1R-426-214

WORKPLANS

Date:
5-7-13

Hansen, Edward J., EMNRD

From: Katie Jones <kjones@riceswd.com>
Sent: Tuesday, May 07, 2013 3:25 PM
To: Hansen, Edward J., EMNRD
Cc: Hack Conder; Kindley, Jeff; Laura Pena
Subject: ROC - BD F-26 vent (1R426-214) ICP Report and CAP Addendum
Attachments: ROC - BD F-26 vent (1R426-214) ICP Report and CAP 4.18.13.pdf; ROC - BD F-26 vent (1R426-214) Soil Data.xlsx; ROC - BD F-26 vent (1R426-214) Figure 5.jpg

Mr. Hansen

ROC submits the following as an Addendum to the BD F-26 vent (1R426-214) ICP Report and CAP. Page 3, section 4.0 Proposed Remedy: text in blue lettering, below, will be added to the paragraph. Red lettering marked with a strike-through will be deleted. If you need any further information, please let me or Hack know.

"4.0 PROPOSED REMEDY

ROC proposes to excavate a 30 foot by 43 foot area to approximately 4 to 5 feet deep and install a 20 mil reinforced polyethylene liner. The liner will have dimensions of approximately 30 feet on the west side, 43 feet on the south side, 29 feet on the north side and then slant southeast along the northeast corner remaining a safe distance from an underground electrical line. Upon completion of the liner, the excavated soils will be evaluated for use as backfill. All backfill material will have a chloride concentration of less than 500 mg/kg and a PID (field) reading of less than 100 mg/kg. Any soil requiring disposal will be properly disposed of at an NMOCD approved facility. The site will be brought up to surface grade, contoured to the surrounding area, and seeded with native vegetation. The use of the 20 mil reinforced polyethylene liner will prevent vertical migration of chlorides and TPH within the soils, thereby protecting the underlying groundwater. Figure 4 depicts the location and proposed dimensions of the barrier.

There is an up-gradient source contributing to the degradation of groundwater quality, but the chloride concentration in the near-source monitor well, MW-1, is now greater than the concentration in the up-gradient well, MW-2. Based on this, ROC proposes to remove the following chloride mass, simultaneously from the ~~first available~~ existing recovery systems located at the BD O-23 vent or BD O-23-1 vent sites beginning as of May 6, 2013 (Figure 5).

Estimate of Chloride Mass in Groundwater

Parameter	Unit	Value	Description
Impact area	ft^2	1,290	Estimated Area of Impact
Aquifer Thickness	ft	15	NMOCD Approved Estimation
Porosity	%	0.25	Professional Estimate for Water Saturated Pore Volume
Volume of Impacted Groundwater Below Site	ft^3	4,838	Impact Area x Aquifer Thickness x Porosity
Volume of Impacted Groundwater Below Site	L	136,982.75	Conversion from ft^3 to Liters

Chloride Concentration from Source	mg/L	1,320	Difference between the Average Chloride Concentration in Monitor Wells (MW-1 = 2,450 mg/L and MW-2 = 1,130 mg/L)
TOTAL CHLORIDE MASS	**kg**	**181**	Volume of Impacted Groundwater Below Site x Chloride Concentration Added to Soil from Source

Chloride Mass in the Vadose Zone

Parameter	Unit	Value	Description
Impact area	ft^2	100	10x10-ft area surrounding the area with the highest chloride concentration (SB-2)
Vadose Zone Thickness	ft	10	10 ft of vadose zone above the water table
Volume of Impacted Vadose Zone	ft^3	1,000	Impact Area x Vadose Zone Thickness
Mass of Impacted Vadose Zone	kg	50,000	Volume of Impacted Vadose Zone x Mass Density (1 ft^3 of soil weighs approx. 50 kg or 110 lb/ft^3)
Chloride Concentration Added to Soil From Source	mg/kg	4,671	Average chloride concentrations from the lab result at 40 ft bgs, and the lab adjusted field result at 35 ft bgs in SB-2 (calculations are attached)
TOTAL CHLORIDE MASS	**kg**	**234**	Mass of Impacted Vadose Zone x Chloride Concentration Added to Soil From Source

Estimated Groundwater Recovery System Removal based on the chloride concentration at BD O-23-1 vent

Parameter	Unit	Value	Description
Groundwater Concentration	mg/L	4,550	Groundwater Concentration from RW-
Groundwater Concentration	kg/gal	0.01722376	Conversion from mg/L to kg/gal
Pumping Rate	gals/min	1	Given
Extraction Rate	kg/min	0.01722376	Pumping rate x Groundwater Concentrat (kg/gal)
Extraction Rate	kg/day	10.3342545	Conversion from kg/min to kg/day
Representative Total Chloride Mass	kg	415	From above
Volume Removal	gals	24,095	Pumping rate x Estimated Removal Time x min/hour x 10 hr/day
Volume Removal	bbls	574	Conversion from gals to bbls
ESTIMATED REMOVAL TIME	**day**	**40**	Representative Total Chloride Mass/Extrac Rate

~~Estimated Groundwater Recovery System Removal at the BD O-23-1 vent~~

~~Parameter~~	~~Unit~~	~~Value~~	~~Description~~
~~Groundwater Concentration~~	~~mg/L~~	~~4,550~~	~~Groundwater Concentration from RW-~~
~~Groundwater Concentration~~	~~kg/gal~~	~~0.01722376~~	~~Conversion from mg/L to kg/gal~~

~~Pumping Rate~~	~~gals/min~~	~~1~~	~~Given~~
~~Extraction Rate~~	~~kg/min~~	~~0.01722376~~	~~Pumping rate x Groundwater Concentration (~~
~~Extraction Rate~~	~~kg/day~~	~~10.3342545~~	~~Conversion from kg/min to kg/day~~
~~Representative Total Chloride Mass~~	~~kg~~	~~181~~	~~From above~~
~~Volume Removal~~	~~gals~~	~~10,498~~	~~Pumping rate x Estimated Removal Time x min/hour x 10 hr/day~~
~~Volume Removal~~	~~bbls~~	~~250~~	~~Conversion from gals to bbls~~
~~ESTIMATED REMOVAL TIME~~	~~day~~	~~17~~	~~Representative Total Chloride Mass/Extractio~~

Based on a current chloride concentration of 4,550 mg/L at BD O-23-1 vent, approximately ~~250~~574 barrels of groundwater and approximately ~~17~~40 days of pumping will be required to remove the ~~181~~415 kg of chloride. Removed groundwater will be utilized for pipeline and well maintenance."

Thank you.

Katie Jones
Environmental Project Manager
RICE *Operating Company*

From: Hansen, Edward J., EMNRD [mailto:edwardj.hansen@state.nm.us]
Sent: Monday, May 06, 2013 11:02 AM
To: Hack Conder
Cc: Leking, Geoffrey R, EMNRD; Katie Jones; Laura Pena
Subject: Remediation Plan (1R426-214) Further Information Required - ROC BD F-26 Vent Site

RE: ICP Report and Corrective Action Plan
for the Rice Operating Company's
BD F-26 Vent Site
Unit Letter F, Section 26, 21S, R37E, NMPM, Lea County, New Mexico
Remediation Plan (1R426-214) Further Information Required

Dear Mr. Conder:

The New Mexico Oil Conservation Division (OCD) has received Rice Operating Company's (ROC) proposed corrective action plan for the above-referenced site (dated April 18, 2013). The plan indicates that additional information is required. Therefore, the OCD cannot approved the proposed plan for the remediation plan at this time:

ROC must address the possible release of chlorides from the vadose zone into groundwater even after the liner is installed (i.e., from the bottom 10' of the vadose zone). At this site SB-2 indicates elevated chloride concentrations at the bottom 10 feet of the vadose zone. Therefore, using a 10' x 10' area around SB-2 and the bottom 10' at SB-2, there would be 1,000 cubic feet of soils (or 50,000 Kg using 110 pound / cubic foot) that could release chlorides into groundwater. At 50,000 Kg of soils and 4,671 mg/Kg chloride in soils (the average 3,821 mg/Kg chloride at a depth of 35', an estimate base upon the difference between the field data and laboratory data for the results at 40', and 5,520 mg/Kg chloride at a depth of 40') there is an additional **233 Kg** of chloride that could be released to groundwater.

If you have any questions regarding this matter, please contact me at 505-476-3489.

Edward J. Hansen
Hydrologist
Environmental Bureau

BD F-26 vent (1R426-214)
Unit F, Section 26, T21S, R37E
Depth to GW: 45 ft

SB-1

Depth (feet)	Chloride	LAB			PID
15	138	Chloride <16	GRO 1,180 DRO 1,960	B 0.148 T 2.31 E 25.4 X 63.4	1,378
20	129				505
25	110				274
30	137				54
35	138				24
40	80	Chloride 16	GRO <10 DRO 17.7	B <0.05 T <0.05 E <0.05 X <0.03	9.4

SB-2

Chloride	LAB		PID
1,214			6.6
226			6
1,289	Chloride 2,440	GRO <10 DRO <10	5.7
1,066			2.9
3,217	Lab adjusted field data	Chloride 3,821	3.3
4,647	Chloride 5,520	GRO <10 DRO <10	4.2

SB-3

Chloride	LAB		PID
230			4.6
272	Chloride 240	GRO <10 DRO <10	5.9
144			2.9
211			5.2
166	Chloride 144	GRO <10 DRO <10	3.4

MW-2

Depth (feet)	Chloride	LAB		PID
5	89			1.3
10	179			0.9
15	140			9
20	207			1.5
25	517	Chloride 896	GRO <10 DRO <10	2.2
30	293			1.1
35	136			0.7
40	149			0.6
45				
50				
55				
60				

Average Chloride Concentration in the bottom 10 ft of SB-2: 4,671 kg