1R - 479

WORKPLANS

Date:

11-8-13

Texerra LLC

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Tel: 719-339-6791 E-mail: lpg@texerra.com

November 8th, 2013

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

RE: **Vadose Zone Corrective Action Plan (CAP) Update**
Rice Operating Company
Vacuum N-6-1 Jct, UL N, Sec 6, T18S, R35E
OCD Case Number 1R0479

Sent via E-mail and U.S. Certified Mail: No. 7011 0110 0002 5197 1457

Mr. Hansen:

Rice Operating Company (ROC) has made steady progress in defining the extent of residual soil chlorides and in removing chloride impacted groundwater beneath their former Vacuum N-6-1 Junction Box location since an accidental discharge of approximately 150 bbls of produced water was discovered there in April of 2003. The first detailed characterization of soil and groundwater conditions was completed in June of 2006 per a NMOCD approved Investigation Characterization Plan (ICP) of December 12, 2005 (and subsequently revised February 27, 2006). The information gained from the ICP field work was used to develop an NMOCD approved Corrective Action Plan (CAP) of February 28, 2007. The CAP first entailed a groundwater impact remedy of groundwater chloride removal and monitoring, which was to be subsequently followed by a vadose zone remedy. Progress in groundwater chloride removal has most recently been summarized in our 2012 Annual Report dated March 28, 2013. To date, approximately 27,820 bbls of groundwater have been removed from beneath the former junction box since groundwater removal began in 2007, and near-source groundwater chloride concentrations have dropped from 21,400 mg/l before pumping began to 4,100 mg/l by September of 2013. The removal of high chloride groundwater continues.

In order to address the vadose zone remedy proposed in the CAP, ROC proposes to undertake the following actions:

1- Excavate chloride-impacted soil over an area of approximately 51 ft x 54 ft to a depth of approximately 3 ft bgs. This area encompasses the most of the volume of soil having high levels of residual chlorides and was determined by soil concentrations to the north and south and by the fence line to the east of the source. It is necessary to remain 5 ft away from the non-ROC pipeline west of the source for safety measures (Figure 2a-2b).

2- Install and properly seat a 20-mil, reinforced poly liner over a prepared bed of approximately 6 inches of clean blow sand, and carefully secure the liner with another 6 inches of clean blow sand above the liner.
3- Backfill the remaining excavation with soil material having a chloride concentration no greater than 500 mg/kg and a field measurement of residual hydrocarbons no greater than 100 ppm. Excavated soil will be evaluated for use as backfill, and any excess or soil material exceeding these standards will be properly disposed of at an NMOCD approved facility.
4- Restore the surface to natural grade, amend with topsoil and seed with a blend of native vegetation mix. Vegetation above the liner will also provide a natural infiltration barrier for the site since plants capture water through their roots thereby reducing the volume of water moving through the vadose zone to groundwater.

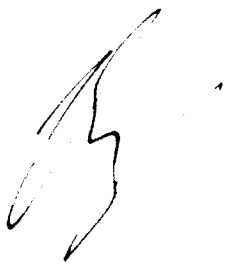
It should be noted that the junction box and associated piping was removed in 2003 and that there is no longer a potential for continued or future produced water spills from this former ROC box.

Upon completion of the vadose zone remediation, ROC will submit a written report providing documentation of CAP activities. ROC will continue with the groundwater recovery and will submit an update in the Annual Groundwater Report.

ROC is the service provider (agent) for the Vacuum Salt Water Disposal System and has no ownership of any portion of pipeline, well or facility. The Vacuum SWD System is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis. We would therefore be most grateful for your review of this proposal at your earliest convenience.

Please contact either myself or Rice Operating Company if you have any questions or need additional information.

Sincerely,



L. Peter Galusky, Jr. Ph.D.

Copy: Rice Operating Company

Appendix:

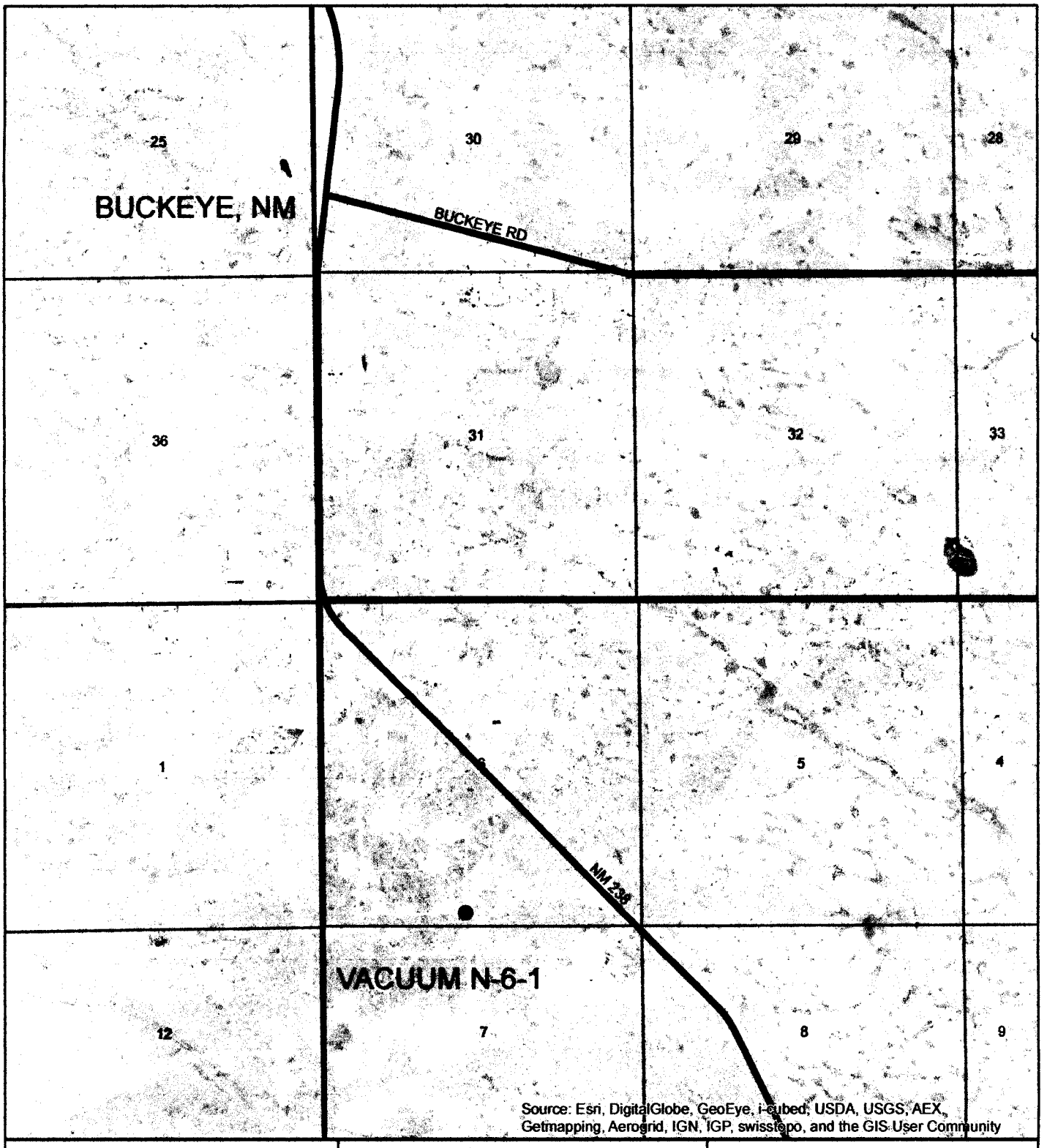
Figure 1 – Site Location Map

Figure 2A and 2B – Proposed Liner Dimensions

Figure 3 – Monitoring Well Locations

Monitoring Well Sampling Data

Site Location Map



RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

VACUUM N-6-1 JUNCTION BOX

LEGALS: UL/N SEC 6
T-18-S R-35-3

NMOCD CASE #: 1R0479

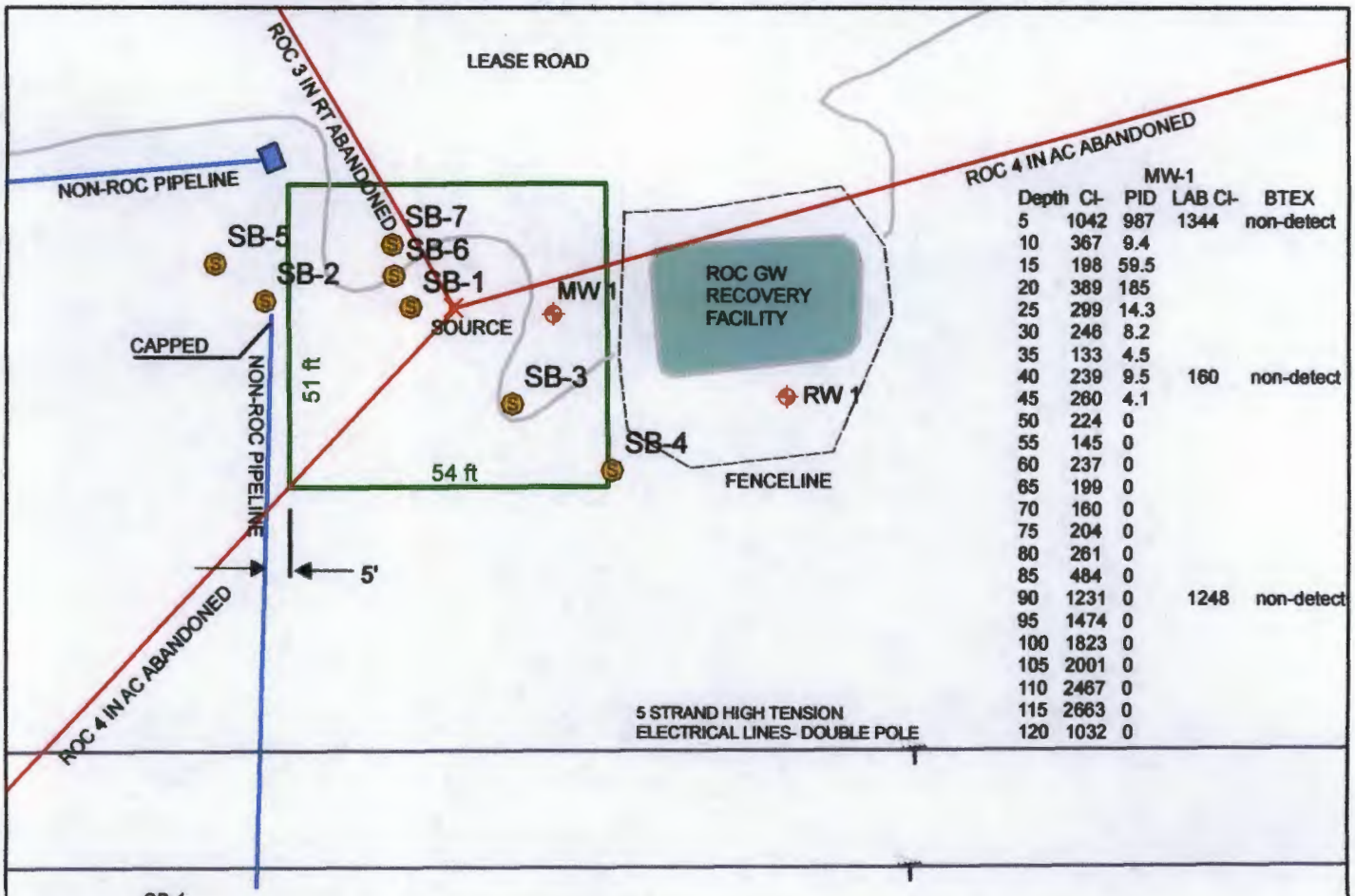
Figure 1

N
W E
S

0 0.25 0.5
Miles

Drawing date: 10/7/13
Drafted by: T. Grieco

Proposed Liner Dimensions



MW-1

Depth	Cl-	PID	LAB Cl-	BTEX
5	1042	987	1344	non-detect
10	367	9.4		
15	198	59.5		
20	389	185		
25	299	14.3		
30	246	8.2		
35	133	4.5		
40	239	9.5	160	non-detect
45	260	4.1		
50	224	0		
55	145	0		
60	237	0		
65	199	0		
70	160	0		
75	204	0		
80	261	0		
85	484	0		
90	1231	0	1248	non-detect
95	1474	0		
100	1823	0		
105	2001	0		
110	2467	0		
115	2663	0		
120	1032	0		

SB-1

Depth	Cl-	PID	LAB Cl-	BTEX
5	486	10.3		
10	166	2317		
15	182	4897	16	non-detect
20	113	3710		
25	112	1182		
30	138	2310		
35	509	1149		
40	680	1818		
45	761	1810		
50	707	1318		
55	629	1113		
60	1285	508		
65	1101	37.7		
70	1032	13.7		
75	927	7.5		
80	1078	9.2		
85	1028	20.1		
90	1002	8.1		
95	899	2.9		
100	887	5.9		
105	1351	11.8		
110	2014	19.8		
115	1949	2.3		
120	2413	1.5	2687	non-detect

SB-2

Depth	Cl-	PID	LAB Cl-	BTEX
5	992	0		
10	1915	0		
15	1977	0		
20	1657	0		
25	895	0		
30	419	1		
35	709	0		
40	801	3.5	880	non-detect
45	693	0.1		
50	892	0		
55	474	0.2		
60	769	1.4		
65	1061	0		
70	950	0		
75	943	0		
80	1107	0		
85	1300	0.1		
90	1337	0.2		
95	1083	0.4		
100	1050	0		
105	1166	0.3		
110	1315	0		
115	1390	0	1951	non-detect

SB-3

Depth	Cl-	PID	LAB Cl-	BTEX
5	1567	4.3		
10	172	0		
15	91	3		
20	782	1.5		
25	1240	1.2		
30	1292	0.3		
35	1424	0.3		
40	1386	2.2		
45	1721	1	2351	non-detect
50	1367	0.6		
55	1549	0.4		
60	1849	0.2		
65	1519	0		
70	1994	0		
75	1226	0		
80	1097	0		
85	1195	0		
90	1358	0		
95	1411	0		
100	1262	0		
105	1259	0		
110	1209	0		
115	1217	0	1504	non-detect

LINER (51' x 54')

DGW = 120 ft

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

VACUUM N-6-1 JUNCTION BOX

LEGALS: UL/N SEC 6 T-18-S R-35-E

NMOCD CASE #: 1R0479

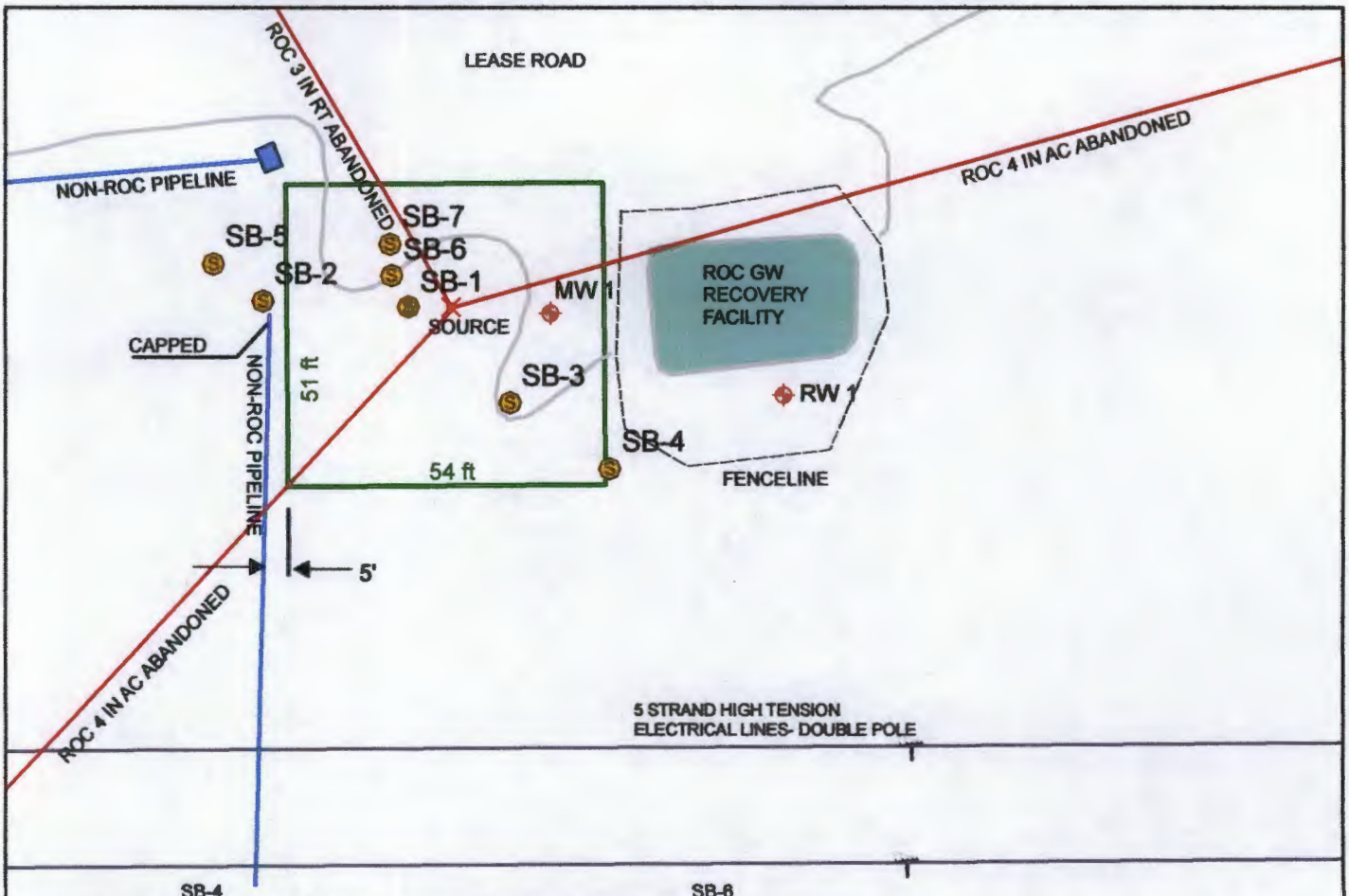
FIGURE 2-A

N W E S

0 25 50 Feet

Drawing date: 5/18/12, 6/13/13
Drafted by: L. Weinheimer, LS

Proposed Liner Dimensions



SB-4

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	261	0.8			
5	647	1			
10	1734	0.4			
15	2950	0.3	3040	<10	<10
20	1106	0.3			
25	1033	0.1			
30	675	0			
35	505	0.1			
40	448	0			
45	345	0			
50	225	0	208	<10	<10

SB-5

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	146	0.3			
5	142	1.4			
10	475	1.1	432	<10	<10
15	207	2.4			
20	175	2.6	96	<10	<10

SB-6

Depth	Cl-	PID	LAB Cl-	GRO	DRO	B	T	E	X
SS	150	0.2							
5	643	51.3							
10	232	195.7							
15	211	330.6							
20	213	241.5	256	300	6760	<0.2	<0.2	1.52	2.51
25	1094	37.7							
30	1252	22							
35	1272	4.2							
40	1262	5.3							
45	732	6.6							
50	1290	5.1							
55	1655	2.4	2200	<10	<10				
60	1023	10.1							
65	1181	3.3							
70	985	2.4							
75	1000	3.6							
80	1350	2.8							
85	1151	3.6							
90	1199	3.4							
95	1165	3.4							
100	852	2.8							
105	1132	2.4							
110	1124	3.6							
115	994	3.7	1070	<10	10.2				

SB-7

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	552	0.7			
5	569	31.5	1100	81.3	1950
10	351	2.6			
15	372	3.4			
20	619	3.1	672	19.5	22.3

LINER (51' x 54')

DGW = 120 ft

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

VACUUM N-6-1 JUNCTION BOX

LEGALS: UL/N SEC 6 T-18-S R-35-E

NMOCD CASE #: 1R0479

FIGURE 2-B

N W E S

0 25 50 Feet

Drawing date: 5/18/12, 6/13/13
Drafted by: L. Weinheimer, LS

Monitoring Well Locations

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

VACUUM N-6-1 JUNCTION BOX

LEGALS: UL/N SEC 6
T-18-S R-35-3

NMOCD CASE #: 1R0479

Figure 3

N W E S

0 50 100 Feet

GPT date: 7/27/11 TG
Drawing date: 10/7/13
Drafted by: T. Grieco

Vacuum N-6-1 (1R0479)

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
1	119.98	125.15	0.8	5	11/16/2012	5400	9240	<0.001	<0.001	<0.001	<0.003	71.8	Silt to clear Slight odor
1	120.03	125.15	0.8	5	2/14/2013	4850	8110	<0.001	<0.001	<0.001	<0.003	65	Silt to clear Slight odor
1	120.4	125.15	0.8	5	5/23/2013	5100	8230	<0.001	<0.001	<0.001	<0.003	74	Silt to Clear/Slight Odor
1	120.6	125.15	0.7	5	9/4/2013	4100	7160	<0.001	<0.001	<0.001	<0.003	55.2	Silt to clear/Slight odor
2	121.08	127	0.9	6	11/16/2012	28	303	<0.001	<0.001	<0.001	<0.003	30.4	Sand to clear No Odor
2	121.11	127	0.9	6	2/14/2013	36	326	<0.001	<0.001	<0.001	<0.003	55.6	Sand to clear No Odor
2	121.27	127	0.9	6	5/23/2013	24	255	<0.001	<0.001	<0.001	<0.003	43.5	Sand to clear No odor
2	121.54	127	0.9	6	9/4/2013	28	290	<0.001	<0.001	<0.001	<0.003	33.1	Sand to Clear/No odor
3	120.81	127.65	1.1	6	11/16/2012	24	296	<0.001	<0.001	<0.001	<0.003	32.2	Sand to clear No Odor
3	120.87	127.65	1.1	6	2/14/2013	28	278	<0.001	<0.001	<0.001	<0.003	38.4	Sand to clear No Odor
3	121.04	127.65	1.1	6	5/23/2013	28	287	<0.001	<0.001	<0.001	<0.003	43.8	Sand to clear No odor
3	121.3	127.65	1	6	9/4/2013	24	305	<0.001	<0.001	<0.001	<0.003	34.8	Sand to Clear/No Odor
4	119.33	125.89	1	6	11/16/2012	40	340	<0.001	<0.001	<0.001	<0.003	43.1	Silt to clear No odor
4	119.35	125.89	1	6	2/14/2013	44	317	<0.001	<0.001	<0.001	<0.003	52.4	Silt to clear No odor
4	119.54	125.89	1	6	5/23/2013	28	265	<0.001	<0.001	<0.001	<0.003	43.2	Silt to clear No odor
4	119.78	125.89	1	6	9/4/2013	24	296	<0.001	<0.001	<0.001	<0.003	33.4	Silt to Clear No Odor
RW-1	XXX	XXX	XXX	Pumping	11/16/2012	3900	6800	<0.001	<0.001	<0.001	<0.003	77.5	Purged with Solar Pump Clear Slight Odor
RW-1	Pump in the Well	XXX	XXX	100	2/14/2013	4200	6840	<0.001	<0.001	<0.001	<0.003	72	Purged with Solar Pump Clear Slight Odor
RW-1	XXX	XXX	XXX	Pumping	5/23/2013	2550	4480	<0.001	<0.001	<0.001	<0.003	66.6	Purged with Solar Pump; clear/slight odor
RW-1	XXX	XXX	XXX	Pumping	9/4/2013	1880	3730	<0.001	<0.001	<0.001	<0.003	65.2	Purged with Solar Pump Clear Slight Odor