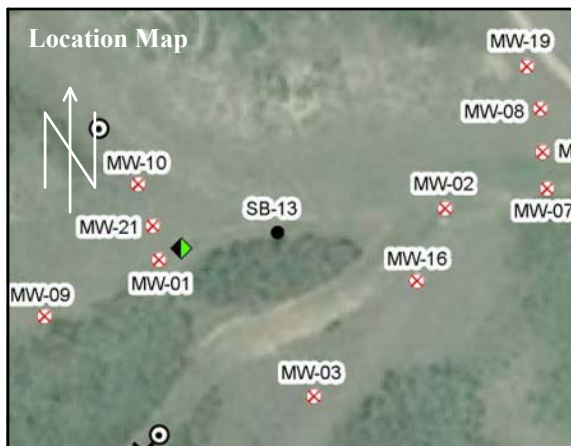
DETECTOR: MiniRAE 3000 PID

FILTER PACK: 10-20 Silica Sand

ANNULUS SEAL: Bentonite Chips

SURFACE SEAL: Sackrete

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
0.5		dry		2/2	5	SM		SILTY SAND - 5.0' - 9.0' - dark brown, with gravel, organics, dry, no odor, no staining	
0.5				2/2					
0.4				2/2	10	SM		SILTY SAND - 10.0' - 14.0' - dark brown to tan-brown, with gravel, sandstone fragments at 12' to 14' bgs, dry, no odor, no staining	
0.5				2/2					
0.2				2/2	15	SM		CLAYEY SAND - 15.0' - 17.0' - tan-brown, with gravel, sandstone fragments, dry, no odor, no staining	
0.4				2/2					
2.5				2/2	20	CL		SILTY CLAY - 20.0' - 23.0' - tan-brown, sandstone fragments, dry, no odor, no staining	
1.2				2/2					
296				2/2	25	SM		SILTY SAND - 25.0' - 29.0' - tan-brown, some silt, some clays, mudstone fragments, dry, hydrocarbon odor, no staining, dry to moist at 27' bgs, LNAPL present at 27' bgs	
1447		wet	MW-02 @27'-29'	2/2					
148.4		moist		2/2	30	SM		SILTY SAND - 30.0' - 31.0' - tan-brown, some silt, some clays, mudstone fragments, moist, hydrocarbon odor, no staining	
25.6			MW-02@ 34'-34.5'	2/2	35	Sandstone		SANDSTONE - 34.0' - 34.5' - tan-brown, laminated with mudstone, moist, no odor, no staining, competent bedrock, auger refusal @ 34.5'	



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 8"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

BORING/WELL ID: MW-03

COMPLETION DATE: 10/11/17

TD (ft bgs): 35.5'

DTW (ft bgs): 24'

SCREEN SLOT: 0.010"

CASING LENGTH: 10.5'

SCREEN LENGTH: 25'

LOGGED BY: Dustin Held

SAMPLE METHOD: 2' Split-Spoon

DRILL METHOD: Hollow Stem Auger

DRILLED BY: Dakota Drilling, Inc.

DETECTOR: MiniRAE 3000 PID

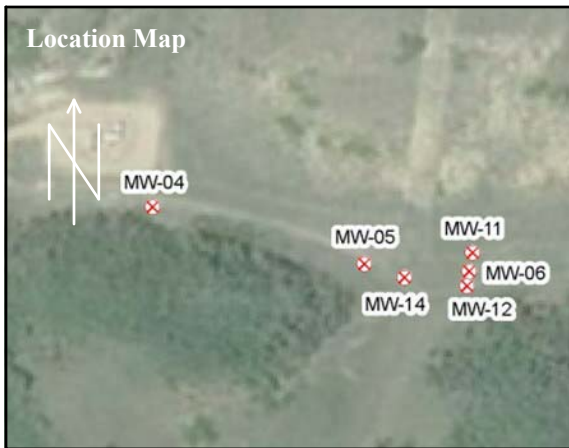
FILTER PACK: 10-20 Silica Sand

ANNULUS SEAL: Bentonite Chips

SURFACE SEAL: Sackrete

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
0.3		dry		2/2	5	CL/SM		SILTY CLAY - 5.0' - 7.0' - brown-red, sandy, sandstone fragments, oxides, dry, no odor, no staining	
1.9				2/2	10	CL/SM		SILTY CLAY - 10.0' - 10.5.0' - brown-red, sandy, sandstone fragments, oxides, dry, no odor, no staining	
						Mudstone		MUDSTONE - 10.5' - 12.0' - gray, fractured, fissle, dry, no odor, no staining	
1.5				2/2	15	Mudstone		MUDSTONE - 16.0' - 16.5' - gray, fractured, dry, no odor, no staining	
5.6				2/2	20	Mudstone		MUDSTONE - 20.0' - 20.5' - reddish-gray, fractured, oxides, dry, no odor, no staining	
1.4		moist	MW-03@ 25'-25.5'	2/2	25	Mudstone		MUDSTONE - 25.0' - 25.5' - gray, fractured, interbedded with sandstone, moist, no odor, no staining	
1.1		wet		2/2	30	Mudstone		MUDSTONE - 30.0' - 30.5' - gray, fractured, interbedded with sandstone, moist, no odor, no staining	
1.2			MW-03@ 35'-35.5'	2/2	35	Mudstone		MUDSTONE - 35.0' - 35.5' - gray, fractured, interbedded with sandstone, moist, no odor, no staining	

Location Map



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 8"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

BORING/WELL ID: MW-04

COMPLETION DATE: 10/12/17

TD (ft bgs): 38'

DTW (ft bgs): 33'

SCREEN SLOT: 0.010"

CASING LENGTH: 23'

SCREEN LENGTH: 15'

LOGGED BY: Dustin Held

SAMPLE METHOD: 2' Split-Spoon

DRILL METHOD: Hollow Stem Auger

DRILLED BY: Dakota Drilling, Inc.

DETECTOR: MiniRAE 3000 PID

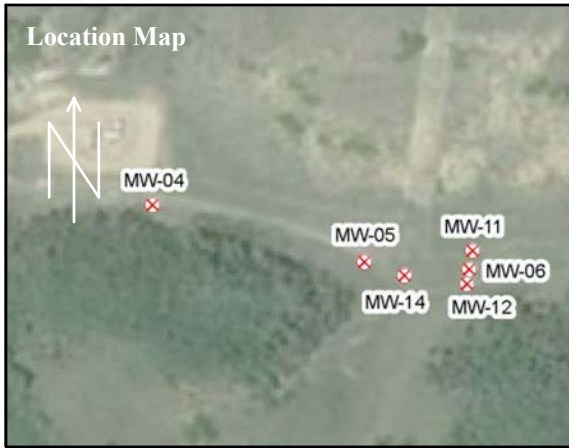
FILTER PACK: 10-20 Silica Sand

ANNULUS SEAL: Bentonite Chips

SURFACE SEAL: Sackrete

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
0.0		dry		2/2	5	SM		SILTY SAND - 5.0' - 7.0' - dark brown, clayey, sandstone fragments, dry, no odor, no staining	
0.0				2/2	10	SM		SILTY SAND - 10.0' - 12.0' - dark brown, clayey, sandstone fragments, dry, no odor, no staining	
0.4				2/2	15	SW/SC		SAND - 15.0' - 17.0' - red-dark brown, clayey, oxides, fine grain sandstone interbeds, dry, no odor, no staining	
0.4				2/2	20	SM		SILTY SAND - 20.0' - 20.5' - red, clayey, mudstone fragments, moist, no odor, no staining	
0.5		moist/dry		2/2	25	Mudstone		MUDSTONE - 20.5' - 22.0' - gray, some sand, fissile, dry, no odor, no staining	
4.5		dry		2/2	30	Mudstone		MUDSTONE - 25.0' - 25.5' - gray, dry to moist, no odor, no staining	
18.8		wet	MW-04@ 35'-35.5'	2/2	35	SM		MUDSTONE - 30.0' - 30.5' - gray, sandy, dry, no odor, no staining	
8.5			MW-04@ 38.'-38.5'	2/2	40	SM		SILTY SAND - 35.0' - 35.5' - red brown, clayey, oxides, wet, no odor, no staining, sandstone layers	
								SILTY SAND - 38.0' - 38.5' - red brown, clayey, some mudstone, oxides, wet, no odor, no staining	

Location Map



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

PROJECT NAME:	K35 CDP Pipeline Release		
PROJECT NO:	050817017	LOGGED BY:	Dustin Held
BORING/WELL ID:	MW-05	SAMPLE METHOD:	2' Split-Spoon
COMPLETION DATE:	10/16/17	DRILL METHOD:	Solid Stem Auger
TD (ft bgs):	15'	DRILLED BY:	Dakota Drilling, Inc.
DTW (ft bgs):	6'	DETECTOR:	MiniRAE 3000 PID
SCREEN SLOT:	0.010"	FILTER PACK:	10-20 Silica Sand
CASING LENGTH:	2.5'	ANNULUS SEAL:	Bentonite Chips
SCREEN LENGTH:	12.5'	SURFACE SEAL:	Sackrete

HOLE DIAMETER: 6"

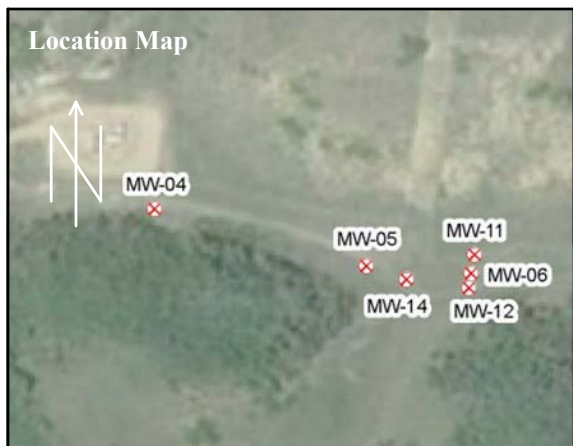
WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
1226		wet	MW-05 @5'-7'	2/2	5	SC		CLAYEY SAND - 5.0' - 7.0' - dark brown, silty, with gravel, wet, hydrocarbon odor, no staining, LNAPL present at 6' bgs	
326				2/2	10	SC		CLAYEY SAND - 10.0' - 12.0' - dark brown, silty, with gravel, wet, hydrocarbon odor, no staining	
32.7			MW-05 @15'-17'	2/2	15	CL		SILTY CLAY - 15.0' - 17.0' dark brown, sandy, few shale fragments, wet, no odor, no staining	

Location Map



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 6"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

BORING/WELL ID: MW-06

COMPLETION DATE: 10/16/17

TD (ft bgs): 25'

DTW (ft bgs): 19.5'

SCREEN SLOT: 0.010"

CASING LENGTH: 15'

SCREEN LENGTH: 10'

LOGGED BY: Dustin Held

SAMPLE METHOD: 2' Split-Spoon

DRILL METHOD: Solid Stem Auger

DRILLED BY: Dakota Drilling, Inc.

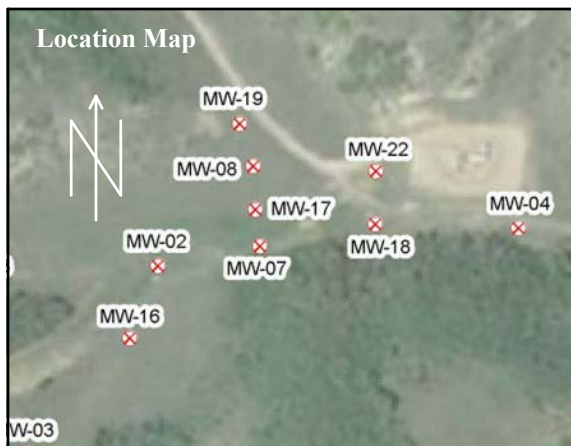
DETECTOR: MiniRAE 3000 PID

FILTER PACK: 10-20 Silica Sand

ANNULUS SEAL: Bentonite Chips

SURFACE SEAL: Sackrete

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
1.5		dry		2/2	5	CL		SILTY CLAY - 5.0' - 7.0' - dark brown, sandy, with gravel, dry, no odor, no staining	
1.1				2/2	10	CL/SC		SILTY CLAY - 10.0' - 11.0' - dark brown, sandy, with gravel, dry, no odor, no staining	
0.3				2/2				CLAYEY SAND - 12.0' - 14.0' - brown, with gravel, dry, no odor, no staining, sandstone layer at 13.75'-14'	
0.2		moist		2/2	15	CL		SILTY CLAY - 15' - 22.0' - brown-gray, sandy, with gravel, 0.5' layer with organics, shale pieces, dry to moist at 17' bgs, wet at 19' bgs, no odor, no staining	
1.6			MW-06@ 17'-19'	2/2					
0.3		wet		1/1	20				
				2/2					
0.5			MW-06@ 25'-27'	2/2	25	CL		SILTY CLAY - 25.0' - 27.0' - gray, sandy, with gravel, wet, no odor, no staining	



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 6"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

BORING/WELL ID: MW-07

COMPLETION DATE: 10/17/17

TD (ft bgs): 39.65'

DTW (ft bgs): 32.71'

SCREEN SLOT: 0.010"

CASING LENGTH: 25'

SCREEN LENGTH: 15'

LOGGED BY: Dustin Held

SAMPLE METHOD: 2' Split-Spoon

DRILL METHOD: solid Stem Auger

DRILLED BY: Dakota Drilling, Inc.

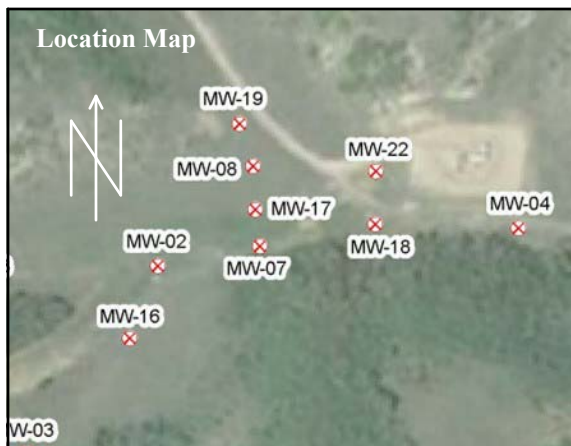
DETECTOR: MiniRAE 3000 PID

FILTER PACK: 10-20 Silica Sand

ANNULUS SEAL: Bentonite Chips

SURFACE SEAL: Sackrete

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
0.1		dry			0	CL		SILTY CLAY - 0.0' - 5.5' - dark brown, sandy, with gravel, shale pieces, low plasticity, dry, no odor, no staining	
				2/2	5	Mudstone		MUDSTONE - 5.5' - 6.0' - brown, sandy, platy, dry, no odor, no staining	
0.6				2/2	10	Mudstone		MUDSTONE - 10.0' - 10.5' - brown, sandy, platy, dry, no odor, no staining	
1.5				2/2	15	Mudstone		MUDSTONE - 15.0' - 15.5' - brown, sandy, platy, dry, no odor, no staining	
1.6				2/2	20	Mudstone		MUDSTONE - 20.0' - 20.5' - brown, sandy, platy, dry, no odor, no staining	
0.8				2/2	25	Mudstone		MUDSTONE - 25.0' - 25.5' - brown, sandy, platy, dry, no odor, no staining	
0.5		moist		2/2	30	Mudstone		MUDSTONE - 30.0' - 30.5' - brown, sandy, platy, moist, no odor, no staining	
1.2			MW-07@ 35'-35.5'	2/2	35	Mudstone		MUDSTONE - 35.0' - 35.5' - brown, sandy, platy, moist, no odor, no staining	
				2/2	40	Mudstone		38.0' - 38.5' - no recovery	



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

LOGGED BY: Dustin Held

BORING/WELL ID: MW-08

SAMPLE METHOD: 2' Split-Spoon

COMPLETION DATE: 10/17/17

DRILL METHOD: Solid Stem Auger

TD (ft bgs): 49.5

DRILLED BY: Dakota Drilling, Inc.

DTW (ft bgs): 39.7'

DETECTOR: MiniRAE 3000 PID

SCREEN SLOT: 0.010"

FILTER PACK: 10-20 Silica Sand

CASING LENGTH: 30'

ANNULUS SEAL: Bentonite Chips

SCREEN LENGTH: 20'

SURFACE SEAL: Sackrete

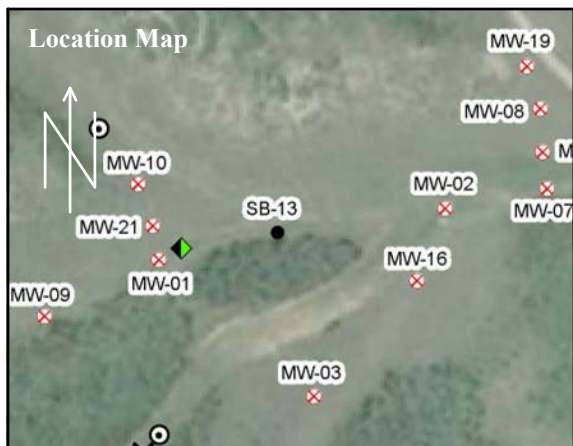
HOLE DIAMETER: 6"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
1.7		dry		2/2	5	SM		SILTY SAND - 5.0' - 7.0' - brown, clayey, with gravel, (shale pieces), low plasticity, organics, dry, no odor, no staining	
0.2				2/2	10	SM		SILTY SAND - 10.0' - 12.0' - red brown, clayey, with mudstone pieces, low plasticity, organics, dry, no odor, no staining	
0.3				2/2	15	SM		SILTY SAND - 15.0' - 17.0' - red brown, loose, clayey, with gravel, low plasticity, dry, no odor, no staining	
0.2				2/2	20	SM		SILTY SAND - 20.0' - 22.0' - brown, loose, with gravel, sandstone, pieces, dry, no odor, no staining	
1.4		moist		2/2	25	SM		SILTY SAND - 25.0' - 27.0' - brown, loose, with gravel, sandstone pieces, 1-3 mm thick sand layers, moist, no odor, no staining	
13.2				2/2	30	SM		SILTY SAND - 30.0' - 34.0' - brown, clayey, loose, with mudstone layers, moist, no odor, no staining	
14.6				2/2	35	SM		SILTY SAND - 35.0' - 37.0' - brown, clayey, loose, with mudstone layers, moist, no odor, no staining	
44.5				1/2	40	SM		SILTY SAND - 38.0' - 39.0' - brown, clayey, loose, with mudstone layers, moist, hydrocarbon odor, no staining, poor recovery, LNAPL present at 38.5' bgs	
1082			MW-08@ 40'-42'	2/2	40	Sandstone			
1127				2/2	45	Sandstone		SANDSTONE - 40.0' - 42.0' - red brown, silty, clayey, loose, with mudstone layers, moist, hydrocarbon odor, no staining	
148		wet		2/2	45	Sandstone		SANDSTONE - 45.0' - 45.5' - brown, fractured, wet, hydrocarbon odor, no staining	
-				NA	50	Sandstone			
					55			50'-50.5' - refusal, no recovery	



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 8"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

BORING/WELL ID: MW-09

COMPLETION DATE: 10/18/17

TD (ft bgs): 19.28'

DTW (ft bgs): 16'

SCREEN SLOT: 0.010"

CASING LENGTH: 5'

SCREEN LENGTH: 15'

LOGGED BY: Dustin Held

SAMPLE METHOD: 2' Split-Spoon

DRILL METHOD: Hollow Stem Auger

DRILLED BY: Dakota Drilling, Inc.

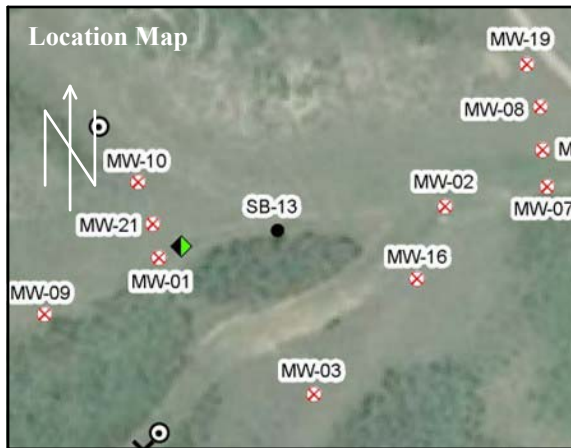
DETECTOR: MiniRAE 3000 PID

FILTER PACK: 10-20 Silica Sand

ANNULUS SEAL: Bentonite Chips

SURFACE SEAL: Sackrete

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
73.5		dry	MW-09 @ 5'-7'	2/2	5	SM		SILTY SAND - 5.0' - 7.0' - brown, medium dense, oxides, dry, hydrocarbon odor, no staining, sandstone at 6.75' bgs	
4.6				2/2	10	Sandstone		SANDSTONE - 10.0' - 10.5' - brown, pulverized, dry, hydrocarbon odor, no staining	
3.5				2/2	15	Sandstone		SANDSTONE - 15.0' - 15.5' - brown, pulverized, dry, no odor, no staining	
20.7		wet	MW-09@ 20'-20.5'	2/2	20	Sandstone		SANDSTONE - 10.0' - 10.5' - brown, pulverized, dry, no odor, no staining	



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 8"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

BORING/WELL ID: MW-10

COMPLETION DATE: 10/18/17

TD (ft bgs): 38.80'

DTW (ft bgs): 31.34'

SCREEN SLOT: 0.010"

CASING LENGTH: 23'

SCREEN LENGTH: 15'

LOGGED BY: Dustin Held

SAMPLE METHOD: 2' Split-Spoon

DRILL METHOD: Hollow Stem Auger

DRILLED BY: Dakota Drilling, Inc.

DETECTOR: MiniRAE 3000 PID

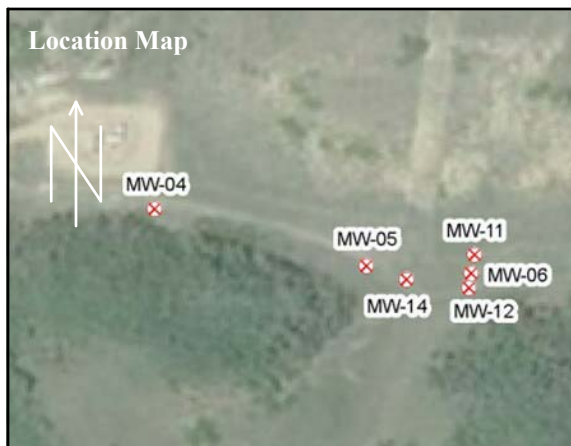
FILTER PACK: 10-20 Silica Sand

ANNULUS SEAL: Bentonite Chips

SURFACE SEAL: Sackrete

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
0.5		dry		2/2	5	SM		SILTY SAND - 5.0' - 7.0' - dark brown, clayey, with shale pieces, organics, dry, no odor, no staining	
					10	SM		SILTY SAND - 10.0' - 12.0' - red brown, clayey, with interbedded sandstone layers, few shale and sandstone pieces, organics, dry, no odor, no staining	
0.5				2/2	15	SM		SILTY SAND - 15.0' - 17.0' - red brown, clayey, with interbedded sandstone layers, few shale and sandstone pieces, organics, poor recovery, dry, no odor, no staining	
6.5				1/2	20	Sandstone		SANDSTONE - 20.0' - 22.0' - tan-red brown, poorly cemented, dry, no odor, no staining	
0.8				2/2	25	Sandstone		SANDSTONE - 25.0' - 25.5' - brown, poorly cemented, moist, no odor, no staining	
0.5		moist		2/2	30	Sandstone		SANDSTONE - 30.0' - 30.5' - brown, moist, no odor, no staining	
0.2			MW-10 @38'	2/2	35	Sandstone		SANDSTONE - 33.0' - 33.5' - brown, pulverized, dry, no odor, no staining	
		dry		2/2	40	Sandstone		SANDSTONE - 38.0' - 38.5' - gray brown, compact, wet, no odor, no staining	
		wet		2/2					

Location Map



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 8"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

BORING/WELL ID: MW-11

COMPLETION DATE: 10/19/17

TD (ft bgs): 34'

DTW (ft bgs): 23.33'

SCREEN SLOT: 0.010"

CASING LENGTH: 14'

SCREEN LENGTH: 20'

LOGGED BY: Wesley Toews

SAMPLE METHOD: 2' Split-Spoon

DRILL METHOD: Hollow Stem Auger

DRILLED BY: Site Services Drilling

DETECTOR: MiniRAE 3000 PID

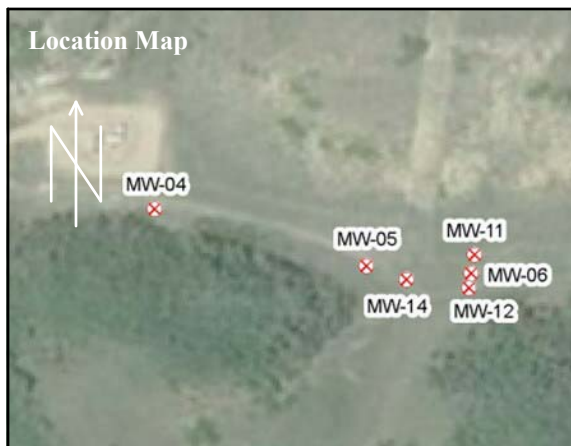
FILTER PACK: 10-20 Silica Sand

ANNULUS SEAL: Bentonite Chips

SURFACE SEAL: Sackrete

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
		dry			0			0.0' - 5.0' - not logged	
0.2				1.8/2	5	ML		SILT - 5.0' - 7.0' - brown, sandy, clayey, few gravels, organics, dry, no odor, no staining	
0.8				1.4/2	10	CL		SILTY CLAY - 10.0' - 12.0' - brown, sandy, few gravels, dry, no odor, no staining	
0.7				2/2	15	CL		SILTY CLAY - 15.0' - 17.0' - brown, sandy, few gravels, 3" sandstone layer, dry, no odor, no staining	
0.6		moist		2/2	20	SC		CLAYEY SAND - 20.0' - 22.0' - tan, few gravels, moist, no odor, no staining	
0.7		wet	MW-11 @25'-27'	2/2	25	SC		CLAYEY SAND - 25.0' - 27.0' - tan, sandstone fragments, wet, no odor, no staining	
0.7				2/2		GW		GRAVEL - 27.0' - 29.0' - tan, sandy, clayey, sandstone fragments, wet, no odor, no staining	
0.7				2/2	30	GC		CLAYEY GRAVEL - 30.0' - 32.0' - brown, sandy, sandstone fragments, wet, no odor, no staining	
0.9				0.1/0.1					
					35	Mudstone		MUDSTONE - 34.0' - 34.1' - brown, wet, no odor, no staining, auger refusal at 34.1' bgs	

Location Map



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 8"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

BORING/WELL ID: MW-12

COMPLETION DATE: 10/19/17

TD (ft bgs): 29'

DTW (ft bgs): 18.45'

SCREEN SLOT: 0.010"

CASING LENGTH: 14'

SCREEN LENGTH: 15'

LOGGED BY: Wesley Toews

SAMPLE METHOD: 2 foot Split-Spoon

DRILL METHOD: Hollow Stem Auger

DRILLED BY: Site Services Drilling

DETECTOR: MiniRAE 3000 PID

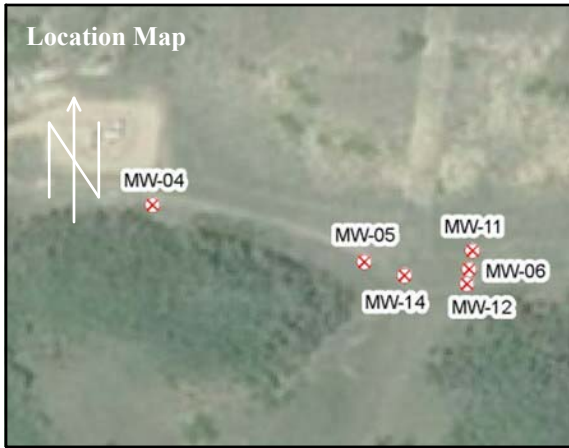
FILTER PACK: 10-20 Silica Sand

ANNULUS SEAL: Bentonite Chips

SURFACE SEAL: Sakrete

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
		dry			0			0.0' - 5.0' - not logged	
0.4				2/2	5	ML		SILT - 5.0' - 7.0' - dark brown, sandy, clayey, with gravel, organics, dry, no odor, no staining	
0.4				2/2	10	ML SS		SILT - 10.0' - 11.0' - dark brown, sandy, clayey, with gravel, organics, dry, no odor, no staining SANDSTONE - 11.0' - 12.0' - tan, poorly graded, dry, no odor, no staining	
2.4		moist		2/2	15	SS		SANDSTONE - 15.0' - 17.0' - tan, poorly graded, moist, no odor, no staining	
14.4		wet	MW-12 @19'-21'	2/2	20	Mudstone		MUDSTONE - 19.0' - 21.0' - dark brown, clayey, mudstone fragments, wet, no odor, no staining	
				NA	25			24.0' - refusal, no recovery	
				NA	29			29.0' - refusal, no recovery	

Location Map



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 8"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PROJECT NAME: K35 CDP Pipeline Releas

PROJECT NO: 050817017

LOGGED BY: Wesley Toews

BORING/WELL ID: MW-14

SAMPLE METHOD: 2' Split-Spoon

COMPLETION DATE: 10/19/17,10/20/17 **DRILL METHOD:** Hollow Stem Auger

TD (ft bgs): 14'

DRILLED BY: Site Services Drilling

DTW (ft bgs): 4.70'

DETECTOR: MiniRAE 3000 PID

SCREEN SLOT: 0.010"

FILTER PACK: K35 CDP Pipeline Relea

CASING LENGTH: 2'

ANNULUS SEAL: Bentonite Chips

SCREEN LENGTH: 12'

SURFACE SEAL: Sakrete

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
0.4		moist	MW-14 @5'-7'	2/2	5	ML		SILT - 5.0' - 9.0' - black, sandy, clayey, few gravels, organics, dry, no odor, no staining	
0.4		wet		1.6/2					
0.6				1.6/2	10	SC		CLAYEY SAND - 10.0' - 12.0' - brown, well graded, few gravels, wet, no odor, no staining	
8.4			MW-14 @14'-16'	2/2	15	GW		GRAVEL - 14.0' - 16.0' - brown, sandy, clayey, sandstone fragments, wet, no odor, no staining	

Location Map



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

PROJECT NAME: K35 CDP Pipeline Releas

PROJECT NO: 050817017

LOGGED BY: Wesley Toews

BORING/WELL ID: MW-15

SAMPLE METHOD: 2' Split-Spoon

COMPLETION DATE: 10/20/17

DRILL METHOD: Hollow Stem Auger

TD (ft bgs): 24'

DRILLED BY: Site Services Drilling

DTW (ft bgs): 15.59'

DETECTOR: MiniRAE 3000 PID

SCREEN SLOT: 0.010"

FILTER PACK: K35 CDP Pipeline Relea

CASING LENGTH: 9'

ANNULUS SEAL: Bentonite Chips

SCREEN LENGTH: 15'

SURFACE SEAL: Sakrete

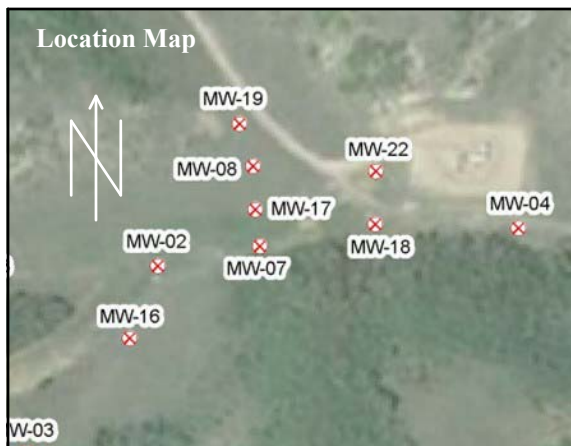
HOLE DIAMETER: 8"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
1.3		dry		2/2	5	ML		SILT - 5.0' - 7.0' - dark brown, sandy, clayey, organics, dry, no odor, no staining	
0.9		moist		2/2	10	SC		CLAYEY SAND - 10.0' - 12.0' - brown, some gravels, oxides, moist, no odor, no staining	
0.8				2/2	15	CL		SILTY CLAY - 15.0' - 17.0' - brown, some gravels, moist to wet at 16.5' bgs, medium plasticity, no odor, no staining	
0.9				1.2/2		CL		SILTY CLAY - 17.0' - 19.0' - brown, sandy, wet, low plasticity, no odor, no staining	
0.7		wet	MW-15 @15'-17'	2/2	20	SHALE		SHALE - 20.0' - 22.0' - tan to gray, fissile, fractured, sandstone layer, wet, no odor, no staining	
				NA				24.0' - refusal, no recovery	
					25				



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 6"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

BORING/WELL ID: MW-16

COMPLETION DATE: 10/20/17

TD (ft bgs): 34.5'

DTW (ft bgs): 29'

SCREEN SLOT: 0.010"

CASING LENGTH: 20'

SCREEN LENGTH: 15'

LOGGED BY: Dustin Held

SAMPLE METHOD: 2' Split-Spoon

DRILL METHOD: Solid Stem Auger

DRILLED BY: Dakota Drilling, Inc.

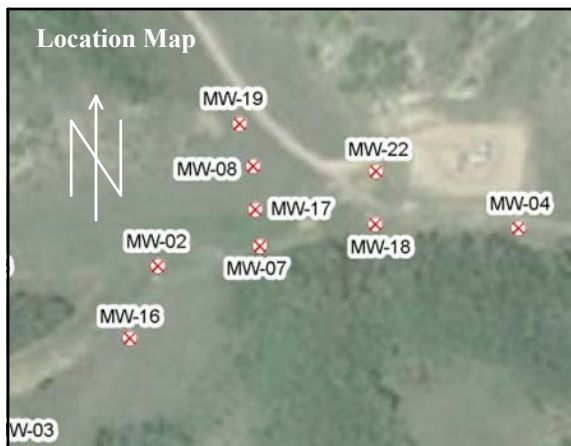
DETECTOR: MiniRAE 3000 PID

FILTER PACK: 10-20 Silica Sand

ANNULUS SEAL: Bentonite Chips

SURFACE SEAL: Sackrete

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
0.4		moist		2/2	5	SM		SILTY SAND - 5.0' - 7.0' - tan brown, clayey, loose, with sandstone and shale pieces, moist, no odor, no staining	
0.5				2/2	10	GW/GC		GRAVEL - 10.0' - 14.0' - tan brown, sandy, clayey, (shale and sandstone pieces), moist, no odor, no staining	
0.4				2/2					
6.4				2/2	15	GW		GRAVEL - 15.0' - 19.0' - tan brown, silty, clayey, loose, with sandstone pieces, oxides, moist, no odor, no staining	
1.5				2/2					
2.2		dry		2/2	20	GP		GRAVEL - 20.0' - 21.0' - tan brown, silty, clayey, loose, with sandstone pieces, oxides, dry, no odor, no staining	
						Sandstone		SANDSTONE - 21.0' - 22.0' - tan-brown, bedrock, dry, no odor, no staining	
				NA	25	Sandstone		25.0' - 25.5' - no recovery	
27.0		wet	MW-16 @30'	0.5/0.5	30	Sandstone		SANDSTONE - 30.0' - 30.5' - gray, fractured, bedrock, wet, hydrocarbon odor, no staining	
				NA	35	Sandstone		SANDSTONE - 35.0' - 35.5' - wet, no odor, no staining	



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

PROJECT NAME: K35 CDP Pipeline Release

PROJECT NO: 050817017

LOGGED BY: Dustin Held

BORING/WELL ID: MW-17

SAMPLE METHOD: 2' Split-Spoon

COMPLETION DATE: 10/23/17

DRILL METHOD: Hollow Stem Auger

TD (ft bgs): 39'

DRILLED BY: Site Services Drilling

DTW (ft bgs): 31'

DETECTOR: MiniRAE 3000 PID

SCREEN SLOT: 0.010"

FILTER PACK: 10-20 Silica Sand

CASING LENGTH: 19'

ANNULUS SEAL: Bentonite Chips

SCREEN LENGTH: 20'

SURFACE SEAL: Sackrete

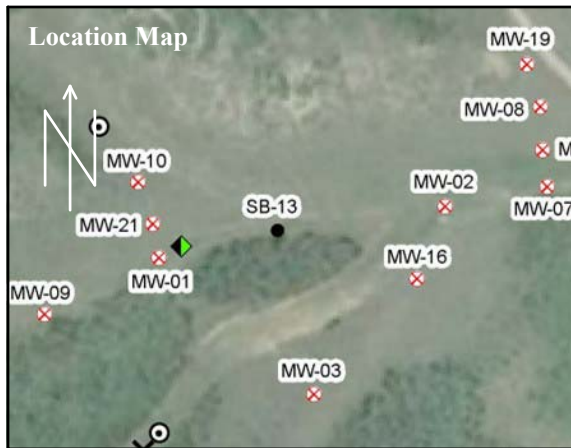
HOLE DIAMETER: 8"

WELL DIAMETER: 2"

CASING TYPE: SCH. 40 PVC

SCREEN TYPE: SCH. 40 PVC

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
					0			0.0' - 5.0' - not logged	
1.6		dry		2/2	5	CL		SILTY CLAY - 5.0' - 7.0' - dark brown, organics, medium plasticity, with sandstone pieces, dry, no odor, no staining	
2.2				2/2	10	CL		SILTY CLAY - 10.0' - 12.0' - red brown, gravelly, low plasticity, interbedded sandstone, dry, no odor, no staining	
7.1		moist		2/2	15	ML		SILT - 15.0' - 17.0' - dark brown, sandy, gravelly, trace clay, low plasticity, moist, no odor, no staining	
11.4				2/2	20	CL		SILTY CLAY - 20.0' - 22.0' - red brown, gravelly, sandy, low plasticity, moist, no odor, no staining	
5.0				2/2	25	CL		SILTY CLAY - 25.0' - 29.0' - brown, sandy, medium plasticity, moist to wet at 27' bgs, no odor, no staining	
11.9		wet	MW- 17 @27'-29'	2/2					
3.8				2/2	30	CL		SILTY CLAY - 30.0' - 33.0' - brown, medium plasticity, with sand layers, wet, no odor, no staining	
8.1				2/2		Sandstone		SANDSTONE - 33.0' - 34.0' - gray, fractured, bedrock, wet, no odor, no staining	
				NA					
					40	Sandstone		SANDSTONE - 39' - poor recovery	



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 6"
WELL DIAMETER: NA
CASING TYPE: NA
SCREEN TYPE: NA

PROJECT NAME: K35 CDP Pipeline Release
PROJECT NO: 050817017 **LOGGED BY:** Dustin Held
BORING/WELL ID: SB-13 **SAMPLE METHOD:** 2' Split-Spoon
COMPLETION DATE: 10/19/17 **DRILL METHOD:** Solid Stem Auger
TD (ft bgs): 49.5' **DRILLED BY:** Dakota Drilling, Inc.
DTW (ft bgs): Not encountered **DETECTOR:** MiniRAE 3000 PID
SCREEN SLOT: NA **FILTER PACK:** 10-20 Silica Sand
CASING LENGTH: NA **ANNULUS SEAL:** Bentonite Chips
SCREEN LENGTH: NA **SURFACE SEAL:** NA

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
		dry			0			0.0' - 5.0' - not logged	
0.4				2/2	5	SM		SILTY SAND - 5.0' - 7.0' - brown, clayey, with shale and sandstone pieces, low plasticity, dry, no odor, no staining, sandstone at 6.75' bgs	
0.3		moist		2/2	10	GC		CLAYEY GRAVEL - 10.0' - 12.0' - brown, sandy, with sandstone pieces, low plasticity, moist, no odor, no staining	
1.0				1/1	15	GC		CLAYEY GRAVEL - 14.0' - 15.0' - brown, sandy, with sandstone layers, medium density, moist, no odor, no staining	
0.6				2/2	15				
0.3		dry		0.5/0.5	20	Sandstone		SANDSTONE - 20.0' - 20.5' - brown, dry, no odor, no staining	
				NA	25			25.0' - 25.5' - no recovery	
				NA	30			30.0' - 30.5' - no recovery	
				NA	35			35.0' - 35.5' - no recovery	
10.1				NA	40	Sandstone		SANDSTONE - 40.0' - 40.1' - brown, pulverized, dry, no odor, no staining	
7.5				NA	45			SANDSTONE - 40.5' - 44.6' - brown, pulverized, fractured, bedrock, dry, no odor, no staining	
				NA	50	Sandstone		SANDSTONE - 49.0' - 49.5' - brown, pulverized, bedrock, dry, no odor, no staining	