Catalyst
ENVIRONMENTAL SOLUTIONS

Technical Memorandum

Date: April 28, 2016

To: The Newhall Land and Farming Company

From: Daniel Tormey, Ph.D., P.G. and Megan Schwartz

RE: North Tapo Oil Field – Seep Containment Soil Sampling Data

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Introduction

This Memorandum is being provided in response to a request by the Los Angeles Regional Water Quality Control Board (LARWQCB) for information relating to the removal of an impoundment that previously was used to capture intermittent seepage from a naturally occurring oil seep on the North Tapo Oil Field, which is located on land of The Newhall Land and Farming Company (Newhall) in Ventura County, California. The North Tapo Oil Field is located in a geographically remote area of Newhall's property that is not slated for development.

The impoundment was installed by a prior operator of the field. In August 2015, in the context of bringing Patriot Resources, LLC (Patriot) in as the new operator of the field, Newhall required that Patriot investigate the impoundment and, depending on the results of that investigation, possibly remove the impoundment. There had not been any prior incidents of storm water overflow from the impoundment of which Newhall was aware, but Newhall desired to eliminate entirely that hypothetical risk. Patriot conducted the required investigation in conjunction with the Division of Oil, Gas & Geothermal Resources (DOGGR), and confirmed that the source of the fluid that had in the past intermittently drained into the impoundment was a nearby naturally-occurring seep. The impoundment was then removed. Confirmation soil samples were taken and analyzed. After those analyses confirmed that there were no environmental issues, the impoundment area was backfilled.

Impoundment Closure Activities

Damon Nygren, on behalf of Newhall, and Megan Schwartz, formerly Ramboll Environ, observed removal of the plastic liner and excavation of soil within the basin on October 26, 2015.

The small amount of free fluid in the impoundment was removed with a vacuum truck. Following the removal of the plastic liner, the sides and bottom of the catch basin were excavated until no visual evidence of hydrocarbons was visible and no hydrocarbon odor was

present. Soil was excavated to approximately 36 inches below the original depth of the liner and approximately 18 inches of material was scraped from all sides.

Upon completion of excavation, Ms. Schwartz collected soil samples to confirm removal of petroleum hydrocarbons. A new stainless steel trowel was used for collection of each sample. Four sample discrete samples and four duplicate discrete samples were collected from within the basin. Two samples were collected near the deep base of the basin. One sample was collected near the center of the basin and one sample was collected in the shallow area of the basin.

Samples were collected in clean 4-oz glass jars. Sample containers were labelled with waterproof marker with sampler's initials, sample location, date and time and samples and duplicates were placed in individual Ziploc bags and placed immediately in a cooler to maintain 4°C temperature. Samples were transferred to American Analytical Laboratory in Chatsworth, California, a state-certified laboratory, within 6 hours of sampling. The samples were analyzed for total petroleum hydrocarbons-carbon chain (TPH-CC) by EPA Method 8015M, CAM metals using EPA Method 6010B/7000, and Semi-Volatile Organic Compounds (SVOCS) using EPA Method 8270C and Volatile Organic Compounds (VOCs) using EPA Method 5035. The laboratory was instructed to report the results of TPH broken down by carbon-chain range for comparison to the Site standard groupings.

Soil Screening Levels

The soil screening level criteria set forth in the LA County Fire Department-approved Remediation Plan for Mission Village (which included similar oil field features) were applied to the samples collected from the North Tapo Oil Field. These levels are also being applied elsewhere in Newhall Ranch, and are appropriate for this area as well. The TPH limit of up to 1,000 mg/kg is considered appropriate for soils from zero to 10 feet below final grade. The 1,000 mg/kg TPH limit is in accordance with the standard typically applied by the Los Angeles County Fire Department Site Mitigation Unit (LACFD-SMU) for residential development, and is based on the LARWQCB cleanup guidance for former oil field areas.

Site cleanup goals for CAM 17 Metals were obtained from California Human Health Screening Levels (CalEPA 2005) (CHHSL) with the exception of: (i) lead, which was obtained from the revised CHHSL for lead (CalEPA 2009a); (ii) beryllium, which was obtained from the revised CHHSL for beryllium (CalEPA 2009b); and (iii) arsenic, which was based on a southern California regional background arsenic concentration. These levels are also part of the approved Mission Village Remediation Plan. The sample results are compared to the soil screening levels in Table 2.

Results

The results for VOCs and SVOCs for all samples were below the minimum reporting level for all constituents. Sample 4B measured 13 mg/kg for TPH, well below the 1,000 mg/kg limit. All other samples contained less than 10 mg/kg TPH. All detections of metals are well below the CHSSLs. Results for petroleum hydrocarbons and metals are presented in Tables 1 and 2 below.

Table 1. Petroleum Hydrocarbons

Carbon Chain	Sample Results (mg/kg)								MRL
	1A	1B	2A	2B	3A	3B	4A	4B	
C6-C8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
C8-C10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
C10-C12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
C12-C14	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
C14-C16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	*1*
C16-C18	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.0**	**1.4**	1
C18-C20	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.3**	1
C20-C22	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.1**	**1.5**	1
C22-C24	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.3**	1
C24-C26	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.2**	1
C26-C28	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.6	**1.5**	1
C28-C32	<1.0	**1.7**	<1.0	**1.4**	<1.0	**2.0**	**2.8**	**3.2**	1
C32-C34	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.3**	1
C34-C36	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**<1.0**	1
C36-C40	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
C40-C44	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
Total TPH	<10	<10	<10	<10	<10	<10	<10	13	10

Table 2. Metals

Metal	CHSSL (mg/kg)	Sample Results (mg/kg)								MRL
		1A	1B	2A	2B	3A	3B	4A	4B	
Antimony	≤30	<10	<10	<10	<10	<10	<10	<10	<10	10
Arsenic	≤12	**2.3**	**2.3**	<0.5	<0.5	<0.5	**2.2**	**1.6**	**3.6**	0.5
Barium	≤5,200	**73**	**75**	**50**	**48**	**75**	**76**	**90**	**91**	10
Beryllium	≤16	<1	<1	<1	<1	<1	<1	<1	<1	1
Cadmium	≤1.7	**3.2**	**3.2**	**2.9**	**2.6**	**3.1**	**3.7**	**3.8**	**3.8**	1
Chromium	≤100,000	**8.8**	**10**	**7.3**	**7.4**	**9.3**	**9.2**	**11**	**11**	3
Cobalt	≤660	**5.6**	**6**	**4.9**	**4.5**	**6.2**	**5.6**	**6.3**	**6.8**	3
Copper	≤3,000	**9.3**	**10**	**7.0**	**7.4**	**9.5**	**9.6**	**12**	**12**	3
Lead	≤80	<3	<3	<3	<3	**3.3**	<3	**3.4**	**3.5**	3
Molybdenum	≤380	<5	<5	<5	<5	<5	<5	<5	<5	5
Nickel	≤1,600	**12**	**15**	**10**	**10**	**14**	**16**	**19**	**19**	3
Selenium	≤380	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Silver	≤380	<1	<1	<1	<1	<1	<1	<1	<1	1
Thallium	≤5	<5	<5	<5	<5	<5	<5	<5	<5	5
Vanadium	≤530	**20**	**20**	**17**	**16**	**19**	**19**	**24**	**24**	10
Zinc	≤23,000	**32**	**32**	**27**	**26**	**32**	**31**	**39**	**37**	3

Subsequent Activity

Based on the analytical results of the confirmation sampling, the subject area was determined to meet the cleanup standards set forth by LACFD-SMU and CHSSLs. Patriot then backfilled the excavation area with clean material.