August 18, 2017

APPROVED
By Olivia Yu at 4:32 pm, Aug 29, 2017

New Mexico Oil Conservation Division
1625 N. French Drive
Hobbs, New Mexico 88240

NMOCD approves of the proposed delineation for 1RP-4760 with these conditions:
Permissible chloride levels are <= 600 mg/kg for horizontal and vertical delineation. Laboratory analyses are required from each soil sample for two depths (depth obtained and depth maintained 5 ft. further) and from the edges of the release area. Provide all relevant field data.

Attn: Olivia Yu
P: (575) 393-6161 Ext. 113
E: Olivia.Yu@state.nm.us

Re: Proposed Delineation Work Plan – Battle Federal #4H
Marathon Oil Company
Unit Letter "M", Section 27, Township 21 South, Range 33 East
Terracon Project No. AR177179

Introduction

Terracon Consultants, Inc. (Terracon) has prepared the following *Delineation Work Plan* for the crude oil release at Marathon Oil Company's (Marathon) Battle Federal #4H location. The release site is located in Unit Letter "B", Section 27, Township 21 South, Range 33 East in Lea County, New Mexico, at 32.44307153692°, -103.565825723177°. Review of the New Mexico Water Rights Reporting System (NMWRRS) online database indicates depth to groundwater information is not available for Section 27, Township 21 South, Range 33 East. Review of a depth to groundwater gradient map utilized by the New Mexico Oil Conservation Division (NMOCD) indicates groundwater is estimated to be encountered at approximately 250 feet below grade surface (bgs). A site location map is provided as Attachment 1.

On July 4, 2017, Marathon discovered a release occurred at the Battle Federal #4H location. The initial Release Notification and Corrective Action (Form C-141) indicates a 4-inch discharge valve was faulty or not closed, resulting in a 23 barrel (bbl) release of produced water; 11 barrels to the pad and 12 bbls within containment. The produced water release affected an area measuring approximately 20 ft. by 75 ft. by 50 in. on the pad and approximately 10 ft. by 40 ft. by 2 in. within containment. During initial response activities approximately 23 bbls of produced water was recovered. A "Proposed Delineation Sample Location Map" is provided as Attachment 2.

Regulatory Framework

Crude oil facilities in New Mexico are generally regulated by the NMOCD. Contamination of soil due to a surface release of produced water is addressed in the NMOCD guidance document title Guidelines for *Remediation of Leaks, Spills, and Releases*, dated August 13, 1993.

The guidance document provides direction for initial response actions, site assessment, sampling procedures and provides a total ranking score based on the depth to groundwater, distance to private and domestic water sources, and the distance to the nearest surface water body as follows:

Ranking Score Criteria		
General Site Characteristics		**Score**
Depth to Groundwater	< 50 feet	**20**
	50 – 99 feet	**10**
	> 100 feet	**0**
Well Head Protection Area <1,000 feet from water source, or <200 feet from private domestic water source	Yes	**20**
	No	**0**
Distance to Surface Water Body	< 200 feet	**20**
	200 – 1,000 feet	**10**
	> 1,000 feet	**0**

The total ranking score is the sum of the four individual ranking criteria and the basis for determining the recommended remediation action levels at the site. Based on Terracon's evaluation of the site ranking criteria, the Site has an initial total ranking score of **0**, based on the following:

Ranking Score Criteria			
General Site Characteristics			**Score**
Depth to Groundwater	< 50 feet	**20**	**0**
	50 – 99 feet	**10**	
	> 100 feet	**0**	
Well Head Protection Area <1,000 feet from water source, or <200 feet from private domestic water source	Yes	**20**	**0**
	No	**0**	
Distance to Surface Water Body	< 200 feet	**20**	**0**
	200 – 1,000	**10**	

	feet		
Total Ranking Score			**0**

Recommended remediation action levels for a site with a total ranking score of 0 points are as follows:

- Chlorides – 1,000 milligrams per kilogram (mg/kg)
- Benzene – 10 mg/kg
- BTEX – 50 mg/kg
- TPH – 5,000 mg/kg

Commitment to Safety

Terracon has a commitment to the safety of all its employees. As such, and in accordance with our *Incident and Injury Free*® safety culture, Terracon will develop a Project Safety Plan to be used by our personnel during field services. Prior to commencement of on-site activities, Terracon will hold a tailgate safety meeting to review site-specific job hazards and health and safety needs for this specific project. In addition, prior to engaging in new on-site activities or tasks, we will re-evaluate potential job hazards and appropriate safe working procedures as part of our Pre-Task Planning process. At this time, we anticipate performing fieldwork in a USEPA Level D work uniform consisting of hard hats, safety glasses, protective gloves, steel-toed boots and fire resistant clothing. It may become necessary to upgrade this level of protection, at additional cost, while sampling activities are being conducted in the event that petroleum or chemical constituents are encountered in soils or groundwater that present an increased risk for personal exposure.

In addition, following receipt of your authorization to proceed and no later than 48 hours prior to intrusive activities, Terracon will contact a utility locator (811) to arrange for underground utility locates at the above-referenced site. Terracon will additionally depend on assistance from client and/or site contact for the location of private underground utilities at the site.

Delineation Plan

Delineation soil samples will be collected from hand-augured soil bores advanced in representative locations across the release site in an effort characterize the horizontal surface of the areas exhibiting visual impacts defined by the inferred release origin, flow path, and pooling areas. Hand-augured soil bores will be advanced until field test results (chloride field tests) and field observations suggest concentrations of BTEX, TPH and chloride are below the NMOCD Recommended Remediation Action Level (RRAL) established for the site, upon achieving a depth of 18 in. bgs or refusal, whichever occurs first.

Laboratory Analytical Program

Collected soil samples will be submitted to the laboratory for analysis of BTEX, TPH and chloride utilizing methods 8260B, 8015M extended, and EPA Method 300, respectively. The

soil samples will be collected into laboratory-prepared containers. The containers will be labeled and placed on ice in a cooler which will be secured with a custody seal. The samples and completed chain-of-custody forms will be transported to the selected analytical laboratory for analysis within five to seven business days following receipt of the samples by the laboratory.

Remedial Work Plan Generation

Upon completion of delineation activities and receipt of laboratory analytical results from soil samples, a remediation work plan will be prepared for submittal and approval by the NMOCD.

Should you have any questions or require additional information, please do not hesitate to contact our office.

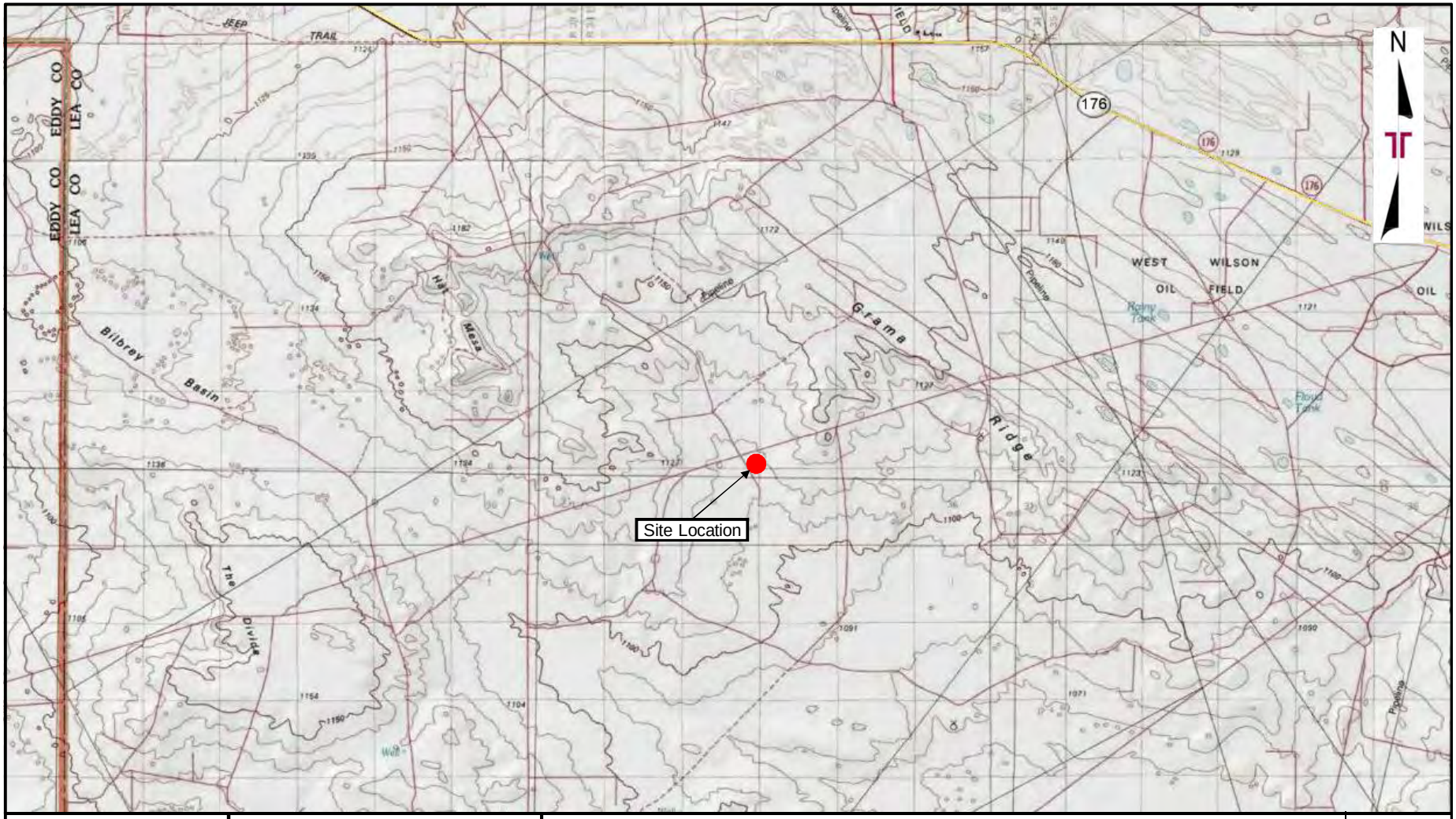
Sincerely,
Terracon Consultants, Inc.

FOR

Kristopher Williams
Senior Staff Scientist

Erin Loyd, P.G.
Senior Associate
Office Manager – Lubbock

Attachments:
Attachment 1: Site Location Map
Attachment 2: Proposed Delineation Sample Location Map
Attachment 3: Photographic Log



Project No.	AR177179
Scale:	1" = ~ 10,000'
Source:	Google Earth
Date:	2017

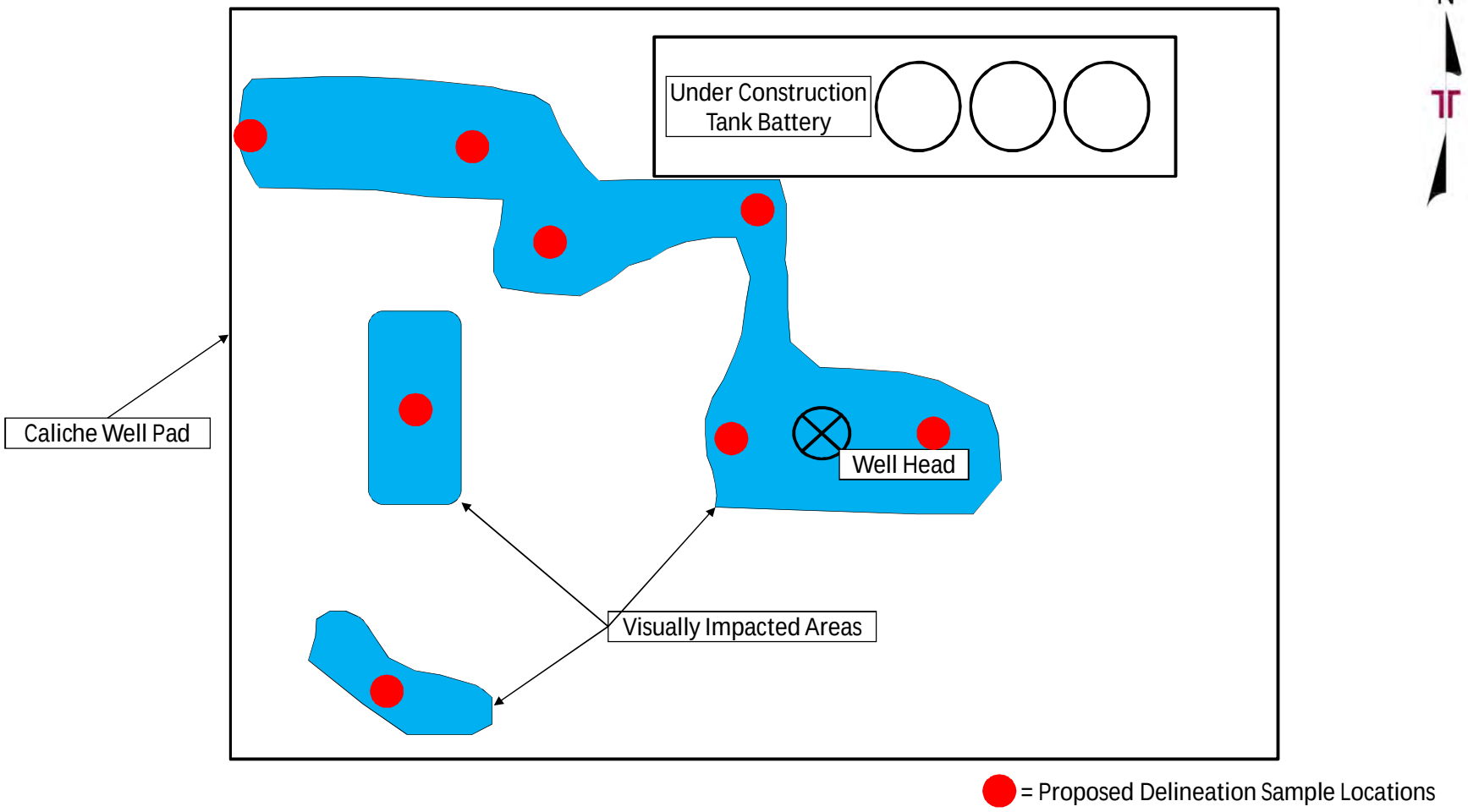
Terracon
Consulting Engineers & Scientists
5827 50th St. Suite 1 Lubbock, Texas 79424
PH. (806) 300-0104 FAX. (806) 797 0947

Site Location Map

Battle Federal #4
32.44307153692°, -103.565825723177°
Lea County, Texas

Attachment

1



Project No.	AR177179
Scale:	1" = ~ 30'
Source:	Google Earth
Date:	2017

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Proposed Delineation Sample Location Map

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Attachment 2

Photographic Log

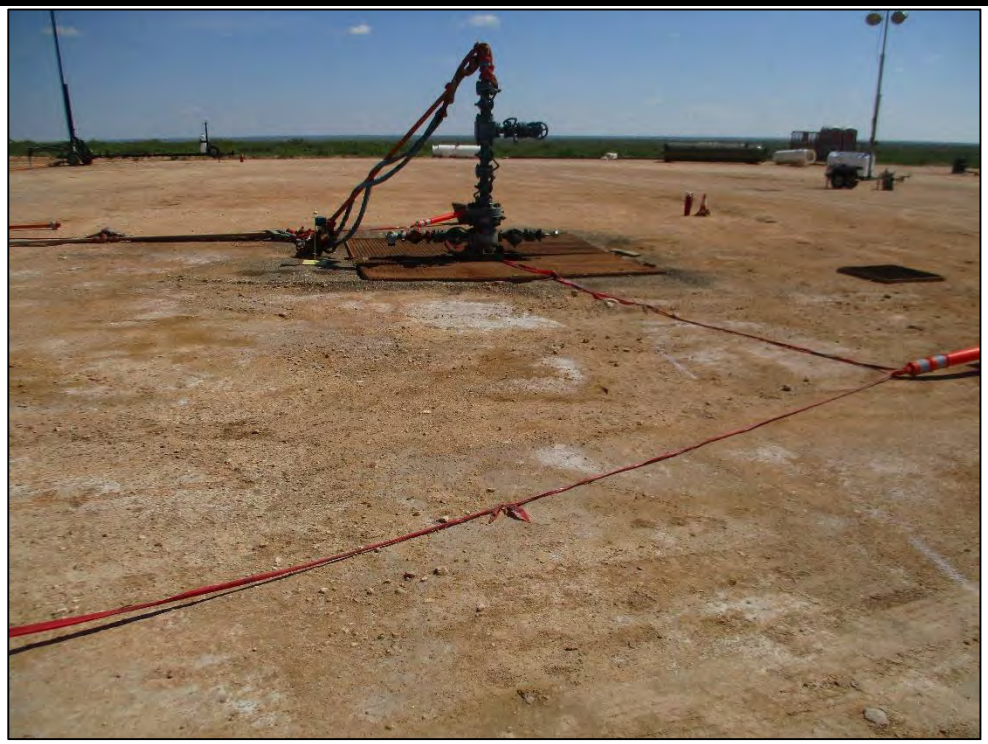

PHOTO 1: View of visual surface impacts from the initial release, facing south.

PHOTO 2: View of visual surface impacts from the initial release, facing east.

PHOTO 3: View of visual surface impacts from the initial release, facing south.