



Whiting Petroleum Corporation
and its wholly owned subsidiary
Whiting Oil and Gas Corporation

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July 11, 2017

Mr. Stan Spencer
Northwest Environmental Protection Specialist
Colorado Oil and Gas Conservation Commission
796 Megan Ave., Suite 201
Rifle, Colorado 81650

Re: Morton Pepper #1 Pit Remediation
Whiting Petroleum Corporation
Remediation No.: No. 9102
Spill No.: 400820094

Introduction

Whiting Petroleum Corporation (Whiting) discovered a historical pit/release in March 2015 on the Pepper, M. et al #1 (COGCC Facility ID #315030); hereinafter as referred to as Morton Pepper #1. During the initial site investigation, soil impacts at a depth of approximately 5 feet below ground surface (ft-bgs) were discovered while removing a partially buried open top vault. Upon discovery, a Colorado Oil and Gas Conservation Commission (COGCC) Form 19, Spill/Release Report was submitted on April 4, 2015 and approved on April 9, 2015 (Spill Tracking #400820094).

A Form 27 Site Investigation Remediation Workplan was submitted to the COGCC on May 22, 2015 and approved on May 27, 2015. The assigned remediation number was 9102.

Information included in this report pertains to the site characterization, excavation activities, field screening results, quarterly groundwater monitoring, and laboratory analytical results.

Site Location

The Morton Pepper #1 well pad is located in the NW $\frac{1}{4}$, NW $\frac{1}{4}$, Section 6, T1N, R101W, of the 6th Prime Meridian. The site is located in the town of Rangely in Rio Blanco County, Colorado. Douglas Creek lies approximately 280 feet east and the White River lies approximately 1,200 feet north and north west of the Morton Pepper #1 location.

Initial Investigation

While removing a partially buried vault on the Morton Pepper #1 location, an area of stained soil was observed in the subsurface soils. An initial investigative site visit was conducted on March 31, 2015. The investigation confirmed that a historic pit was located on the northwest side of the Morton Pepper #1 well pad, off the pad surface. The pit had been backfilled and native vegetation had grown over the surface of the pit area.

A small excavation was conducted by Whiting contractors on the west edge of the pit and black stained soil was observed at approximately 4 ft-bgs. Initial field screen readings collected from within the excavation indicated that the soil was above COGCC Table 910-1 allowable standards for hydrocarbons. Screening was conducted using a PetroFlag™ screening kit, which estimated a soil total petroleum hydrocarbon (TPH) concentration of approximately 19,220 mg/kg.

Site Characterization Activities and Results

A site characterization event was conducted on April 15 and 16, 2015 to determine the vertical and lateral extent of hydrocarbon impacts. A total of twenty-one (21) soil borings were advanced into the subsurface soil around the area of the historic pit. Groundwater was encountered at approximately 4 ft-bgs; and a groundwater sample was collected from the impacted BH 15 location. Field screen readings, visual observations, and analytical results were utilized to determine the extent of the impacts.

Refer to the attached Figure 1 for a map of soil boring locations. Analytical results from the site characterization event are summarized in the attached Tables 1 and 2.

The Form 27 was submitted to the COGCC following the site characterization event.

Remediation

Remediation activities were conducted between June 3 and June 8, 2015. Approximately 208 load cubic yards of hydrocarbon impacted soil was excavated from the pit area and transported to the RN Industries Piceance Creek Disposal Facility for landfarming.

During excavation activities, field screen equipment was utilized to guide excavation activities to ensure compliance with COGCC Table 910-1. When field screening equipment indicated that all hydrocarbon impacted soil had been removed, confirmation soil samples were collected from the north, south, east, and west side walls and from the bottom of the excavation. Confirmation samples were collected in accordance with Rule 905.b.(4) from all four (4) walls at a position centered vertically and horizontally. The bottom sample was collected at the low point of the base of excavation. Each sample was submitted to ALS Environmental and analyzed for constituents outlined in COGCC Table 910-1.

Confirmation analytical results indicated that the sidewall and bottom of the excavation met the COGCC Table 910-1 requirements, except for arsenic, sodium adsorption ratio (SAR), and electrical conductivity (EC). Upon receiving the confirmation analytical results, the excavated area was backfilled with imported fill material and reclaimed as outlined in the COGCC 1000 series rule.

A Trimble Geo XT 2011 was used to satisfy requirements as outlined in COGCC Rule 215 for collecting GPS locations of each confirmation sample location from the excavation walls and bottom.

Refer to Figure 2 for a Confirmation Sample Location Map. Refer to Table 3 for a summary of excavation confirmation analytical results.

Background Sampling

Three (3) grab samples were collected from the undisturbed soil surrounding the well pad to satisfy Amendment 1 of the COGCC Table 910-1. All three (3) samples were analyzed for arsenic, as well as an additional analysis at one location which included the Inorganics in Soils parameters listed in Table 910-1 (SAR/EC/pH). Refer to Table 4.

Exceptions to COGCC Table 910-1 Soils Concentration Levels

As shown in Table 3, the five confirmation soil samples exhibited arsenic concentrations that exceeded the COGCC Table 910-1 standard. The four sidewall confirmation samples also exhibited SAR and EC results that exceeded Table 910-1. Whiting is requesting site closure and no further action on this site, as remaining arsenic concentrations in the excavated area are with background concentrations, and the elevated SAR/EC was observed at a depth of 4 ft-bgs, which is beneath the typical root zone.

Groundwater Monitoring

On June 15, 2015, five (5) piezometers (PZ-01 – PZ-05) were installed per the approved Form 27, and the quarterly groundwater monitoring program was implemented. The piezometer locations are depicted in Figure 3. The well construction logs are included in Appendix A.

All groundwater monitoring was completed in accordance with the approved Form 27. Sampling was conducted at each piezometer on a quarterly basis between July 2015 and April 2016. Static water levels were measured at the start of each sampling event. These were utilized to prepare potentiometric surface contour maps, included in Appendix B. The groundwater gradient ranged from approximately 0.0009 to 0.0012 feet/foot and mildly varied in direction between south-southwesterly and west-northwesterly.

Piezometer purging and sampling was conducted via a peristaltic pump and clean sample tubing. Water quality stabilization readings were collected using a YSI 556 multi-parameter meter. These data are summarized on Table 5.

Per the approved Form 27, gasoline range organics (GRO), diesel range organics (DRO), and benzene, ethylbenzene, toluene, and xylenes (BTEX) were monitored for four quarters. The results are summarized on Table 6. The quarterly monitoring data indicated that these analytes were compliant with their respective Table 910-1 groundwater concentration levels.

Please note that GRO and DRO were inadvertently left off the laboratory test assignments during the first quarterly monitoring event; however, since these parameters do not actually have Table 910-1 standards the omission did not impact Whiting's assessment of compliance with Table 910-1. GRO and DRO were sampled in subsequent quarterly monitoring events. At no time was liquid phase hydrocarbon observed.

Conclusion and Request for Closure

It is the opinion of Whiting that the site remediation activities represented to COGCC on the approved Form 27 have been successfully completed. Therefore, Whiting requests closure of Remediation 9102 and permission to plug and abandon the five piezometers.

Thank you for your assistance with this project. Please feel free to contact me at 303-390-1340 or at Jed.Smith@whiting.com.

WHITING PETROLEUM CORPORATION

A handwritten signature in black ink, appearing to read 'Jed Smith', with a large, stylized loop at the end.

Jed Smith
Environmental Professional III

Figure 1: Sample Location Map – Site Characterization

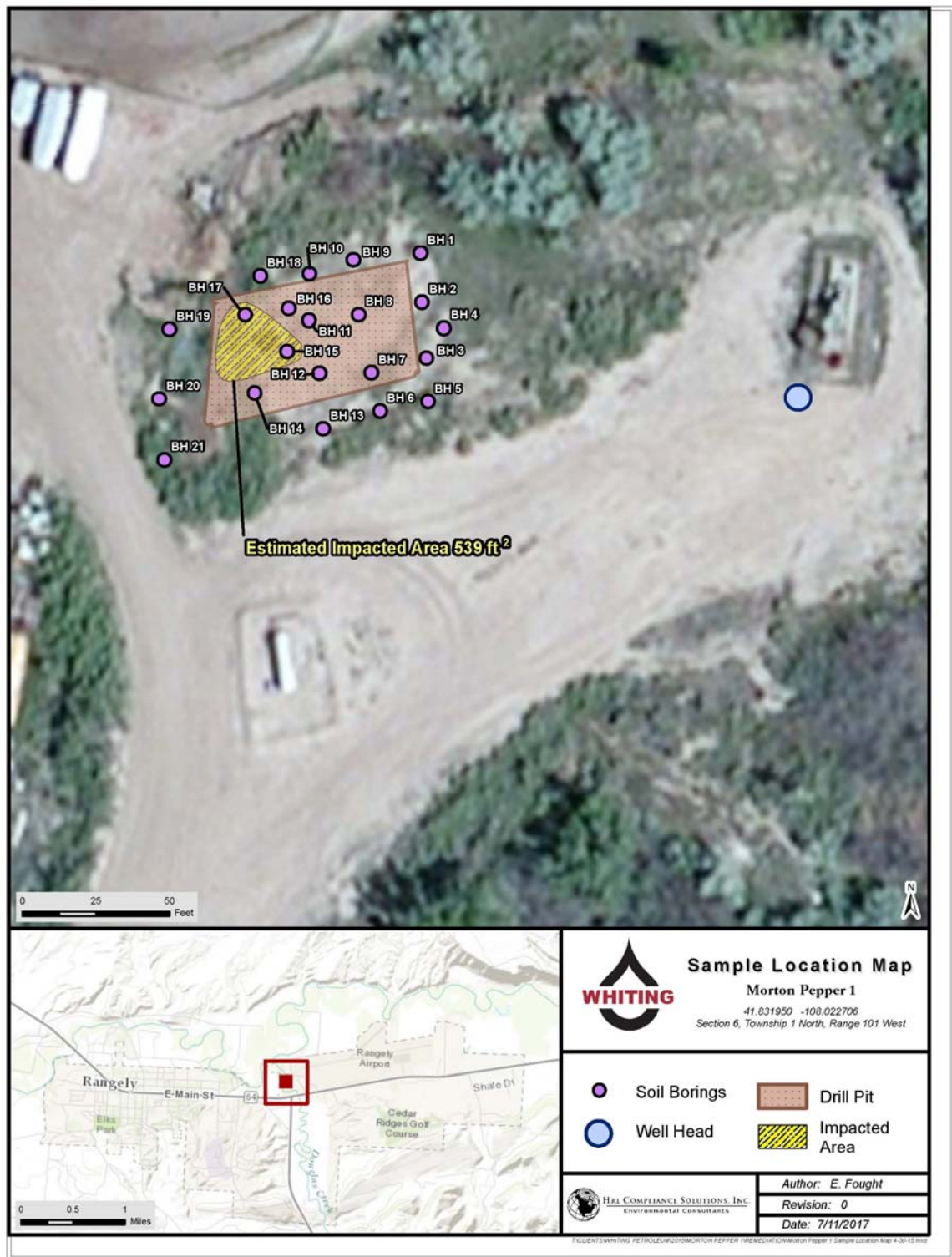
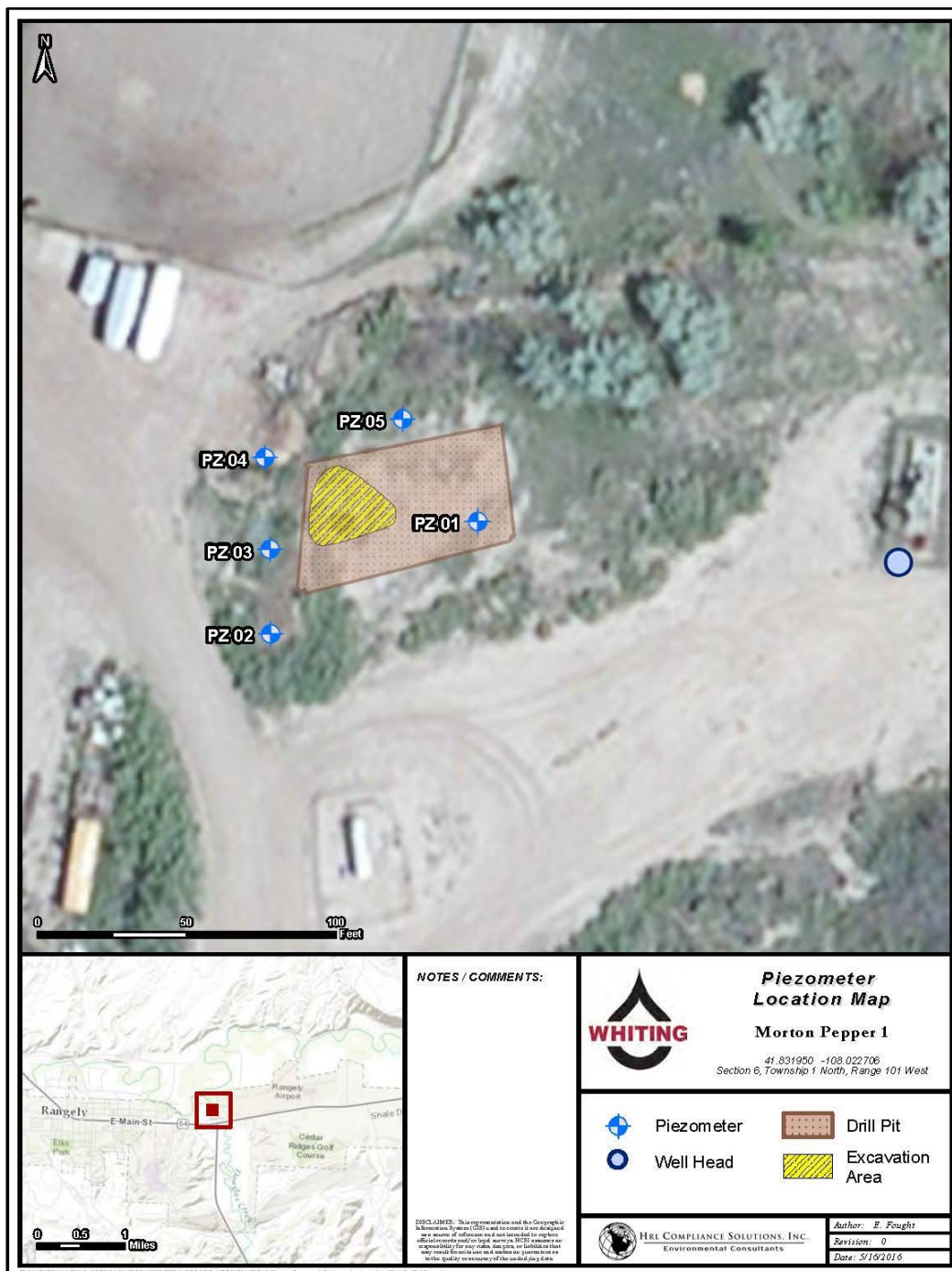


Figure 2: Sample Location Map



Figure 3: Piezometer Location Map



TABLES

Whiting Petroleum Corporation
Morton Pepper #1
TABLE 1: Site Characterization Soil Analytical Results

			Sample Location Name									
COGCC Table 910-1 Analyte Suite	Table 910-1 Standard (mg/kg)		BH 02, 3-5'	BH 04, 3-5'	BH 11, 3-5'	BH 12, 3-5'	BH 13, 3-5'	BH 14, 3-5'	BH 15, 3-5'	BH 17, 3-5'	BH 18, 3-5'	BH 19, 3-5'
		Lab ID →	15041225-01	15041225-02	15041225-03	15041225-04	15041225-05	15041225-06	15041165-01	15041165-02	15041225-07	15041225-08
		Sample Date →	4/15/2015	4/15/2015	4/15/2015	4/16/2015	4/16/2015	4/16/2015	4/16/2015	4/16/2015	4/16/2015	4/16/2015
		Method ↓	Results (mg/kg)									
Organics Compounds in Soils												
TEPH (DRO)	500	SW8015M	27	23	64	100	31	210	1,800	4,400	250	17
TVPH (GRO)	500		ND(3.1)	ND(3.3)	ND(2.9)	ND(2.9)	ND(2.9)	ND(3.2)	190	400	ND(2.9)	ND(3.1)
TPH (DRO+GRO)	500		27	23	64	100	31	210	1,990	4,800	250	17
BENZENE	0.17	SW8260B	ND(0.038)	ND(0.039)	ND(0.035)	ND(0.034)	ND(0.035)	ND(0.038)	ND(0.037)	0.230	ND(0.035)	ND(0.037)
ETHYLBENZENE	100		ND(0.038)	ND(0.039)	ND(0.035)	ND(0.034)	ND(0.035)	ND(0.038)	0.045	0.72	ND(0.035)	ND(0.037)
TOLUENE	85		ND(0.038)	ND(0.039)	ND(0.035)	ND(0.034)	ND(0.035)	ND(0.038)	ND(0.037)	0.1	ND(0.035)	ND(0.037)
XYLENES, TOTAL	175		ND(0.110)	ND(0.120)	ND(0.100)	ND(0.100)	ND(0.110)	ND(0.110)	ND(0.110)	3.6	ND(0.100)	ND(0.110)

NA = not analyzed

ND = non detect

Above COGCC Table 910-1 Standard

Laboratory reporting limits are shown in parentheses.

Laboratory analyses performed by ALS Environmental, Holland, Michigan

Whiting Petroleum Corporation Morton Pepper #1 TABLE 2: Site Characterization Groundwater Analytical Results				Method	SW8260						SW9056A		A2540 C-97
				Analyte	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Xylenes - Total	Sulfate	Chloride	Total Dissolved Solids
				Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L
				COGCC Table 910-1 Standard	5	560 to 1,000	700	NA	NA	1,400 to 10,000	<1.25 x background	<1.25 x background	<1.25 x background
Sample ID	Matrix	Sample Date	WO #										
BH 15	GW	4/16/2015	15041165-03		ND(5.0)	ND(5.0)	ND(5.0)	ND(10)	ND(5.0)	ND(15)	3,600	230	6,000

ND = non detect

Laboratory reporting limits are shown in parentheses.

Laboratory analyses performed by ALS Environmental, Holland, Michigan

Whiting Oil and Gas
Morton Pepper #1
TABLE 3: Excavation Confirmation Sample Analytical Results

				Sample Location / Depth (ft-bgs)				
COGCC Table 910-1 Analyte Suite	Table 910-1 Standard	Units		North Wall, 4'	South Wall, 4'	East Wall, 4'	West Wall, 4'	Bottom, 8'
			Lab ID →	1506380-01	1506380-03	1506380-04	1506380-02	1506380-05
			Sample Date →	6/3/2015	6/3/2015	6/3/2015	6/3/2015	6/3/2015
			Method ↓	Results				
Organics Compounds in Soils								
TEPH (DRO)	500	mg/kg	SW8015M	230	150	260	47	25
TVPH (GRO)	500	mg/kg		ND(3.0)	ND(3.3)	ND(3.1)	ND(3.1)	ND(3.1)
TPH (DRO+GRO)	500	mg/kg		230	150	260	47	25
BENZENE	0.17	mg/kg	SW8260B	ND(0.036)	ND(0.039)	ND(0.037)	ND(0.038)	ND(0.038)
TOLUENE	85	mg/kg		ND(0.036)	ND(0.039)	ND(0.037)	ND(0.038)	ND(0.038)
ETHYLBENZENE	100	mg/kg		ND(0.036)	ND(0.039)	ND(0.037)	ND(0.038)	ND(0.038)
XYLENE TOTAL	175	mg/kg	SW846 8270D	ND(0.110)	ND(0.120)	ND(0.110)	ND(0.110)	ND(0.110)
ACENAPHTHENE	1,000	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
ANTHRACENE	1,000	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
BENZO(A)ANTHRACENE	0.22	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
BENZO(A)PYRENE	0.022	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
BENZO(B)FLUORANTHENE	0.22	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
BENZO(K)FLUORANTHENE	2.2	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
CHRYSENE	22	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
DIBENZO(A,H)ANTHRACENE	0.022	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
FLUORANTHENE	1,000	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
FLUORENE	1,000	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
INDENO(1,2,3-CD)PYRENE	0.22	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
NAPHTHALENE	23	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
PYRENE	1,000	mg/kg		ND(0.0078)	ND(0.0086)	ND(0.0081)	ND(0.0081)	ND(0.0083)
Metals in Soils								
MERCURY	23	mg/kg	SW7471B	0.024	0.046	0.022	0.050	ND(0.017)
ARSENIC	0.39	mg/kg	SW846 6010C	6.6	8.0	4.6	7.3	5.5
BARIUM	15,000	mg/kg		140	160	160	160	120
CADMIUM	70	mg/kg		ND(0.35)	ND(0.38)	ND(0.36)	ND(0.35)	ND(0.39)
CHROMIUM (III)	120,000	mg/kg		10	11	7.1	12	3.5
CHROMIUM (VI)	23	mg/kg		ND(1.1)	2.6	ND(1.1)	ND(1.2)	ND(1.1)
COPPER	3,100	mg/kg		18	26	15	22	6.2
LEAD	400	mg/kg		13	19	9.7	16	7.9
NICKEL	1,600	mg/kg		13	19	11	16	6.4
SELENIUM	390	mg/kg		0.78	0.71	0.62	0.53	0.63
SILVER	390	mg/kg		ND(0.43)	ND(0.47)	ND(0.45)	ND(0.44)	ND(0.49)
ZINC	23,000	mg/kg		70	99	50	85	40
Inorganics in Soils								
Sodium Absorption Ratio	<12	unitless	USDA H60	31.0	24.0	16.0	27.0	8.8
Electrical Conductivity	<4mmhos/cm or 2x background	mmhos/cm		32.0	24.0	18.0	36.0	4.2
pH	6 to 9	Std pH Units	SW9045D	8.4	8.5	7.7	8.6	7.8
Moisture	NA	Percent	W160.3M	16.0	23.0	19.0	20.0	20.0

ND = non detect

Above COGCC Table 910-1 Standard

Laboratory reporting limits are shown in parentheses.

Laboratory analyses performed by ALS Environmental, Holland, Michigan

Morton Pepper #1

TABLE 4: Soil Background Sample Analytical Results

			Sample Location		
COGCC Table 910-1 Analyte Suite	Table 910-1 Standard		BKGD 01	BKGD 02	BKGD 03
		Lab ID →	1506693-01	1506693-02	1506693-03
		Sample Date →	6/8/2015	6/8/2015	6/8/2015
		Method ↓	Results		
Arsenic (mg/kg)	0.17 mg/kg	SW846 6010C	4.5	4.7	6.6
Sodium Absorption Ratio (unitless)	<12	USDA H60	NA	NA	0.73
Electrical Conductivity (mmhos/cm)	<4mmhos/cm or 2x background		NA	NA	4.1
pH (Std pH Units)	6 to 9	SW9045D	NA	NA	7.9
Moisture (%)		E160.3M	16	14	21

NA = not analyzed

ND = non detect

Laboratory analyses performed by ALS Environmental, Holland, Michigan

TABLE 5: Whiting Petroleum Corporation - Morton Pepper #1 Quarterly GW Monitoring Field Parameters

Field Parameters »				Static Depth to Water	Top of Casing Elevation	Static Groundwater Elevation	Temp	Conductivity	Conductivity	Resistivity	TDS	Salinity	Dissolved Oxygen (DO)	Dissolved Oxygen (DO)	pH	pHmV	ORP
Sample ID	Matrix	Date	Time	ft. BTOC	ft. AMSL	ft. AMSL	°C	mS/cm ^c	mS/cm	Ω*cm	g/L	ppt	% Saturation	mg/L	Std. Units	mV	mV
PZ-01	GW	7/10/2015	915	7.11	5224.77	5217.66	16.5	7.127	5.969	167.52	4.63	3.94	28.4	2.71	6.99	-23.3	120.3
PZ-01	GW	10/15/2015	1055	7.96	5224.77	5216.81	17.18	6.575	5.592	178.82	4.273	3.61	14.9	1.4	6.09	-18.9	-18.5
PZ-01	GW	1/12/2016	1135	7.51	5224.77	5217.26	7.55	7.215	4.81	207.89	4.689	3.97	100.9	11.78	7.43	-18.1	25.8
PZ-01	GW	4/14/2016	1125	6.68	5224.77	5218.09	12.55	7.085	5.401	185.16	4.606	3.92	17.9	1.85	7.30	171.4	187.6
PZ-02	GW	7/10/2015	933	9.51	5227.07	5217.56	14.61	10.01	8.029	124.55	6.51	5.67	21.3	2.09	7.01	-24.4	163.14
PZ-02	GW	10/15/2015	1133	10.34	5227.07	5216.73	16.93	11.99	10.14	98.612	7.793	6.88	13.5	1.25	5.85	-13.2	-24.0
PZ-02	GW	1/12/2016	1232	9.83	5227.07	5217.24	7.86	11.34	7.625	131.14	7.369	6.44	16.0	1.82	7.38	85.1	77.5
PZ-02	GW	4/14/2016	1212	8.99	5227.07	5218.08	12.94	5.099	3.924	254.82	3.314	2.76	136.3	14.13	6.91	192.5	279.7
PZ-03	GW	7/10/2015	946	7.92	5225.49	5217.57	15.17	10.16	8.25	121.21	6.6	5.76	10.3	1.0	7.0	-24.2	126.8
PZ-03	GW	10/15/2015	1150	8.75	5225.49	5216.74	17.2	8.007	6.815	146.74	5.205	4.46	8.1	0.76	6.39	-26.1	-82.0
PZ-03	GW	1/12/2016	1205	8.29	5225.49	5217.20	6.79	11.24	7.331	136.4	7.307	6.37	11.5	1.35	7.41	-11.8	75.7
PZ-03	GW	4/14/2016	1202	7.45	5225.49	5218.04	12.03	7.76	5.837	171.32	5.044	4.31	134.5	14.1	6.88	194.0	254.2
PZ-04	GW	7/10/2015	1000	7.61	5225.22	5217.61	16.6	8.19	6.876	145.42	5.32	4.57	23.6	2.24	7.07	-27.9	157.7
PZ-04	GW	10/15/2015	1212	8.44	5225.22	5216.78	20.34	7.566	6.893	146.08	4.918	1.19	27.5	2.42	6.78	-11.2	-36.0
PZ-04	GW	1/12/2016	1245	8.00	5225.22	5217.22	7.27	8.462	5.597	178.67	5.5	4.7	39.4	4.61	7.45	63.8	71.8
PZ-04	GW	4/14/2016	1151	7.17	5225.22	5218.05	12.86	9.416	7.233	138.25	6.121	5.31	131.3	13.43	6.98	189	275.0
PZ-05	GW	7/10/2015	1015	6.54	5224.18	5217.64	17.42	7.08	6.055	165.25	4.6	3.91	16.1	1.5	7.18	-33.5	119.9
PZ-05	GW	10/15/2015	1114	7.38	5224.18	5216.80	18.37	6.285	5.489	182.19	4.085	3.44	16.2	1.49	6.41	-26.5	-48.5
PZ-05	GW	1/12/2016	1217	6.94	5224.18	5217.24	5.74	6.956	4.397	227.42	4.522	3.8	15.6	1.91	7.45	127	47.2
PZ-05	GW	4/14/2016	1138	6.10	5224.18	5218.08	11.11	6.213	4.564	219.1	4.038	3.4	117.3	15.86	7.00	187.8	178.2

Notes:

All chemistry readings collected with a YSI 556 multi-parameter instrument

YSI unit calibrated prior to each sample event

Field personnel did not observe liquid hydrocarbons during the course of quarterly monitoring activities; therefore, only depths to water are shown in this table.

"BTOC" = below top of casing

"AMSL" = above mean sea level

Whiting Petroleum Corporation Morton Pepper #1 TABLE 6: Quarterly Groundwater Monitoring Analytical Results				Method	SW8015D		SW8260			
				Analyte	DRO (C10-C28)	GRO (C6-C10)	Benzene	Toluene	Ethylbenzene	Xylenes - Total
				Units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L
				COGCC Table 910-1 Standard	NA	NA	5	560 to 1,000	700	1,400 to 10,000
Sample ID	Matrix	Sample Date	WO #							
PZ-01	GW	7/10/2015	1507758-01		NA	NA	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-01	GW	10/15/2015	15101151-01		1.2	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-01	GW	1/12/2016	1601508-01		0.73	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-01	GW	4/14/2016	1604911-01		3.4	ND(0.2)	ND(10)	ND(10)	18	21
PZ-02	GW	7/10/2015	1507758-02		NA	NA	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-02	GW	10/15/2015	15101151-02		1.1	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-02	GW	1/12/2016	1601508-02		0.76	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-02	GW	4/14/2016	1604911-02		0.37	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-03	GW	7/10/2015	1507758-03		NA	NA	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-03	GW	10/15/2015	15101151-03		0.96	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-03	GW	1/12/2016	1601508-03		1.0	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-03	GW	4/14/2016	1604911-03		0.48	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-04	GW	7/10/2015	157758-04		NA	NA	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-04	GW	10/15/2015	15101151-04		0.80	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-04	GW	1/12/2016	1601508-04		0.78	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-04	GW	4/14/2016	1604911-04		0.39	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-05	GW	7/10/2015	1507758-05		NA	NA	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-05	GW	10/15/2015	15101151-05		0.76	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-05	GW	1/12/2016	1601508-05		0.76	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
PZ-05	GW	4/14/2016	1604911-05		ND(0.1)	ND(0.2)	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
Trip Blank	W	7/10/2015	1507758-06		NA	NA	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
Trip Blank	W	10/15/2015	15101151-06		NA	NA	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
Trip Blank	W	1/12/2016	1601508-06		NA	NA	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)
Trip Blank	W	4/14/2016	1604911-06		NA	NA	ND(1.0)	ND(1.0)	ND(1.0)	ND(3.0)

NA = not analyzed

ND = non detect

Laboratory reporting limits are shown in parentheses.

Laboratory analyses performed by ALS Environmental, Holland, Michigan

Appendix A: Well Construction Logs

[illegible]

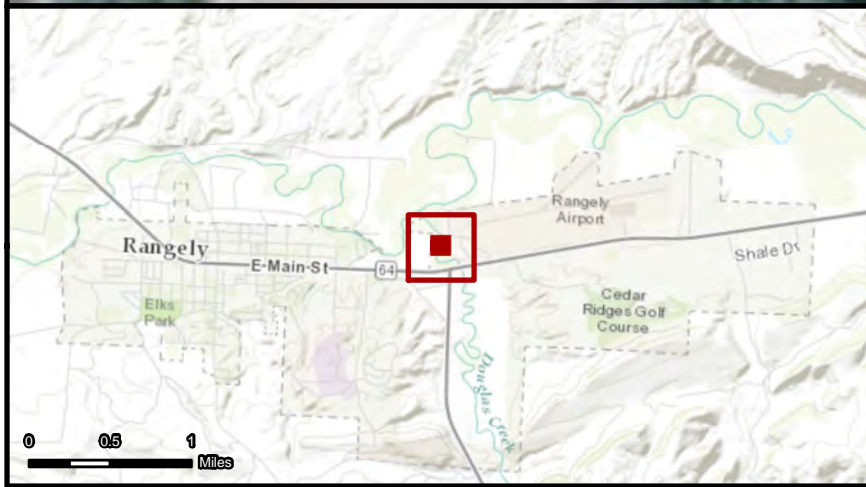
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


FORM NO. GWS-31 4/2012		WELL CONSTRUCTION AND TEST REPORT <small>STATE OF COLORADO, OFFICE OF THE STATE ENGINEER 1313 Sherman St., Ste 821, Denver, CO 80203 Main (303) 866-3581 Fax (303) 866-3589 www.water.state.co.us</small>		For Office Use Only	
1. WELL PERMIT NUMBER: MH 53910					
2. WELL OWNER INFORMATION					
NAME OF WELL OWNER: Whiting Oil and Gas Corporation					
MAILING ADDRESS: 2500 County road 26					
CITY: Rifle			STATE: CO	ZIP CODE: 81650	
TELEPHONE NUMBER w/area code:					
3. WELL LOCATION AS DRILLED: NW 1/4, NW 1/4, Sec., 6 Twp 1 N or S, Range 101 E or W					
DISTANCES FROM SEC. LINES: _____ ft. from _____ N or _____ S section line and _____ ft. from _____ E or _____ W section line.					
SUBDIVISION: _____ LOT _____ BLOCK _____ FILING (UNIT) _____					
Optional GPS Location: GPS Unit must use the following settings: Format must be UTM, Units must be meters, Datum must be NAD83, Unit must be set to true N, Zone 12 or Zone 13					
STREET ADDRESS AT WELL LOCATION: N/A					
Owner's Well Designation: PZ-03 Easting: 689398 Northing: 4400116					
4. GROUND SURFACE ELEVATION 5222.56 feet		DRILLING METHOD 4.25 I.D. Hollow Stem Auger			
DATE COMPLETED 06/15/2015 TOTAL DEPTH 13 feet		DEPTH COMPLETED 13 feet			
5. GEOLOGIC LOG:					6. HOLE DIAM (in.) From (ft) To (ft)
Depth	Type	Grain Size	Color	Water Loc.	
0-2 Feet	Clayey silt	Silt/Clay	Brown		8.25 0 13
2-5.5 Feet	Silt/Sand	Silt/f-m gr	gray brn	~5.5 feet	
5.5-13	River Gravel	2-6 inches	variable		
					7. PLAIN CASING:
					OD (in) Kind Wall Size (in) From (ft) To (ft)
					2 PVC Sched 40 2.5 ags 3 bqs
					PERFORATED CASING: Screen Slot Size (in): 0.10
					2 PVC Sched 40 3 13
					8. FILTER PACK:
					Material Sand Type
					Size 10-20 Depth
					Interval 2-13 feet
					10. GROUTING RECORD
					Material Amount Density Interval Placement
					See Remarks
Remarks: Well was sealed with a hydrated bentonite chips from 1-3 feet. Cemented from 0-1 foot. Lockable steel above ground cover					
11. DISINFECTION: Type					Amt. Used
12. WELL TEST DATA: Check box if Test Data is submitted on Form Number GWS 39 Supplemental Well Test.					
TESTING METHOD Well was not flow tested as it is being utilized for water gaulity measurements only					
Static Level 7.92 ft. Date/Time measured: 7/10/2015 Production Rate N/A gpm.					
Pumping Level N/A ft. Date/Time measured: N/A Test Length (hrs) N/A					
Remarks:					
13. I have read the statements made herein and know the contents thereof, and they are true to my knowledge. This document is signed (or name entered if filing online) and certified in accordance with Rule 17.4 of the Water Well Construction Rules, 2 CCR 402-2. The filing of a document that contains false statements is a violation of section 37-91-108(1)(e), C.R.S., and is punishable by fines up to \$5000 and/or revocation of the contracting license. If filing online the State Engineer considers entering of licensed contractor name to be compliance with Rule 17.4					
Company Name: HRL Compliance Solutions Inc.			Phone w/area code: 970-243-3271		License Number: Utah 5212206-2250
Mailing Address: 2385 F 1/2 Road Grand Junction, CO 81505					
Sign (or enter name if filing online) Mark E. Mumby			Print Name and Title Mark E. Mumby, RPG		Date 02/17/2016

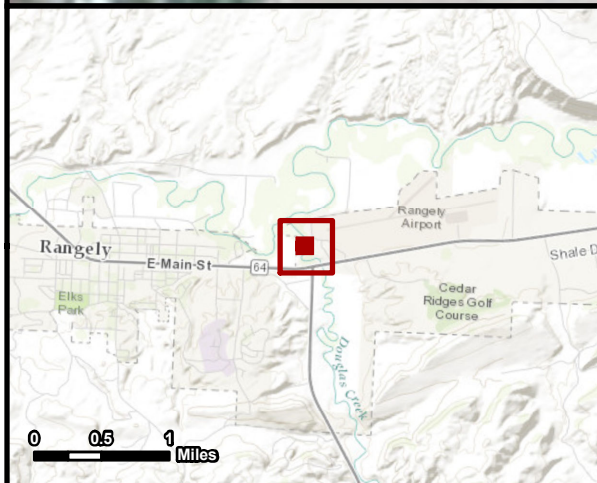
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[illegible]

Appendix B: Quarterly Potentiometric Surface Contour Maps



2015 3rd Quarter Potentiometric Map 	
Morton Pepper 1 41.831950 -108.022706 Section 6, Township 1 North, Range 101 West	
— Potentiometric Contours  Piezometer  Well Head	 Drill Pit  Excavation Area
 HRI COMPLIANCE SOLUTIONS, INC. Environmental Consultants	Author: E. Fought Revision: 0 Date: 8/7/2015



NOTES / COMMENTS:

DISCLAIMER: This representation and the Geographic Information System (GIS) used to create it are designed as a source of reference and not intended to replace official records and/or legal surveys. HCSL assumes no responsibility for any risks, dangers, or liabilities that may result from its use and makes no guarantee as to the quality or accuracy of the underlying data.



2015 4th Quarter Potentiometric Map

Morton Pepper 1

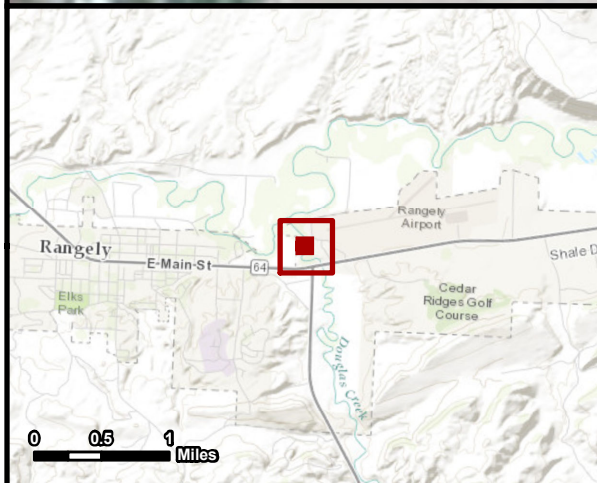
41.831950 -108.022706
Section 6, Township 1 North, Range 101 West

— Potentiometric Contours	Drill Pit
⊕ Piezometer	Excavation Area
○ Well Head	



HRL COMPLIANCE SOLUTIONS, INC.
Environmental Consultants

Author: E. Fought
Revision: 0
Date: 2/11/2016



NOTES / COMMENTS:

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2016 1st Quarter Potentiometric Map

Morton Pepper 1

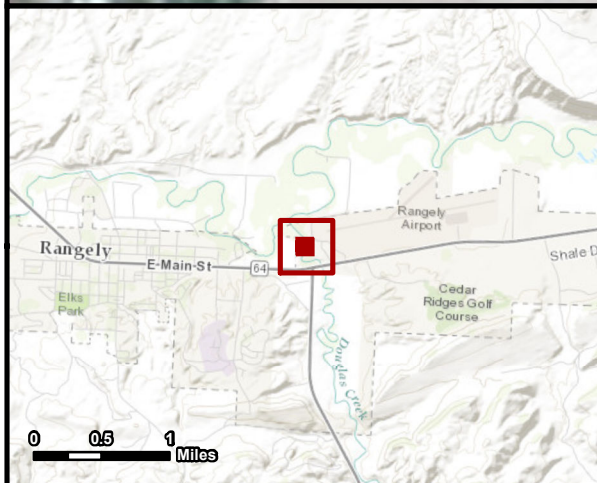
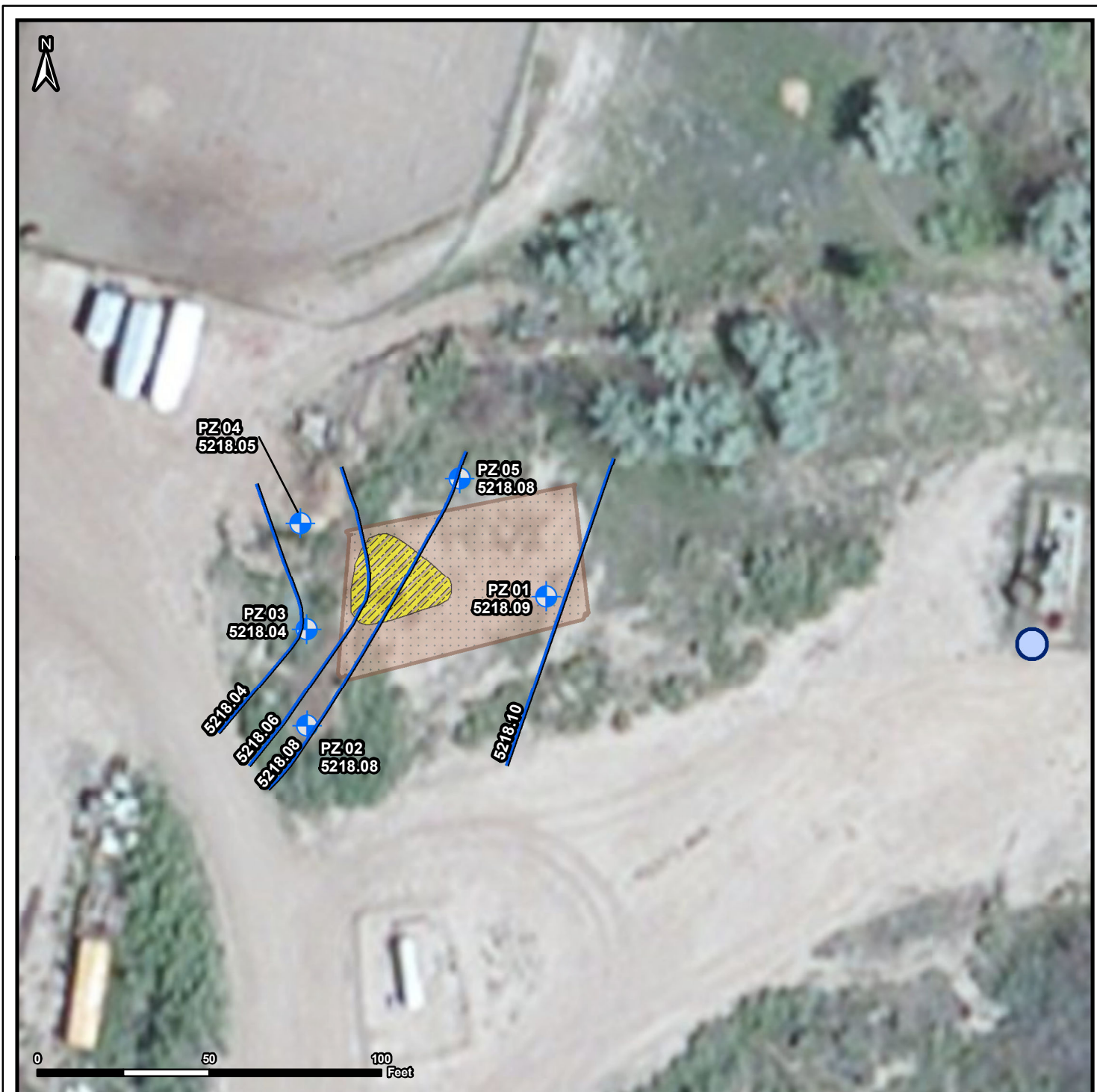
41.831950 -108.022706
Section 6, Township 1 North, Range 101 West

- | | |
|-------------------------|-----------------|
| Potentiometric Contours | Drill Pit |
| Piezometer | Excavation Area |
| Well Head | |



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Environmental Consultants

Author: E. Fought
Revision: 0
Date: 2/11/2016



NOTES / COMMENTS:

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2016 2nd Quarter Potentiometric Map

Morton Pepper 1

41.831950 -108.022706
Section 6, Township 1 North, Range 101 West

— Potentiometric Contours	Drill Pit
⊕ Piezometer	Excavation Area
○ Well Head	



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Environmental Consultants

Author: E. Fought
Revision: 0
Date: 6/14/2017