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REPORTS

DATE: 2003 December 31, 2003

NMOCD Environmental ATTN: Wayne Price Box 6429 1220 S. Saint Francis Drive Santa Fe, NM 87504

RE: Pure Resources - Lovington Site: Pure 21 - Closure

Mr. Price:

Pure Resources has completed excavation of the Pure 21 site, the bottom and sidewalls are within OCD guidelines for closure. Find analytical, photos and associated information within. Pure used a PID and conducted headspace test for BTEX, final were all below 25 ppm.

Pure excavated and hauled 1536 cu. yds. to C & C Landfarm. The remainder of the material is being remediated on an adjacent site, when the remediation pile reaches a level below 250 ppm chloride, pure will seek permission for OCD to use the soil for other purposes.

Pure would like to backfill the excavated area with clean soil, hauled from a site West of Lovington, cleanup area of trash and reseed with a mixture suitable to all parties.

If this satisfies the OCD and the City of Lovington, Pure would like to begin backfilling.

Thanks,

Eddin W Acan

Eddie W. Seay, Agent City of Lovington 601 W. Illinois Hobbs, NM 88242 (505)392-2236

cc: Patrick McMahon, Attorney, City of Lovington OCD Hobbs NMOCD

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PURE RESOURCES SITE: PURE 21 LOVINGTON WATER FIELD

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PROJECT PLAN (PJP) & SITE INVESTIGATION REPORT

for the Injection Fluid Release associated with the

LOVINGTON PADDOCK UNIT Well #21 Injection Line

~7 mile south of Lovington Lea County, New Mexico UL-G SW¹/₄ of theNE¹/₄ Sec 36, T16S, R36E Latitude: 32°52'45.65"N Longitude: 103°18'22.77"W $\mathbf{b}_{\mathbf{r}}$

February 2003

Prepared by

Environmental Plus, Inc. 2100 Avenue O P.O. Box 1558 Ennice, New Mexico 88231 Tele 505•394•3481 FAN 505•394•2601



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1 LOVINGTON PADDOCK UNIT WELL #21 PROJECT PLAN (PJP)

This plan investigated the vertical extents of secondary injection fluid contamination, i.e., saline produced water and residual crude oil, at the Pure Resources Lovington Paddock Unit Well #21 release site approximately 7 miles south of Lovington, New Mexico. Five soil borings were advanced and discretely sampled at 5 feet below ground surface ('bgs) intervals and analyzed to identify concentration gradients for the "Constituents of Concern" (CoC), i.e., Total Petroleum Hydrocarbon using EPA Method 8015M (TPH^{8015m}), Benzene, Toluene, Ethylbenzene, m,p,o-Xylenes, and Chloride. Acceptability of the delineation concentrations are based on thresholds and protocols provided by the New Mexico Oil Conservation Division (NMOCD) guidelines.

1.1 Site Description

The site is located ~ 7 miles south of Lovington, New Mexico on land owned by the City of Lovington. Annotated aerial and topographical maps are included in Attachment I.

1.1.1 Historical Use

This land surface is used for livestock grazing and oil and gas production facilities access roads.

1.1.2 Photographic documentation

Photographs of the site are included in Attachment II.

1.1.3 Ecological Description

The area is typical of the northern most extent of the Upper Chihuahuan Desert Biome consisting primarily of Honey Mesquite (Prosopis glandulosa) and typical desert grasses and weeds. Mammals present, include Orrd's and Merriam's Kangaroo Rat, Deer Mouse, White Throated Wood Rat, Cottontail Rabbit, Black Tailed Jackrabbit (Lepus californicus), and the occasional Pronghorn Antelope. Reptiles, Amphibians, and Birds are numerous and typical of area. While a biotic survey was not conducted, Listed, Threatened, or Endangered species are not known to exist in this immediate area.

1.1.4 Environmental Media Characterization

Chemical parameters of the soil will be characterized consistent with the New Mexico Oil Conservation Division (NMOCD) guidelines published in the following documents;

- Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993)
- Unlined Surface Impoundment Closure Guidelines (February 1993)

Site Ranking and acceptable "Site Specific" thresholds for contaminants of concern (CoCs), i.e., soil TPH^{8015m}, Benzene, BTEX (mass sum of Benzene, Toluene, Ethyl Benzene, and m, p, and o Xylenes), and soil Chloride, will be determined based on the following;

- Depth to Ground water, i.e., distance from the lower most acceptable concentration to the ground water.
- Wellhead Protection Area, i.e., distance from fresh water supply wells.
- Distance to Surface Water Body, i.e., horizontal distance to all down gradient surface water bodies.

1.1.4.1 Ground Water Level

The New Mexico State Engineer's Office (NMSEO) and the New Mexico Tech Geo-Information system ground water level on-line databases showed five wells in the southern half of Section 36 with an average water level of 51.14'bgs. The City of Lovington currently produce 2 wells approximately 0.5 miles northwest of the site and were drilled to a depth of 256 and 257'bgs. The water levels provided by the database are reported as the same and cannot be correct and are not used in the average calculation. A simple average of the ground water levels of the wells in Sections 36, 25, and 26 is 57.9'bgs.

Well Number	Source	Tws	Rng	Sec	Easting	Northing	Date	Well Depth	Water Level
L 01350 APPRO	Shallow	16S	36E	36	658945	3638695	1/11/1952	110	55
L 01371 APPRO	Shallow	16S	36E	36	658644	3638187	2/22/1952	115	45
L 01438 APPRO	Shallow	16S	36E	36	658545	3638288	5/8/1952	110	45
L 01557 APPRO	Shallow	16S	36E	36	657836	3638176	8/25/1952	110	40
L 04058 (EXPLORE		16S	36E	36	657827	3639178		230	
L 04058 (EXPLORE)		165	36E	36	657823	3639579		230	
L 04058 S-24	Shallow	16S	36E	36	657823	3639579	4/4/2000	257	257?
L 04058 S-25	Shallow	16S	36E	36	657827	3639178	4/10/2000	256	256?
8774		16S	36E	36			1961		72.69
8816		16S	36E	36			1961	150	70.94
L 02507 APPRO	Shallow	16S	36E	25	657705	3641089	3/8/1954	110	52
L 03031	Shallow	16S	36E	26	657415	3639772	11/23/1955	115	60
L 03627	Shallow	16S	36E	26	656609	3639757	7/30/1957	98	65
8896		165	36E	25			1961	126	65.38
8945		16S	36E	25			1961		65.95
						AVER	AGE WATER	LEVEL	57.905

1.1.4.2 Depth to Ground Water Calculation

According to the NMOCD Guidelines, depth to ground water (DtoGW) is defined as the "the vertical distance from the lowermost contaminants (LC) to the seasonal high water elevation of the ground water (WL)." TPH^{8015m} above 1000 mg/Kg was detected down to 2'bgs; therefore, the calculated depth to ground water is 55.9'bgs.

$$57.9 ft^{WL} - 2 ft^{LC} = 55.9 ft^{DtoGW}$$

1.1.4.3 Ground Water Gradient

Based on available information, the gradient is to the east southeast.

1.1.4.4 Wellhead Protection Area

There are no public water supply wells located within 1,000 horizontal feet of the site. There are two City of Lovington municipal water supply wells located within 2,500 feet to the north and west of the site.

1.1.4.5 Distance to Nearest Surface Water Body

There are no naturally occurring surface water bodies located within a 1-mile radius of the site.

1.1.4.6 Soil Assessment

Soil samples were collected at 5 strategically located locations within the spill pooling areas. The sample locations are noted on the site map included in Attachment I.

1.1.4.7 Ground Water Assessment

The ground water level is conservatively estimated to occur at -58'bgs. The soil investigation did not warrant ground water assessment.

1.1.5 NMOCD Site Rank and Remedial Goals

Based on the site information, the site has a ranking of 10 points and the respective remedial goals/thresholds for the Constituents of Concern (CoCs). The Chloride remedial goal cannot

exceed a soil concentration capable of impacting ground water above the New Mexico Water Quality Control Commission (WQCC) standard of 250 mg/Liter.

1. Groun	nd Water	2. Wo	ellhead Protection Area	3. Distance to Surface Water Body
If Depth to C feet: 20 point	GW <50 ts	lf <1000' f	rom water source, or;	<200 horizontal feet: 20 points
If Depth to C 99 feet: 10 p	GW 50 to oints	source: 20	points	200-100 horizontal feet: 10 points
If Depth to C feet: 0 points	GW >100	If >1000' f from privat points	rom water source, or; >200' e domestic water source: 0	>1000 horizontal feet: 0 points
Ground water	Score = 10	Wellhead P	rotection Area Score= 0	Surface Water Score= 0
Site Rank (1+	(2+3) = = 1	10 points		
Total Site Ra	nking Score	and Acceptal	ole Concentrations	
Parameter	>19(Soil	>8'bgs)	10-19(Soil from 0 to 8'bgs)	0-9 (Not Applicable)
Benzene	10 p	pm	10 ppm	10 ppm
BTEX	50 p	pm	50 ppm	50 ppm
TPH	100	ppm	1000 ppm	5000 ppm
100 ppm fie	ld VOC head	space measur	ement may be substituted for	lab analysis

2 LOVINGTON PADDOCK UNIT WELL #21 INVESTIGATION REPORT

On November 11, 2002, Environmental Plus, Inc. (EPI) personnel, with the assistance and direction of Pure Resources, implemented the Project Plan and collected subsurface soil samples at the Lovington Paddock Unit Well #21. The Borehole Map and annotated topographical and aerial maps of the Lovington Paddock Unit Well #21 site are included in Attachment I, photographs in Attachment II, and the original analytical reports are included in Attachment III along with a data summary.

2.1 Analytical Results

The soil borings were advanced in areas considered to be the most contaminated, i.e., fluid pooling areas with the longest residence times. The results are discussed and illustrated below. The analytical reports are summarized and included in Attachment III.

2.1.1 Borehole #1 (BH1)

BH1 was advanced adjacent to the leak origin. TPH^{8015m} was monitored at 1,240 mg/Kg from 0-2 'bgs and 91.6 mg/Kg from 5-7 'bgs. Benzene and BTEX were detected but not above the NMOCD remedial goals. Chloride was monitored at 10,637 mg/Kg in the 0-2'bgs sample and 736 mg/Kg in the 5-7'bgs sample. The 10-12'bgs and 15-17'bgs samples were <100 mg/Kg.

2.1.2 Borehole #2 (BH2)

BH2 was advanced in a pooling area east of the leak origin between BH1 and BH3. TPH^{8015m} was monitored at 143 mg/Kg from 0-2'bgs and non-detectable at 5-7'bgs. Benzene and BTEX were detected but nominally. Chloride was monitored at 19,594 mg/Kg in the 0-2'bgs sample and <250 mg/Kg at the other intervals to 17'bgs.

2.1.3 Borehole #3 (BH3)

BH3 was advanced in a pooling area at the east extent of the spill area. TPH^{8015m}, Benzene, and BTEX were not detected above the instrument detection limits down to 15'bgs. The Chloride gradient was monitored at 9,917 mg/Kg in the 0-2'bgs sample, 592 mg/Kg at the 10-12'bgs interval, and at 96 mg/Kg from 15-17'bgs.

2.1.4 Borehole #4 (BH4)

BH4 was advanced midway between BH1 and BH5 in the west flowpath pooling area. Nominal detections of TPH^{8015m}, Benzene, and BTEX were monitored from 0-2'bgs and not detected at 5, 10, and 15'bgs. Chloride was monitor at 8,397 mg/Kg in the near surface, i.e., 0-2'bgs sample and <250 mg/Kg at 5, 10, and 15'bgs.

2.1.5 Borehole #5 (BH5)

BH5 was advanced in the west most pooling area of the west flow path. TPH^{8015m}, Benzene, and BTEX were not detected at the surface, 5, 10, or 15'bgs intervals. Chloride was monitored at 18,794 mg/Kg in the near surface, i.e., 0-2'bgs sample and <250 mg/Kg at 5, 10, and 15'bgs.

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Pure Resources Lovington Paddock Unit #21 Chloride Delineation

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Pure Resources Lovington Paddock Unit #21 Benzene Delineation





Pure Resources Lovington Paddock Unit #21 BTEX Delineation

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LOVINGTON PADDOCK UNIT WELL #21 INJECTION LINE

2.2 Discussion of Hydrocarbon Data

TPH^{8015m} in the area of the leak origin exceeds the 1,000 mg/Kg NMOCD remedial goal at the 0-2'bgs interval at BH1. Benzene and BTEX were not detected above the remedial goals, i.e., 10 mg/Kg and 50 mg/Kg, respectively.

2.3 Discussion of Chloride Data

Chloride contamination concentrations >250 mg/Kg were monitored as follows;

- BH1 5-7'bg
- BH2 0-2'bgs
- BH3 10-12'bgs
- BH4 0-2'bgs
- BH5 0-2'bgs

2.4 Conclusions

Based on the information collected during this investigation it is concluded that;

- TPH^{8015m} contamination in excess of the NMOCD Guideline remedial goal of 1,000 mg/Kg occurs in BH1, the area of the leak origin, down to 2'bgs.
- Benzene and BTEX residuals at all locations are below the remedial goals of 10 and 50 mg/Kg, respectively.
- Chloride residual in excess of 250 mg/Kg occurs from the surface to 2'bgs through out the site, from the surface to 7'bgs in the area of BH1 near the leak origin, and from the surface to 12'bgs in the area of BH3.

2.5 Remediation Proposal

It is not feasible to blend the near surface soil with clean soil to achieve the remedial goals for the TPH^{8015m} and Chloride source terms because of the extremely high Chloride concentrations and, given that the site is located within the City of Lovington's water well field, leaching or rinsing the Chloride into the subsurface to restore the surface is not feasible because of the potential to impact the ground water above the New Mexico Water Quality Control Commission standard of 250 mg/L.

It is proposed to excavate and dispose of the impacted soil down to 2'bgs. The remaining soil contaminated above the NMOCD remedial guidelines in the areas of BH1 and BH3 will be excavated and blended with local clean soil to acceptable levels and placed back into the excavated areas. Clean soil will be used to replace the hauled soil and bring the excavation to grade. After contouring the site will be reseeded.

LOVINGTON PADDOCK UNIT WELL #21 INJECTION LINE



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Pure Resources	Incident Date and NMOCD Notifie	-42
Site Information and Metrics	1-26-03 NMOCD notified i	mmediately (on call pager)
SITE: Lovington Paddock Ut	vit Well #21 Ini Line Assigne	d Site Reference #: 12603
Company: Pure Resources. Ir		
Street Address: Hobbs Highw	ay south of Lovington, NM	
Mailing Address: P.O. Box 60	9	
City, State, Zin: Lovington	NM 88260	
Representative: Mike Northcut		
Representative Telephone: 5	05 396 7503	
Telephone:	505.390.1090	
Fluid volume released (bbls):	230 Recovered (bbls):	130
>25 bbls: Notify NMO	CD verbally within 24 hrs and submit form C	C-141 within 15 days.
(Also app 5-25 bbls: Submit form C-141 with	in 15 days. (Also applies to upauthorized rel	eases of 50-500 mcf Natural Gas)
Leak Spill or Pit (LSP) Name	Lovington Paddock Unit Well #21	Ini. Line
Source of contamination: Stee	Injection Water Line	
Land Owner, i.e., BLM, ST, Fe	e. Other: City of Lovington	
LSP Dimensions ~70' x 410	,	анала _{н т} ан такан так
LSP Area: 19,286	ft ²	
Location of Reference Point (R	P)	
Location distance and direction	from RP	· · · · · · · · · · · · · · · · · · ·
Latitude: 32° 52' 45.65"N	ny <u>ana ang ang ang ang ang ang ang ang ang </u>	
Longitude: 103° 18' 22.77"W		
Elevation above mean sea level:	3,835'amsl	
Feet from South Section Line		
Feet from West Section Line		
Location - Unit or 1/4 1/4: SW 1/4	of the NE ¹ / ₄ Unit I	Letter: G
Location- Section: 36		
Location- Township: 16S		
Location- Range: 36E		
Surface water body within 1000) radius of site: None	
Domestic water wells within 10	100' radius of site: None	
Agricultural water wells within	1000' radius of site: none	<u> </u>
Public water supply wells within	n 1000 radius of site: None	
Public water supply wells within	n 1000 radius of site:	
Depth from land sufface to gro	und water (DG) ~ 58 bgs	
Depth of contamination (DC)	-2 bgs	
Depth to ground water (DG -	JC = DtGW - 30 bgs	3 Distance to Surface Water
1. Ground Water	2. Wellhead Protection Area	Body
If Depth to GW <50 feet: 20 points	If <1000' from water source, or;<200' from private	<200 horizontal feet: 20 points
If Depth to GW 50 to 99 feet: 10 points	domestic water source: 20 points	200-100 horizontal feet: 10 points
If Depth to GW >100 feets a paints	If >1000' from water source, or; >200' from private	>1000 horizontal feet: 0 points
	domestic water source: 0 points	
Ground water Score = 10	Wellhead Protection Area Score= 0	Surface Water Score= 0
Site Rank $(1+2+3) = 10$		·
I otal Site Ranking Score and A	cceptable Concentrations	0.0
Parameter >19	10-19	0-9
Denzene IU ppm	<u>10 ppm</u>	<u>10 ppm</u>
TPH 100	<u> </u>	5000 m
100 ppm	IUUU ppm	ab apalvois
L 100 ppm meru vOC neauspace	measurement may be substituted for i	au analysis

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Attachment I: Site Maps

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WELL #21 INJECTION LINE

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WELL #21 INJECTION LINE WELL #21 INJECTION LINE

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LOVINGTON PADDOCK UNIT WELL #21 INJECTION LINE

Attachment II: Photographs

LOVINGTON PADDOCK UNIT Well #21 Injection Line

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LOVINGTON PADDOCK UNIT WELL #21 INJECTION LINE

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Attachment III: Analytical Reports

LOVINGTON PADDOCK UNIT WELL #21 INJECTION LINE

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				Lovington Pad	dock Uni	it Well #2	11 Injectio	n Line						
	Samoline					GRO ³	DRO⁴	² HdT	BTEX	Benzene	Toluene	Ehtyl Benzene	m,p,o- Xylene	Chloride
Sample	Interval	SAMPLE ID#	Sample Date	Lithology	Headspace			E	strument D	etection Lim	uts and Uni	ts.		
Area	(FT. BGS ¹)				bhm	10.0 ma/Ka	10.0 ma/K.o	mg/Kg	mg/Kg	0.005 ma/K a	0.005 ma/Ko	0.005 ma/Ka	0.025 ma/Ka	1.0 ma/Ka
	0-2	201220220202020202020202020202020202020	2/7/2003	Tan sand/Indurated sandstone/Caliche	0.6	10	1230	1240	0.384	0.037	0.101	0.100	0.146	10637
BH1	5-7	SPRLP212703BH1-5'	2/7/2003	Tan sand/Indurated sandstone/Caliche	1.1	10	10	91.6	0.194	0.005	0.011	0.056	0.122	736
	10-12	SPRLP212703BH1-10'	2/7/2003	Tan sand/Indurated sandstone/Caliche	2.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	96
	15-17	SPRLP212703BH1-15'	2/7/2003	Tan Sand Fine	3.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	80
	0-2	SPRLP212703BH2-2'	2/7/2003	Dark Brown Clayey Loam	1.6	10	133	143	0.278	0.024	0.086	0.069	0.099	19594
BH2	5-7	SPRLP212703BH2-5'	2/7/2003	Tan sand/Indurated sandstone/Caliche	1.4	10	10	20	0.030	0.005	0.005	0.005	0.015	176
	10-12	SPRLP212703BH2-10'	J2/7/2003	Tan sand/Indurated sandstone/Caliche	6.0	\mathbf{V}/\mathbf{N}	N/A	N/A	N/A	N/A	\mathbf{W}/\mathbf{W}	W/N	N/A	128
	15-17	SPRLP212703BH2-15'	2/7/2003	Tan Sand Fine	1.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	96
	0-2	SPRLP212703BH3-2'	2/7/2003	Tan sand/Indurated sandstone/Caliche	8.7	10	10	20	0.159	0.016	0.056	0.034	0.053	9917
BH3	5-7	SPRLP212703BH3-5'	2/7/2003	Tan sand/Indurated sandstone/Caliche	2.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	992
	10-12	SPRLP212703BH3-10'	2/7/2003	Tan Sand Fine	1.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	592
	15-17	SPRLP212703BH3-15'	2/7/2003	Tan Sand Fine	0.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	96
	0-2	SPRLP2121003BH4-2'	2/10/2003	Tan sand/Indurated sandstone/Caliche	6.5	10	163	173	0.134	0.031	0.053	0.021	0.029	8397
BH4	5-7	SPRLP2121003BH4-5'	2/10/2003	Tan sand/Indurated sandstone/Caliche	2.0	10	10	20	0.030	0.005	0.005	0.005	0.015	160
	10-12	SPRLP2121003BH4-10'	2/10/2003	Fine Brown Sand	1.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	192
	15-17	SPRLP2121003BH4-15	2/10/2003	Tan Sand Fine	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	80
	0-2	SPRLP2121003BH5-2'	2/10/2003	Tan sand/Indurated sandstone/Caliche	6.3	10	10	20	0.081	0.013	0.026	0.015	0.027	18794
BH5	5-7	SPRLP2121003BH5-5'	2/10/2003	Tan Sand Fine	3.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	128
	10-12	SPRLP2121003BH5-10	2/10/2003	Fine Brown Sand	2.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	160
	15-17	SPRLP2121003BH5-15	2/10/2003	Tan Sand Fine	1.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	192
^{bgs} – belo	w ground surfa	ace Consmissmeel/Constitutons												
GRO-Gas	oline Range Or	rganics C ₆ -C ₁₂												
¹ DRO-Die	sel Range Orga	mics C ₁₂ -C ₃₅												
TPH-Tot	ał Petroleum H	lydrocarbon = GRO+DRO.												<u> </u>
Bolded va	lues are in exce	ss of the New Mexico (Jil Conserva	ttion Division guideline thr	shold for the parameter										
IDUI - TNO N/A - No	cares that the p t Analyzed	barameter was not detected above th	ie instrument derection limi											

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LOVINGTONPADDOCKUNITWELL#21INJECTIONLINE

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PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603 PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR ENVIRONMENTAL PLUS, INC. ATTN: PAT McCASLAND P.O. BOX 1558 EUNICE, NM 88231 FAX TO: (505) 394-2601

Receiving Date: 02/11/03 Reporting Date: 02/12/03 Project Owner: PURE RESOURCES Project Name: LOVINGTON PADDOCK WELL #21 Project Location: NOT GIVEN Analysis Date: 02/12/03 Sampling Date: 02/07/03 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: AH Analyzed By: AH

LAB NUMBER	SAMPLE ID	CI (mg/Kg)
H7469-1	SPRLP212703BH1-2	10637
H7469-2	SPRLP212703BH1-5	736
H7469-3	SPRLP212703BH1-10	96
H7469-4	SPRLP212703BH1-15	80
H7469-5	SPRLPW212703BH2-2	19594
H7469-6	SPRLPW212703BH2-5	176
H7469-7	SPRLPW212703BH2-10	128
H7469-8	SPRLPW212703BH2-15	96
H7469-9	SPRLPW212703BH3-2	9917
H7469-10	SPRLPW212703BH3-5	992
Quality Control		1030
True Value QC		1000
% Recovery		103
Relative Percent I	Difference	3.0

METHOD: Standard Methods 4500-Cl'B Note: Analyses performed on 1:4 w:v aqueous extracts.

PLEASE NOTE: Liability and Damages: Cardinal's liability and carn'ts endusive remedy for any charm ansing is whether based in constant or both is had be interfered as the phone for any case. All charms is musing more for neglegence and any other cause writescever shall be deemed withing unless mande in writing and receive or Cardinal unlike theth (3) carys after combines of the upplicable service. In one event shall cardinal be labored to consequentiate carages, including without historiation results and the upplicable inthat http://active.com/

> LOVINGTON PADDOCK UNIT Well #21 Injection Line

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PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603 PHONE (505) 383-2326 • 101 E. MARLAND • HOBBS NM 88240

ANALYTICAL RESULTS FOR ENVIRONMENTAL PLUS, INC. ATTN: PAT McCASLAND P.O. BOX 1558 EUNICE, NM 88231 FAX TO: (505) 394-2601

Receiving Date: 02/11/03 Reporting Date: 02/12/03 Project Owner: PURE RESOURCES Project Name: LOVINGTON PADDOCK WELL #21 Project Location: NOT GIVEN Analysis Date: 02/12/03 Sampling Date: 02/07-02/10/03 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: AH Analyzed By: AH

SAMPLE ID	Cl (mg/Kg)
SPRLPW2121003BH4-2	8397
SPRLPW2121003BH4-5	160
SPRLPW2121003BH4-10	192
SPRLPW2121003BH4-15	80
SPRLPW2121003BH5-2	18794
SPRLPW2121003BH5-5	128
SPRLPW2121003BH5-10	160
SPRLPW2121003BH5-15	192
SPRLPW212703BH3-10	592
SPRLPW212703BH3-15	96
та <i>и</i> т. на такжа с	1030
	1000
	103
Difference	3.0
	SAMPLE ID SPRLPW2121003BH4-2 SPRLPW2121003BH4-5 SPRLPW2121003BH4-10 SPRLPW2121003BH5-15 SPRLPW2121003BH5-5 SPRLPW2121003BH5-10 SPRLPW2121003BH5-15 SPRLPW212703BH3-10 SPRLPW212703BH3-15 Difference

METHOD: Standard Methods 4500-CI'B Note: Analyses performed on 1:4 w:v aqueous extracts.

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PLEASE NOTE: Liability and Damages: Cardinal's liability and clent's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount baild by clent for analyses. All claims: including those for negligence and any other cause whatsoever shall be deemed waved unless made in writing and rearved by Cardinal when they (30) days after completion of me applicable service. In no event shall cardinal be table for incedential damages, including, whitout limitator, business interruptions: lines of use, or loss to brick incurred by clent by subscittures, altitlater and the second by the applicable of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the applicable tradems or intervise

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PHONE (915) 573-7001 • 2111 BEECHWOOD • ABILENE, TX 79603 PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS NM 88240

ANALYTICAL RESULTS FOR ENVIRONMENTAL PLUS, INC. ATTN: PAT McCASLAND P.O. BOX 1558 EUNICE, NM 88231 FAX TO: (505) 394-2601

Receiving Date: 02/11/03 Reporting Date: 02/12/03 Project Owner. PURE RESOURCES Project Name: LOVINGTON PADDOCK WELL #21 Project Location: NOT GIVEN Sampling Date: 02/07 & 02/10/03 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: AH Analyzed By: BC

		GRO	DRO			ETHYL	TOTAL
LAB NO.	SAMPLE ID	(C ₆ -C ₁₀)	(>C10-C28)	BENZENE	TOLUENE	BENZENE	XYLENES
		(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(m g /Kg)	(mg/Kg)
ANALYSIS	DATE:	02/11/03	02/11/03	02/11/03	02/11/03	02/11/03	02/11/03
H7469-1	SPRLPW212703BH1-2'	<10.0	1230	0.037	0.101	0.100	0.146
H7469-2	SPRLPW2127038H1-5'	<10.0	. 91.6	<0.005	0.011	0.056	0.122
H7469-5	SPRLPW212703BH2-2'	<10.0	133	0.024	0.086	0.069	0.099
H7469-6	SPRLPW212703BH2-5'	<10.0	<10.0	<0.005	<0.005	<0.005	< 0.015
H7469-9	SPRLPW212703BH3-2'	<10.0	<10.0	0.016	0.056	0 034	0.053
H7469-11	SPRLPW212703BH4-2'	<10.0	163	0.031	0 053	0 021	0.029
H7469-12	SPRLPW212703BH4-5	<10.0	<10.0	<0.005	<0.005	<0 005	< 0.015
H7469-15	SPRLPW212703BH5-2	<10.0	<10.0	0.013	0.026	0 015	0.027
Quality Co	ntrol		801	0.107	0 104	0 107	0.306
True Value	QC	800	800	0.100	0.100	0.100	0.300
% Recover	γ	104	100	107	104	107	102
Relative Pe	ercent Difference	. 4.4	2.2	2.2	3.3	2.9	3.3

METHODS: TPH GRO & DRO - EPA SW-846 8015 M; BTEX - SW-846 8260.

Burgess J. A. Cooke. Ph. D.

12/00 Date

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PLEASE NOTE: Liability and Damages: Carolinal's leaders, and cherts evolusive remedy for any plant assing instructed in contract or fort, shall be united to the ombum paid by plant for analyses. All claims: including those for leag gence and any other cause whatewave shall be deemed ware unless made in wrining and neckent by Cardinal is there is up 200 days after complete the applicable service. In or event shall Cardinal be table for incompanial company, including including united interview of the service shall be deemed ware unless induces in a subalificates or successors ansing out of or related to the performance or services Pereurder by Cardinal integrations of sort of an is based upon any of the appreciate resulting matching and by the appreciation or interviews.

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LOVINGTON PADDOCK UNIT WELL #21 INJECTION LINE

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Attachment IV: New Mexico Office of the State Engineer Water Level Reports

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New Mexico Office of the State Engineer

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Page 1 of 1

New Mexico Office of the State Engineer Well Reports and Downloads

Township: 16S Range: 36E Sections: 35,36

NAD27 X: Y. Zone: • Search Radius

County: 🝸 Basin: 🍸 Number Suffix

Owner Name: (First) (Last) Non-Domestic Domestic • All

> Well / Surface Data Report Avg Depth to Water Report Water Column Report Clear Form WATERS Menu Help

AVERAGE DEPTH OF WATER REPORT 12/12/2002

								(Depth	Water	in	Feet)
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- 	163	36E	35				5	1.0	1.5		1_
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Record Count: 11

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Page 1 of 1

	<i>New Mexico Oj</i> Well Rep	fice of the State Engineer orts and Downloads
Township: 178	Range: 36E	Sections: 1.2
NAD27 X	Y	Zone: Search Radius:
County:	Basin	Y Number: Suffix:
Owner Name: (First)	(La	() (Non-Domestic Domestic (* All
Well / Su	Inface Data Report Wate	Avg Depth to Water Report r Column Report

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AVERAGE DEPTH OF WATER REPORT 12/12/2002

								(Depth	Water	in Feet)
Bsn	Tws	Rng	Sec	Zone	x	Y	Wells	Min	Max	Avg
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LOVINGTON PADDOCK UNIT Well #21 Injection Line

PAGE **Ø**1 URE RESOURCES 3965950 29/2003 13:25 Eddi 392-6949 fron tee e Pure Resource C&CLANDFARM, INC. **BOX 55** بجي وتوج أبريه MONUMENT, NEW MEXICO 88265 (505) 397-2045 PHONE: 6 (505) 397-2860 02175 (505) 392-2236 FURP KOSOURCOS OMPANYNAME Mike North COMPANY REPRESENTATIVE NAME. 11.011 EASENAME SEC. TOWNSHIP RANGE 36 E 165 TRUCKING COMPANY NAME EA WELL CONST DRIVERSSIGNATURE 153646 TYPE OF MATERIAL BEING HAULED AND QUANTITY Contaminat OPY OF ANALYSIS ATTACHED, IF REQUIRED TPHC_ 1 BENZENE TOLUENE ETHYL BENZENE ~ 2.2 PARA XYLENE ATTENDANT ON DUTY



PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR EDDIE SEAY CONSULTING ATTN: EDDIE SEAY 601 W. ILLINOIS HOBBS, NM 88242 FAX TO:

Receiving Date: 10/16/03 Reporting Date: 10/17/03 Project Owner: PURE RESOURCES Project Name: PURE-LOVINGTON 21 Project Location: LOVINGTON, NM

Sampling Date: 10/16/03 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: AH Analyzed By: BC/AH

GRO DRO $(C_{6}-C_{10})$ CI* $(>C_{10}-C_{28})$ (mg/Kg) (mg/Kg)(mg/Kg)

LAB NUMBER SAMPLE ID

ANALYSIS DATE	10/16/03	10/16/03	10/17/03
H8091-1 PURE-21-1	* <10:0	<u>10.0</u>	2190
H8091-2	** <10:0	 1010	3360
H8091-3 _PURE_21_3	~~ <10:0	~10 <u>:</u> 0»	4000
H8091-4 -PURE-21-4	<10:0	2002 2<10:0>	2800
Quality Control	802	761	1040
True Value QC	800	800	1000
% Recovery	100	95.1	104
Relative Percent Difference	1.7	7.4	1.0

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; CI: Std. Methods 4500-CIB *Analyses performed on 1:4 w:v aqueous extracts.

esof R Cook

(6/17/03



H8091.XLS 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 client for 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 thirty (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.

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ARL	DINAL LABORATORIES, INC						
	2111 Beechwood, Abilene, TX 79603 (915) 673-7001 Fax (915) 673-7020	101 Eas (505) 39	t Marland, Ho)3-2326 Fax (obbs, NM 88240 505) 393-2476		Page	of
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PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR EDDIE SEAY CONSULTING ATTN: EDDIE SEAY 601 W. ILLINOIS HOBBS, NM 88242 FAX TO:

Receiving Date: 11/12/03 Reporting Date: 11/13/03 Project Number: PURE 21 Project Name: PURE RESOURCES Project Location: LOVINGTON, NM

LAB NUMBER

Analysis Date: 11/12/03 Sampling Date: 11/12/03 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: BC Analyzed By: HM

> Cl⁻ (mg/Kg)

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H8168-1	PURE 21-1	1310
H8168-2	CRURE 21-2	1124
H8168-3	CPURE 2153	2241
H8168-4	PURE 21-4	736
H8168-5	PURE R-A	512
H8168-6	PURE R-B	624
Quality Control		980
True Value QC		1000
% Recovery		98.0
Relative Perce	nt Difference	3.1

SAMPLE ID

METHOD: Std. Methods 4500-CI⁻B NOTE: Analyses performed on 1:4 w:v aqueous extracts.

Akohe

Date



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changes to (915) 673-7020.	Sample/Gondition Checked Temp, 92 Intact? By: By: No (intitials)	Bussey & Corke	Required By: (Leb Staff)	Raceived By: Faceived By: Faceived By:	name in wrang are noosen. Dy Courana wran, 30 Gryn eithe Competion of the opposite Innse idenrydfora, hoe a (use, of the of the carined by district, in a abaidering. I whether such claim, is, based upon any of the above stated measure, or otherwriter.	g whether based in contract or fort, shall be leased to the amount part by the cleant for the						VII V 1 V 1/3 2:15	B)RAB OR (C)	MATRIX PRESERV. SAMPLING	Fax #:	Phone #:	State: Zip:	time Kessmen city:	Address:	Zip: Attn:	Company:	P.O. #:	O.I. THE	903 101 East Marland, Hobbs, NM 88240 020 (605) 393-2326 Fax (505) 383-2476	CHAIN-OF-CU:
			s j med	U Yes D No	St Carly past case at the rate of 47%, per annual team the original over a movie, and all costs of collections, including attorney's lens.	Terms and Coordinants: Interest will be charged on all accounts more than							Ortp: Chlo								·····		ANALYSIS REQUEST	Page 01	STODY AND ANALYSIS REQUEST



PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR EDDIE SEAY CONSULTING ATTN: EDDIE SEAY 601 W. ILLINOIS HOBBS, NM 88242 FAX TO:

Receiving Date: 12/03/03 Reporting Date: 12/04/03 Project Number: PURE 21 Project Name: PURE 21-CITY OF LOVINGTON Project Location: LOVINGTON, NM

Sampling Date: 12/03/03 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: BC Analyzed By: BC/AH

	GRO	DRO	
	(C ₆ -C ₁₀)	(>C ₁₀ -C ₂₈)	CI*
LAB NUMBER SAMPLE ID	(mg/Kg)	(mg/Kg)	(mg/Kg)
ANALYSIS DATE	12/03/03	12/03/03	12/04/03

ANALYSIS [DATE	12/03/03	12/03/03	12/04/03	
H8219-1	PURE:21-1S	<u></u> ≦1;0:0	10:0	464	
H8219-2	RURE 21=2S	<u></u>	······	496	
H8219-3	PURE,21-3S	3	<10:00	272	
H8219-4	RURE-21-4S	-10-0	<1010	304	
Quality Cont	rol	764	779	1010	
True Value (QC	800	800	1000	-
% Recovery		95.5	97.4	101	
Relative Per	cent Difference	0.8	0.5	1.0	
 		· · · · · · · · · · · · · · · · · · ·			-

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; CI: Std. Methods 4500-CI B *Analyses performed on 1:4 w:v aqueous extracts.



H8219.XLS 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 client for 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 thirty (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 profils 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.





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ANALYTICAL RESULTS FOR EDDIE SEAY CONSULTING ATTN: EDDIE SEAY 601 W. ILLINOIS HOBBS, NM 88242 FAX TO:

Receiving Date: 11/17/03 Reporting Date: 11/17/03 Project Number: PURE 21 Project Name: PURE-CITY OF LOVINGTON Project Location: LOVINGTON Analysis Date: 11/17/03 Sampling Date: 11/17/03 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: GP Analyzed By: AH

CI

(mg/Kg)

LAB NUMBER

SAMPLE ID

H8182-1	PURE 21-1	896
H8182-2	CPURE 214	224
a and a second	and the second	
· · · · · · · · · · · · · · · · · · ·		
Quality Control		1000
True Value QC		1000
% Recovery		100
Relative Percent D	Difference	2.0

METHOD: Standard Methods 4500-CI'B Note: Analyses performed on 1:4 w:v aqueous extracts.

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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 client for 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 thirty (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. h8182





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ANALYTICAL RESULTS FOR EDDIE SEAY CONSULTING ATTN: EDDIE SEAY 601 W. ILLINOIS HOBBS, NM 88242 FAX TO:

Receiving Date: 12/19/03 Reporting Date: 12/22/03 Project Owner: PURE RESOURCES Project Name: PURE 21/CITY OF LOVINGTON Project Location: LOVINGTON WATER FIELD Analysis Date: 12/19/03 Sampling Date: 12/19/03 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: BC Analyzed By: AH

LAB NUM	
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BER SAMPLE ID

CI⁻ (mg/Kg)

4500-CI⁻B

H8276-1	<pure-21=1< th=""><th>80</th></pure-21=1<>	80
H8276-2	PURE 21-1R	416
Quality Control		940
True Value QC	<u></u>	1000
% Recovery		94.0
Relative Percent	Difference	7.4

METHOD: Standard Methods

Note: Analyses performed on 1:4 w:v aqueous extracts.

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 client for 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 thirty (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. h8276

† Cardinal cannot accept verbai changes. Please fax writte	Time: Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Relinquished By:	Sampler Relinquished: Date: /2//9	- services the section of the service section of the section of		- 1 Vune 21 - 1 K	H8776-1 1/11-21-1	Lab I.D. Sample I.D.	FOR LABUSE ONLY	Sampler Name: GJL v'W See	Project Location: be what a hard the solution of the	Project Name:	Phone #: 542.7236 Fax#:	City: U Los State: N V	Address: (101 W Ilkining	Project Manager: Eddin Say	Company Name: Edd in Son Cus Win	ARDINAL LABORATORIES, INC. 2111 Beechwood, Abliene, TX 78 (916) 673-7001 Fax (916) 673-7
n changes to (915) 673-7020.	BUNLUJAL & LAAA Sample Condition Checked Tomp, Condition By: By: Br. IM Yes (Initiate)	Received By: (Lab Staff)	Received By:	sar anade missing pesson in iteratives, or ver, a swar se ministri or the emission juent usy the turbit on the sea made in writing and reacework by Contrain which 30 days after completion of the applicable business interruptions, bes of use, or loss of profix insumod by clark, he subsidiaries, a of which ar such clark is based about one my of the above stated nessons or observice.				(G)RAB OR (C) (M) # CONTAINERS GROUNDWATER WASTEWATER SOIL OIL SLUDGE OTHER : ACID/BASE: ICE / COOL OTHER : M	MATRIX PRESERV. SAM	Fax #:	Phone #:	State: Zio:	Address: Va	Zip: 87242 Attn: 2	Company	P.O. #:	OL THE	CHA 9603 101 East Marland, Hobbs, NM 88240 7020 (505) 393-2326 Fax (505) 393-2476
		REMARKS:	Phone Result: Fax Result:			7.50	7:30	TIME	PLING							ć.		UN-OF-CUS
			D Yes D No	30 days past due at the rate of 24% per annum from the original dat and all costs of collections, including attorney's tees.				Chlor	<u>, d</u>	<u> </u>) 						ANALYSIS REQUEST	TODY AND ANALYSIS REQUE

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ANALYTICAL RESULTS FOR EDDIE SEAY CONSULTING ATTN: EDDIE SEAY 601 W. ILLINOIS HOBBS, NM 88242 FAX TO:

Receiving Date: 12/19/03 Reporting Date: 12/22/03 Project Owner: PURE RESOURCES Project Name: PURE 21/CITY OF LOVINGTON Project Location: LOVINGTON WATER FIELD Analysis Date: 12/19/03 Sampling Date: 12/19/03 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: BC Analyzed By: AH

LAB NUMBER

SAMPLE ID

CI (mg/Kg)

H8277-1	<rure-21-1-s< th=""><th>1,1-2,</th></rure-21-1-s<>	1,1-2,
H8277-2	<u>P⊍RE-21-2-S</u>	1:12
H8277-3	PURE-2:1-3=S	803
H8277-4	PURE-21.4-S	96
Quality Control		940
True Value QC		1000
% Recovery		94.0
Relative Percent [Difference	7.4

METHOD: Standard Methods

hods 4500-CIB

Note: Analyses performed on 1:4 w:v aqueous extracts.

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+ Caudinal names appart works about the Bioson fav unit	Sampler - UPS - Bus - Other:	Delivered Rv. (Cime One)	Time:	Bolinational Mr Jan 10:0		efficients or successors anticipation be save by processing or consequence damages, structure estimate structur efficients or successors anticipation of or related to the performance of services hereunder by Century in oper	anthrees. Al chains including those for negligence and any other cause whatsoever shall be deemed weived	PLASE NOTE: Laberty and Damages Candina's lability and client's exciteive namedy by any claim			S-h le mol fr	-3 Pu al 3-5	2 Pun 21 2-5	H&277-1 Rue 21 1-5		Lab I.D. Sample I.D.		FOR LABUSE ONLY	Sampler Name: Pold Sampler Name:	Project Location: 1 on the the boot	Project Name: Por a I. C. A. I. au me	Project #: Put and Project Owne	Phone # 392. 2236 Fax #:	City: La obtos State: NY	Address: Leo 1 w I (I no internet	Project Manager: Edit av Sam 1	Company Name: Editer Some Consul	ARDINAL LABORATORIES, IN 2111 Beechwood, Abliene, TX (915) 673-7001 Fax (915) 67	Pr .
	Temp © Intact? By:	Sample Candition Checked	- Isun all (len.	S Bacabad Bur (1 at Stath)		rdiess of inhether such claim is based upon any of the above stated reasons or otherwise. Gless of inhether such claim is based upon any of the above stated reasons or otherwise.	d unless name in writing and received by Cardinal within 30 days after completion of the applicable	n around whether based in contract or fort, shall be limited to the amount oad by the client by the				V V V			(G)RAB # CONT GROUN WASTE SOIL OIL SLUDG OTHER ACID/B, ICE / CO OTHER	OR (C) AINER IDWATI WATE E : ASE: DOL :	ER R	MATRIX PRESERV. SAMI	Fax #:	Phone #:	State: Zip:	Print and Kalonian of City:	Address		Company:	P.O. #:	IT. BILL TO	C. (79603 101 East Mariand, Hobbs, NM 88240 73-7020 (505) 393-2326 Fax (505) 393-2476	
		_			Fax Result REMARKS:						8:15	7:55	7.46-	7:30	TIME			PLING											
							30 days past due at the rate of 24% per annum from the or	Terms and Conditions: Inferest will be charged on all accou						\			<u> </u> ,	<u> </u>									ANALYSIS REQUEST		TODY AND ANALYSIS DEI
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