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**Annual GW Mon.
REPORTS**

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Environmental Bureau
Oil Conservation Division

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

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December 30th, 2009

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

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Environmental Bureau
Oil Conservation Division

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

Sent via Certified Mail w/ Return Receipt No. 7007 0710 0003 0305 3798

Dear Mr. Hansen:

This letter summarizes progress made over the past year pursuant to the NMOCD approved Corrective Action Plan for this site. The site is an active SWD produced water disposal facility operated by Rice Operating Company (ROC) in the EME field, located approximately 4 miles south of Monument, New Mexico (Figure 1).

Over the course of 2009 we continued to operate two bio-sparge wells, (BSP-1 and BSP-2; Figures 2 & 3) to facilitate the natural attenuation of benzene previously found in the at-source monitor well (MW-1). We also continued to monitor up and down-gradient monitor wells for chlorides and petroleum hydrocarbons (BTEX). The results of this work may be summarized as follows:

1. Benzene concentrations in the at-source monitor well (MW-1) dropped from 0.055 ppm to 0.017 ppm over the course of 2009 (Figure 4). This appears to be due to the effectiveness of the bio-sparge system. Groundwater chloride concentrations in the at-source monitor well (MW-1) were relatively stable, oscillating around an average value of 1,260 ppm during 2009.
2. Groundwater chloride concentrations in the up-gradient monitor well (MW-2) have risen from 1,010 to 1,200 ppm over the course of 2009 (Figure 4). This indicates that the groundwater flowing onto and across the subject site from up-gradient has become increasingly contaminated with respect to chloride.
3. The monitor well (MW-3) most directly down-gradient from the subject site exhibited an increase in groundwater chlorides from 1,940 in late 2008 to 2,050 in December of this year (Figure 5). The off-center, down-gradient monitor wells (MW-4 and MW-5) also exhibited slight increases in groundwater chloride concentrations in comparison with late 2008 levels (Figure 5). We believe that these increases may be due in part to the

entrainment of groundwater chlorides that have migrated onto the site from up-gradient.

During the course of 2010 we plan to continue the operation of the solar-powered bio-sparge system and to continue the quarterly monitoring of groundwater for chlorides and BTEX. We propose to submit an Annual Groundwater Report with the results of our 2010 work to NMOCD by April 1st, 2011 (thus putting this project on the same reporting schedule as other projects).

ROC is the service provider (agent) for the EME Salt Water Disposal System and has no ownership of any portion of pipeline, well or facility. The EME SWD System is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis.

Please do not hesitate to contact either myself or Rice Operating Company if you have any questions or need additional information.

Sincerely,

A handwritten signature in black ink, appearing to read 'L. Peter Galusky, Jr.', with a stylized flourish at the end.

L. Peter Galusky, Jr. Ph.D.

Copy: Rice Operating Company



Figure 1 – Location map.

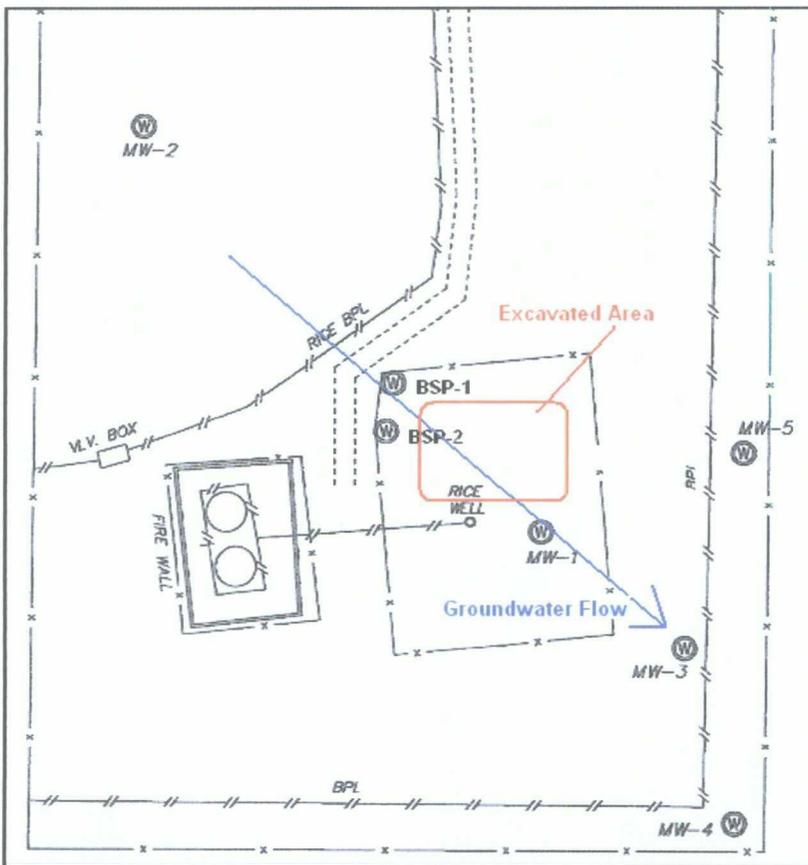


Figure 2 – EME H-20 SWD locations of monitor wells MW-1 through MW-5 and bio-sparge wells BSP-1 and BSP-2.

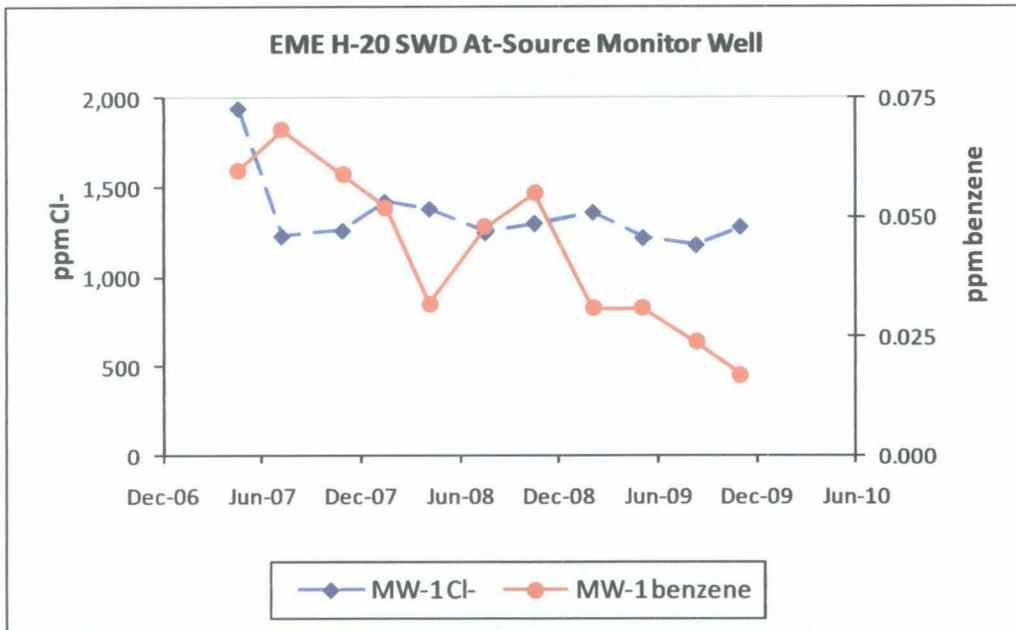


Figure 4 – Groundwater chloride (dashed blue line, left axis) and benzene (solid red line, right axis) concentrations in near-source monitor well (MW-1).

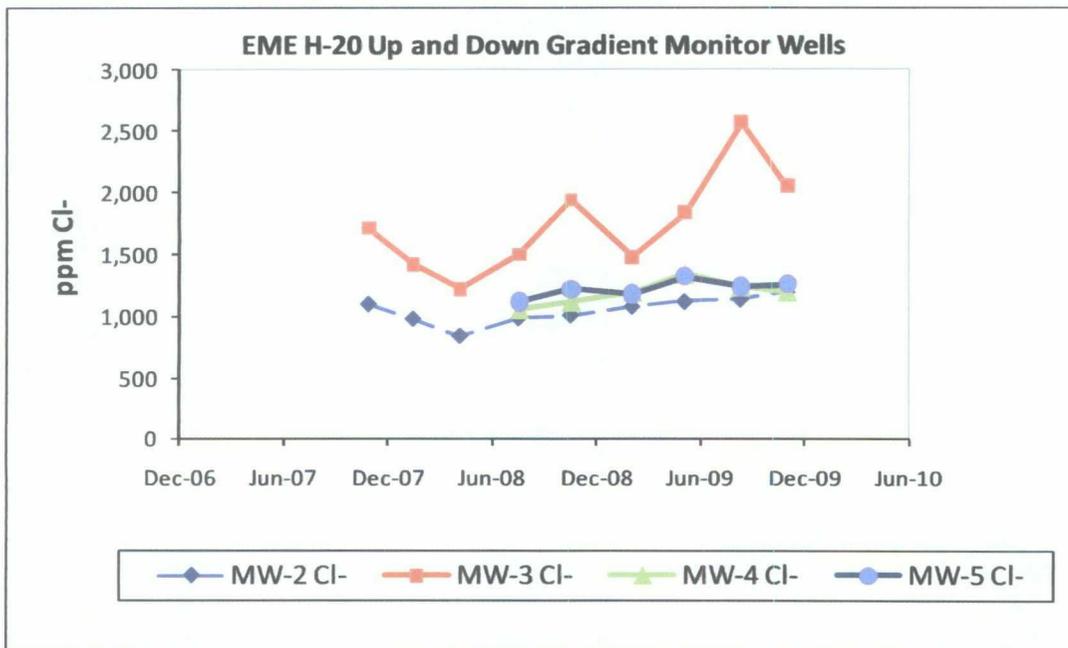


Figure 5 – Groundwater chloride concentrations in up-gradient monitor well (MW-2) and down-gradient monitor wells (MW-3, MW-4 and MW-5). See site map for monitor well location.



Figure 3a (above) – EME H-20 SWD solar powered bio-sparge system, view across system toward the southeast (in the direction of groundwater flow). **Figure 3b** (below) close-up view showing bio-sparge air injection wells looking toward the north.