AP - 99

STAGE 1 & 2 WORKPLANS

DATE: 7-2-10

TETRA TECH

RECEIVED OCD

2010 JUL -6 P 1:21

CERTIFIED MAIL
RETURN RECEIPT NO. 7008 3230 0001 9310 9550

July 2, 2010

Mr. Edward Hansen
New Mexico Energy, Minerals, & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505

Re: Stage 1 and Stage 2 Abatement Plan Amendment, Rice Operating Company, Justis Saltwater Disposal System (SWD), E-1 Vent, Unit E, Section 1, T-25-S, R-37-E, Lea County, New Mexico, NMOCD CASE #1R0423-06 (AP-99).

Mr. Hansen:

On behalf of Rice Operating Company (ROC), Tetra Tech submits the following Amendment to the Stage 1 and Stage 2 Abatement Plan for the Justis Saltwater Disposal System (SWD) E-1 (NMOCD AP-99) site. In an email dated June 3, 2010, the NMOCD requested that ROC submit "a proposed amendment to the Plan regarding potential groundwater impact of chlorides from the deep (i.e., 50' to 90' bgs) vadose zone in the area of SB-1". This letter details a chloride mass calculation for the soils from the deep zone and their potential to impact the underlying groundwater. ROC is the service provider (agent) for the Justis SWD system and has no ownership of any portion of the pipeline, well or facility. The Justis SWD system is owned by a consortium of oil producers, Systems Parties, who provide all operating capital on a percentage ownership/usage basis.

As part of the ROC Junction Box Upgrade Workplan, starting on November 11, 2003, the three junction boxes were removed and the site investigated vertically and horizontally with a backhoe to dimensions of 20' by 20' by 12'. The site was found to be impacted with TPH and chlorides. In late 2003, a clay liner measuring 20' x 20' by 6' deep was installed in the excavation in order to impeded further vertical migration of the remaining chlorides in the subsurface. In order to vertically delineate the site, one soil boring was drilled in the center of the excavation on March 17, 2004. The soil boring (SB-1) was extended to the groundwater at a depth of approximately 89.2' bgs. Chloride concentrations did not decrease with depth. (See attached soil boring log SB-1). In order to define the horizontal extent of the chloride impacts, an additional six soil

Tetra Tech
1910 North Big Spring, Midland,TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

TETRA TECH

borings (SB-2 through SB-7) were drilled at the site from August to October 2007. Chloride concentrations in SB-2 through SB-7 decreased with depth at a depth of 55' bgs or less. In order to account for any potential contribution from the 50 to 90' (40') section around soil boring SB-1, we took a 10' x 10' area around the boring. The average chloride concentration in the soil (deep zone) is 1,463.66 mg/kg. If background concentration of 250 mg/kg is removed the average chloride concentration for the soils is 1,213.66 mg/kg. If all of this chloride concentration was to impact groundwater, the total chloride loading would be:

10' x 10' by 40' = 4,000 cu. Ft./ 27 cu. Ft./ cu. Yd. = 148.15 cubic yards.

Using 2,600 lbs./cubic yard = 148.15 x 2,600 = 385,190 lbs. of soil x 0.45359237 kg/lb = 174,719.25 kg of soil.

At 1,213.66 mg chloride per kg of soil = 174,719.25 kg x 1,213.66 mg/kg / 1,000,000 mg/kg = 212.05 kg of chloride.

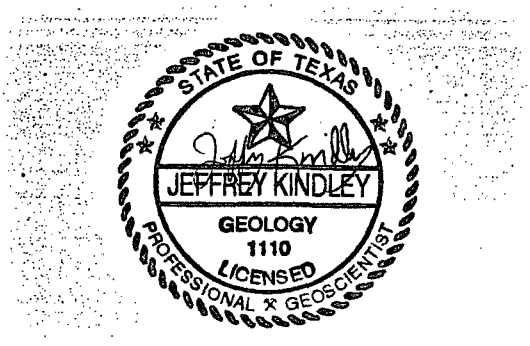
We propose to remove the calculated mass by pumping groundwater from Recovery Well (RW-1) which was installed adjacent to MW-1 in June 2010. The 4" recovery well will allow for a high pumping rate. In March 2010, chloride concentrations of 5,350 mg/L were observed in MW-1.

Using 5,350 mg/L (0.00535 kg/L) yields:

212.05 kg / 0.00535 kg/L / 3.7854 L/gal = 10,471 gallons of water to be removed.

Combining the chloride mass calculated in the vadose zone (212.05 kg) with the chloride mass calculated in the groundwater (2,121.6 kg) equals a total mass of 2,333.65 kg of chloride to be removed for this site.

If you have any questions or comments, please do not hesitate to contact me at (432) 682-4559, or Hack Conder of ROC at (575) 393-9174.



Respectfully Submitted,
Tetra Tech, Inc.

Jeffrey W. Kindley, P.G.
Senior Project Manager

cc: Hack Conder –ROC
attachment: SB-1 boring log

LOG OF BORING

K. Farris
RICE Operating Company

Logger:	Israel Juarez; Mort Bates	**Client:**	**Well ID:**
Driller:	Atkins Engineering Associates, Inc.	RICE Operating Company	
Drilling Method:	Hollow Stem Auger	**Project Name:**	
Start Date:	3/17/2004	E-1 vent	
End Date:	3/17/2004	**Location:**	**SB-1**
Notes:	Site of former junction box; 100 ft south of new box Total Depth = 90 ft Groundwater = 89.30 ft	Justis SWD System Sec. 1, T25S, R37E Lea County, NM	

Depth (feet)	Split Spoon chloride	Split Spoon PID	Description	Lithology	Additional Notes
0.0			0-6 ft Silty Sand w/Broken Caliche: loose, light tan, damp		
5.0			COMPACTED CLAY BARRIER		4-10 ft hydrated bentonite plug
10.0			8-13 ft Silty Sand w/Caliche: loose, tan, damp		
15.0	209	4000+	13-16 ft Silty Sand: loose, gray, damp		
20.0	975	4000+	16-21 ft Silty Sand w/Cemented Sandstone: hard, gray, damp		
25.0	1000	50.0	21-66 ft Silty Sand: loose, brown, damp		Backfilled with drill cuttings
30.0	844	31.9			
	944	21.7			
35.0	706	36.1			
40.0	623	86.0			
45.0	714	53.2			
50.0	1177	27.6			
55.0	824	28.6			
60.0	2299	23.3			
65.0	2439	42.9			
70.0	1703	43.0	66-69 ft Clayey Sand: loose, brown, damp		
75.0	928	73.0	69-84 ft Silty Sand: loose, brown, damp		
80.0	1032	32.2			
85.0	1364	16.7	84-89 ft Poorly-graded Sand: loose, brown, damp		
90.0	1407	74.9	wet	*water*	lab = 936 ppm Cl