

April 1, 2010

Mr. Mike Bratcher  
Oil Conservation Division  
New Mexico Energy, Minerals and Natural Resources Department  
1301 W. Grand Avenue  
Artesia, New Mexico 88210

**Re: Remediation Workplan,  
Marks and Garner Production LTD Co., Diamond State #2  
Unit Letter M (SW/4, SW/4), Section 4, Township 17 South, Range 29 East,  
Eddy County, New Mexico  
(Latitude: N 32.85727°, Longitude: W 104.08527°)**

Dear Mr. Bratcher:

Marks and Garner Production LTD Co. (M&G), has retained Ocotillo Environmental, LLC (Ocotillo) to remediate impacts to soil from a leak at the Diamond State #2 tank battery. The battery is located in the southwest quarter (SW/4) of the southwest quarter (SW/4), Section 4, Township 17 South, Range 29 East, Eddy County, New Mexico (Site). The date and volume of the release are unknown. An initial C-141 is included in Appendix A. Figure 1 shows the site location.

Based on published literature (1961), well records of the New Mexico State Engineer, and well records of the United States Geological Survey, groundwater occurs at approximately 65 feet bgs in the well located nearest the Site. No domestic water wells are located within 1,000 feet of the site. The NMOCD has established recommended remediation action levels (RRALs) for benzene, total BTEX and TPH resulting from spills of natural gas liquids ("Guidelines for Remediation of Leaks, Spills and Releases, August 13, 1993"). Remediation levels for benzene, total BTEX and TPH were calculated using the following NMOCD criteria:

Criteria	Result	Ranking Score
Depth-to-Groundwater	50 - 99 Feet	10
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1000 Horizontal Feet	0
Total:		10

The following RRALs have been assigned based on NMOCD criteria:

Benzene 10 mg/kg  
Total BTEX 50 mg/kg  
TPH 1,000 mg/kg

OCD Case# 14393  
Marks & Garner  
July 22, 2010  
Ex# 6

### **Initial Investigation**

On September 10, 2009, a letter was prepared for the NMOCD by R.T. Hicks Consultants, Ltd. (Hicks), that provided documentation that groundwater in the area is confined, thereby making the depth to groundwater "not relevant".

### **Current Investigation**

On March 3 and 4, 2010, Ocotillo installed eight (8) soil borings (BH-1 through BH-8) at the site, using an air rotary drilling rig, in order to assess the horizontal and vertical limits of the spill. Soil samples from the exploratory borings were collected in five foot intervals from the ground surface to a depth of approximately 51 feet below ground surface (bgs) in BH-1, to 26' in BH-2 and BH-4, to 31' in BH-3 and BH-5, to 41' in BH-6, to 36' in BH-7, and to 21' in BH-8. All soil borings were plugged with bentonite. Figure 2 shows the locations of the soil borings. Appendix B provides copies of the Well Record and Logs provided to the Office of the State Engineer.

The soil samples from borings BH-1 through BH-8 were placed in clean glass sample jars, labeled, chilled in an ice chest, and delivered under chain-of-custody control to Xenco Laboratories, located in Odessa, Texas.

All soil samples collected from borings BH-1 through BH-8 were analyzed for chlorides by EPA method E300. The uppermost two (2) samples (0-1' and 5-6') from borings BH-1, BH-2, BH-3, BH-4, BH-5 and BH-8 were also analyzed for total petroleum hydrocarbons (TPH) by EPA method SW 8015 (extended) for gasoline range organics (GRO) and diesel range organics (DRO). The samples from borings BH-4 and BH-5 at a depth of approximately 10-11' bgs, and the sample from boring BH-7 at the surface (0-1' bgs) were also analyzed for TPH. The PID reading from each sample was less than 100 ppm, therefore, no analysis for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) was conducted. Table 1 presents a summary of the laboratory analysis of soil samples. Laboratory analysis and chain of custody documentation are included in Appendix C.

Referring to Table 1, TPH concentrations in samples from borings BH-1 through BH-5 at a depth of 0-1' bgs, were reported above the RRAL of 1,000 mg/kg. Soil samples from BH-1, BH-2, and BH-3 reported TPH concentrations below 1,000 mg/kg at a depth of 5-6' bgs (115 mg/kg, 62.4 mg/kg, <47.4 mg/kg, respectively). Soil samples from boring BH-4 reported TPH concentrations above 1,000 mg/kg at a depth of 10-11' bgs (1,034 mg/kg). TPH concentrations in samples from boring BH-5 were reported at 17.4 mg/kg at a depth of 10-11' bgs, and samples from borings BH-7 (0-1' bgs) and BH-8 (0-1' and 5-6' bgs), reported TPH concentrations below 1,000 mg/kg (31.9 mg/kg, 62.6 mg/kg, and <48.6 mg/kg, respectively).

Chloride concentrations in samples from borings BH-1 through BH-8 were below the NMOCD standard of 250 mg/kg at the following depths:

BH-1	40-41'	117 mg/kg
BH-2	20-21'	119 mg/kg
BH-3	25-26'	135 mg/kg

BH-4	25-26'	126 mg/kg
BH-5	25-26'	111 mg/kg
BH-6 (background)	All depths	
BH-7	30-31'	107 mg/kg
BH-8	15-16'	199 mg/kg

**Proposed Remediation**

Marks and Garner proposes to conduct excavation of the hydrocarbon and chloride impacted soil in the vicinity of borings BH-1 through BH-5, and BH-7 to a depth of approximately five (5) feet bgs.

Horizontal delineation will be determined by laboratory analysis of samples collected during excavation. All excavated soil with a chloride concentration greater than 5,000 mg/kg will be hauled to an NMOCD approved disposal facility. Excavated soil with a chloride concentration less than 5,000 mg/kg will be blended on-site with organic material, in order to reduce the chloride concentrations to less than 1,000 mg/kg. A 20 mil plastic liner will be installed at the five foot depth, and the excavated areas will be backfilled with either clean soil or blended soil with a chloride concentration less than 1,000 mg/kg. Excess blended soil (with a chloride concentration less than 1,000 mg/kg) will be used to construct firewalls around the Marks and Garner tank batteries and / or other ancillary equipment.

If you have any questions or need additional information, please call Mr. Quinton Welborn at (575) 631-0949, or myself at (575) 441-7244. We may also be reached by email at [qwelborn@valornet.com](mailto:qwelborn@valornet.com) or [Cindy.Crain@gmail.com](mailto:Cindy.Crain@gmail.com).

Sincerely,  
*Ocotillo Environmental, LLC*

Cindy K. Crain, P.G.  
Environmental Manager

cc: Quinton Welborn, Marks & Garner

## FIGURES

## TABLE

APPENDIX A

INITIAL C141

APPENDIX B

WELL RECORD AND LOGS

## APPENDIX C

### ANALYTICAL DATA AND CHAIN OF CUSTODY DOCUMENTATION