FREMONT ENVIRONMENTAL INC.

February 4, 2020

Mr. Jacob Evans
Noble Energy
2115 117th Avenue
Greeley, CO 80634

Subject: **Remediation and Groundwater Sampling Report**
Wiedeman PM J28-2, 28-7
API # 05-123-14002 (J28-2)
NWSW Sec 28, T5N, R66W
Weld County, Colorado
Fremont Project No. C016-093
Facility #327010, Remediation #10028

Dear Mr. Evans:

Enclosed please find a copy of the above referenced Remediation and Groundwater Sampling Report for the Wiedeman PM J28-2, 28-7 release site in Weld County, Colorado. The enclosed report describes remedial actions to address impacted groundwater as well as the recent quarterly groundwater monitoring at the site.

Please contact me at (303) 956- 8714 if you require any additional information.

Fremont appreciates the opportunity to provide this service.

Sincerely,
FREMONT ENVIRONMENTAL INC.

Paul V. Henehan, P.E.
Senior Consultant

Enclosure

1759 REDWING LANE, BROOMFIELD, CO 80020
(303) 956-8714 (DIRECT)

REMEDIATION AND GROUNDWATER SAMPLING REPORT

NOBLE ENERGY INC.

WIEDEMAN PM J28-2, 28-7

WELD COUNTY, COLORADO

FREMONT PROJECT NO. C016-110

FACILITY #327010, REMEDIATION #10028

Prepared by:

Fremont Environmental Inc.
1759 Redwing Lane
Broomfield, CO 80020
(303) 956-8714

February 4, 2020

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NOBLE ENERGY INC.

WIEDEMAN PM J28-2, 28-7

WELD COUNTY, COLORADO

FREMONT PROJECT NO. C016-110

FACILITY #327010, REMEDIATION #10028

1.0 INTRODUCTION

The purpose of this document is to present information collected during the remediation of petroleum-impacted groundwater at the Wiedeman PM J28-2, 28-7 former water vault release location in Weld County, Colorado. A solar-powered groundwater remediation system consisting of a soil vapor extraction (SVE) bubbler unit was installed and activated at the site in June 2018. This remediation system has been deactivated following the removal of light non-aqueous phase liquid (LNAPL) in MW-2.

A new propane powered system consisting of five air sparge (AS) wells and two passive SVE wells was installed December 2019 to replace the previous solar-powered system and address the remaining soil and dissolved phase groundwater impacts. The system is awaiting activation pending the installation of the propane fuel source.

2.0 BACKGROUND INFORMATION

2.1 Site Location

The Wiedeman PM J28-2, 28-7 site is in Evans, Weld County, Colorado as shown on Figure 1. The site is located on cultivated land approximately 0.3 miles southeast of the intersection of West 37th St. and 65th Ave. The location is further described as the NE ¼ of the SW ¼ of Section 28, Township 5N, Range 66W.

2.2 Site History

The site consists of the area adjacent to and beneath the former water vault for the Wiedeman PM J28-2 natural gas well. The Wiedeman PM J28-2 well was drilled in 1988

to a total vertical depth of 7,501 feet. Soil impacts were identified adjacent to the former water vault during its removal.

A site investigation to determine the extent of soil impacts was conducted in October 2016. A total of seven soil borings were advanced utilizing a Geoprobe rig. These borings were completed as flush-mounted 1-inch diameter monitoring wells. These monitoring wells were used to delineate the extent of soil and groundwater impacts at the site. The locations of the monitoring wells are illustrated on the attached figures.

An excavation to remediate the source impacts was undertaken in September 2017. Approximately 160 cubic yards of impacted soil were removed and transported to the landfill. Soil samples were collected from the excavation sidewalls and floor and analyzed for petroleum constituents. The laboratory analyses of the soil samples indicated that petroleum constituent concentrations were less than the Colorado Oil and Gas Conservation Commission's (COGCC's) Table 910-1 limits in the samples.

On March 25, 2019 seven additional soil borings were advanced utilizing a Geoprobe rig to define the remaining extent of impacts onsite. The soil boring logs and data from the investigation were used to establish a target area for the installation of a combined AS/passive SVE remediation system with a larger radius of influence. A monitoring well (MW-8) was also installed during this investigation to establish a point of compliance to the north.

3.0 GROUNDWATER MONITORING AND REMEDIATION ACTIVITIES

3.1 Groundwater Level Measurements

Groundwater levels were measured in the eight monitoring wells on January 13, 2020. The data are summarized in Table 1.

Water table contours inferred from the January 13, 2020 data are illustrated on Figure 3. Based on these data, groundwater is inferred to flow to the east. The water table gradient was calculated at approximately 0.016 feet per foot (ft/ft) for the January 2020 data.

3.2 Groundwater Sampling and Analysis

Groundwater samples were collected from eight monitoring wells on January 13, 2020 to monitor the magnitude and extent of groundwater impacts at the site. No monitoring wells contained LNAPL.

The groundwater samples were submitted to Summit Scientific Inc. in Golden, Colorado for analyses of benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA Method 8260B. The groundwater chemistry data is illustrated on Figure 4.

The laboratory data indicate that the BTEX constituents were below their respective laboratory detection limits in seven of the eight wells for the January 2020 sampling event. The groundwater analytical data are summarized in Table 1. A copy of the laboratory reports, quality control data, and chain-of-custody documentation are presented in Appendix A.

3.3 Groundwater Remediation System

As a result of groundwater impacts in monitoring well MW-2, Noble installed a solar-powered soil vapor extraction (SVE) bubbler system at this site in June 2018. The remediation system was effective in removal of LNAPL and has been deactivated.

To address remaining impacts in the vadose zone and dissolved phase groundwater impacts a propane powered remediation system consisting of five AS and 2 passive SVE wells was installed. The AS wells are manifolded directly to the propane powered remediation trailer. Figure 5 illustrates the layout of the remediation system.

The recent quarterly groundwater sampling event, which was conducted on January 13, 2020 indicates that LNAPL remediation via solar powered SVE remains effective post deactivation. Due to an influx of sedimentation, MW-2 was abandoned and replaced with MW-2R in April 2019 and, as previously mentioned, MW-8 was added to establish a northern point of compliance. As of October 7, 2019, LNAPL was removed and remains absent in MW-2R. Concentrations of dissolved phase constituents in the monitoring point are decreasing but remain above the COGCC Table 910-1 limits. These impacts to the saturated and unsaturated zone will be addressed with the activation of newly installed AS/passive SVE remediation system.

4.0 DISCUSSION

As demonstrated by soil sampling and analyses, the petroleum-impacted soil was removed from the site by excavation in September 2017. Approximately 160 cubic yards of impacted soil were removed and transported to the landfill.

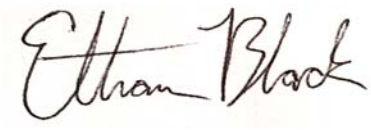
Since groundwater impacts (LNAPL and dissolved constituents) were present after the excavation was completed, an SVE/bubbler remediation system was installed and activated in June 2018 to address LNAPL impacts. The remediation system has effectively removed LNAPL from MW-2 over the term of its operation and has since been deactivated and replaced by a propane powered remediation system installed to address the remaining impacts in the saturated and unsaturated zones.

Noble will sample the groundwater on a quarterly basis to evaluate the BTEX concentrations relative to COGCC's Table 910-1 requirements. After four consecutive quarters of COGCC-compliant BTEX concentrations, Noble will request closure of this site.

5.0 REMARKS

The discussion and conclusions contained in this report represent our professional opinions. These opinions are based on currently available information and are arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. No warranty is implied or intended.

This report was prepared by **FREMONT ENVIRONMENTAL INC.**



2/4/20

_____ Date_____

Ethan Black
Geologist

Reviewed by:

2/4/20

_____ Date_____

Paul V. Henehan, P.E.
Senior Consultant

TABLES

TABLE 1

SUMMARY OF GROUND WATER ELEVATION DATA AND CHEMISTRY DATA

NOBLE ENERGY INC.

WIEDEMAN PMJ 28-2, WELD COUNTY, COLORADO

FREMONT PROJECT NO. C016-110

SAMPLE LOCATION	DATE	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)	TOC ELEVATION (feet)	DEPTH TO GROUND WATER (ft)	GROUND WATER ELEVATION (ft)	FREE PRODUCT THICKNESS (ft)
MW-1	10/12/16	<1.0	1.5	<1.0	<1.0	98.19	12.67	85.52	NP
	01/06/17	<1.0	<1.0	<1.0	<1.0		15.87	82.32	NP
	04/05/17	<1.0	<1.0	<1.0	<1.0		18.19	80.00	NP
	08/14/17	<1.0	<1.0	<1.0	<1.0		9.36	88.83	NP
	10/11/17	<1.0	<1.0	<1.0	<1.0		12.43	85.76	NP
	01/11/18	<1.0	<1.0	<1.0	<1.0		15.46	82.73	NP
	04/27/18	<1.0	<1.0	<1.0	<2.0		17.85	80.34	NP
	07/27/18	<1.0	<1.0	<1.0	<2.0		8.79	89.40	NP
	08/23/18	NS	NS	NS	NS		8.12	90.07	NP
	10/17/18	<1.0	<1.0	<1.0	<2.0		13.58	84.61	NP
	01/21/19	<1.0	<1.0	<1.0	<2.0		16.55	81.64	NP
	04/23/19	<1.0	<1.0	<1.0	<2.0		18.76	79.43	NP
	07/09/19	<1.0	<1.0	<1.0	<2.0		18.41	79.78	NP
	10/07/19	<1.0	<1.0	<1.0	<2.0		11.49	86.70	NP
	01/13/20	<1.0	<1.0	<1.0	<2.0		15.41	82.78	NP
MW-2	10/12/16	**20000**	**32000**	**1400**	**19000**	97.58	12.43	85.15	NP
	01/06/17	NS	NS	NS	NS		15.95	81.63	**0.34**
	04/05/17	NS	NS	NS	NS		18.42	79.16	**1.00**
	08/14/17	NS	NS	NS	NS		9.03	88.55	**0.13**
	10/11/17	NS	NS	NS	NS		12.11	98.19	**0.25**
	01/11/18	NS	NS	NS	NS		15.39	82.19	**0.24**

SAMPLE LOCATION	DATE	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)	TOC ELEVATION (feet)	DEPTH TO GROUND WATER (ft)	GROUND WATER ELEVATION (ft)	FREE PRODUCT THICKNESS (ft)
MW-2	04/27/18	NS	NS	NS	NS	97.58	18.82	78.76	**1.66**
	07/27/18	**1900**	41	27	**81000**		8.05	89.53	NP
	08/23/18	NS	NS	NS	NS		7.61	89.97	NP
	10/17/18	**4200**	**4800**	150	**26000**		13.06	84.52	NP
	01/21/19	DRY	DRY	DRY	DRY		DRY	DRY	DRY
MW-2R	04/23/19	IW	IW	IW	IW	97.99	18.97	79.02	IW
	07/09/19	**1200**	**1700**	20	**5200**		17.59	80.40	NP
	10/07/19	**300**	**270**	36	**2700**		11.48	86.51	NP
	01/13/20	**5000**	**9000**	630	**8400**		15.62	82.37	NP
MW-3	10/12/16	**260**	**640**	150	**2600**	97.52	12.53	84.99	NP
	01/06/17	**1400**	**1900**	310	**6700**		15.99	81.53	NP
	04/05/17	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	08/14/17	<1.0	<1.0	<1.0	2.2		7.61	89.91	NP
	10/11/17	2.7	2.0	7.6	280		12.18	98.19	NP
	01/11/18	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	04/27/18	Dry	Dry	Dry	Dry		Dry	Dry	Dry
MW-3R	07/27/18	<1.0	<1.0	<1.0	<2.0	97.55		97.55	NP
	08/23/18	NS	NS	NS	NS		5.64	91.91	NP
	10/17/18	<1.0	2.7	4.9	12		13.45	84.10	NP
	01/21/19	**8.6**	<1.0	<1.0	390		16.65	80.90	NP
	04/23/19	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	07/09/19	<1.0	<1.0	<1.0	<2.0		9.37	88.18	NP
	10/07/19	<1.0	<1.0	<1.0	<2.0		10.91	86.64	NP
	01/13/20	<1.0	<1.0	<1.0	<2.0		15.43	82.12	NP
MW-4	10/12/16	<1.0	<1.0	<1.0	<1.0	96.80	12.38	84.42	NP
	01/06/17	<1.0	<1.0	<1.0	<1.0		15.62	81.18	NP

SAMPLE LOCATION	DATE	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)	TOC ELEVATION (feet)	DEPTH TO GROUND WATER (ft)	GROUND WATER ELEVATION (ft)	FREE PRODUCT THICKNESS (ft)
MW-4	04/05/17	Dry	Dry	Dry	Dry	96.80	Dry	Dry	Dry
	08/14/17	<1.0	<1.0	<1.0	<1.0		7.84	88.96	NP
	12/23/17	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	01/11/18	<1.0	<1.0	<1.0	<1.0		15.22	81.58	NP
	04/27/18	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	07/27/18	<1.0	<1.0	<1.0	<2.0		5.90	90.90	NP
	08/23/18	NS	NS	NS	NS		6.22	90.58	NP
	10/17/18	<1.0	<1.0	<1.0	<2.0		13.02	83.78	NP
	01/21/19	<1.0	<1.0	<1.0	<2.0		16.22	80.58	NP
	04/23/19	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	07/09/19	<1.0	<1.0	<1.0	<1.0		13.40	83.40	NP
	10/07/19	<1.0	<1.0	<1.0	<2.0		10.55	86.25	NP
	01/13/20	<1.0	<1.0	<1.0	<2.0		14.98	81.82	NP
MW-5	10/12/16	<1.0	<1.0	<1.0	2.9	95.98	11.50	84.48	NP
	01/06/17	<1.0	<1.0	<1.0	2.8		15.24	80.74	NP
	04/05/17	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	08/14/17	<1.0	<1.0	<1.0	<1.0		5.74	90.24	NP
	10/11/17	<1.0	<1.0	<1.0	<1.0		11.13	84.85	NP
	01/11/18	<1.0	<1.0	<1.0	<1.0		14.70	81.28	NP
	04/27/18	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	07/27/18	<1.0	<1.0	<1.0	<2.0		4.03	91.95	NP
	08/23/18	NS	NS	NS	NS		4.72	91.26	NP
	10/17/18	<1.0	<1.0	<1.0	<2.0		12.39	83.59	NP
	01/21/19	<1.0	<1.0	<1.0	<2.0		15.77	80.21	NP
	04/23/19	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	07/09/19	<1.0	<1.0	<1.0	<2.0		5.20	90.78	NP
	10/07/19	<1.0	<1.0	<1.0	<2.0		9.79	86.19	NP

SAMPLE LOCATION	DATE	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)	TOC ELEVATION (feet)	DEPTH TO GROUND WATER (ft)	GROUND WATER ELEVATION (ft)	FREE PRODUCT THICKNESS (ft)
MW-5	01/13/20	<1.0	<1.0	<1.0	<2.0	95.98	14.47	81.51	NP
MW-6	10/12/16	<1.0	<1.0	<1.0	<1.0	100.00	14.63	85.37	NP
	01/06/17	<1.0	<1.0	<1.0	<1.0		18.27	81.73	NP
	04/05/17	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	08/14/17	<1.0	<1.0	<1.0	<1.0		9.23	90.77	NP
	10/11/17	<1.0	<1.0	<1.0	<1.0		14.31	85.69	NP
	01/11/18	<1.0	<1.0	<1.0	<1.0		18.33	81.67	NP
	04/27/18	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	07/27/18	<1.0	<1.0	<1.0	<2.0		7.26	92.74	NP
	08/23/18	NS	NS	NS	NS		7.58	92.42	NP
	10/17/18	<1.0	<1.0	<1.0	<2.0		15.68	84.32	NP
	01/21/19	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	04/23/19	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	07/09/19	<1.0	<1.0	<1.0	<2.0		12.00	88.00	NP
	10/07/19	<1.0	<1.0	<1.0	<2.0		13.08	86.92	NP
	01/13/20	<1.0	<1.0	<1.0	<2.0		17.73	82.27	NP
MW-7	10/12/16	<1.0	<1.0	<1.0	<1.0	97.02	11.80	85.22	NP
	01/06/17	<1.0	<1.0	<1.0	<1.0		14.91	82.11	NP
	04/05/17	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	08/14/17	<1.0	<1.0	<1.0	<1.0		9.55	87.47	NP
	10/11/17	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	01/11/18	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	04/27/18	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	07/27/18	<1.0	<1.0	<1.0	<2.0	96.91		96.91	NP
	08/23/18	NS	NS	NS	NS		8.08	88.83	NP
	10/17/18	<1.0	<1.0	<1.0	<2.0		12.38	84.53	NP

SAMPLE LOCATION	DATE	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)	TOC ELEVATION (feet)	DEPTH TO GROUND WATER (ft)	GROUND WATER ELEVATION (ft)	FREE PRODUCT THICKNESS (ft)
MW-7R	01/21/19	<1.0	<1.0	<1.0	<2.0	96.91	15.49	81.42	NP
	04/23/19	<1.0	<1.0	<1.0	<2.0		17.72	79.19	NP
	07/09/19	<1.0	<1.0	<1.0	<2.0		18.13	78.78	NP
	10/07/19	<1.0	<1.0	<1.0	<2.0		11.57	85.34	NP
	01/13/20	<1.0	<1.0	<1.0	<2.0		14.29	82.62	NP
MW-8	04/23/19	Dry	Dry	Dry	Dry	99.30	Dry	Dry	Dry
	07/09/19	Dry	Dry	Dry	Dry		Dry	Dry	Dry
	10/07/19	3.3	<1.0	<1.0	<2.0		12.98	86.32	NP
	01/13/20	<1.0	<1.0	<1.0	<2.0		16.75	82.55	NP
Table 910-1 Limits		5	560	700	1,400				

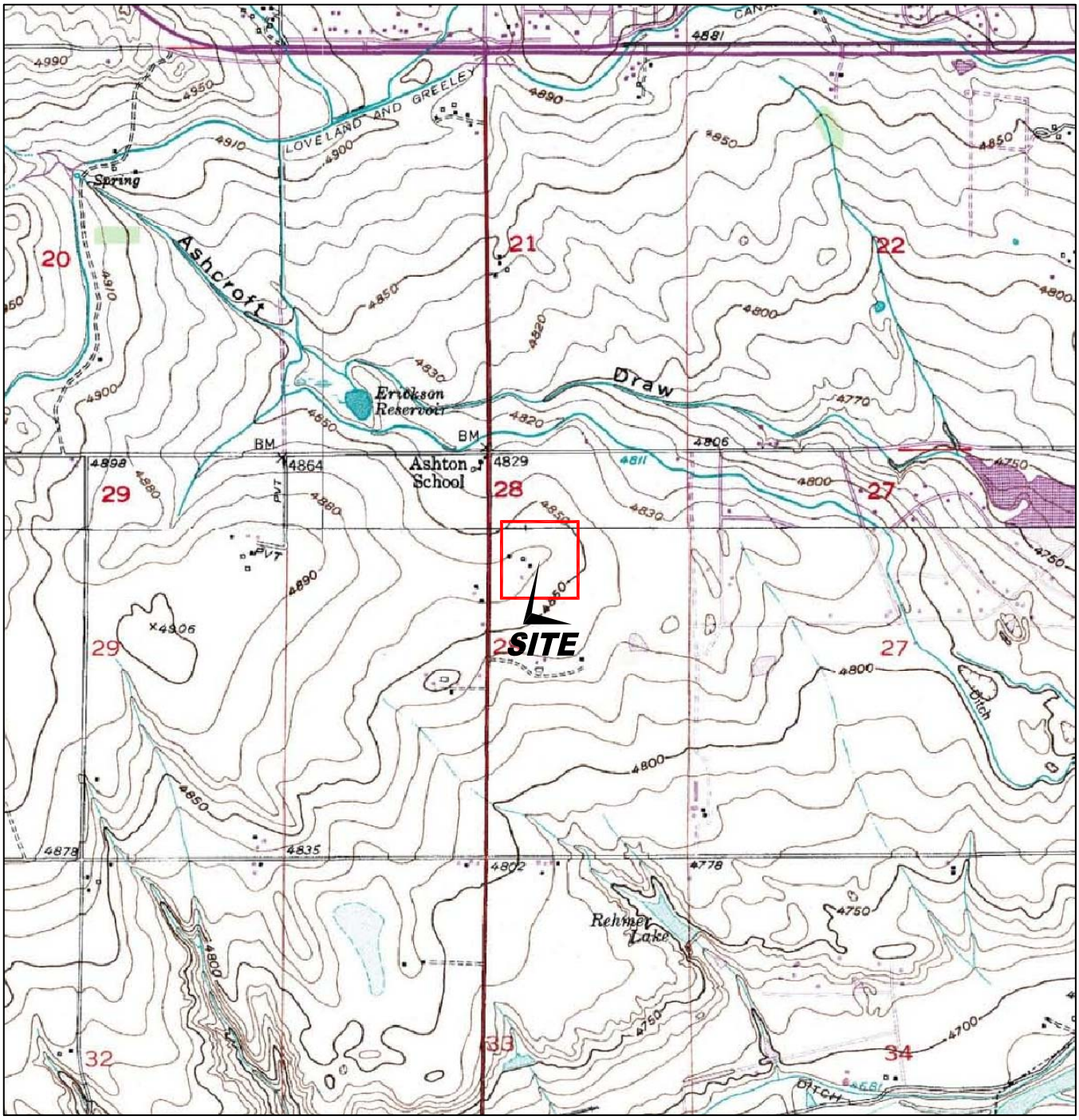
Bold face values exceed the COGCC limits

NP - No Free Product

NS - Not Sampled

IW - Insufficient Water

FIGURES



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Scale (miles)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1
0 1000 2000 3000 4000 5000
Scale (feet)

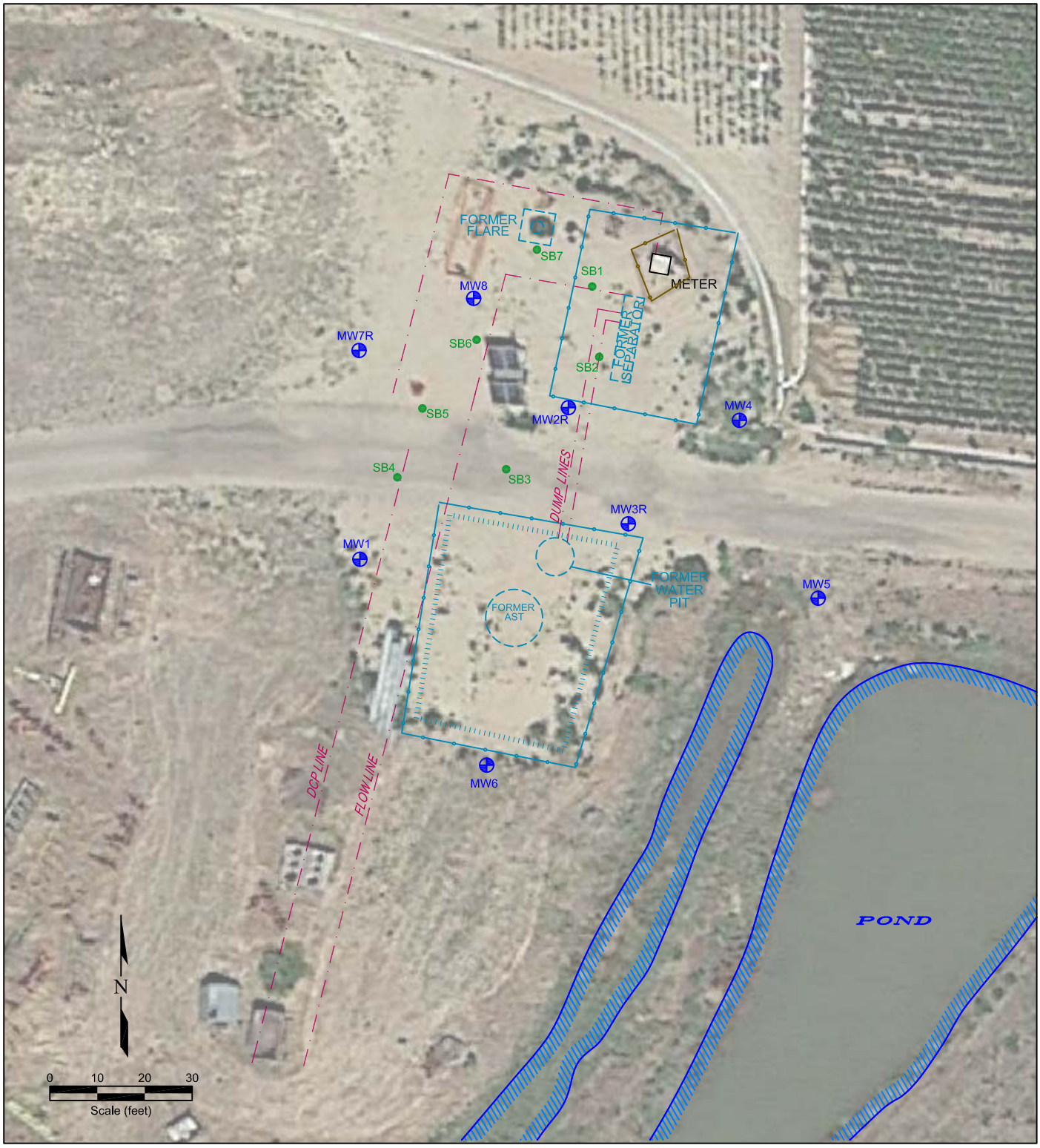
USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)

Figure 1
SITE LOCATION MAP

Noble Wiedeman PM J28-2, 28-7
NE SW Section 28, T5N, R66W
Weld County, Colorado

Project No.	Prepared by	Drawn by
C016-110		**JMA**
Date	Reviewed by	Filename
1/30/20	**EB**	**16110T**

FREMONT ENVIRONMENTAL



LEGEND

- SOIL BORING
- MONITORING WELL
- FENCE LINE
- CONTAINMENT BERM
- PIPELINE
- FORMER — ABOVE GROUND STORAGE TANK
- FORMER FACILITY

Figure 2
SITE MAP

Noble Wiedeman PM J28-2, 28-7
NE SW Section 28, T5N, R66W
Weld County, Colorado

Project No.	Prepared by	Drawn by
C016-110		**JMA**
Date	Reviewed by	Filename
1/30/20	**EB**	**16110Q**

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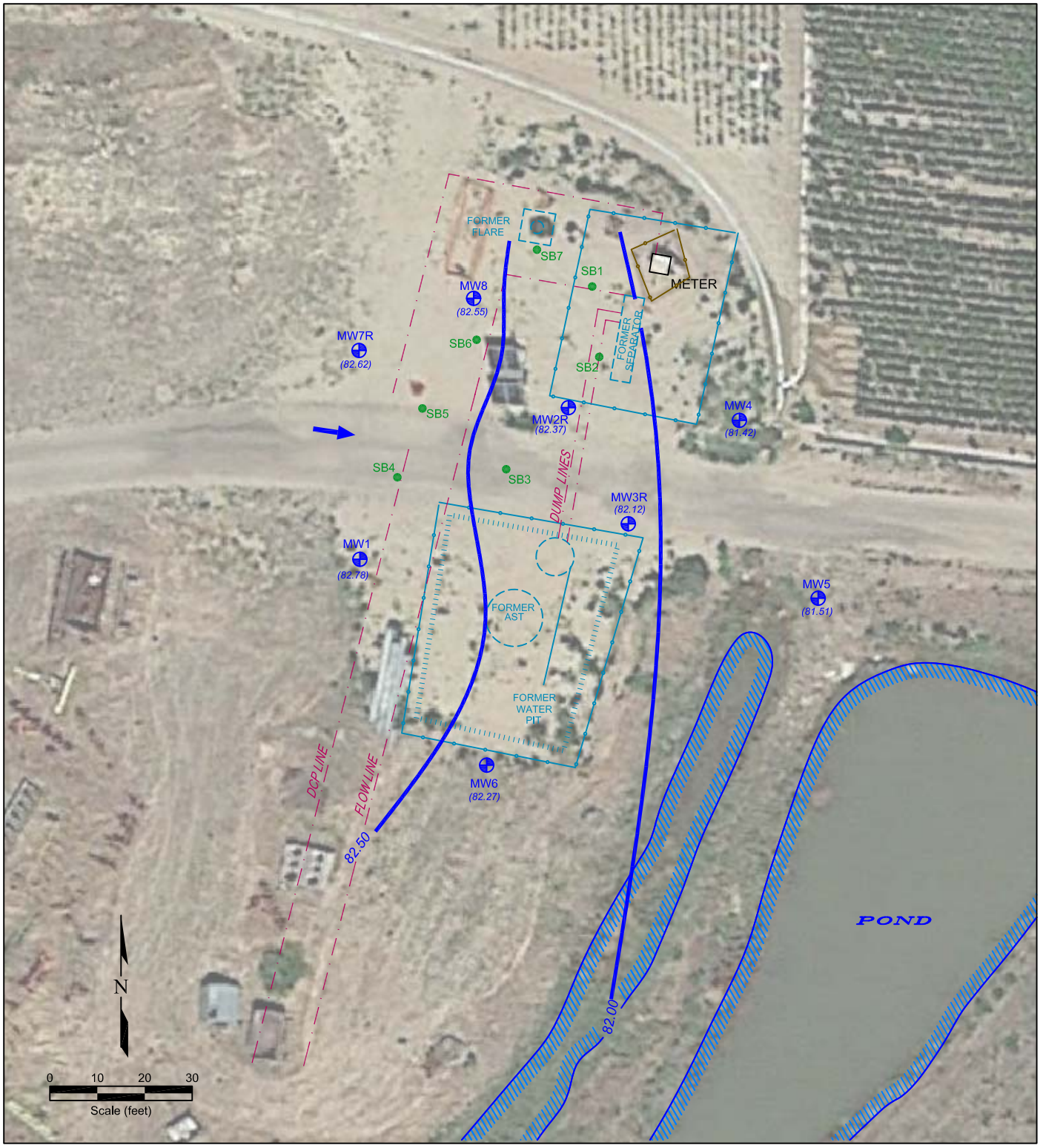


LEGEND

- SOIL BORING
- MONITORING WELL
- FENCE LINE
- CONTAINMENT BERM
- PIPELINE
- ABOVE GROUND STORAGE TANK
- FORMER FACILITY
- (82.78) GROUND WATER ELEVATION (ft above arbitrary datum)
- 85.50 WATER TABLE CONTOUR
- GROUND WATER FLOW DIRECTION

Figure 3

INFERRED GROUNDWATER CONTOUR MAP

January 13, 2020

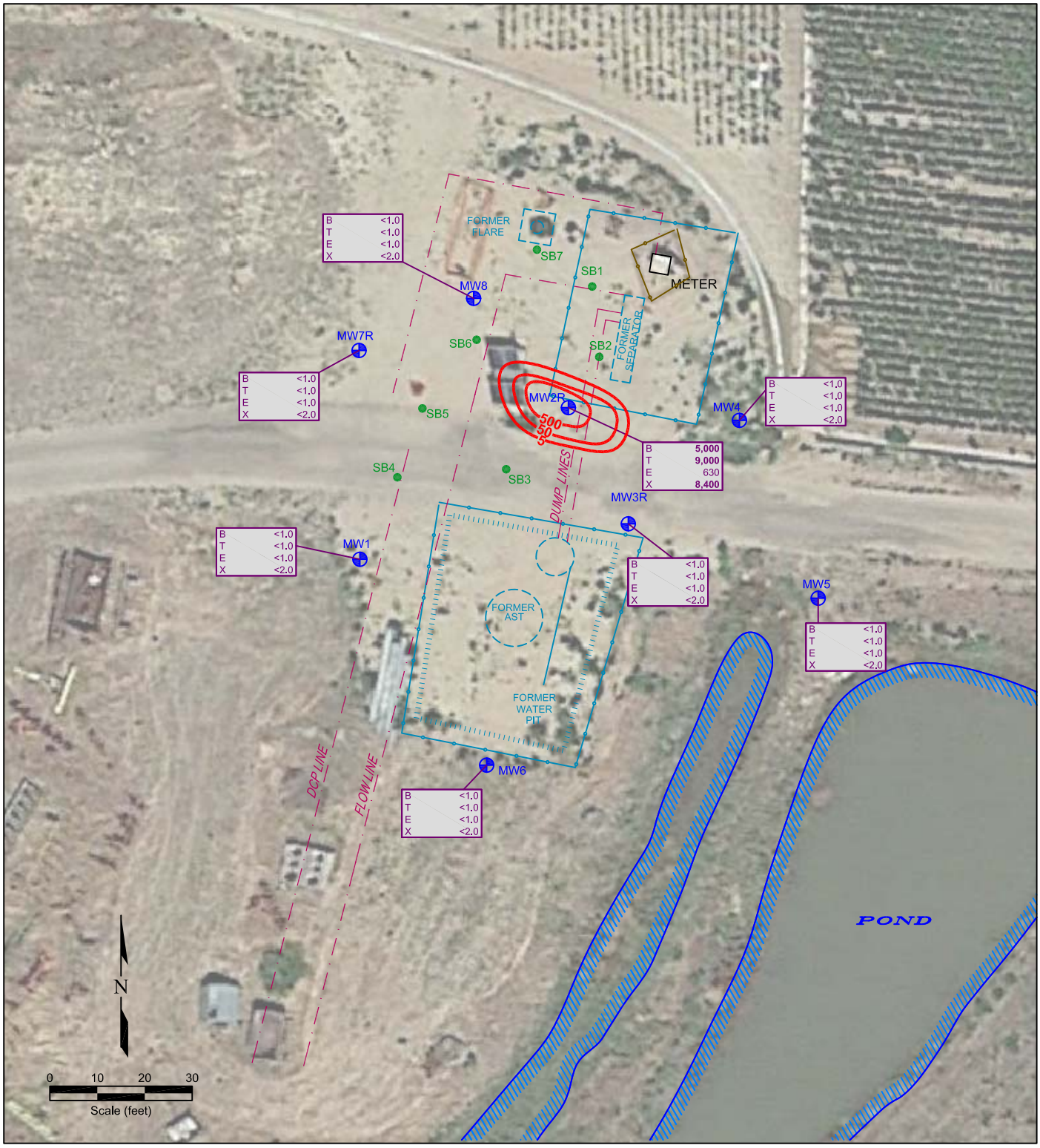
Noble Wiedeman PM J28-2, 28-7

NE SW Section 28, T5N, R66W

Weld County, Colorado

Project No.	Prepared by	Drawn by
C016-110		**JMA**
Date	Reviewed by	Filename
1/30/20	**EB**	**16110Q**

FREMONT ENVIRONMENTAL



LEGEND

- SOIL BORING
- MONITORING WELL
- FENCE LINE
- CONTAINMENT BERM
- PIPELINE
- FORMER — ABOVE GROUND STORAGE TANK / FORMER FACILITY
- B <1.0, T <1.0, E <1.0, X <2.0 — BENZENE (ug/L), TOLUENE (ug/L), ETHYLBENZENE (ug/L), TOTAL XYLENES (ug/L)
- 5 — BENZENE ISOCONCENTRATION (ug/L) Base in part on historical data Dashed where inferred

Figure 4

GROUND WATER CHEMISTRY WITH BENZENE ISO-CONCENTRATION MAP

January 13, 2020

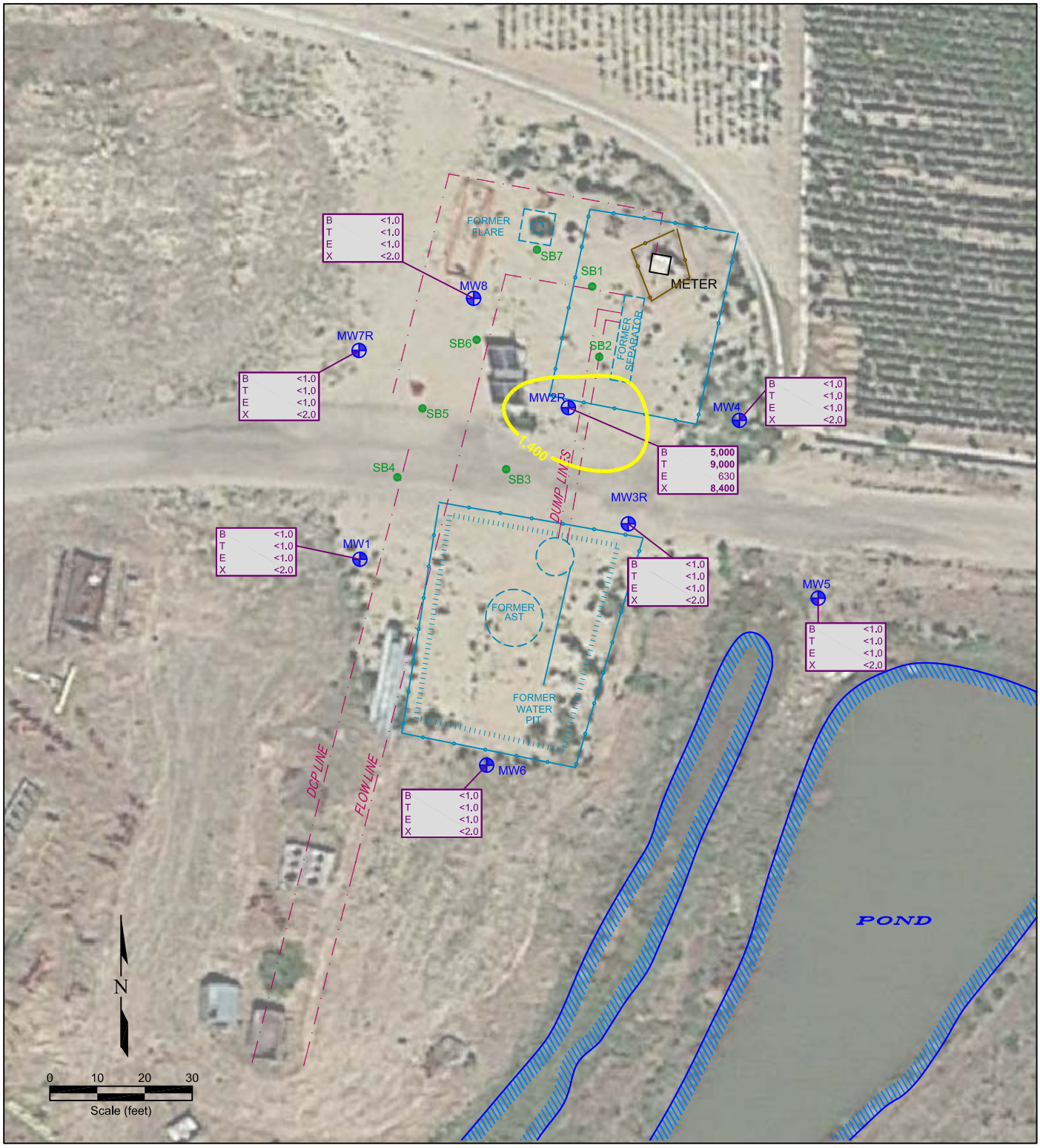
Noble Wiedeman PM J28-2, 28-7

NE SW Section 28, T5N, R66W

Weld County, Colorado

Project No.	Prepared by	Drawn by
C016-110		**JMA**
Date	Reviewed by	Filename
1/30/20	**EB**	**16110Q**

FREMONT ENVIRONMENTAL



LEGEND

- SOIL BORING
- MONITORING WELL
- FENCE LINE
- CONTAINMENT BERM
- PIPELINE
- ABOVE GROUND STORAGE TANK
- FORMER FACILITY

B <1.0
T <1.0
E <1.0
X <2.0

BENZENE (ug/L)
TOLUENE (ug/L)
ETHYLBENZENE (ug/L)
TOTAL XYLENES (ug/L)

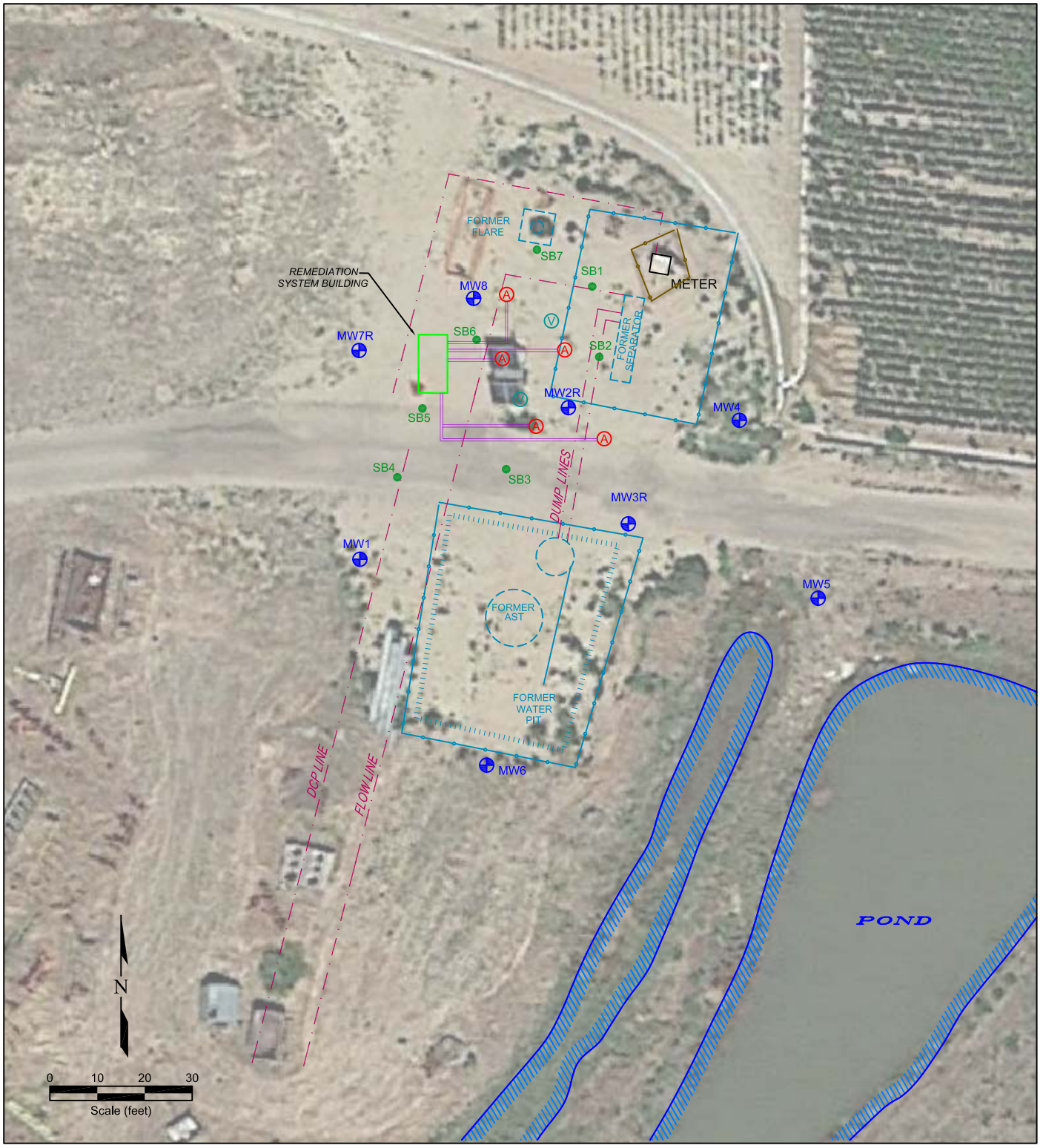
1,400

XYLENES ISOCONCENTRATION (ug/L)
Dashed where inferred

Figure 5
GROUND WATER CHEMISTRY WITH XYLENES ISO-CONCENTRATION MAP
January 13, 2020
Noble Wiedeman PM J28-2, 28-7
NE SW Section 28, T5N, R66W
Weld County, Colorado

Project No.	Prepared by	Drawn by
C016-110		**JMA**
Date	Reviewed by	Filename
1/30/20	**EB**	**16110Q**

FREMONT ENVIRONMENTAL



LEGEND

- SOIL BORING
- MONITORING WELL
- AIR SPARGE WELL (5@1"dia), TD = 20' w/ 2' screen
- PASSIVE SOIL VAPOR EXTRACTION WELL (2@2"dia), TD = 16' w/ 2' screen
- ABOVE GROUND STORAGE TANK
- FORMER — FORMER FACILITY
- BUILDING — BUILDING
- FENCE LINE
- CONTAINMENT BERM
- PIPELINE
- SYSTEM TRENCH

Figure 6

AS-BUILT REMEDIATION SYSTEM

Noble Wiedeman PM J28-2, 28-7
NE SW Section 28, T5N, R66W
Weld County, Colorado

Project No.	Prepared by	Drawn by
C016-110		**TDA**
Date	Reviewed by	Filename
2/4/20	**EB**	**16110Q**

FREMONT ENVIRONMENTAL

APPENDIX A

LABORATORY DOCUMENTATION

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

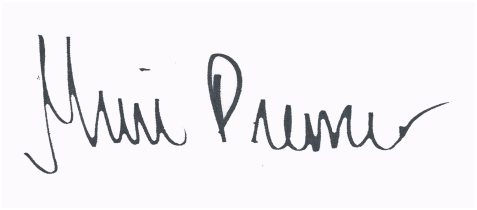
January 20, 2020

Paul Henehan
Fremont Environmental
PO Box 1289
Wellington, CO 80549

RE: Noble - Wiedeman PM J28 2
Work Order #2001164

Enclosed are the results of analyses for samples received by Summit Scientific on 01/14/20 16:55. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Muri Premer For Paul Shrewsbury
President

S2

Fremont Environmental PO Box 1289 Wellington CO, 80549	Project: Noble - Wiedeman PM J28 2 Project Number: [none] Project Manager: Paul Henehan	**Reported:** 01/20/20 09:49

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	2001164-01	Water	01/13/20 00:00	01/14/20 16:55
MW-2	2001164-02	Water	01/13/20 00:00	01/14/20 16:55
MW-3	2001164-03	Water	01/13/20 00:00	01/14/20 16:55
MW-4	2001164-04	Water	01/13/20 00:00	01/14/20 16:55
MW-5	2001164-05	Water	01/13/20 00:00	01/14/20 16:55
MW-6	2001164-06	Water	01/13/20 00:00	01/14/20 16:55
MW-7	2001164-07	Water	01/13/20 00:00	01/14/20 16:55
MW-8	2001164-08	Water	01/13/20 00:00	01/14/20 16:55

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Summit Scientific

S_2

2001164

4653 Table Mountain Drive ♦ Golden, Colorado 80403
303-277-9310 ♦ 303-374-5933 (f)

Page 1 of 1

Client: Fremont Environmental | Project Manager: Paul Henehan
Address: P.O Box 1289 | E-Mail: paulh@fremontenv.com, ethanb@fremontenv.com
City/State/Zip: Wellington, CO 80549 | Bill to: Jacob
Phone: 303-956-8714 | Project Name: Noble - Wiedeman PMT28-2
Sampler Name: Black | Project Number:

					Preservative				Matrix				Analysis Requested								Special Instructions
ID	Sample Description	Date Sampled	Time Sampled	# of containers	HCl	HNO3	None	Other ___	Water	Soil	Air-Canister #	Other ___	BTEX	Naphthalene	GRO	DRO	SAR	EC	pH		
1	MW-1	1/13/20		2			X		X				X								
2	MW-2	"		"			"		"				"								
3	MW-3	"		"			"		"				"								
4	MW-4	"		"			"		"				"								
5	MW-5	"		"			"		"				"								
6	MW-6	"		"			"		"				"								
7	MW-7	"		"			"		"				"								
8	MW-8	"		"			"		"				"								
9																					
10																					

Relinquished by:	Date/Time:	Received by:	Date/Time:
Ethan Black	1/14/20 1655		01/14/2020 1655
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:

Turn Around Time (Check)
Same Day ___ 72 hours ___
24 hours ___ Standard X
48 hours ___

Sample Integrity:
Temperature Upon Receipt: 5.2
Samples Intact: Yes No

Notes:

Sample Receipt Checklist

2001164

S2 Work Order_____

Client: FREMONT ENVIRONMENTAL Client Project ID: NOBLE - WIEDEMAN

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other_____ Airbill #: PMJ 28-2

☐ ☑ ☐ ☐ ☐

Matrix (check all that apply): ☐ Air ☐ Soil/Solid ☑ Water ☐ Other:_____ (Describe)

Temp (°C)	5.2

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C (1)? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	✓			
Were all samples received intact (1)?	✓			
Was adequate sample volume provided (1)?	✓			
If custody seals are present, are they intact (1)?			✓	
Are samples with holding times due within 48 hours sample due within 48 hours present?		✓		
Is a chain-of-custody (COC) form present and filled out completely (1)?	✓			
Does the COC agree with the number and type of sample bottles received (1)?	✓			
Do the sample IDs on the bottle labels match the COC (1)?	✓			
Is the COC properly relinquished by the client w/ date and time recorded (1)?	✓			
For volatiles in water – is there headspace present? **If yes, contact client and note in narrative.**		✓		
Are samples preserved that require preservation **(excluding cooling)** (1)? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			✓	
If samples are acid preserved for metals, is the pH ≤ 2(1)? Record the pH in Comments.			✓	
If dissolved metals are requested, were samples field filtered?			✓	
Additional Comments (if any):				

(1) If NO, then contact the client before proceeding with analysis and note in case narrative.

RZ	RZ	1/14/20
Custodian Printed Name or Initials	**Signature of Custodian**	**Date/Time**

S2

Fremont Environmental PO Box 1289 Wellington CO, 80549	Project: Noble - Wiedeman PM J28 2 Project Number: [none] Project Manager: Paul Henehan	**Reported:** 01/20/20 09:49

MW-1

2001164-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001219	01/15/20	01/15/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*115 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*105 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*103 %*	*21-167*		"	"	"	"	

S2

Fremont Environmental PO Box 1289 Wellington CO, 80549	Project: Noble - Wiedeman PM J28 2 Project Number: [none] Project Manager: Paul Henehan	**Reported:** 01/20/20 09:49

MW-2

2001164-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	**5000**	100	ug/l	100	2001219	01/15/20	01/15/20	EPA 8260B	
Toluene	**9000**	100	"	"	"	"	"	"	
Ethylbenzene	**630**	100	"	"	"	"	"	"	
Xylenes (total)	**8400**	200	"	"	"	"	"	"	

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*106 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*109 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*102 %*	*21-167*		"	"	"	"	

S2

Fremont Environmental PO Box 1289 Wellington CO, 80549	Project: Noble - Wiedeman PM J28 2 Project Number: [none] Project Manager: Paul Henehan	**Reported:** 01/20/20 09:49

MW-3

2001164-03 (Water)

Summit Scientific

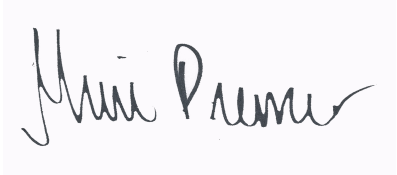
Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001219	01/15/20	01/17/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*83.0 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*119 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*123 %*	*21-167*		"	"	"	"	



S2

Fremont Environmental PO Box 1289 Wellington CO, 80549	Project: Noble - Wiedeman PM J28 2 Project Number: [none] Project Manager: Paul Henehan	**Reported:** 01/20/20 09:49

MW-4

2001164-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001219	01/15/20	01/16/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*112 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*105 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*101 %*	*21-167*		"	"	"	"	

S2

Fremont Environmental PO Box 1289 Wellington CO, 80549	Project: Noble - Wiedeman PM J28 2 Project Number: [none] Project Manager: Paul Henehan	**Reported:** 01/20/20 09:49

MW-5

2001164-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001219	01/15/20	01/16/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*110 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*107 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*101 %*	*21-167*		"	"	"	"	

S2

Fremont Environmental PO Box 1289 Wellington CO, 80549	Project: Noble - Wiedeman PM J28 2 Project Number: [none] Project Manager: Paul Henehan	**Reported:** 01/20/20 09:49

MW-6

2001164-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001219	01/15/20	01/16/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*114 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*96.9 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*102 %*	*21-167*		"	"	"	"	

S2

Fremont Environmental PO Box 1289 Wellington CO, 80549	Project: Noble - Wiedeman PM J28 2 Project Number: [none] Project Manager: Paul Henehan	**Reported:** 01/20/20 09:49

MW-7

2001164-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001219	01/15/20	01/16/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*108 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*106 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*104 %*	*21-167*		"	"	"	"	

S2

Fremont Environmental PO Box 1289 Wellington CO, 80549	Project: Noble - Wiedeman PM J28 2 Project Number: [none] Project Manager: Paul Henehan	**Reported:** 01/20/20 09:49

MW-8

2001164-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001219	01/15/20	01/16/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/13/20 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*118 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*105 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*105 %*	*21-167*		"	"	"	"	

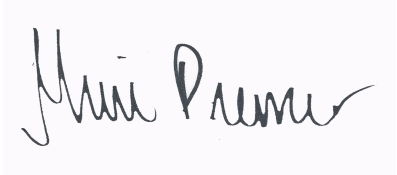
S2

Fremont Environmental PO Box 1289 Wellington CO, 80549	Project: Noble - Wiedeman PM J28 2 Project Number: [none] Project Manager: Paul Henehan	**Reported:** 01/20/20 09:49

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2001219 - EPA 5030 Water MS										
Blank (2001219-BLK1)				Prepared & Analyzed: 01/15/20						
Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	*15.3*		*"*	*13.3*		*115*	*23-173*			
Surrogate: Toluene-d8	*14.2*		*"*	*13.3*		*106*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*13.9*		*"*	*13.3*		*104*	*21-167*			
LCS (2001219-BS1)				Prepared & Analyzed: 01/15/20						
Benzene	40.9	1.0	ug/l	41.7		98.3	51-132			
Toluene	42.3	1.0	"	41.7		102	51-138			
Ethylbenzene	39.4	1.0	"	41.7		94.5	58-146			
m,p-Xylene	75.6	2.0	"	83.3		90.7	57-144			
o-Xylene	39.2	1.0	"	41.7		94.2	53-146			
Surrogate: 1,2-Dichloroethane-d4	*14.3*		*"*	*13.3*		*107*	*23-173*			
Surrogate: Toluene-d8	*14.6*		*"*	*13.3*		*110*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*13.5*		*"*	*13.3*		*101*	*21-167*			
Matrix Spike (2001219-MS1)		**Source: 2001164-01**		Prepared & Analyzed: 01/15/20						
Benzene	46.6	1.0	ug/l	41.7	ND	112	34-141			
Toluene	44.4	1.0	"	41.7	ND	106	27-151			
Ethylbenzene	41.8	1.0	"	41.7	ND	100	29-160			
m,p-Xylene	81.8	2.0	"	83.3	ND	98.1	20-166			
o-Xylene	41.7	1.0	"	41.7	ND	100	33-159			
Surrogate: 1,2-Dichloroethane-d4	*15.3*		*"*	*13.3*		*115*	*23-173*			
Surrogate: Toluene-d8	*14.0*		*"*	*13.3*		*105*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*13.5*		*"*	*13.3*		*102*	*21-167*			



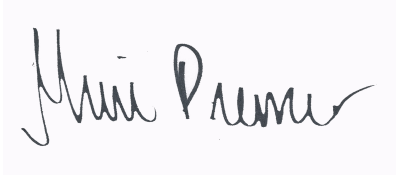
S2

Fremont Environmental PO Box 1289 Wellington CO, 80549	Project: Noble - Wiedeman PM J28 2 Project Number: [none] Project Manager: Paul Henehan	**Reported:** 01/20/20 09:49

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2001219 - EPA 5030 Water MS										
Matrix Spike Dup (2001219-MSD1)	**Source: 2001164-01**			Prepared & Analyzed: 01/15/20						
Benzene	47.9	1.0	ug/l	41.7	ND	115	34-141	2.81	30	
Toluene	45.5	1.0	"	41.7	ND	109	27-151	2.49	30	
Ethylbenzene	42.0	1.0	"	41.7	ND	101	29-160	0.573	30	
m,p-Xylene	82.7	2.0	"	83.3	ND	99.2	20-166	1.12	30	
o-Xylene	41.4	1.0	"	41.7	ND	99.4	33-159	0.626	30	
Surrogate: 1,2-Dichloroethane-d4	*16.1*		*"*	*13.3*		*121*	*23-173*			
Surrogate: Toluene-d8	*14.3*		*"*	*13.3*		*107*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*13.6*		*"*	*13.3*		*102*	*21-167*			



Fremont Environmental PO Box 1289 Wellington CO, 80549	Project: Noble - Wiedeman PM J28 2 Project Number: [none] Project Manager: Paul Henehan	**Reported:** 01/20/20 09:49

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference