

1R - 427-87

# WORKPLANS

DATE:

3-7-08

**L. Peter Galusky, Jr. Ph.D., P.G.**

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*Texerra*

**March 7th, 2008**

**Mr. Edward Hansen**

New Mexico Energy, Minerals, & Natural Resources  
Oil Conservation Division, Environmental Bureau  
1220 S. St. Francis Drive  
Santa Fe, New Mexico 87504

**RE: Proposed Corrective Action Plan  
Rice Operating Company – EME SWD System  
H-20 SWD Facilities (UL H Sec 20 T 20S R 37E)  
OCD Case Number: 1R427-87**

Sent via E-mail and U.S. Certified Mail (with Annual Report)  
Return Receipt No. 7007 0710 0003 0305 3712

**Dear Mr. Hansen:**

Rice Operating Company removed two below-grade redwood tanks and closed an emergency overflow pit in April and May, 2007. (See Figures 1 & 2 for site location). Soils were excavated to a depth of approximately 27 ft below ground surface (approximately three feet below the water table). Petroleum contaminated soils were removed from the site to the South Monument Surface Waste Facility and the excavation was backfilled with clean material per NMOCD approval. A compacted clay barrier was installed on May 15th at a depth of approximately 5.5 to 7 ft below ground surface. Texerra subsequently completed a preliminary evaluation of groundwater contamination per an NMOCD approved Investigation and Characterization Plan (ICP) and the results of this are summarized below.

Elevated chloride levels (1,420 ppm) were found in a monitor well (MW-1) approximately 25 ft down-gradient from the former excavation. Groundwater chloride concentrations were similarly elevated (also 1,420 ppm) in a down-gradient well (MW-3) and 980 ppm in an up-gradient well (MW-2). Low levels of BTEX (0.052 ppm) were found in the near-source well (MW-1). Near-trace concentrations of BTEX (0.002 ppm) were found in the down-gradient well (MW-3). (See Figure 3 and Table 1). A hydrocarbon sheen has also been noted in the near-source well (MW-1).

The presence of elevated chlorides (980 ppm) in the up-gradient well (MW-2) indicates that groundwater is not pristine as it flows onto the subject site. However, the presence of more elevated chlorides in the near-source well (1,420 ppm in MW-1) and the down-gradient well (1,420 ppm in MW-3) suggests some chloride movement into groundwater from soils beneath the former redwood tanks. Further, the presence of low levels of BTEX in the near-source well (MW-1) and down-gradient well (MW-3) corroborates the

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observed hydrocarbon sheen in the near-source well and suggesting, also, some movement of hydrocarbons from beneath the former redwood tanks.

The following measures are recommended based upon the above information:

- 1- Two additional down-gradient monitor wells will be installed (approximately where shown in Figure 1) in order to more completely delineate the groundwater impact from the site.
- 2- Two oxygen (air) injection wells will be installed up-gradient of the former excavation in order to provide enhanced natural attenuation of groundwater hydrocarbons.
- 3- Groundwater will be analyzed for chlorides and BTEX quarterly for the 2008 calendar year. The data will be analyzed and the path forward revisited with NMOCD.

**It is requested that these proposed measures be considered a Corrective Action Plan (CAP) for this project.** In addition to collecting further baseline data, we are proposing intervention to address the slightly elevated groundwater hydrocarbon levels. Further, the ability to proceed in this manner without invoking "Rule 19" will enable us to undertake these actions more quickly.

I welcome your review of this information and look forward to your reply.

Thank you for your consideration.

Sincerely,



L. Peter Galusky, Jr. Ph.D.  
Principal

Encl: Site maps and data

Copy: Kristin Pope, Rice Operating Company

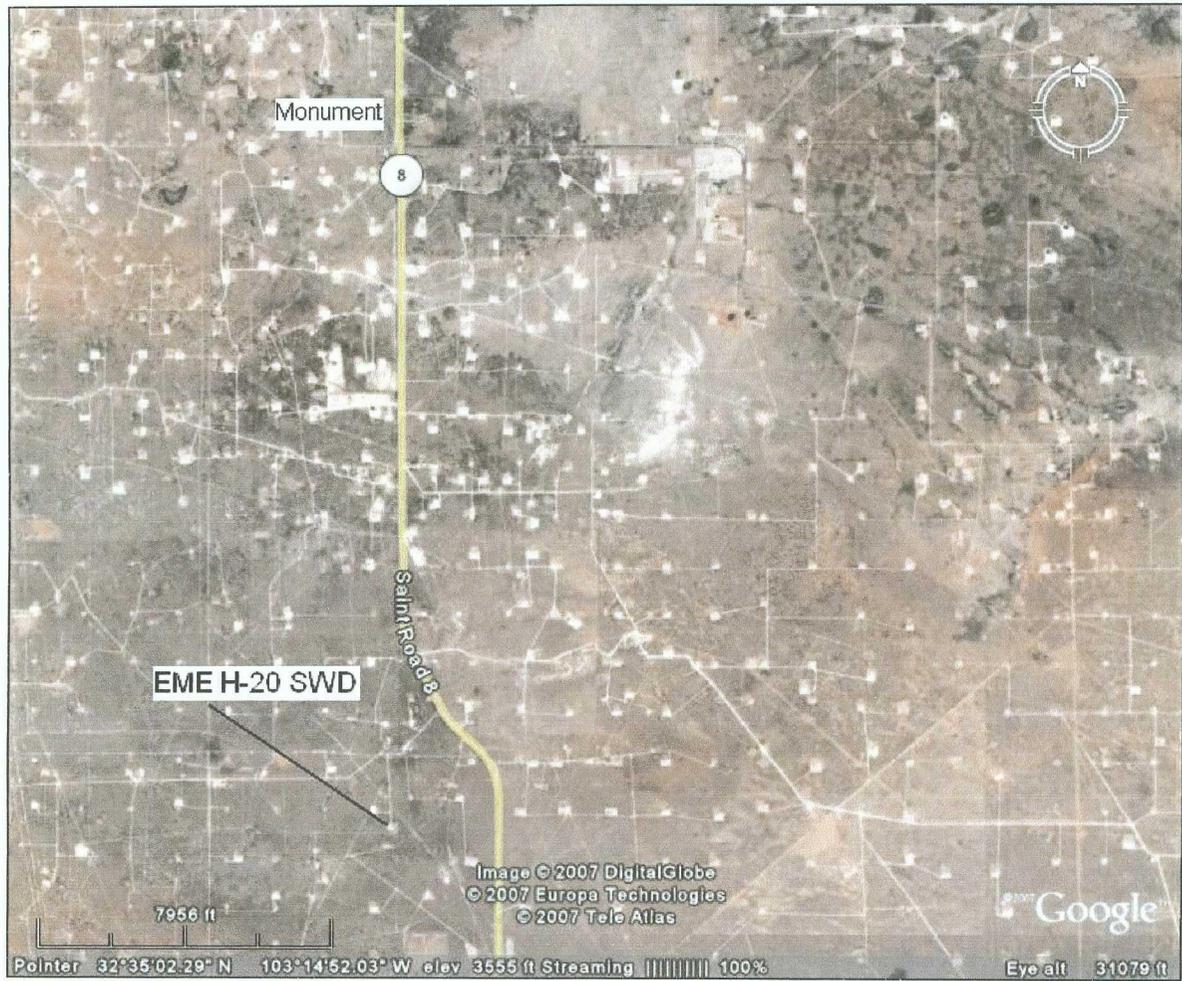


Figure 1 – EME H-20 SWD location.

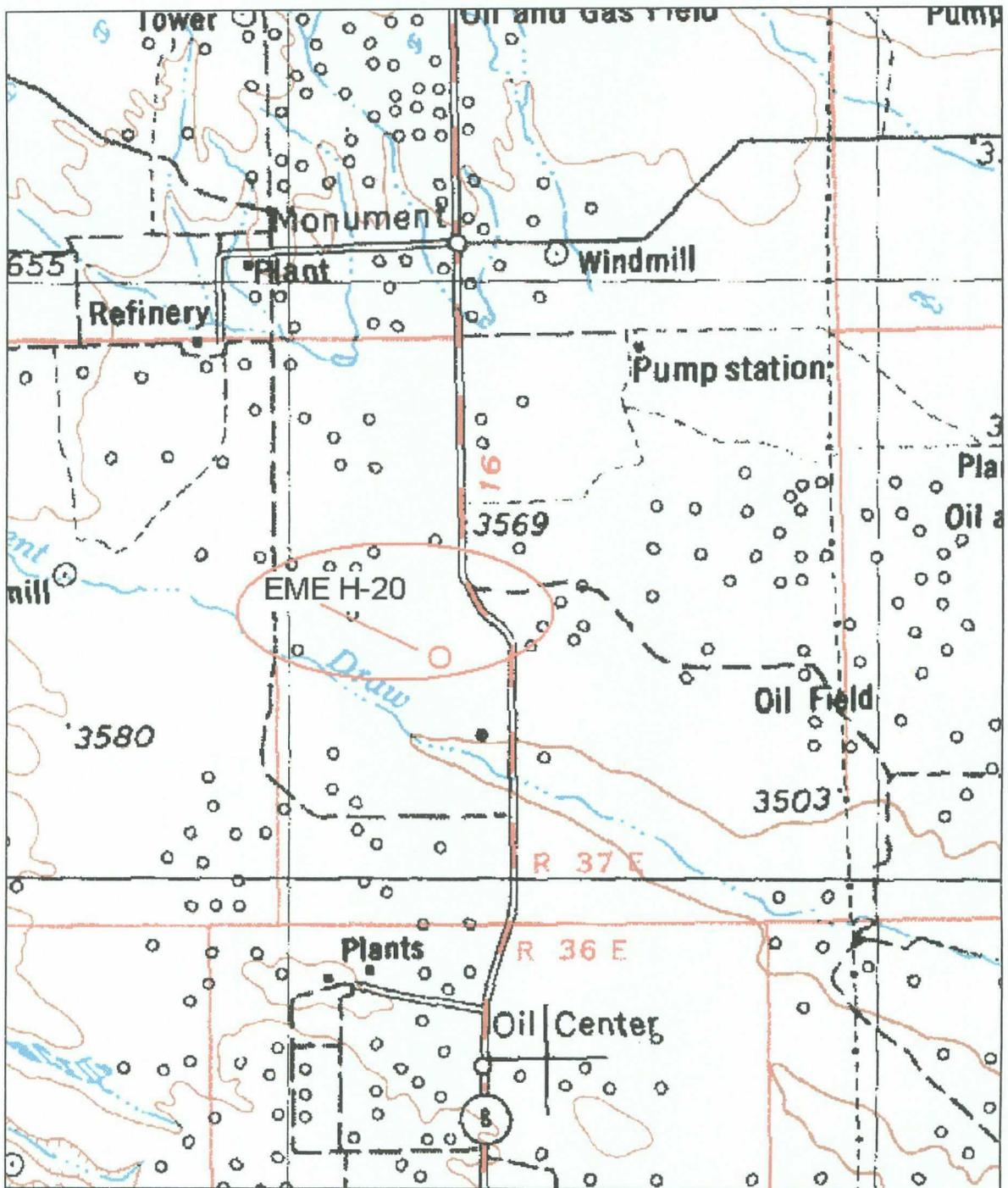
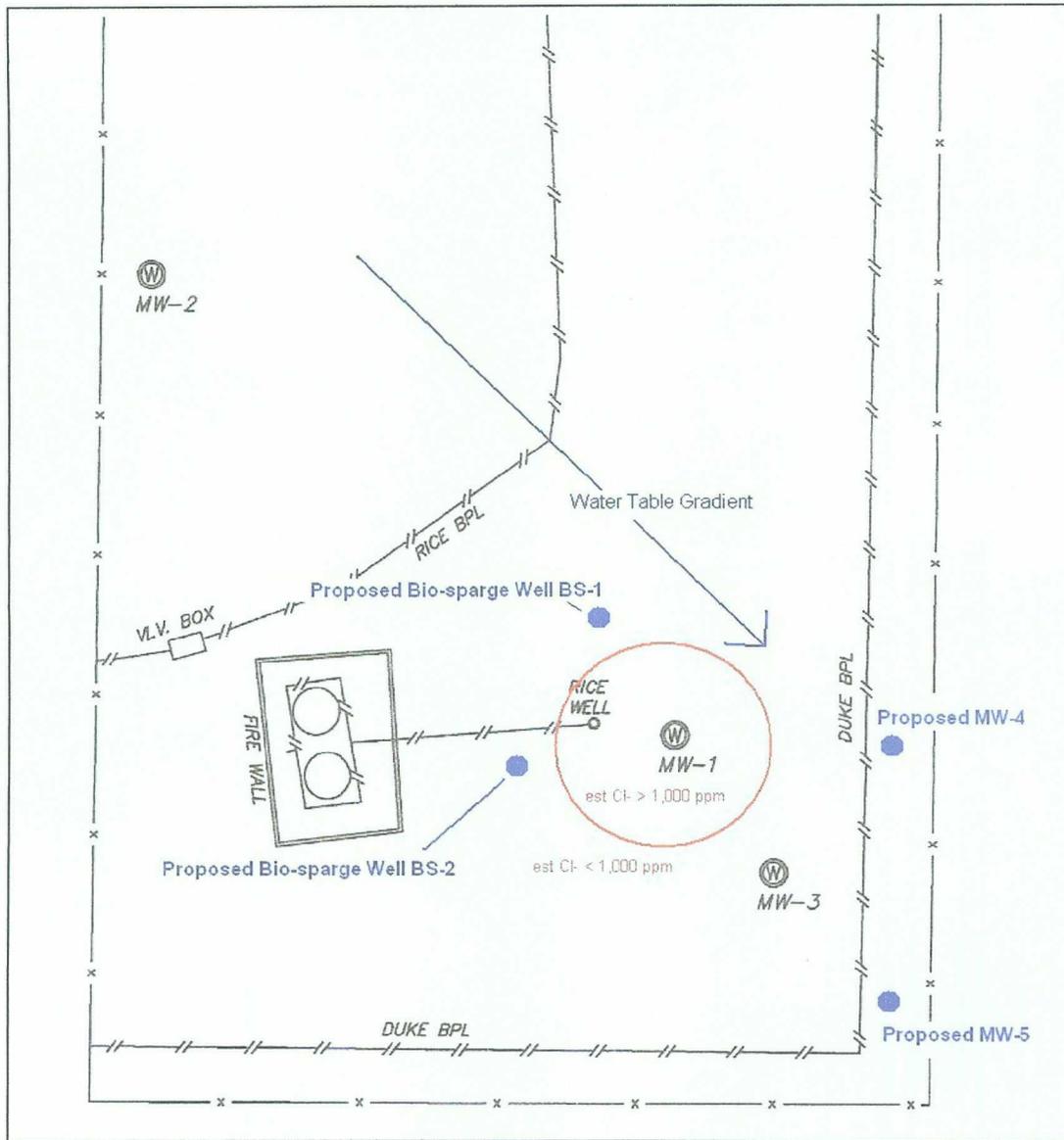


Figure 2 - EME H-20 SWD location on a USGS topographic base map. The direction of groundwater flow is from northwest to southeast, parallel to the ground surface.



**Figure 3** – Site map showing approximate locations of proposed monitor wells (MW-4 and MW-5) and oxygen injection wells (IW-1 and IW-2) in relation to existing facilities and monitor well locations (MW-1, MW-2 and MW-3). Not to scale.

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**Table 1 – Groundwater chloride and BTEX concentrations.**

<b>EME H-20 SWD</b>			
<b>Chloride concentrations (mg/l or ppm)</b>			
	<b>Well ID</b>		
	<b>MW-1</b>	<b>MW-2</b>	<b>MW-3</b>
	<b>approx dist (ft) from ctr of excavation</b>		
	<b>25</b>	<b>100</b>	<b>-300</b>
4/23/2007	1,939	<i>not yet installed</i>	
7/12/2007	1,230	"	
11/1/2007	1,260	1,100	1,710
1/18/2008	1,420	980	1,420
<b>BTEX concentrations (mg/l or ppm)</b>			
	<b>Well ID</b>		
	<b>MW-1</b>	<b>MW-2</b>	<b>MW-3</b>
	<b>approx dist (ft) from ctr of excavation</b>		
	<b>25</b>	<b>100</b>	<b>-300</b>
4/23/2007	0.062	<i>not yet installed</i>	
7/12/2007	0.084	"	
11/1/2007	0.065	<0.006	<0.006
1/18/2008	0.052	<0.003	0.002