1R - 425-85

WORKPLANS

Date:
4-17-12

L. Peter Galusky, Jr. Ph.D., P.G.
Texerra LLC
20055 Laredo Lane, Monument, Colorado 80132
Tel: 719-339-6791 E-mail: lpg@texerra.com

April 17th, 2012

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

Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

APR 25 2012

RECEIVED

RE: **Corrective Action Plan (CAP)**
Rice Operating Company – Vacuum SWD System
Vacuum N-28 Vent: UL/N, Sec. 28, T17S, R35E
NMOCD Case Number: 1R425-85

Sent via Certified U.S. Mail w/ Return Receipt No. 7011 0110 0001 5863 4875

Mr. Hansen:

Rice Operating Company (ROC) has retained Texerra to address potential environmental concerns at the above-referenced site in the abandoned Vacuum Salt Water Disposal (SWD) system. This report summarizes work to date completed according to the Investigation and Characterization Plan submitted May 2nd, 2011, OCD approved on June 9th, 2011, for this site.

The location of the Vacuum N-28 Vent site is given in Figure 1. A summary of soil boring analyses from samples taken in June and July 2011 are given in Figure 2. Copies of laboratory analyses are given in the Appendix.

The depth to groundwater at this site is estimated to be approximately 68 ft below ground surface (bgs). Residual soil chlorides were found in all of the soil borings near the surface. However, soil chloride concentrations dropped to below 250 mg/kg in SB-2, SB-3, SB-4, SB-5 and SB-6. Chloride concentrations in SB-2 decreased from 960 mg/kg at 20 ft to 32 mg/kg at 40 ft, SB-3 decreased from 1,170 mg/kg at 8 ft to 224 mg/kg at 12 ft, concentrations in SB-4 decreased from 3,680 mg/kg at 8 ft to 48 mg/kg at 55 ft, concentrations decreased in SB-5 decreased from 3,560 mg/kg at 7 ft to 32 mg/kg at 40 ft, and SB-6 decreased from 2,240 mg/kg at 7 ft to 64 mg/kg at 40 ft. Residual soil petroleum hydrocarbons were low (PID readings < 100 ppm) in all soil borings except SB-6 where the gasoline range organics (GRO) concentration was 136 mg/kg at 3 ft and the diesel range organics (DRO) concentration was 1,740 mg/kg, at 7 ft the GRO was 179 mg/kg and the DRO was 2,430 mg/kg, but decreased to a value of non-detect by 40 ft. Taken together, these data indicate that residual chlorides and petroleum hydrocarbons are concentrated in the near-surface across the location.

It should be noted that site is located within the immediate vicinity of oil field facilities having a long history with apparent surface spillage (Figures 3 to 8) and that the elevated levels of residual soil chlorides are likely due to activities not directly caused by ROC operations. Nevertheless, in order

to protect groundwater quality from the potential migration of residual soil chlorides, ROC proposes the following actions to serve as a Corrective Action Plan (CAP) for this project. *These measures will provide protection beyond the impacts directly caused by past operation of the Vacuum N-28 vent.*

ROC will:
Install a 20-mil Reinforced Sub-surface Infiltration Barrier and Restore the Ground Surface

- Excavate the area encompassed by the soil borings (48 by 96 ft as shown in Figure 9) to a depth of approximately 3 ft bgs (limited by the presence of hard rock). Due to the close proximity between this and the ROC Vacuum Jct. N-28-1 junction box, the excavation and liner will encompass the affected areas of both former boxes.
- Install a 20-mil, reinforced poly liner over a 6 inch layer of clean blow sand and pad this with another 6 inch layer of the same.
- The excavation will then be backfilled with soil that chlorides measure less than 500 mg/kg and PID hydrocarbons measure less than 100 ppm. Excavated soil will be evaluated for use as backfill, and any soil requiring disposal will be properly disposed of at a NMOCD approved facility.
- Restore the ground surface to natural contours and seed with a blend of native vegetation mix.

Report Course and Results of Work to NMOCD

- Submit a brief report to NMOCD with photographs summarizing the course and completion of these corrective actions and a request for remediation termination. Please note that we do not anticipate the need for, nor propose to, install any monitor wells as our proposed liner system will provide effective protection of groundwater from residual chlorides at this former ROC junction box. Chloride concentrations at this site decreased with depth before reaching the capillary fringe. Historical aerial photos given in Figures 3 through 8 illustrate oil-field impacts of non-ROC facilities surrounding the location of this former box. This is particularly clear in the 1966 and 1949 historical aerial photos.

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

We appreciate your consideration of this Corrective Action Plan. Please do not hesitate to contact either Hack Conder of Rice Operating Company or myself if you have any questions or need additional information.

Sincerely,

L. Peter Galusky, Jr. Ph.D.

Copy: Rice Operating Company

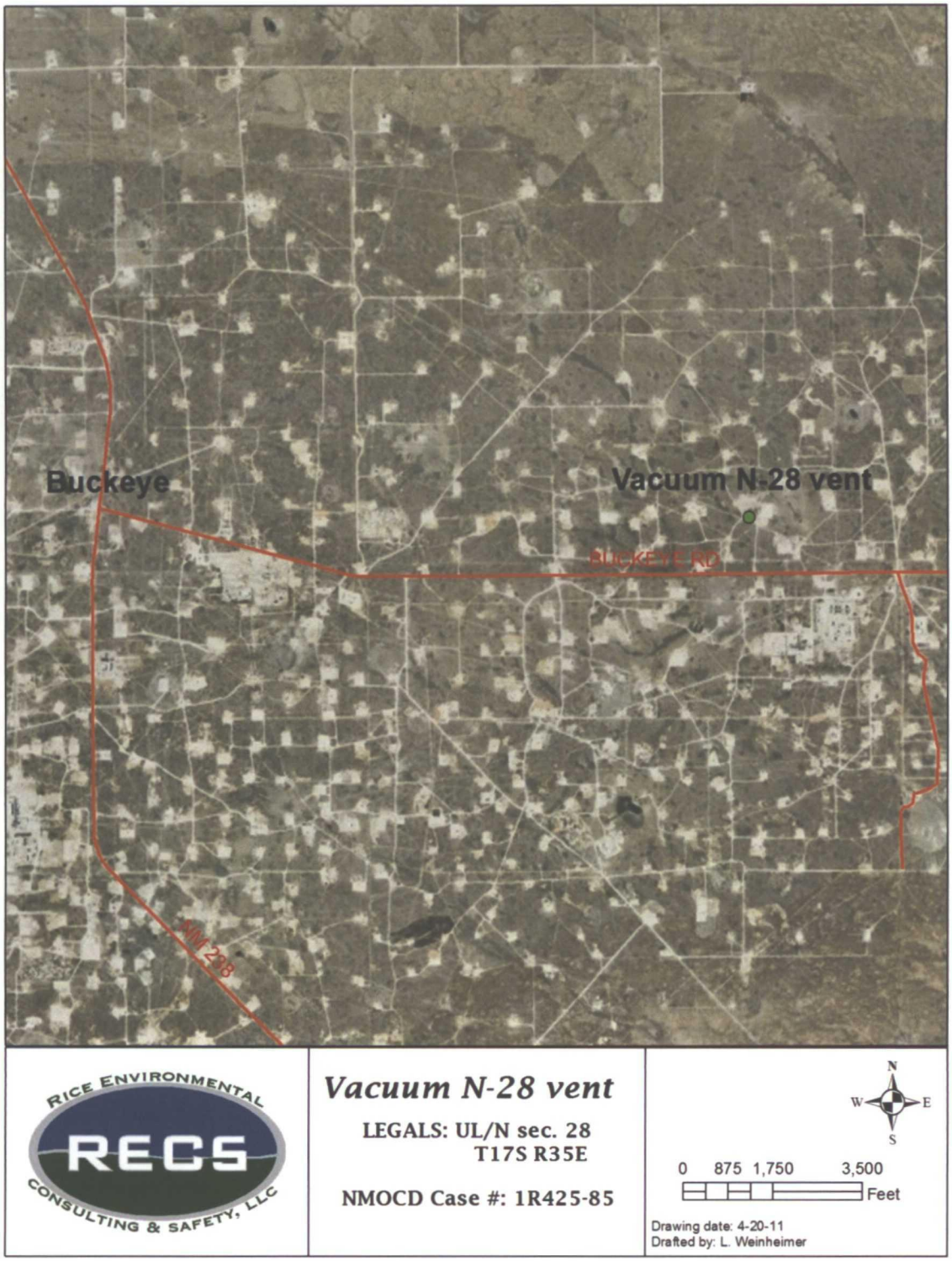

Figure 1 – Vacuum N-28 vent location.

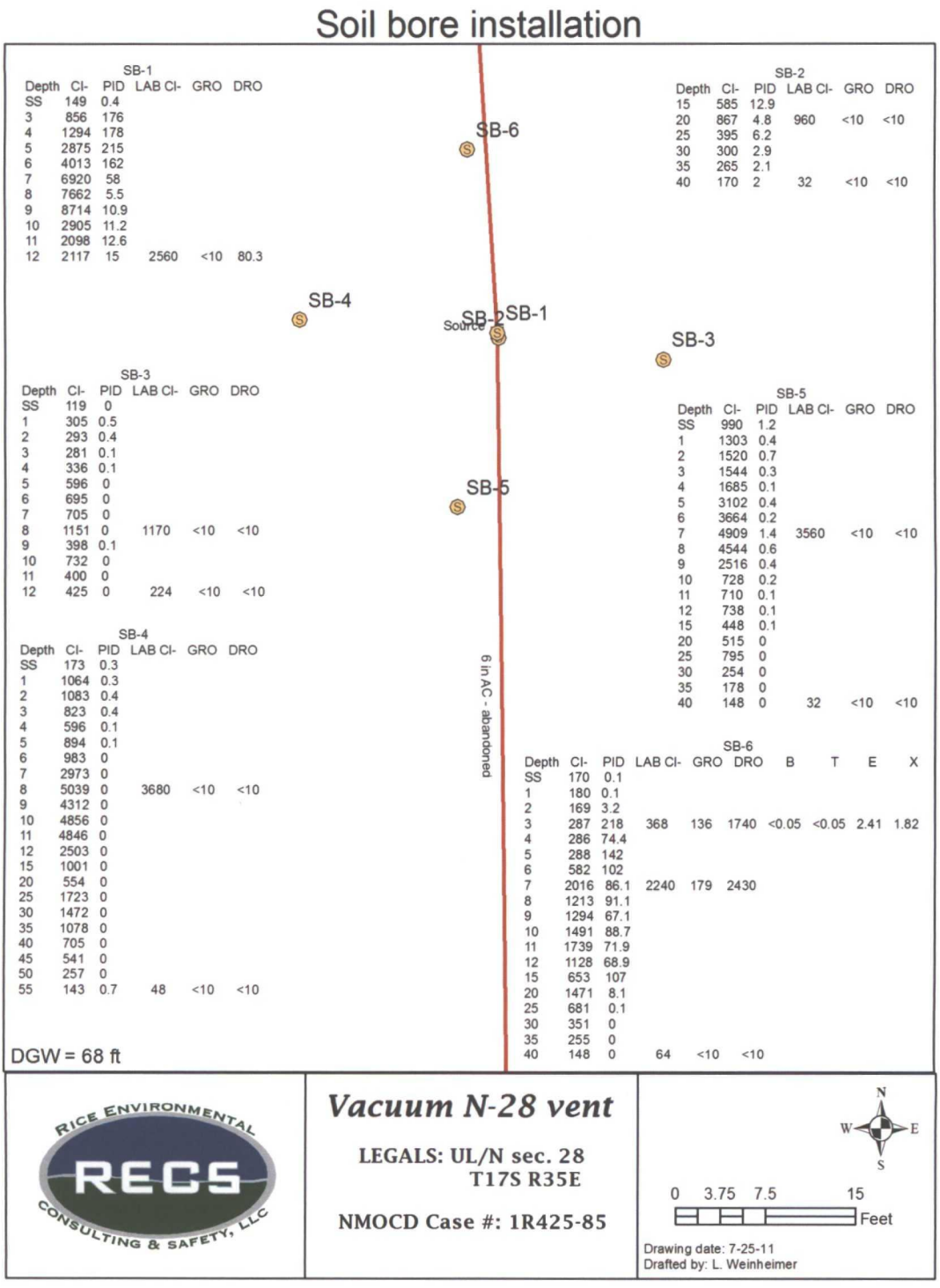

Figure 2 – Summary of soil chloride and petroleum hydrocarbon concentrations from samples taken in June and July 2011.

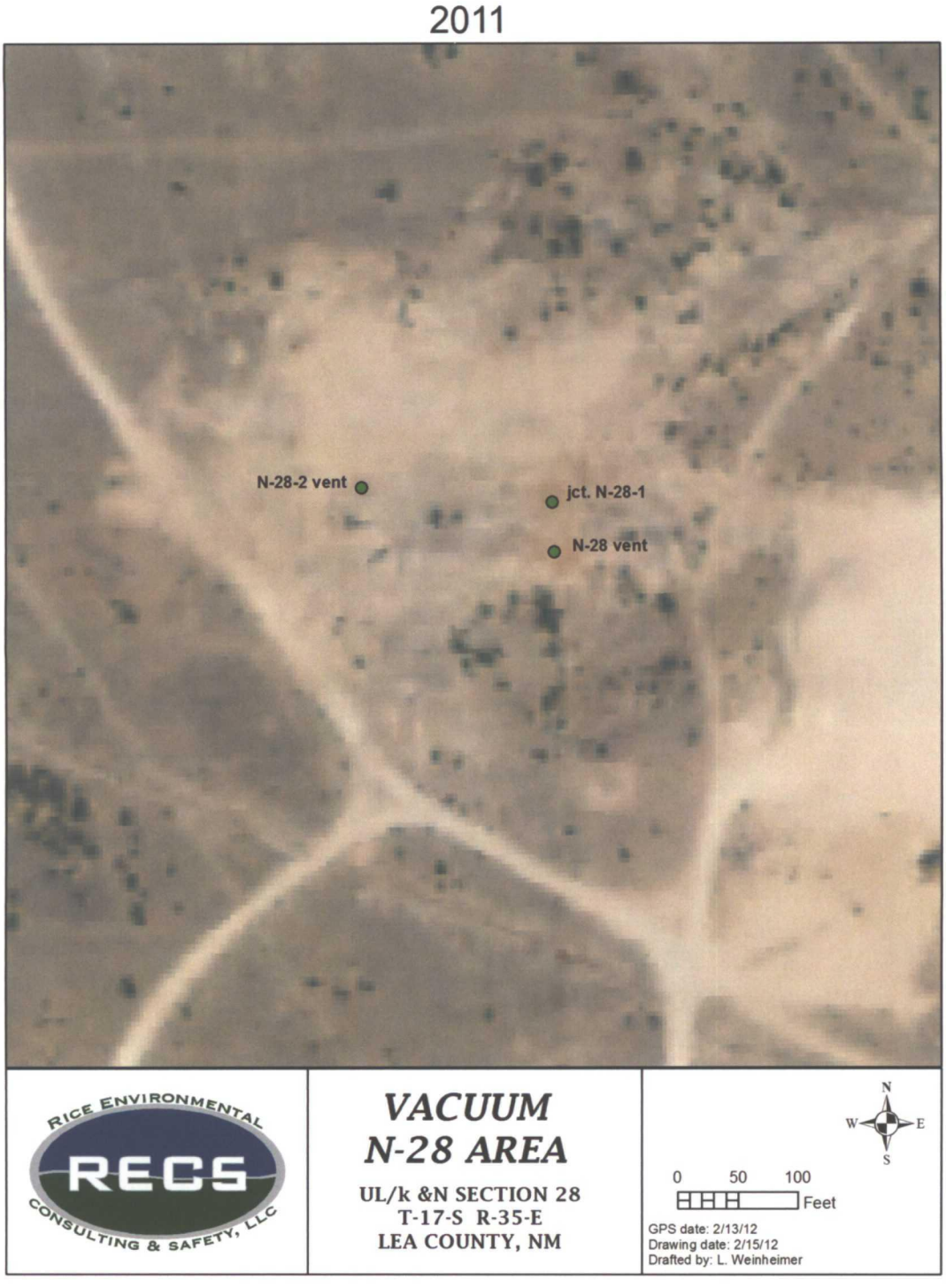

Figure 3 – Aerial of Vacuum N-28 vent location in 2011.

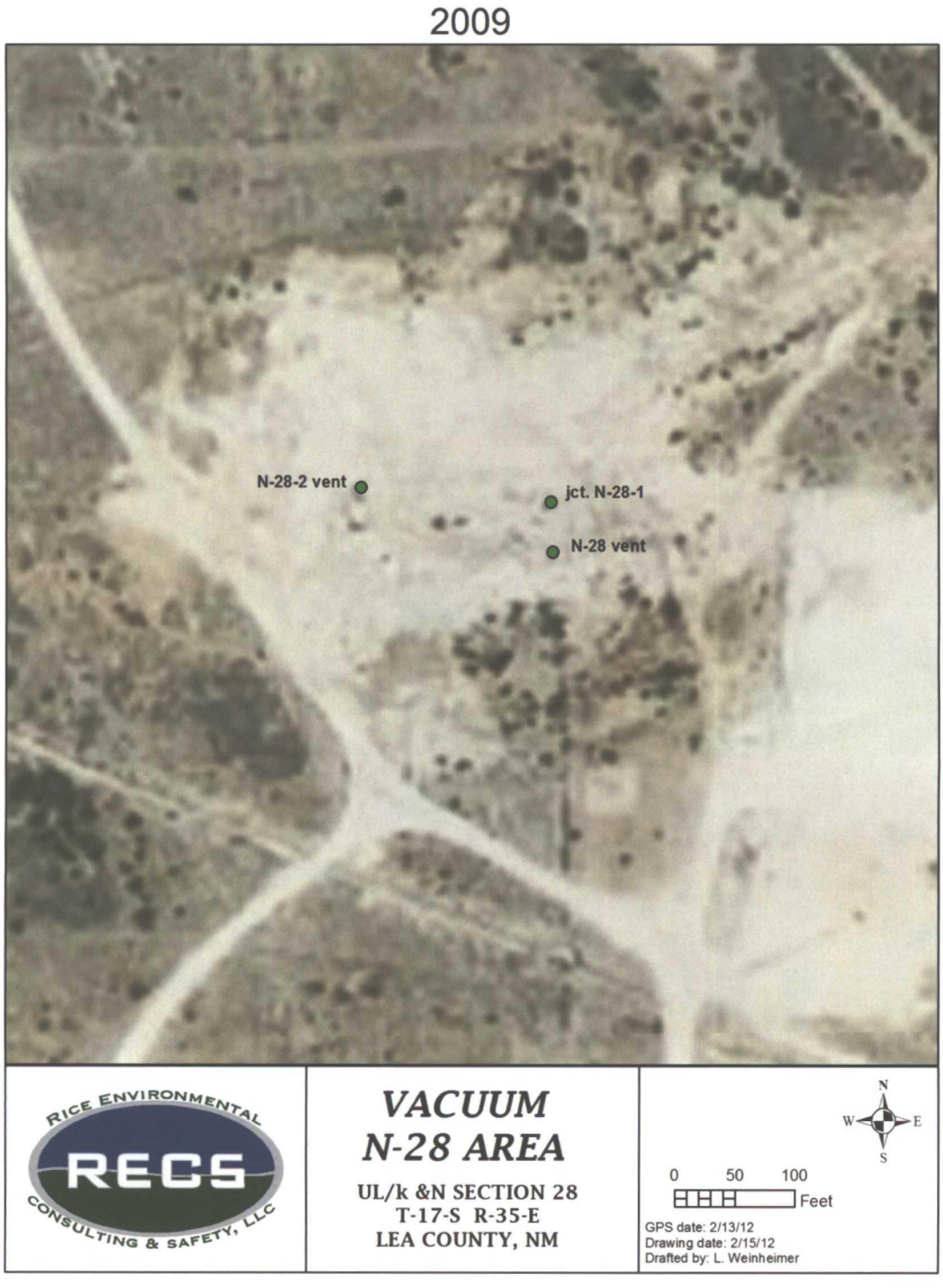

Figure 4 – Aerial of Vacuum N-28 vent location in 2009.

Figure 5 – Aerial of Vacuum N-28 vent location in 2005.

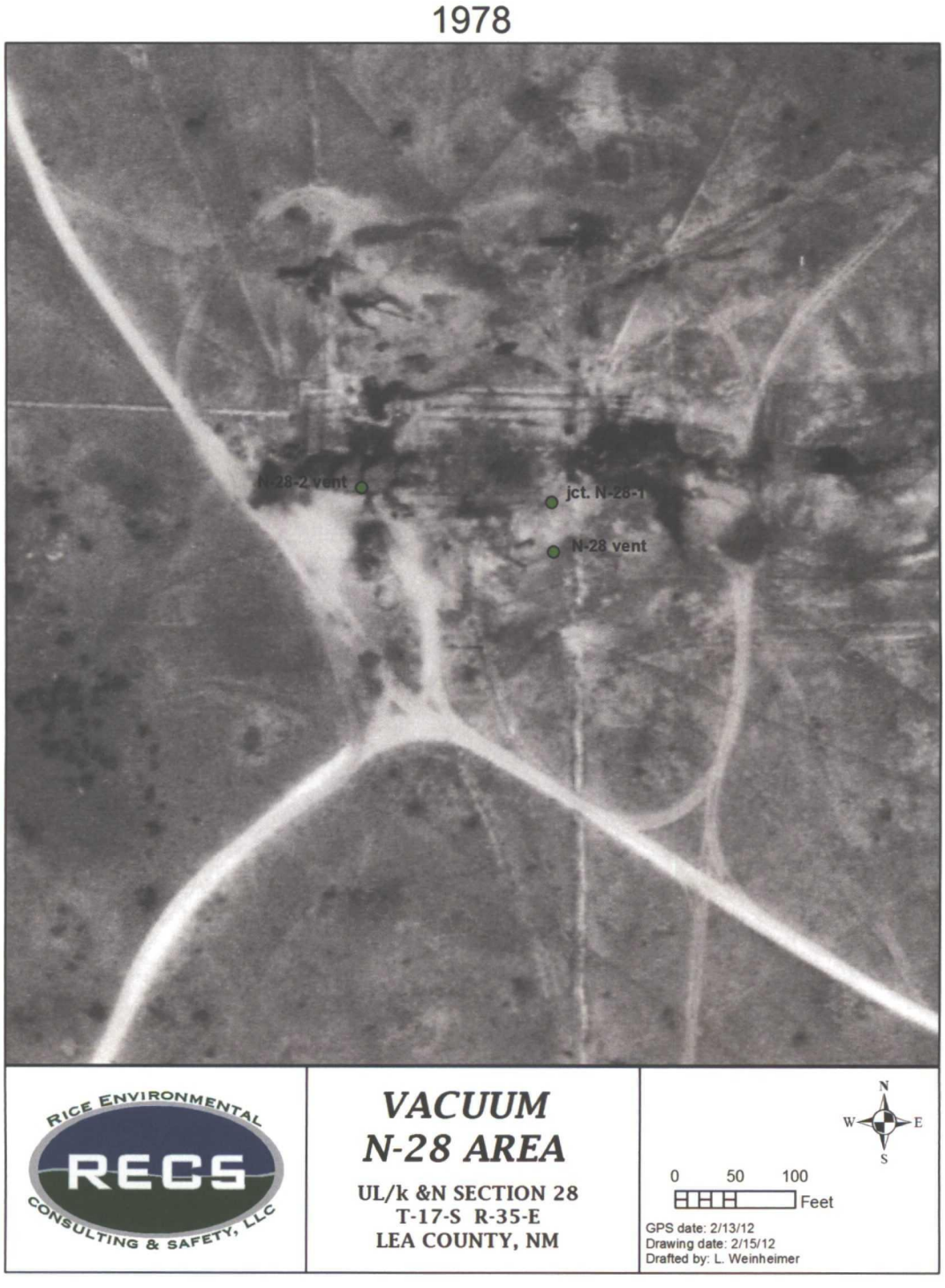

Figure 6 – Aerial of Vacuum N-28 vent location in 1978.

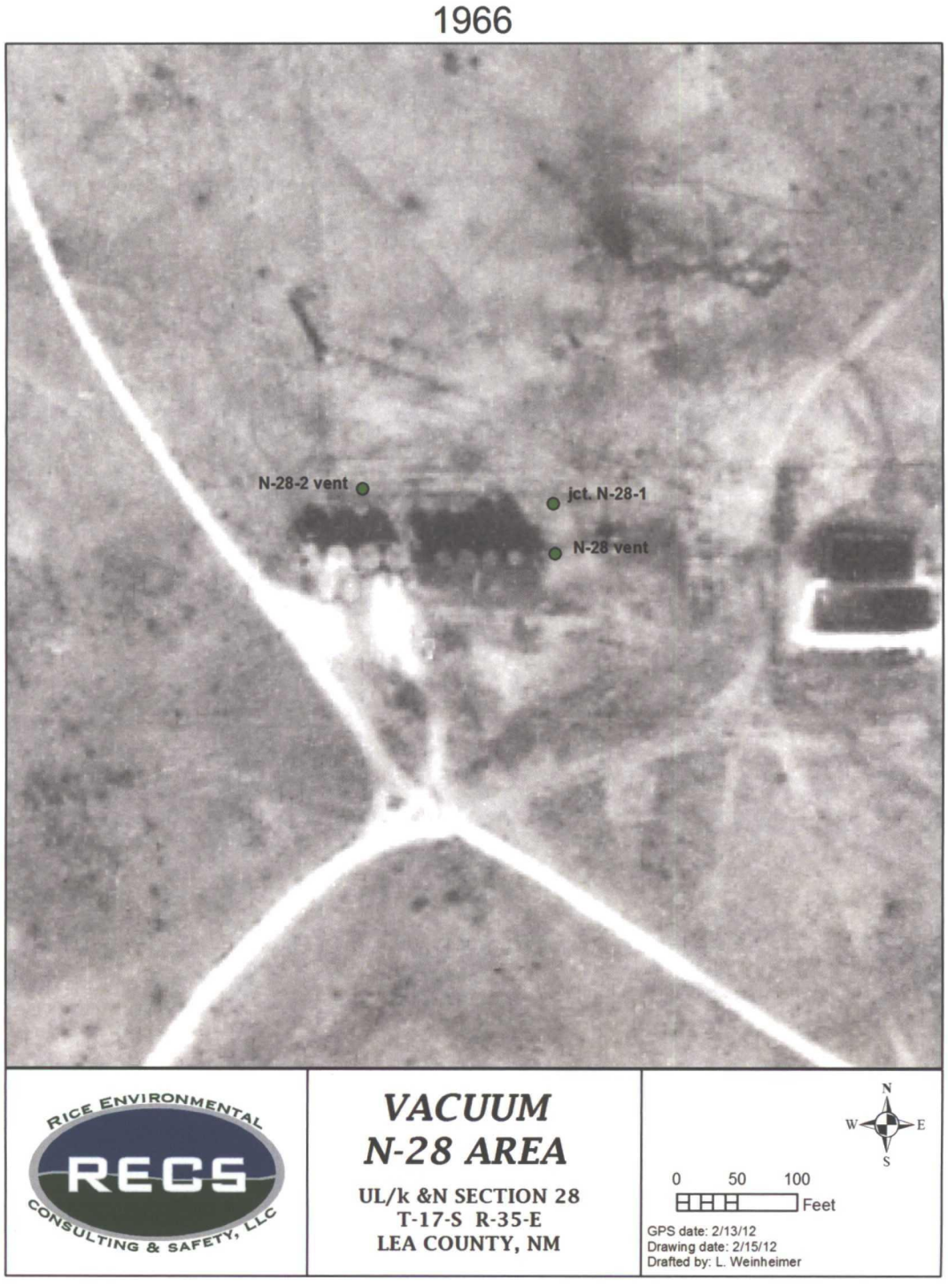

Figure 7 – Aerial of Vacuum N-28 vent location in 1966.

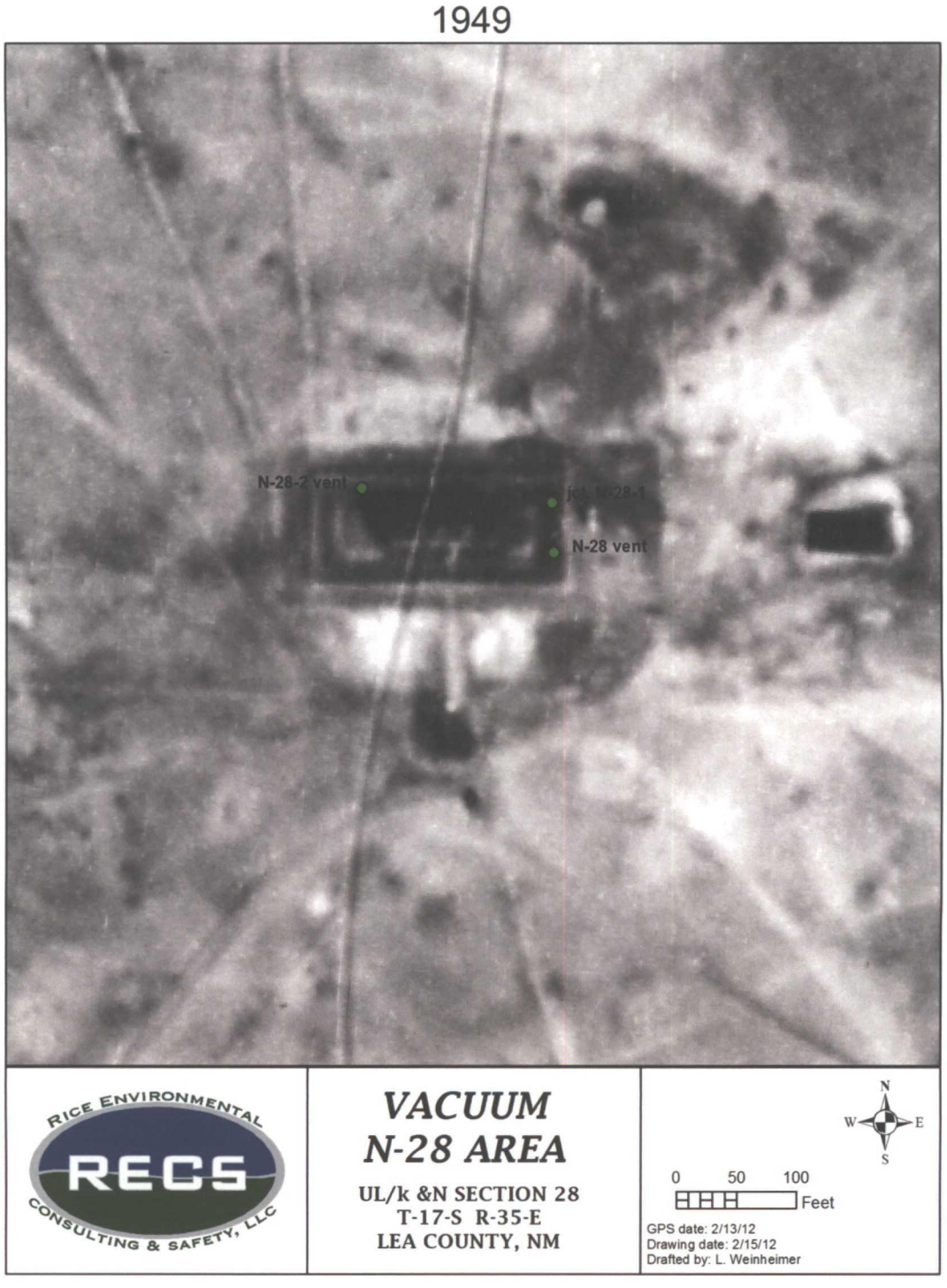

Figure 8 – Aerial of Vacuum N-28 vent location in 1949.

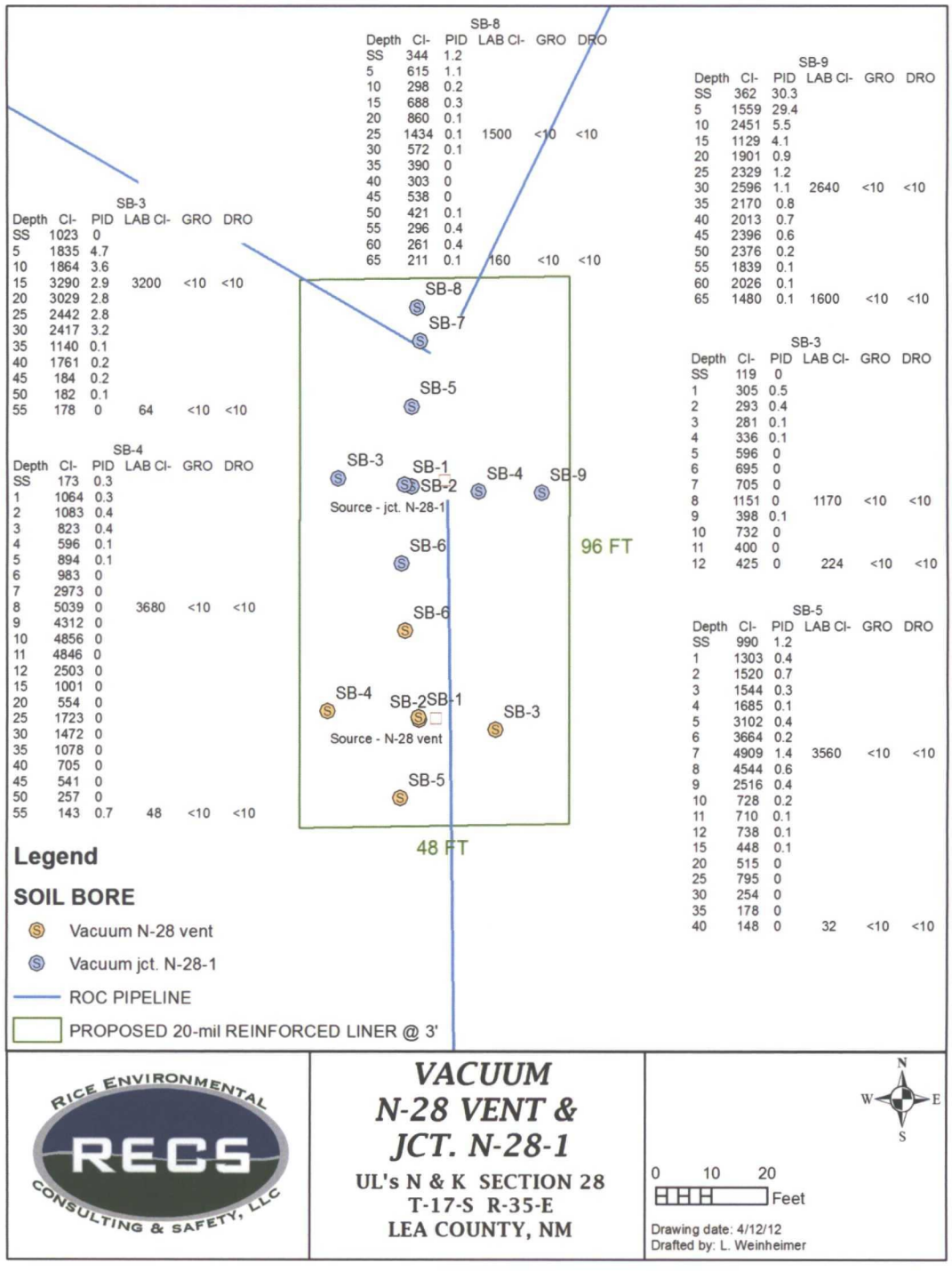

Figure 9- Soil boring locations and analysis summary and surface footprint of proposed excavation and sub-surface synthetic infiltration barrier. Due to the close proximity between this location and the ROC Vacuum Jct. N-28-1 location, the excavation and liner will encompass both former junction boxes.

Appendix –Laboratory Reports

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

June 20, 2011

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM N-28 VENT

Enclosed are the results of analyses for samples received by the laboratory on 06/10/11 16:20.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydorcarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	06/10/2011	Sampling Date:	06/10/2011
Reported:	06/20/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 2 @ 20' (H101215-01)

Chloride, SM4500Cl-B mg/kg **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**960**	16.0	06/15/2011	ND	448	112	400	0.00	

TPH 8015M mg/kg **Analyzed By: CK**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	06/18/2011	ND	199	99.3	200	3.48	
DRO >C10-C28	<10.0	10.0	06/18/2011	ND	189	94.7	200	3.43	

Surrogate: 1-Chlorooctane	*98.0 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*119 %*	*70-130*

Sample ID: SB 2 @ 40' (H101215-02)

Chloride, SM4500Cl-B mg/kg **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	06/15/2011	ND	448	112	400	0.00	

TPH 8015M mg/kg **Analyzed By: CK**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	06/18/2011	ND	199	99.3	200	3.48	
DRO >C10-C28	<10.0	10.0	06/18/2011	ND	189	94.7	200	3.43	

Surrogate: 1-Chlorooctane	*74.8 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*83.4 %*	*70-130*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL LABORATORIES
101 East Marland, Hobbs, NM 88240 2111 Beechwood, Abilene, TX 79603
(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325)673-7020

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name:	Rice Operating Company	BILL TO	
Project Manager:	Hack Conder	P.O. #:	
Address:	122 West Taylor	Company:	
City:	Hobbs	State: NM Zip: 88240	Attn:
Phone #:	575-393-9174	Fax #: 575-397-1471	Address:
Project #:		Project Owner:	City:
Project Name:	Vacuum N-28 VENT		State: Zip:
Project Location:	Vacuum N-28 VENT		Phone #:
Sampler Name:	Jordan Woodfin		Fax #:

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRESERV: ACID/BASE:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME	ANALYSIS REQUEST: Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TPH 8015 M Extended Thru C40
H101215 1	SB 2 @ 20'	S	1			✓					✓		6/10/11	08:05	✓	✓				
2	SB 2 @ 40'	S	1			✓					✓			08:10	✓	✓				

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: Jordan Woodfin	Date: 6/10/11 Time: 12:20	Received By:	Phone Result: ☐ Yes ☑ No Add'l Phone #:
Relinquished By:	Date: Time:	Received By:	Fax Result: ☐ Yes ☑ No Add'l Fax #: REMARKS: email results
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition Cool: Yes No Intact: Yes No	CHECKED BY: (Initials)	Hconder@riceswd.com; jwoodfin@rice-ecs.com; Lweinheimer@rice-ecs.com kjones@riceswd.com

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476

#26

NEED SAMPLES BACK, PLEASE

Page 4 of 4

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

July 28, 2011

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM N-28 VENT

Enclosed are the results of analyses for samples received by the laboratory on 07/15/11 8:01.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydorcarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	07/15/2011	Sampling Date:	07/13/2011
Reported:	07/28/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 3 @ 8' (H101462-01)

Chloride, SM4500Cl-B mg/kg **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1170**	16.0	07/15/2011	ND	416	104	400	3.77	

TPH 8015M mg/kg **Analyzed By: ab**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/18/2011	ND	201	101	200	3.59	
DRO >C10-C28	<10.0	10.0	07/18/2011	ND	170	85.1	200	0.0329	

Surrogate: 1-Chlorooctane	*111 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*123 %*	*70-130*

Sample ID: SB 3 @ 12' (H101462-02)

Chloride, SM4500Cl-B mg/kg **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**224**	16.0	07/15/2011	ND	416	104	400	3.77	

TPH 8015M mg/kg **Analyzed By: ab**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/18/2011	ND	201	101	200	3.59	
DRO >C10-C28	<10.0	10.0	07/18/2011	ND	170	85.1	200	0.0329	

Surrogate: 1-Chlorooctane	*109 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*120 %*	*70-130*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	07/15/2011	Sampling Date:	07/14/2011
Reported:	07/28/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 5 @ 7' (H101462-05)

Chloride, SM4500Cl-B mg/kg **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**3560**	16.0	07/15/2011	ND	416	104	400	3.77	

TPH 8015M mg/kg **Analyzed By: ab**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/18/2011	ND	201	101	200	3.59	
DRO >C10-C28	<10.0	10.0	07/18/2011	ND	170	85.1	200	0.0329	

Surrogate: 1-Chlorooctane	*104 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*113 %*	*70-130*

Sample ID: SB 5 @ 40' (H101462-06)

Chloride, SM4500Cl-B mg/kg **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	07/15/2011	ND	416	104	400	3.77	

TPH 8015M mg/kg **Analyzed By: ab**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/18/2011	ND	201	101	200	3.59	
DRO >C10-C28	<10.0	10.0	07/18/2011	ND	170	85.1	200	0.0329	

Surrogate: 1-Chlorooctane	*110 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*121 %*	*70-130*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	07/15/2011	Sampling Date:	07/14/2011
Reported:	07/28/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 6 @ 3' (H101462-07)

BTEX 8021B mg/kg **Analyzed By: CMS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/21/2011	ND	1.51	75.7	2.00	29.5	
Toluene*	<0.050	0.050	07/21/2011	ND	1.63	81.5	2.00	28.3	
Ethylbenzene*	**2.41**	0.050	07/21/2011	ND	1.73	86.7	2.00	29.0	
Total Xylenes*	**1.82**	0.150	07/21/2011	ND	5.21	86.9	6.00	27.7	

Surrogate: 4-Bromofluorobenzene (PIL *143 %* *70-130*

Chloride, SM4500Cl-B mg/kg **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**368**	16.0	07/15/2011	ND	416	104	400	3.77	

TPH 8015M mg/kg **Analyzed By: ab**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	**136**	50.0	07/18/2011	ND	201	101	200	3.59	
DRO >C10-C28	**1740**	50.0	07/18/2011	ND	170	85.1	200	0.0329	

Surrogate: 1-Chlorooctane *120 %* *70-130*

Surrogate: 1-Chlorooctadecane *119 %* *70-130*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	07/15/2011	Sampling Date:	07/14/2011
Reported:	07/28/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 6 @ 7' (H101462-08)

Chloride, SM4500Cl-B mg/kg **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2240**	16.0	07/15/2011	ND	416	104	400	3.77	

TPH 8015M mg/kg **Analyzed By: ab**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	**179**	50.0	07/18/2011	ND	201	101	200	3.59	
DRO >C10-C28	**2430**	50.0	07/18/2011	ND	170	85.1	200	0.0329	

Surrogate: 1-Chlorooctane	*128 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*124 %*	*70-130*

Sample ID: SB 6 @ 40' (H101462-09)

Chloride, SM4500Cl-B mg/kg **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**64.0**	16.0	07/15/2011	ND	416	104	400	3.77	

TPH 8015M mg/kg **Analyzed By: ab**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/18/2011	ND	201	101	200	3.59	
DRO >C10-C28	<10.0	10.0	07/18/2011	ND	170	85.1	200	0.0329	

Surrogate: 1-Chlorooctane	*114 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*122 %*	*70-130*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

A-01	BFB surrogate failed due to objective matrix interference. Reanalysis not necessary.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL LABORATORIES

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240 2111 Beechwood, Abilene, TX 79603
(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325)673-7020

Company Name: Rice Operating Company		BILL TO	
Project Manager: Hack Conder		P.O. #:	
Address: 122 West Taylor		Company:	
City: Hobbs	State: NM Zip: 88240	Attn:	
Phone #: 575-393-9174	Fax #: 575-397-1471	Address:	
Project #:	Project Owner:	City:	
Project Name: Vacuum N-28 Vent		State: Zip:	
Project Location: Vacuum N-28 Vent		Phone #:	
Sampler Name: Jordan Woodfin		Fax #:	

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRESERV: ACID/BASE:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TPH 8015 M Extended Thru C40
H1D1402																				
1	SB 3 @ 8'		1			✓					✓		7/13/11	300	✓	✓				
2	SB 3 @ 12'		1			✓					✓		7/13/11	345	✓	✓				
3	SB 4' @ 8'		1			✓					✓		7/14/11	1000	✓	✓				
4	SB 4 @ 55'		1			✓					✓		7/14/11	1045	✓	✓				
5	SB 5 @ 7'		1			✓					✓		7/14/11	1130	✓	✓				
6	SB 5 @ 40'		1			✓					✓		7/14/11	1230	✓	✓				
7	SB 6 @ 3'		1			✓					✓		7/14/11	300	✓	✓	✓			
8	SB 6 @ 7'		1			✓					✓		7/14/11	310	✓	✓				
9	SB 6 @ 40'		1			✓					✓		7/14/11	340	✓	✓				

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: Jordan Woodfin	Date: 7-15-11	Received By: Jodie Henson		Phone Result: ☐ Yes ☑ No	Add'l Phone #:
Relinquished By:	Time: 8:01	Received By:		Fax Result: ☐ Yes ☑ No	Add'l Fax #:
	Date:			REMARKS: email results	
	Time:			Hconder@riceswd.com; jwoodfin@rice-ecs.com; Lweinheimer@rice-ecs.com kjones@riceswd.com	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Sample Condition Cool ☑ Yes ☐ No Intact ☑ Yes ☐ No	CHECKED BY: (Initials)		

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476

#26

NEED SAMPLES BACK, PLEASE

Page 8 of 8

Hansen, Edward J., EMNRD

From: Laura Pena <lpena@riceswd.com>
Sent: Wednesday, May 09, 2012 11:41 AM
To: Hansen, Edward J., EMNRD
Cc: Hack Conder; Katie Jones; L Peter Galusky Jr
Subject: Vacuum N-28 vent, jct. N-28-1, and N-28-2 vent Plats
Attachments: Vacuum N-28 vent and N-28-1 ALL SB data and Proposed Liner 5-9-12.jpg; Vacuum N-28 vent, N-28-2 vent and N-28-1 OUTSIDE SB DATA 5-9-12.jpg

Mr. Hansen,

Attach are the plats for Vacuum N-28 vent (1R425-85), Jct. N-28-1 (1R425-87), and N-28-2 vent (1R425-86) as discussed during the May 1, 2012 meeting between NMOCD and Rice Operating Company.

- One plat depicts the relationship of N-28 vent and jct. N-28-1 to each other with soil data and the proposed liner.
- The other plat depicts all 3 sites and the relationships between them with all outside soil data.

If you have any questions or require more information, please do not hesitate to contact Hack Conder at (575) 631-6432.

Thank you,
Laura Peña

SB-6

Depth	Cl-	PID	LAB Cl-	GRO	DRO	B	T	E	X
SS	266	0.1							
5	303	312	272	<50	358	<0.05	<0.05	<0.05	<0.15
10	3410	29.6							
15	5065	44.8							
20	2332	6.1							
25	6010	6.1							
30	4372	9.6							
35	4171	11.2							
40	4331	7.2							
45	6172	5.1	6240	<10	<10				
50	3009	4.2							
55	2033	3.8							
60	2106	2.5							
65	1988	2.6	2050	<10	<10				

SB-3

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	1023	0			
5	1835	4.7			
10	1864	3.6			
15	3290	2.9	3200	<10	<10
20	3029	2.8			
25	2442	2.8			
30	2417	3.2			
35	1140	0.1			
40	1761	0.2			
45	184	0.2			
50	182	0.1			
55	178	0	84	<10	<10

SB-6

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	224	0			
5	392	0.2			
10	1315	0.8			
15	2435	0.4			
20	1119	0.6			
25	3049	0.2	3240	<10	<10
30	2420	0.2			
35	1620	0.2			
40	983	0.2			
45	421	0.2			
50	256	0.2			
55	144	0.2	32	<10	<10

SB-8

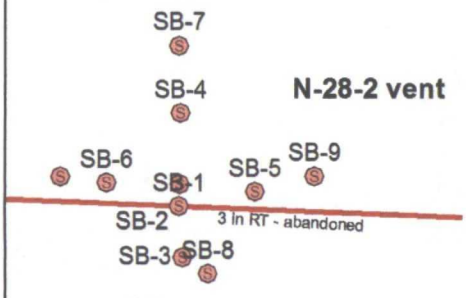
Depth	Cl-	PID	LAB Cl-	GRO	DRO	B	T	E	X
SS	138	0.7							
5	370	117.4							
10	649	156.4							
15	1110	83.9							
20	1270	67.9							
25	2468	193.8	2920	214	1510	<0.05	0.077	0.315	3.16
30	960	154.3							
35	2042	179.4							
40	2553	172.4	2960	134	840	<0.05	0.059	0.223	1.52
45	1636	179.3							
50	2103	148.9							
55	2511	176.7							
60	2509	175.7							
65	2003	104.1	2400	23.3	283	<0.05	<0.05	0.056	0.248

SB-9

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	2648	1.5			
5	1184	24.6			
10	5624	5.5	4960	<10	<10
15	3437	2.6			
20	2183	2.6			
25	4371	3.4			
30	3487	3.5			
35	3826	3.2			
40	3057	5.3			
45	4059	4			
50	1553	5.7			
55	484	5.9			
60	291	5.8			
65	288	4.2	240	<10	<10

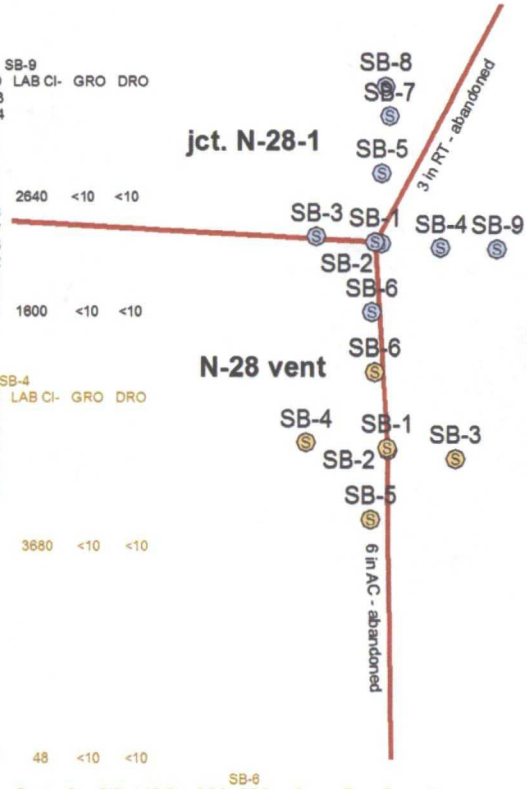
SB-8

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	344	1.2			
5	615	1.1			
10	298	0.2			
15	688	0.3			
20	860	0.1			
25	1434	0.1	1500	<10	<10
30	572	0.1			
35	390	0			
40	303	0			
45	538	0			
50	421	0.1			
55	296	0.4			
60	281	0.4			
65	211	0.1	160	<10	



SB-9

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	362	30.3			
5	1559	29.4			
10	2451	5.5			
15	1129	4.1			
20	1901	0.9			
25	2329	1.2			
30	2596	1.1	2640	<10	<10
35	2170	0.8			
40	2013	0.7			
45	2396	0.6			
50	2376	0.2			
55	1839	0.1			
60	2026	0.1			
65	1480	0.1	1600	<10	<10



SB-7

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	13356	2.5	15400	<10	28.2
5	2832	4.9			
10	4960	3.9	4560	<10	13
15	4927	4.5			
20	4423	4.8			
25	4244	4.6			
30	2952	3.1			
35	2951	5.9			
40	2951	3.7			
45	2847	5.4			
50	2489	4.2			
55	2609	3.1			
60	2999	2.2			
65	2423	3.3	2480	<10	<10

SB-4

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	173	0.3			
1	1064	0.3			
2	1083	0.4			
3	823	0.4			
4	596	0.1			
5	894	0.1			
6	983	0			
7	2973	0			
8	5039	0	3680	<10	<10
9	4312	0			
10	4856	0			
11	4846	0			
12	2503	0			
15	1001	0			
20	554	0			
25	1723	0			
30	1472	0			
35	1076	0			
40	705	0			
45	541	0			
50	257	0			
55	143	0.7	48	<10	<10

SB-3

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	119	0			
1	305	0.5			
2	293	0.4			
3	281	0.1			
4	336	0.1			
5	596	0			
6	695	0			
7	705	0			
8	1151	0	1170	<10	<10
9	398	0.1			
10	732	0			
11	400	0			
12	425	0	224	<10	<10

SB-5

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	990	1.2			
1	1303	0.4			
2	1520	0.7			
3	1544	0.3			
4	1685	0.1			
5	3102	0.4			
6	3664	0.2			
7	4909	1.4	3560	<10	<10
8	4544	0.6			
9	2516	0.4			
10	728	0.2			
11	710	0.1			
12	738	0.1			
15	448	0.1			
20	515	0			
25	795	0			
30	254	0			
35	178	0			
40	148	0	32	<10	<10

SB-6

Depth	Cl-	PID	LAB Cl-	GRO	DRO	B	T	E	X
SS	170	0.1							
1	180	0.1							
2	169	3.2							
3	287	218	368	136	1740	<0.05	<0.05	2.41	1.82
4	286	74.4							
5	288	142							
6	582	102							
7	2016	86.1	2240	179	2430				
8	1213	91.1							
9	1294	67.1							
10	1491	88.7							
11	1739	71.9							
12	1128	68.9							
15	653	107							
20	1471	8.1							
25	681	0.1							
30	351	0							
35	255	0							
40	148	0	64	<10	<10				

Legend

SOIL BORES

- VACUUM N-28 VENT
- VACUUM JCT. N-28-1
- VACUUM N-28-2 VENT
- ROC PIPELINES

RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

VACUUM N-28 VENT
NMOCD Case #: 1R425-85

VACUUM JCT. N-28-1
NMOCD Case #: 1R425-87

VACUUM N-28-2 VENT
NMOCD Case #: 1R425-86

LEGALS: UL/N& K sec. 28
T-17-S R-35-E

N W E S

0 30 60 Feet

Drawing date: 5/9/12
Drafted by: L. Weinheimer

SB-1

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	183	0.1			
3	581	120.6			
4	688	53.7			
5	1906	12.5			
6	5498	3.7			
7	5628	2.9			
8	6249	8.1			
9	6224	1.5			
10	8182	1.2			
11	7635	0.5			
12	6958	0.7	7400	<10	<10

SB-2

Depth	Cl-	PID	LAB Cl-	GRO	DRO
15	4900	11.9	4800	<10	<10
20	1573	2.4			
25	3822	4.2			
30	3456	2.6			
35	3463	2.1			
40	2622	4.7			
45	1872	3.9			
50	924	4.1			
55	770	0.7			
60	895	1.3			
65	852	1.2	928	<10	<10

SB-3

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	1023	0			
5	1835	4.7			
10	1864	3.6			
15	3290	2.9	3200	<10	<10
20	3029	2.8			
25	2442	2.8			
30	2417	3.2			
35	1140	0.1			
40	1761	0.2			
45	184	0.2			
50	182	0.1			
55	178	0	64	<10	<10

SB-4

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	345	0.1			
5	385	5.7			
10	803	7.7			
15	1368	6.1			
20	1749	3.1			
25	3726	2.7	4000	<10	<10
30	3504	2.1			
35	3019	2			
40	2259	1.1			
45	914	2.4			
50	697	4.2			
55	535	0.9			
60	521	1.3			
65	452	1	432	<10	<10

SB-5

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	3295	0.2			
5	4157	1.2	4560	<10	<10
10	1589	2.2			
15	1384	3.2			
20	1515	4.9			
25	2083	6.7			
30	1559	1.3			
35	1251	1.2			
40	1165	1.1			
45	857	1.1			
50	728	1			
55	608	0.9			
60	517	0.2			
65	528	0.1	480	<10	<10

SB-6

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	224	0			
5	392	0.2			
10	1315	0.8			
15	2435	0.4			
20	1119	0.6			
25	3049	0.2	3240	<10	<10
30	2420	0.2			
35	1620	0.2			
40	983	0.2			
45	421	0.2			
50	258	0.2			
55	144	0.2	32	<10	<10

SB-7

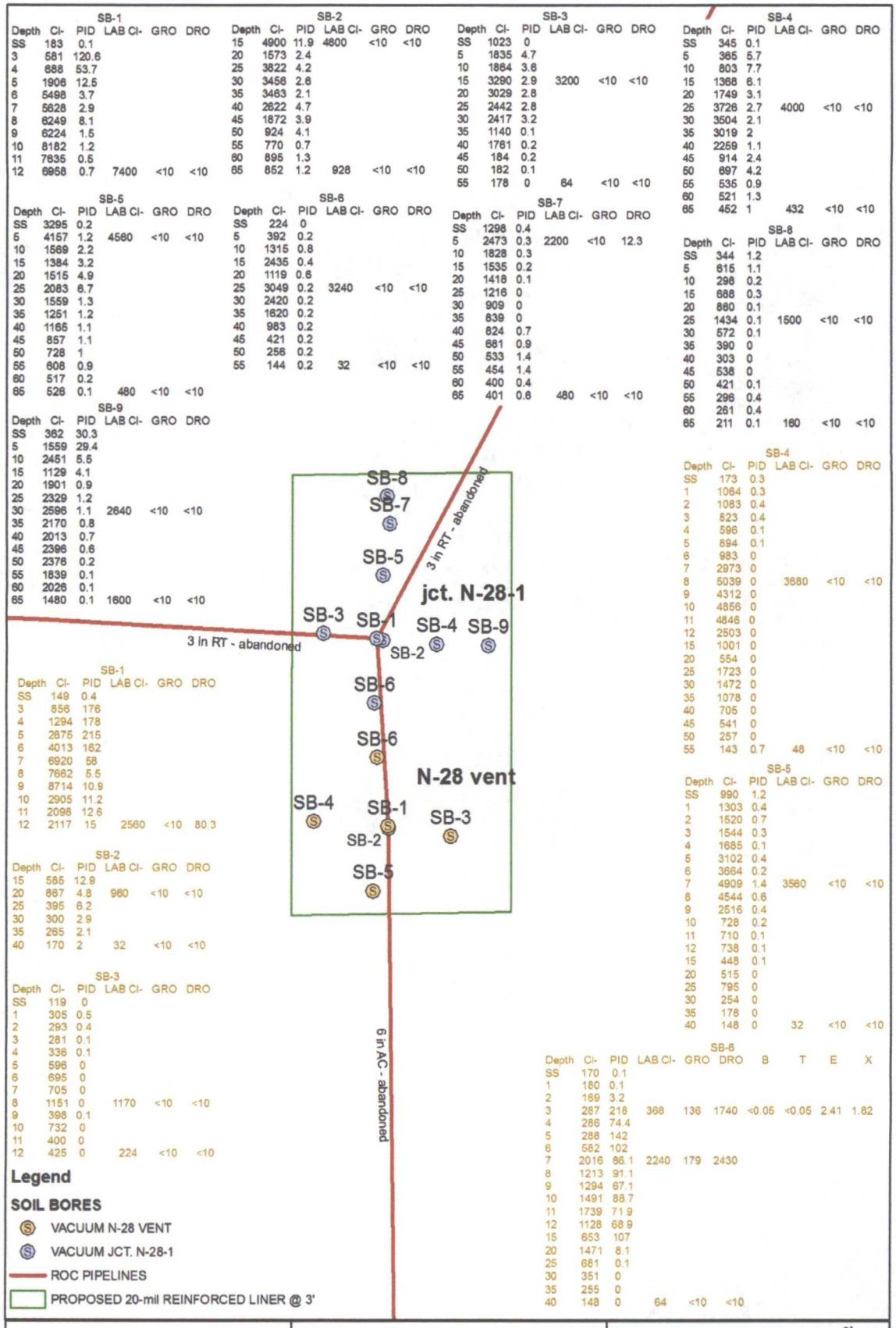
Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	1298	0.4			
5	2473	0.3	2200	<10	12.3
10	1828	0.3			
15	1535	0.2			
20	1418	0.1			
25	1216	0			
30	909	0			
35	839	0			
40	824	0.7			
45	681	0.9			
50	533	1.4			
55	454	1.4			
60	400	0.4			
65	401	0.6	480	<10	<10

SB-8

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	344	1.2			
5	615	1.1			
10	298	0.2			
15	688	0.3			
20	860	0.1			
25	1434	0.1	1500	<10	<10
30	572	0.1			
35	390	0			
40	303	0			
45	538	0			
50	421	0.1			
55	296	0.4			
60	261	0.4			
65	211	0.1	180	<10	<10

SB-9

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	362	30.3			
5	1559	29.4			
10	2451	5.5			
15	1129	4.1			
20	1901	0.9			
25	2329	1.2			
30	2596	1.1	2640	<10	<10
35	2170	0.8			
40	2013	0.7			
45	2396	0.6			
50	2376	0.2			
55	1839	0.1			
60	2026	0.1			
65	1480	0.1	1600	<10	<10



SB-4

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	173	0.3			
1	1064	0.3			
2	1083	0.4			
3	823	0.4			
4	596	0.1			
5	894	0.1			
6	983	0			
7	2973	0			
8	5039	0	3680	<10	<10
9	4312	0			
10	4856	0			
11	4846	0			
12	2503	0			
15	1001	0			
20	554	0			
25	1723	0			
30	1472	0			
35	1078	0			
40	705	0			
45	541	0			
50	257	0			
55	143	0.7	48	<10	<10

SB-1

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	149	0.4			
3	856	176			
4	1294	178			
5	2875	215			
6	4013	162			
7	6920	58			
8	7662	5.5			
9	8714	10.9			
10	2905	11.2			
11	2098	12.6			
12	2117	15	2560	<10	80.3

SB-5

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	990	1.2			
1	1303	0.4			
2	1520	0.7			
3	1544	0.3			
4	1685	0.1			
5	3102	0.4			
6	3664	0.2			
7	4909	1.4	3560	<10	<10
8	4544	0.6			
9	2516	0.4			
10	728	0.2			
11	710	0.1			
12	738	0.1			
15	448	0.1			
20	515	0			
25	795	0			
30	254	0			
35	178	0			
40	148	0	32	<10	<10

SB-2

Depth	Cl-	PID	LAB Cl-	GRO	DRO
15	585	12.9			
20	867	4.8	960	<10	<10
25	395	6.2			
30	300	2.9			
35	265	2.1			
40	170	2	32	<10	<10

SB-6

Depth	Cl-	PID	LAB Cl-	GRO	DRO	B	T	E	X
SS	170	0.1							
1	180	0.1							
2	169	3.2							
3	287	218	368	136	1740	<0.05	<0.05	2.41	1.82
4	286	74.4							
5	288	142							
6	562	102							
7	2016	86.1	2240	179	2430				
8	1213	91.1							
9	1294	67.1							
10	1491	88.7							
11	1739	71.9							
12	1128	68.9							
15	653	107							
20	1471	8.1							
25	661	0.1							
30	351	0							
35	255	0							
40	148	0	64	<10	<10				

SB-3

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	119	0			
1	305	0.5			
2	293	0.4			
3	281	0.1			
4	336	0.1			
5	596	0			
6	695	0			
7	705	0			
8	1151	0	1170	<10	<10
9	398	0.1			
10	732	0			
11	400	0			
12	425	0	224	<10	<10

Legend

SOIL BORES

- VACUUM N-28 VENT
- VACUUM JCT. N-28-1
- ROC PIPELINES
- PROPOSED 20-mil REINFORCED LINER @ 3'

RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC — RECS

VACUUM N-28 VENT

NMOCD Case #: 1R425-85

VACUUM JCT. N-28-1

NMOCD Case #: 1R425-87

LEGALS: UL/N& K sec. 28
T-17-S R-35-E

N W E S

0 25 50 Feet

Drawing date: 5/9/12
Drafted by: L. Weinheimer