NM - 71

GENERAL CORRESPONDENCE

YEAR(S):

1999-1997

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

April 13, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. P-326-936-529

Mr. V. Ed Butler
Northland Operating Company
13760 Noel Road
Suite 1030
Dallas, TX 75240-7336

RE: Pit Closure Approval
Northland Operating Company
SE/4, NW/4, Section 30, Township 13 South, Range 32 East, NMPM
Lea County, New Mexico

Dear Mr. Butler:

The New Mexico Oil Conservation Division (OCD) has received the Northland Operating Company (Northland) pit remediation and closure report dated December 30, 1998 and April 7, 1999 regarding the pit closures at the above referenced location. The OCD has reviewed the information provided by Northland on the **lined pit** and the **non-exempt (non-hazardous) pit**. The pit sites have been remediated, filled, compacted and contoured according to the OCD requirements outlined in the November 19, 1998 letter. The Rock Queen Unit Tract 20 **pit closures are hereby approved.**

Please be advised that this approval does not relieve Northland of liability should their operation result in pollution of surface water, ground water, or the environment. In addition, OCD approval does not relieve Northland of liability for compliance with other laws and/or regulation.

If you require any further information please contact me at (505) 827-7153.

Sincerely,

Martyne J. Kieling
Environmental Geologist

xc: Hobbs OCD Office
Mike Matush, State Land Office
Leon Anderson, Hobbs, State Land Office

QSR

QUEEN SAND RESOURCES, INC.

Queen Sand Resources, Inc. and Northland Operating Co.
are pleased to announce
the relocation of their offices
effective December 4, 1998,
to the following address:

13760 Noel Road
Suite 1030, LB 44
Dallas, Texas 75240-7336

Please update your records accordingly.
Queen Sand & Northland's telephone and fax number will change to the following:

972-233-9906 (Tel.)
972-233-9575 (Fax)

QSR
QUEEN SAND RESOURCES, INC.
13760 Noel Road
Suite 1030, LB 44
Dallas, Texas 75240-7336

BULK RATE
U.S. POSTAGE
PAID
WICHITA FALLS,
TX
PERMIT NO. 189

Martyne Kieling
New Mexico - OCD
2040 So. Pacheco Street
Santa Fe, NM 87505

RECEIVED

APR 09 1999

Environmental Bureau
Oil Conservation Division

District I
P.O. Box 1980, Hobbs, NM
District II
Drawer DD, Artesia, NM 88211
District III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

SUBMIT 1 COPY TO APPROPRIATE DISTRICT OFFICE AND 1 COPY TO SANTA FE OFFICE

(Revised 3/9/94)

OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NM 87505

PIT REMEDIATION AND CLOSURE REPORT

Operator: NORTHLAND OPER Telephone: 972-233-9906

Address: 13760 NOEL RD SUITE 1030 LB 44 DALLAS TX 75240-7336 972-383-8260

Facility Or: ROCK QUEEN UNIT TRAC 20 - NON EXEMPT PIT (NON HAZARDOUS)
Well Name

Location: Unit or Qtr/Qtr Sec SE/4 NW/4 Sec 20 T 13S R 32E County LEA

Pit Type: Separator ___ Dehydrator ___ Other ABANDONED - NOT IN USE

Land Type: BLM ___, State YY, Fee ___, Other ___

Pit Location: (attach diagram)

Pit dimensions: length 92', width 72', depth 14'6"

Reference: wellhead ___, other ___

Footage from reference: ___

Direction from reference: ___ Degrees ___ East North ___ of ___ West South ___

Depth To Ground Water: (Vertical distance from contaminants to seasonal high water elevation of ground water)	Less than 50 feet (20 points) 50 feet to 99 feet (10 points) Greater than 100 feet (0 Points)	0
Wellhead Protection Area: (Less than 200 feet from a private domestic water source, or; less than 1000 feet from all other water sources)	Yes (20 points) No (0 points)	0
Distance To Surface Water: (Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches)	Less than 200 feet (20 points) 200 feet to 1000 feet (10 points) Greater than 1000 feet (0 points)	10
	RANKING SCORE (TOTAL POINTS):	10

Date Remediation Started: 8-15-98 Date Completed: JAN -27-99

Remediation Method: (Check all appropriate sections) Excavation ✓ Approx. cubic yards _____

Landfarmed ✓ Insitu Bioremediation ___

Other _____

Remediation Location: (ie. landfarmed onsite, name and location of offsite facility) Onsite ✓ Offsite HAULED 882 yds TO MARLEY-GANDY NEAR TATUM N.M.

General Description Of Remedial Action: HAULED 882 YDS MATERIAL TO LAND FARM- DUG OUT APPROX 2750 CU. YARDS MIXED WITH 850 YARD CLIACHE, 800 YARD'S SAND & NATURAL SOIL- DUG PIT TO 14'6"- SPREAD 6" SAND IN BOTTOM- INSTALLED 30 MIL PLASTIC LINER- FILLED TO 12'6" WITH ~~REMEDIATE~~ REMEDIATED SOIL- CLOSED & SEALED LINER- COVERED TOP & DOMED WITH CLIACHE

Ground Water Encountered: No ✓ Yes ___ Depth _____

Final Pit: Closure Sampling: (if multiple samples, attach sample results and diagram of sample locations and depths)

Sample location _____

MULTIPLE SAMPLES ATTACHED

Sample depth _____

Sample date _____ Sample time _____

Sample Results

Benzene(ppm) _____

Total BTEX(ppm) _____

Field headspace(ppm) _____

TPH _____

Ground Water Sample: Yes ___ No X (If yes, attach sample results)

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF

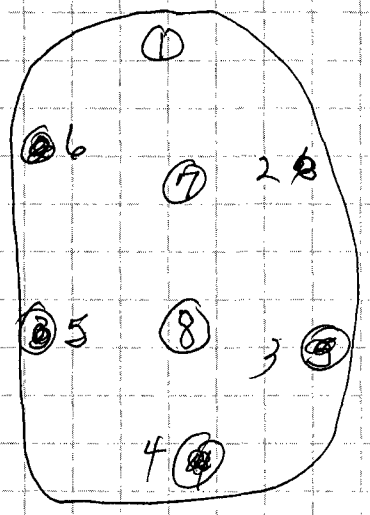
DATE 4/7/99

SIGNATURE James L Hull Jr PRINTED NAME AND TITLE JAMES L HULL JR PRODUCTION CLERK

915-393-8260

PATTERSON DRILLING COMPANY

Soil Sample of TRAC 20 NON-EXEMPT PIT



Bottom & SIDES

FILL - REMEDIATED SOIL

NORTH MIDDLE - #1

SOUTH MIDDLE #2

DALLAS, TEXAS
OFFICE (214) 368-5324 • FAX (214) 686-8866

MIDLAND, TEXAS
OFFICE (915) 682-9401 • FAX (915) 682-1565

KILGORE, TEXAS
OFFICE (903) 983-1296 • FAX (903) 983-1634

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
NORTHLAND OPERATING
ATTN: BENNY GRAYSON
P.O. BOX 119
MALJAMAR, NM 88260
FAX TO:

Receiving Date: 01/20/99
Reporting Date: 01/21/99
Project Number: NOT GIVEN
Project Name: PIT – TRAC 20 NON-EXEMPT
Project Location: NOT GIVEN

Sampling Date: 01/20/99
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: AH
Analyzed By: BC

LAB NO.	SAMPLE ID	TPH (mg/kg)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL BENZENE (mg/kg)	TOTAL XYLENES (mg/kg)
ANALYSIS DATE:		01/20/99	01/20/99	01/20/99	01/20/99	01/20/99
H4002-1	#1	2700	<0.002	<0.002	<0.002	<0.006
H4002-2	#2	2500	<0.002	<0.002	<0.002	<0.006
Quality Control		243	0.090	0.103	0.100	0.3
True Value QC		240	0.100	0.100	0.100	0.300
% Recovery		101	90	103	100	100
Relative Percent Difference		4.2	1.8	3.8	3.0	2.0

METHODS: TRPHC - EPA 600/7-79-020, 418.1; BTEX - EPA SW846-8020, 8260

Burgess J.A. Cooke
Chemist

1/21/99
Date

H4002-1.XLS

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 (915) 673-7001 Fax (915) 673-7020
101 East Marland, Hobbs, NM 88240 (505) 393-2326 Fax (505) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page____ of ____

Company Name:	Northland Operating
Project Manager:	Benny Grayson
Address:	119 Box
City:	Maljamar State: NM Zip: 88260
Phone #:	676-2130
Fax #:	Same
Project #:	P.4 Project Owner:
Project Name:	TRAC 20 NON-EXEMPT
Project Location:	

BILL TO PO #:

Company:	Northland
Attn:	Benny Grayson
Address:	Box 119
City:	Maljamar
State:	NM Zip: 88260
Phone #:	676-2130
Fax #:	SAME

ANALYSIS REQUEST: TPH, BTEX

FOR LAB USE ONLY LAB I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRES.: ACID:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME
H4002-1	#1	G	1			✓							1/20	
-2	#2	G	1			✓								

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 consequental 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.

Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invoice, and all costs of collections, including attorney's fees.

Sampler Relinquished: Benny Grayson	Date: 1/20/99 Time: 3:50	Received By:	Phone Result ☐ Yes ☐ No Additional Fax #:
Relinquished By:	Date: 1/20/99 Time: 3:50	Received By: (Lab Staff) Amy Hill	Fax Result: ☐ Yes ☐ No
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Sample Condition: Cool ☒ Yes ☐ No; Intact ☒ Yes ☐ No	CHECKED BY: (Initials)

REMARKS:

† Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
NORTHLAND OPERATING
ATTN: ROGER W. ANDERSON
3500 OAK LAWN, SUITE 380
DALLAS, TX 75219-4398
FAX TO:

Receiving Date: 01/07/99
Reporting Date: 01/11/99
Project Number: NOT GIVEN
Project Name: TRAC-20 - NONEXEMPT
Project Location: NOT GIVEN

Sampling Date: 01/07/99
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC/AH

LAB NUMBER	SAMPLE ID	TPH (mg/Kg)	Cl (mg/Kg)	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)
ANALYSIS DATE:		01/08/99	01/08/99	01/08/99	01/08/99	01/08/99	01/08/99
H3985-1	14' 6' SAMPLES 1	2100	160	<0.002	0.022	0.06	0.192
H3985-2	14' 6' SAMPLES 2	4640	80	<0.002	0.003	0.017	0.065
H3985-3	14' 6' SAMPLES 3	2705	72	<0.002	0.003	0.021	0.077
H3985-4	14' 6' SAMPLES 4	1090	248	<0.002	<0.002	0.007	0.027
H3985-5	14' 6' SAMPLES 5	1320	72	<0.002	0.002	0.011	0.042
H3985-6	14' 6' SAMPLES 6	4880	168	<0.002	0.002	0.014	0.05
H3985-7	14' 6' SAMPLES 7	3890	120	<0.002	0.006	0.034	0.111
H3985-8	14' 6' SAMPLES 8	2350	192	<0.002	0.002	0.013	0.047
Quality Control		254	1257	0.089	0.100	0.100	0.300
True Value QC		240	1319	0.100	0.100	0.100	0.300
% Recovery		106	95	89	100	100	100
Relative Percent Difference		2.4	3.5	1.5	3.5	1.5	0.6

METHODS: TRPHC-EPA 600/4-79-020, 418.1;Cl-EPA 600/4-79-020 325.3 BTEX-EPA SW-846-8260

Burgess J. A. Cooke. Ph. D.

01/11/99
Date

H3985-1.XLS

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 (915) 673-7001 Fax (915) 673-7020
101 East Marland, Hobbs, NM 88240 (505) 393-2326 Fax (505) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page____ of____

Company Name: NORTHLAND OPER,	BILL TO PO #:
Project Manager: Roger W. ANDERSON	Company: NORTHLAND
Address:	Attn:
City: DALLAS State: TX Zip:	Address: (
Phone #: 915-~~673~~ 338-4506	City: DALLAS, TX
Fax #:	State: TX Zip:
Project #: Project Owner:	Phone #:
Project Name: TRAC-20 NONEXEMPT	Fax #:
Project Location:	

ANALYSIS REQUEST: TPH, BTEX, Cl

FOR LAB USE ONLY LAB I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRES.: ACID:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME
#3985-1	146 Samples 1					X							1-7-99	14:30
-2	2					X								
-3	3					X								
-4	4					X								
-5	5					X								
-6	6					X								
-7	7					X								
-8	8					X								

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 consequental 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.

Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invoice, and all costs of collections, including attorney's fees.

Sampler Relinquished:	Date:	**Received By:**	Phone Result ☐ Yes ☐ No Additional Fax #:
	Time:		Fax Result: ☐ Yes ☐ No
Relinquished By: Roger W. Anderson	Date: 1-7-98	**Received By: (Lab Staff)**	REMARKS:
Delivered By: (Circle One)	Time: 17:00	Sample Condition: Cool ☑ Yes ☐ No; Intact ☑ Yes ☐ No	CHECKED BY: (Initials)
Sampler - UPS - Bus - Other:			

† Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

2040 South Pacheco
P.O. Box 6429
Santa Fe, New Mexico 87505-5472

Mr. V. Ed Butler
Northland Operating Company
3500 Oak Lawn
Suite 380
Dallas, TX 75219-4398

NON-EXEMPT TRAC-20

SW pit Exempt Top of Picture Closed

January 1999?

NON-EXEMPT TRAC-20

January 1999?

NON-EXEMPT TRAC-20

Saltwater Exempt + Pit closed top of Picture.

January 1999?

NON-EXEMPT TRAC-20

January 1999?

NON-EXEMPT TRRC-20

1999 January?

Northland
Non Exempt

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal	Time	Date
	10:00	1-12-94

Originating Party	Other Parties
Roger Anderson For Northland drilling	Martyne Kieling

Subject

Northland Non-Exempt Non Hazardous pit

Discussion

Final lab analysis ≤10,000 TPH. Greatest Result is 4880 ppm on the sides. Bottom 1080 PPM TPH. Benzene .002, .034 ppm BTEX .002, .003, .006 PPM

Sand Has Been Layed in the Bottom a liner is on its way Sand will be blended with Contaminated Soil & Placed in liner & Sealed & Burried.

Hole at Present is 92' x 76' x 15' Deep

Gary Wink Has Been out at the site (Billy?)

114.

Conclusions or Agreements

Pictures Have Been taken will be include in Closuer Report.

Distribution

Signed Martyne J Kieling

District I
P.O. Box 1980, Hobbs, NM
District II
P.O. Drawer DD, Artesia, NM 88211
District III
1000 Rio Brazos Rd, Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

SUBMIT 1 COPY TO APPROPRIATE DISTRICT OFFICE AND 1 COPY TO SANTA FE OFFICE

(Revised 3/9/94)

PIT REMEDIATION AND CLOSURE REPORT

Operator: Northland Operating Co. **Telephone:** (972) 233-9906

Address: 13760 Noel Rd., Suite 1030, LB #44, Dallas, TX 75240-7336

Facility Or: Rock Queen Unit Trac 20 Lined Pit
Well Name

Location: Unit or Qtr/Qtr Sec SE/4, NW/4 Sec 30 T 13S R 32E County Lea

Pit Type: Separator___ Dehydrator___ Other Emergency salt water overflow

Land Type: BLM___, State X, Fee ___, Other_____

Pit Location: (Attach diagram)
Pit dimensions: length 100', width 100', depth 10'6"
Reference: wellhead___, other _____
Footage from reference: _____
Direction from reference: _____ Degrees ___ East ___ North
of
___ West ___ South

Depth To Ground Water: (Vertical distance from contaminants to seasonal high water elevation of ground water)	Less than 50 feet (20 points) 50 feet to 99 feet (10 points) Greater than 100 feet (0 Points)	0
Wellhead Protection Area: (Less than 200 feet from a private domestic water source, or; less than 1000 feet from all other water sources)	Yes (20 points) No (0 points)	0
Distance To Surface Water: (Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches)	Less than 200 feet (20 points) 200 feet to 1000 feet (10 points) Greater than 1000 feet (0 points)	10
	RANKING SCORE (TOTAL POINTS):	10

Date Remediation Started: _____ **Date Completed:** _____

Remediation Method: (Check all appropriate sections) Excavation XX Approx. cubic yards 504

Landfarmed ___ Insitu Bioremediation ___

Other _____

_____

Remediation Location: (ie. landfarmed onsite, name and location of offsite facility) Onsite___ Offsite Controlled Recovery Inc.

_____

General Description Of Remedial Action: Hauled

Controlled Recovery Inc. (CRI)

Cardinal Lab - Hobbs, NM - Sample # H3371-3

Ground Water Encountered: No XX Yes ___ Depth _____

Final Pit:
Closure Sampling:
(if multiple samples, attach sample results and diagram of sample locations and depths)

Sample location _____

TPH, BTEX and Chlorides from vertical profile

Sample depth _____

Sample date _____ Sample time _____

Sample Results

Benzene(ppm) _____

Total BTEX(ppm) _____

Field headspace(ppm) _____

TPH _____

Ground Water Sample: Yes ___ No XX (If yes, attach sample results)

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF

DATE 12/30/99

SIGNATURE James L Hull II PRINTED NAME AND TITLE JAMES L HULL JR Production Clerk

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page____ of____

Company Name: NORTHLAND GAS CO		BILL TO	PO #:
Project Manager: ROGER W. ANDERSON		Company: SAME	
Address:		Attn:	
City: DALLAS, TX State: TX Zip:		Address:	
Phone #: 915-338-4506		City:	
Fax #:		State: Zip:	
Project #: Project Owner:		Phone #:	
Project Name: TRAC-20 EXEMPT PIT		Fax #:	
Project Location:			

FOR LAB USE ONLY				MATRIX							PRES.			SAMPLING		ANALYSIS REQUEST
LAB I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:		ACID:	ICE / COOL	OTHER:	DATE	TIME	BTEX TPHC
H3953-1	#1 CEN @ 10'6"					X								12/4/98	2:00	X

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.

Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invoice, and all costs of collections, including attorney's fees.

Sampler Relinquished: Roger W. Anderson	Date: 12/4/98 Time: 4:30 PM	Received By:	Phone Result ☐ Yes ☐ No Additional Fax #:
Relinquished By:	Date: Time:	Received By: (Lab Staff)	Fax Result: ☐ Yes ☐ No REMARKS:
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 915-673-7020.

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
NORTHLAND OPERATING CO.
ATTN: ROGER W. ANDERSON
3500 OAK LAWN, SUITE 380
DALLAS, TX 75219-4398
FAX TO: (214) 521-9960

Receiving Date: 12/04/98
Reporting Date: 12/07/98
Project Number: NOT GIVEN
Project Name: TRAC-20 EXEMPT PIT
Project Location: NOT GIVEN

Sampling Date: 12/04/98
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC/AH

LAB NUMBER	SAMPLE ID	TPH (mg/Kg)	Cl (mg/Kg)	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)
ANALYSIS DATE:		12/07/98	12/07/98	12/07/98	12/07/98	12/07/98	12/07/98
H3953-1	#1 CEN @ 10' 6"	900	188	<0.002	0.003	<0.002	<0.006
Quality Control		241	1301	0.094	0.098	0.096	0.290
True Value QC		240	1319	0.100	0.100	0.100	0.300
% Recovery		101	98.6	94.4	97.9	96.3	96.6
Relative Percent Difference		1.0	0.2	1.9	2.0	5.4	6.2

METHODS: TRPHC-EPA 600/4-79-020, 418.1;Cl-EPA 600/4-79-020 325.3 BTEX-EPA SW-846-8020

Burgess A. Cooke, Ph. D.

12/7/98
Date

H3953-1.XLS

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DYKE BROWNING
703 E. CLINTON, SUITE 103
HOBBS, NM 88240
FAX TO: 505-393-4388

Receiving Date: 12/11/97
Reporting Date: 12/12/97
Project Number: NORTHLAND OPERATING
Project Name: PIT CLOSINGS
Project Location: 22 MI. N. OF MALJAMAR

Analysis Date: 12/11/97
Sampling Date: 12/10/97
Sample Type: SOIL
Sample Condition: COOL, INTACT
Sample Received By: AH
Analyzed By: BC

LAB NUMBER	SAMPLE ID	TPH (mg/Kg)
H3371-1	N. PIT @ 28' CENTER	<10
H3371-2	MIDDLE PIT @ 20' CENTER	<10
H3371-3	TRACT 20 LINED PIT @ 10' CTR.	<10
H3371-4	TRACT 20 NON-EXEMPT @ 38' DEPTH	458
Quality Control		184
True Value QC		200
% Recovery		92.1
Relative Percent Difference		2.7

METHOD: EPA 418.1, 3510, 3540, or 3550; Infrared Spectroscopy

Chemist

12/12/97
Date

H3371.xls

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

November 19, 1998

CERTIFIED MAIL
RETURN RECEIPT NO. P-326-936-489

Mr. V. Ed Butler
Northland Operating Company
3500 Oak Lawn
Suite 380
Dallas, TX 75219-4398

RE: Pit Closure Plan
Northland Operating Company
SE/4, NW/4, Section 30, Township 13 South, Range 32 East, NMPM
Chaves County, New Mexico

Dear Mr. Butler:

The New Mexico Oil Conservation Division (OCD) has received the Northland Operating Company (Northland) letter and pit closure plan dated May 22, 1998 and memo to file dated August 18, 1998 regarding the pit closures at the above referenced location.

The OCD has reviewed the information provided by Northland on the **lined pit**. The vertical profile of TPH and BTEX were below the regulatory levels at the 10 foot interval. The lined pit has been excavated to the 10 foot level and the material disposed of at an OCD approved surface waste management facility. Subsequent VADSAT modeling shows that the chloride levels remaining will not migrate to groundwater in the foreseeable future. The Rock Queen Unit Tract 20 Lined Pit will be approved for closure upon completion of the following:

1. Filling, compacting and contouring the excavated pit for positive drainage.

2. Re-seeding the site with native grasses.

3. Receipt of an OCD Pit Remediation and Closure Report with the final remedial activities including excavation depth and TPH, BTEX and chloride results from the vertical profile.

The OCD has reviewed the closure plan for the **non-exempt pit** and approves the plan with the following conditions:

1. All pit material will be excavated until the bottom of the pit and all side walls have TPH concentrations <10,000 ppm , benzene <10 ppm and total BTEX <50 ppm.

2. When the pit excavation is complete 6" of sand will be added to bottom of the pit and then a polyethylene liner of a minimum thickness of 30 mils will be spread into the bottom and side walls of the pit. An additional 6" of sand will be added on top of the liner.

3. The excavated material will be mixed and blended following protocol 6.5 of the Northland proposal. The soil will then be placed back into the pit excavation, compacted and the polyethylene liner folded up to encase the contaminated soil.

4. The top two feet of the excavation shall be covered with remediated materials having a maximum TPH concentration of <100ppm and benzene concentrations <2 ppm.

5. The surface will be contoured for positive drainage and re-seeded with native grasses

6. Following all activities Northland shall submit an OCD Pit Remediation and Closure Report with the final remedial activities including excavation depth and TPH, BTEX and chloride results from the bottom and sides of the excavation.

Northland shall submit the requested materials to the OCD Santa Fe office and a copy to the Hobbs District office.

If you require any further information please contact me at (505) 827-7153.

Sincerely,

Martyne J. Kieling
Environmental Geologist

xc: Hobbs OCD Office
Jens W. Deichmann, State Land Office
Hobbs, State Land Office

Attention: Mrs. Martyne Kieling

Date: 11/18/98

Company: New Mexico OCD

Number of Pages: 2

Fax Number: 1-505-827-8177

Voice Number: 1-505-827-7153

From: John E. Rhoads

Company: Eagle Eye Monitoring

Fax Number: 1-940-723-8511

Voice Number: 1-940-723-8511

Subject: Northland Operating Tract 20 Pits

Comments:

The following is a copy of some of the contemporaneous notes I made during discussions with Mr. Peel. Mr. Peel was on-site during this excavation and I am relying on his reports and copies of the tickets supplied by Gandy Corp. I will e-mail you the material I mentioned re your son.
Respectfully, JR

Memo to File

To: File
From: John Rhoads
Date: August 18, 1998
Re: Pit closure work, by Mr. Herb Peel, Tract 20 Rock Queen Unit, Lea County, New Mexico; Exempt and non-exempt pits; material hauled to Gandy Corporation

The limited information available to me at this point is that approximately 882 yards of non-exempt material has now been hauled from the small non-exempt pit area south of the Tract 20 tank battery. This includes all of the material that was visible above the ground level and material from two pits discovered under the surface deposit. The pit under the surface deposit was excavated to an approximate dimension of 45' x 45' x 5' deep. The second pit, south of the first pit, appears to have been constructed as an overflow pit from the north pit. This construction is very similar to that which was visible at saltwater plant #2 before being covered. The south pit, after excavation, measured 30' x 30' x 3' deep.

Additional excavation was done on the exempt pit to the west of the non-exempt pit. The information supplied to me is that the bottom of this pit was excavated an additional 3'. The total additional volume removed from this exempt pit is reported to be between 350 and 400 yards. Since the TPH was at 2000 ppm prior to excavation, one expects that TPH levels in the bottom of this pit should now approximate that found when vertical profiling was done, i.e., essentially non-detectable.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☐ Telephone ☐ Personal	Time	Date

Originating Party	Other Parties

Subject

Diaper --- >10000 ppm Put in the 406 & Solve

Discussion

Conclusions or Agreements

Distribution

Signed

Price, Wayne

From: Price, Wayne
Sent: Thursday, January 15, 1998 5:24 PM
To: Martyne Kieling
Cc: Chris Williams
Subject: Northland Operating Co.

Re: Ul H-sec 25-Ts13s-r31e SWD INJ ST.
Ul F-sec 30-Ts13s-r32e Tk Bat & Playa Lake

Subject: Field Trip with NMSLO

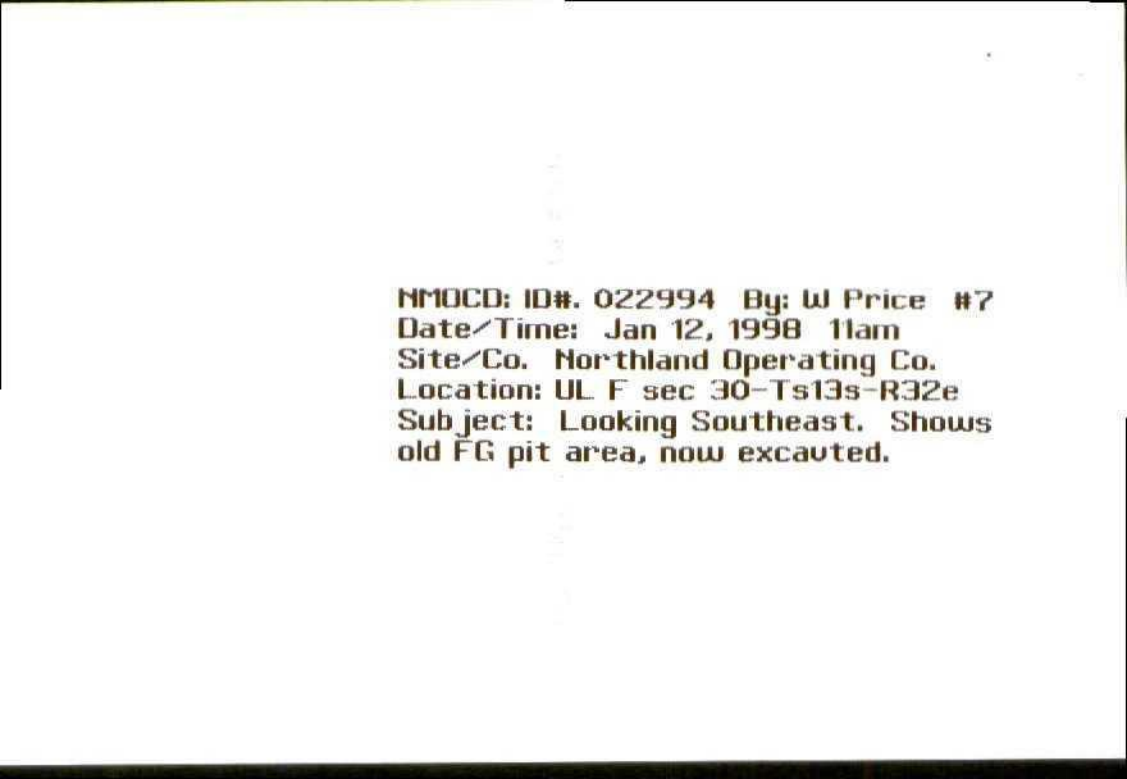
Took Pictures;

Dear Martyne,

I am dropping in the mail today pictures of the above sites.

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NM 87505


NMOCD: ID#. 022994 By: W Price #7
Date/Time: Jan 12, 1998 11am
Site/Co. Northland Operating Co.
Location: UL F sec 30-Ts13s-R32e
Subject: Looking Southeast. Shows
old FG pit area, now excavted.

NMOCD: ID#. 022994 By: W Price #8
Date/Time: Jan 12, 1998 11am
Site/Co. Northland Operating Co.
Location: UL F sec 30-Ts13s-R32e
Subject: Looking South, Shows west half old FG pit area, liner removed.

NMOCD: ID#. 022994 By: W Price #9
Date/Time: Jan 12, 1998 11am
Site/Co. Northland Operating Co.
Location: UL F sec 30-Ts13s-R32e
Subject: Looking West, south side of tk battery, oily residue.

NMOCD: ID#. 022994 By: W Price #10
Date/Time: Jan 12, 1998 11am
Site/Co. Northland Operating Co.
Location: UL F sec 30-Ts13s-R32e
Subject: East of Tk Batt. looking N
non-exempt pit.

NMOCD: ID#. 022994 By: W Price #11
Date/Time: Jan 12, 1998 11am
Site/Co. Northland Operating Co.
Location: UL F sec 30-Ts13s-R32e
Subject: East of Tk Batt. looking W
non-exempt pit. sides pushed out.

NMOCD: ID#. 022994 By: W Price #12
Date/Time: Jan 12, 1998 11am
Site/Co. Northland Operating Co.
Location: UL F sec 30-Ts13s-R32e
Subject: East of Tk Batt. looking S
Bkgd. shows playa lake.

Sec 30, T13S, R32E
Northland Queen Sand Unit Lined Pit

May 18, 1998

OCD
Martyne Kieling
ROGER ANDERSON

Northland
Shane
John Rhodes

Sec. 30, T. 13S, R 32E

Northland Queen Sand Unit Lined Pit

MAY 18, 1998

OCD
MARTYNE KIELING
ROGER ANDERSON

Northland
SHANE
John RHODES

Sec 30, T 13 S, R 32 E

Northland Non Exempt P.+

May 18, 1998

OCD MARTYNE KILLING

ROGER ANDERSON

Northland SHANE

John RHODES

Sec 30, T13S, R32E

Northland Non Exempt Pit

May 18, 1998

OCD MARTYNE KIELING
ROGER ANDERSON

NORTHLAND

Shane
John Rhodes

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

April 15, 1998

CERTIFIED MAIL
RETURN RECEIPT NO. P-326-936-417

Mr. V. Ed Butler
Northland Operating Company
3500 Oak Lawn
Suite 380
Dallas, TX 75219-4398

RE: Pit Closure Report
Northland Operating Company
SE/4, NW/4, Section 30, Township 13 South, Range 32 East, NMPM
Chaves County, New Mexico

Dear Mr. Butler:

The New Mexico Oil Conservation Division (OCD) has received the Northland Operating Company (Northland) letter and information dated February 27, 1998 and April 9, 1998 regarding the pit closures at the above referenced location.

The OCD has reviewed the information provided by Northland on the **non-exempt pit** and agrees that **the material within is non-hazardous**. Northland may proceed with the removal of contaminated soil to the maximum extent practical by earthmoving equipment that is available. Northland will notify the OCD Hobbs District Office 24 hours prior to excavation and confirmatory sampling of the non-exempt non-hazardous pit to allow an OCD representative the opportunity to witness the excavation and sampling. All excavated materials will be disposed of at an OCD approved facility. Confirmatory samples shall be collected from the excavation to determine the vertical extent of any remaining contamination. Samples will be analyzed for BTEX, TPH, chloride.

The OCD has reviewed the information provided by Northland on the **lined pit** and finds the remaining chloride level below the pit liner, 15,800 mg/kg, to be in excess of the New Mexico Drinking Water Standard of 250 ppm. Northland shall determine vertical extent of the chloride below the lined pit.

If Northland proposes to leave any contamination in the subsurface that is above 10 ppm Benzene, 50 ppm BTEX, 1000 ppm TPH, and 250 ppm chloride Northland must submit a proposal that demonstrates that there will be no migration of any contamination to the ground water that would

exceed New Mexico Drinking Water Standard or upward migration that would inhibit native plant growth.

Final approval of the closure plan for the **lined pit and non-exempt pit** will be deferred until the requested analytical results are received and evaluated. Northland shall submit the requested materials to the OCD Santa Fe office and a copy to the Hobbs District office.

If you require any further information please contact me at (505) 827-7153.

Sincerely,

Martyne J. Kieling
Environmental Geologist

xc: Hobbs OCD Office
Jens W. Deichmann, State Land Office
Hobbs, State Land Office
Ed Morney, Field Superintendent, Northland, P.O. Box 119, Maljamar, NM 88264

NORTHLAND OPERATING COMPANY

April 9, 1998

Ms. Martyne Kieling
Environmental Geologist
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division – Environmental Bureau
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Re: Rock Queen Unit Tract 20 Lined Pit
SE/4 NW/4 Section 30 T13S R32E Lea County, New Mexico

Dear Ms. Kieling:

Enclosed please find BTEX and chloride data as it relates to the composite soil sample taken from the referenced pit on March 5, 1998. The BTEX results were ready March 16; for some reason, the chloride test was not completed until April 2. We hope the delay has not caused any undue hardship. Chain of custody records for these samples are also enclosed.

Total BTEX levels in samples JR012 and JR013 were 27 micrograms/Kg and less than 2 micrograms/Kg, respectively. The benzene concentration in JR012 was below detection limits. The chloride concentration (JR-015) was determined to be 15,800 mg/Kg.

As related to you by telephone earlier, the sampling protocol involved taking soil from thirty different points in the bottom of the pit on a regular grid. The starting for collecting samples was 25' west and 25' north of the southeast corner post for the fence that surrounded the pit. Soil samples (approximating 70 grams each) were taken on a 9' grid from the top of undisturbed soil to a depth of approximately 3". Six samples were taken along the first north-south line; there were five such north-south lines, each 9' from the other. All samples were placed in a large mixing bag. After collection, the thirty-sample composite was thoroughly mixed. From this mixture, two samples were taken for BTEX analysis. A portion of the remaining soil was submitted for chloride testing. All remaining soil was retained under refrigeration at NTCCL. The samples were delivered to North Texas Chemical Consultants Laboratory on March 6, 1998. After a review of these BTEX results, we requested a TPH determination from a sample of the remaining (refrigerated) soil. We recognize the excessive time lag from sample collection to TPH testing, but believe the results will still be informative. TPH results will be provided to you when they become available.

We again thank you for your patience.

Respectfully,

John E. Rhoads

John E. Rhoads
Agent for Northland Operating

cc: Mr. Wayne Price, OCD

3500 OAKLAWN, L. B. #31 • DALLAS, TEXAS • 75219-4398
PHONE: 214-521-9959 • FAX: 214-521-9960

Intertek Testing Services
Environmental Laboratories

ANALYTICAL REPORT

DATE RECEIVED : 11-MAR-1998

REPORT NUMBER : D98-2002
REPORT DATE : 16-MAR-1998

ATTENTION : R.J. Williams
SAMPLE SUBMITTED BY : North Texas Chemical Consultants Laboratory,
ADDRESS : 2000 Old Burk Road
: Wichita Falls, Tx. 76304

PROJECT : Northland Operating

The data enclosed herein, to the best of my knowledge, is compliant and complete, with any exceptions noted above, with regard to the method(s) employed by ITS and/or the terms and conditions of the contract, purchase order, or other vehicle through which ITS has agreed to conduct these analyses. The enclosed data are representative of the samples as received by the laboratory. ITS makes no representation or certification as to the method of sample collection, identification or handling/ transportation procedures prior to receipt of samples by ITS. These data should be considered in their entirety; ITS can not be responsible for the detachment, separation or otherwise partial use of this report. Release of the data contained in this hardcopy data package and in the accompanying electronic data deliverable (if applicable) has been authorized by the Laboratory Director or their designee, as verified by the following signature.

D. Sims / Debra Sims 3/17/98
Name/Signature Date

Intertek Testing Services NA Inc.
1089 East Collins Boulevard Richardson, TX 75081
Telephone (972) 238-5591 Fax (972) 238-5592

Intertek Testing Services
Environmental Laboratories

DATE RECEIVED : 11-MAR-1998

REPORT NUMBER : D98-2002-1
REPORT DATE : 16-MAR-1998

SAMPLE SUBMITTED BY : North Texas Chemical Consultants Laboratory,
ADDRESS : 2000 Old Burk Road
: Wichita Falls, Tx. 76304
ATTENTION : R.J. Williams

SAMPLE MATRIX : Soil
ID MARKS : JR012
PROJECT : Northland Operating
DATE SAMPLED : 5-MAR-1998
ANALYSIS METHOD : EPA 8021B /1
ANALYZED BY : MKS
ANALYZED ON : 12-MAR-1998
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 25-031298

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	2.0 µg/Kg	< 2.0 µg/Kg
Toluene	2.0 µg/Kg	2.2 µg/Kg
Ethyl benzene	2.0 µg/Kg	4.9 µg/Kg
Xylenes	2.0 µg/Kg	19.9 µg/Kg
BTEX (total)		27.0 µg/Kg #

QUALITY CONTROL DATA		
SURROGATE COMPOUND		SPIKE RECOVERED
Bromofluorobenzene (SS)		100 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Intertek Testing Services NA Inc.
1089 East Collins Boulevard Richardson, TX 75081
Telephone (972) 238-5591 Fax (972) 238-5592

Intertek Testing Services
Environmental Laboratories

DATE RECEIVED : 11-MAR-1998

REPORT NUMBER : D98-2002-1
REPORT DATE : 16-MAR-1998

SAMPLE SUBMITTED BY : North Texas Chemical Consultants Laboratory,
ADDRESS : 2000 Old Burk Road
: Wichita Falls, Tx. 76304
ATTENTION : R.J. Williams

SAMPLE MATRIX : Soil
ID MARKS : JR012
PROJECT : Northland Operating
DATE SAMPLED : 5-MAR-1998

MISCELLANEOUS ANALYSES			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Total Solids	/1	0.010 %	88.0 %
Analyzed using ASTM D2216 mod. on 13-MAR-1998 by JJH QC Batch No : AC391-57			

Intertek Testing Services NA Inc.
1089 East Collins Boulevard Richardson, TX 75081
Telephone (972) 238-5591 Fax (972) 238-5592

Intertek Testing Services
Environmental Laboratories

DATE RECEIVED : 11-MAR-1998

REPORT NUMBER : D98-2002-2
REPORT DATE : 16-MAR-1998

SAMPLE SUBMITTED BY : North Texas Chemical Consultants Laboratory,
ADDRESS : 2000 Old Burk Road
: Wichita Falls, Tx. 76304
ATTENTION : R.J. Williams

SAMPLE MATRIX : Soil
ID MARKS : JR013
PROJECT : Northland Operating
DATE SAMPLED : 5-MAR-1998
ANALYSIS METHOD : EPA 8021B /1
ANALYZED BY : MKS
ANALYZED ON : 13-MAR-1998
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 25-031298

BTEX ANALYSIS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Benzene	2.0	µg/Kg	< 2.0	µg/Kg	
Toluene	2.0	µg/Kg	< 2.0	µg/Kg	
Ethyl benzene	2.0	µg/Kg	< 2.0	µg/Kg	
Xylenes	2.0	µg/Kg	< 2.0	µg/Kg	
BTEX (total)			< 2.0	µg/Kg	#

QUALITY CONTROL DATA		
SURROGATE COMPOUND		SPIKE RECOVERED
Bromofluorobenzene (SS)		92.0 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Intertek Testing Services NA Inc.
1089 East Collins Boulevard Richardson, TX 75081
Telephone (972) 238-5591 Fax (972) 238-5592

Intertek Testing Services
Environmental Laboratories

DATE RECEIVED : 11-MAR-1998

REPORT NUMBER : D98-2002-2
REPORT DATE : 16-MAR-1998

SAMPLE SUBMITTED BY : North Texas Chemical Consultants Laboratory,
ADDRESS : 2000 Old Burk Road
: Wichita Falls, Tx. 76304
ATTENTION : R.J. Williams

SAMPLE MATRIX : Soil
ID MARKS : JR013
PROJECT : Northland Operating
DATE SAMPLED : 5-MAR-1998

MISCELLANEOUS ANALYSES			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Total Solids	/1	0.010 %	88.3 %
Analyzed using ASTM D2216 mod. on 13-MAR-1998 by JJH QC Batch No : AC391-57			

Intertek Testing Services NA Inc.
1089 East Collins Boulevard Richardson, TX 75081
Telephone (972) 238-5591 Fax (972) 238-5592

Intertek Testing Services
Environmental Laboratories

REPORT DATE : 16-MAR-1998 REPORT NUMBER : D98-2002

SAMPLE SUBMITTED BY : North Texas Chemical Consultants Laboratory,
ATTENTION : R.J. Williams
PROJECT : Northland Operating

LABORATORY QUALITY CONTROL REPORT

ANALYTE	Benzene	Ethylbenzene	Total Solids
BATCH NO.	25-031298	25-031298	AC391-57
LCS LOT NO.	AC360-8C	AC360-8C	K17589
PREP METHOD	---	---	---
PREPARED BY	---	---	---
ANALYSIS METHOD	EPA 8021B	EPA 8021B	ASTM D2216 mod.
ANALYZED BY	MKS	MKS	JJH
UNITS	µg/Kg	µg/Kg	%
METHOD BLANK	< 2.00	< 2.00	< 0.0100
SPIKE LEVEL	50.0	50.0	---
SPK REC LIMITS	70.0 - 130	70.0 - 130	---
SPK RPD LIMITS	25.0	25.0	---
MS RESULT	56.7	65.4	NA
MS RECOVERY %	107	99.6	NA
MSD RESULT	53.6	63.1	NA
MSD RECOVERY %	100	95.0	NA
MS/MSD RPD %	5.99	4.73	NA
BS RESULT	NA	NA	NA
BS RECOVERY %	NA	NA	NA
BSD RESULT	NA	NA	NA
BSD RECOVERY %	NA	NA	NA
BS/BSD RPD %	NA	NA	NA
DUP RPD LIMITS	---	---	10.0
DUPLICATE RPD %	NA	NA	0.44
LCS LEVEL	50.0	50.0	100
LCS REC LIMITS	70.0 - 130	70.0 - 130	90.0 - 110
LCS RESULT	55.2	52.8	100
LCS RECOVERY %	110	106	100
SPIKE SAMPLE ID	2020-6	2020-6	---
SAMPLE VALUE	3.38	15.6	---
DUP SAMPLE ID	---	---	1815-1
DUP SAMPLE VAL/1	---	---	87.3
DUP SAMPLE VAL/2	---	---	87.7

NA Not applicable

Intertek Testing Services NA Inc.
1089 East Collins Boulevard Richardson, TX 75081
Telephone (972) 238-5591 Fax (972) 238-5592

NTCC
North Texas Chemical Consultants
Laboratory
Environmental & Analytical Services
2000 Old Burk Road Wichita Falls Texas 76304-1714
940-723-5868 / Fax 940-723-5886

Sample Submitted By: Northland Operating
719 Scott Suite 624
Wichita Falls, Texas 76301
Attention: John Rhodes

Report Date: April 2, 1998
Report Number: JR-015
Received Date: March 6, 1998
Received Time: 1658
Chain of Custody #: 3288

SAMPLE ID: JR-20-C (soil sample) - March 5, 1998; 1125 Composite						
Parameter	*Method*	*Detection Limit mg/L*	*Analyst*	*Analyzed Date*	*Time*	*Results mg/kg*
Chloride, as Cl^-	325.3	1.	ITS			**15,800.**

R.J. Williams, Ph.D.
President

Methods utilized are from "Methods for Chemical Analysis of Water and Wastes" EPA-600/4-79-020,"Test Methods for Evaluating Solid Waste EPA-SW846", and "Standard Methods for the Examination of Water and Wastewater" 18th Edition.

NTCC
North Texas Chemical Consultants
Laboratory
Environmental & Analytical Services
2000 Old Burk Road Wichita Falls, Texas 76304-1714
940-723-5868
FAX 940-723-5886

CHAIN OF CUSTODY RECORD

№ 3288

CUSTOMER INFORMATION

COMPANY: Northland Operating Company
SEND REPORT TO: John RHOADS
ADDRESS: 719 Scott, Suite 624
CITY: Wichita Falls STATE: Texas ZIP: 76301
TELEPHONE: 940-723-8511 FAX: 940-766-3089

BILLING INFORMATION

ADDRESS: 3500 Oak Lawn, Ste 330, L.B. #31
CITY: Dallas STATE: Texas ZIP: 75219-4398
PO NUMBER: TERMS:

PROJECT INFORAMATION

LOCATION: ROCK Queen Tract 20 NUMBER:
CITY: Lea County STATE: New Mexico ZIP:
SAMPLER: John RHOADS SIGNATURE: John R. Rhoads

REQUIRED TURNAROUND TIME: ☑ NORMAL
* expedited service may require surcharge ☐ EXPEDITED *
SHIPMENT METHOD: Private Vehicle DATE: 3-5-98
CUSTODY SEALED: Yes DATE: 3-5-98
NTCC LABORATORY JOB NUMBER:
COMMENTS:

REQUESTED ANALYSES

NTCC LAB ID	SAMPLE ID AND FIELD DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	TYPE G	TYPE C	PRESERVATIVE	NUMBER OF CONTAINERS	BTEX	Chlorides/TDS	Chlorides	COMMENTS
JR012	JR-20-A	3/5	11:15	Soil		✓	none	1	✓			
JR013	JR-20-B	3/5	11:20	Soil		✓	None	1	✓			
JR014	JR-20-Pit	3/5	12:10	Water	✓		None	1		✓		
JR015	JR-20-C	3/5	11:25	Soil		✓	None	1			✓	

RELINQUISHED BY: John R. Rhoads	DATE: 3/6/98	TIME: 4:58PM	RECEIVED BY:	DATE:	TIME:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
	RECEIVED IN LABORATORY BY:			DATE:	TIME:

NTCC
North Texas Chemical Consultants
Laboratory
Environmental & Analytical Services
2000 Old Burk Road Wichita Falls, Texas 76304-1714
940-723-5868
FAX 940-723-5886

CHAIN OF CUSTODY RECORD

№ 3316

CUSTOMER INFORMATION			
COMPANY: NORTHLAND OPERATING			
SEND REPORT TO: R. J. WILLIAMS			
ADDRESS: 2000 OLD BURK RD			
CITY: WICHITA FALLS	STATE: TX	ZIP: 76308	
TELEPHONE: 940-723-5868	FAX: 940-723-5886		

BILLING INFORMATION		
ADDRESS: (SAME)		
CITY:	STATE:	ZIP:
PO NUMBER:	TERMS:	

PROJECT INFORAMATION		
LOCATION: ROCK QUEEN TRACT 20	NUMBER:	
CITY:	STATE:	ZIP:
SAMPLER: J. RHOADS	SIGNATURE:	

REQUIRED TURNAROUND TIME: ☒ NORMAL
* expedited service may require surcharge ☐ EXPEDITED *

SHIPMENT METHOD: UPS DATE: 03/10/98

CUSTODY SEALED: YES DATE: 03/05/98

NTCC LABORATORY JOB NUMBER:

COMMENTS:

REQUESTED ANALYSES

NTCC LAB ID	SAMPLE ID AND FIELD DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	TYPE G	TYPE C	PRESERVATIVE	NUMBER OF CONTAINERS	BTEX										COMMENTS
JR012	JR-20-A	3/5/98	11:15	SOIL		X	4°C	1	X					8021-1					
JR013	JR-20-B	3/5/98	11:20	SOIL		X	4°C	1	X								2		

RELINQUISHED BY:	DATE: 03/10/98	TIME: 1330	RECEIVED BY:	DATE:	TIME:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
	RECEIVED IN LABORATORY BY: B. Williams			DATE: 3-11-98	TIME: 1130

Northland Operating Company
3500 Oak Lawn, L.B. #31
Dallas, Texas 75219-4398
February 27, 1998

Ms. Martyne J. Kieling, Environmental Geologist
Environmental Bureau - OCD
New Mexico Energy, Minerals & Natural Resources
2040 South Pacheco
Santa Fe, New Mexico 87505

Re: Pit Closures - SE/4 NW/4 Section 30 T13S - R32E NMPM
Lea County, New Mexico

Dear Ms. Kieling:

We are in receipt of your letter dated February 18, 1998 regarding certain information needed to assist you in evaluating the work done so far on the two pits at this site - the large lined exempt pit to the west and the small perched non-exempt non-hazardous pit to the east (see map, your requested item 4).

As previously related, approximately 504 cubic yards of material was excavated from the lined pit and hauled to Controlled Recovery, Inc. near Hobbs. All of the delivery tickets for material hauled from this (and all other) site to CRI are available. A field analysis for TPH on a composite sample from the floor of this pit after excavation (see next paragraph) yielded 2000 ppm. A test hole was drilled in the center of this pit after excavation. A field test for TPH a mere 3' below the bottom of the pit yielded a TPH level of 20 ppm; the laboratory confirming sample from this depth found TPH at less than 10 ppm (mg/Kg). As related in our conversation this afternoon, we will plan on taking a pit-bottom sample next Thursday March 5, with the understanding that if BTEX levels are below levels of regulatory concern, this pit will be considered for closing. Mr. Wayne Price will be notified on Monday regarding this sample collecting. Chloride analysis as per the State Land Office request will also be performed on the collected sample. We believe these actions should address your item 2. Obviously, the results of that testing will not be available by March 6. We will ask our laboratory for an expedited report and supply you with those results as soon as possible.

The enclosed map depicts the location of the vertical profiling boreholes drilled for both pits as well as the sites where samples were taken from the pits. Soil was taken from about 24 sites in the bottom of the lined pit after excavation; this soil was mixed

thoroughly and a composite sample tested for TPH in the field by Safety and Environmental Solutions, Inc. A total of four (4) grab samples were taken from the small non-exempt pit near each of the four corners of this small pit (see map). The chain of custody forms will show that these four samples were composited by North Texas Chemical Laboratory into two (2) samples prior to shipment to LNS Environmental for analysis by the latter laboratory. For completeness, the LNS laboratory results are included here along with the chain of custody form you requested in item 1.

Mr. Ken Flournoy, Operations Manager for Northland Operating, has signed the Pit Remediation and Closure Form for the lined pit as per your request - item 3. Our proposal for action on the non-exempt pit will await your evaluation of the submitted materials.

Respectfully,

John E. Rhoads
Agent

Enclosures

Cc: Mr. Wayne Price, OCD, Hobbs
Mr. V. Ed Butler, Northland Operating Company
Mr. K. H. Flournoy, Northland Operating Company

NTCC
North Texas Chemical Consultants
Laboratory
Environmental & Analytical Services
2000 Old Burk Road Wichita Falls, Texas 76304-1714
940-723-5868

LNSAS

CHAIN OF CUSTODY RECORD

№ 3161

CUSTOMER INFORMATION

COMPANY: Northland Operating Company
SEND REPORT TO: John E. Rhoads
ADDRESS: 719 Scott Ste 624
CITY: Wichita Falls STATE: Texas ZIP: 76301
TELEPHONE: 940-723-8511 FAX: 940-766-3089

BILLING INFORMATION

ADDRESS: 3500 Oak Lawn L.B. #31
CITY: Dallas STATE: Texas ZIP: 75219
PO NUMBER: TERMS:

PROJECT INFORAMATION

LOCATION: Rock Queen Tract 20 NUMBER: Non-Exempt Pit
CITY: Lea County STATE: New Mexico ZIP:
SAMPLER: John E. Rhoads SIGNATURE: John E. Rhoads

REQUIRED TURNAROUND TIME: [X] NORMAL
* expedited service may require surcharge [ ] EXPEDITED *
SHIPMENT METHOD: Private vehicle DATE:
CUSTODY SEALED: DATE: 12/10/97
NTCC LABORATORY JOB NUMBER:
COMMENTS: Witness by Dyke Browning (SES)

REQUESTED ANALYSES

TCLP Metals
Volatiles
Semi-Volatiles
PCI

NTCC LAB ID	SAMPLE ID AND FIELD DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	TYPE G	TYPE C	PRESERVATIVE	NUMBER OF CONTAINERS	COMMENTS
1	Tract 20-NE	12/10	4:34 PM	Soil/Asp			-	4	JR005
~~2~~									
~~3~~ 2									
~~4~~									

RELINQUISHED BY: John E. Rhoads	DATE: 12/12/97	TIME: 13:24	RECEIVED BY: A Williams	DATE:	TIME:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
	RECEIVED IN LABORATORY BY:			DATE:	TIME:

NTCC
North Texas Chemical Consultants
Laboratory
Environmental & Analytical Services
2000 Old Burk Road Wichita Falls, Texas 76304-1714
940-723-5868
FAX 940-723-5886

1623-1

CHAIN OF CUSTODY RECORD

№ 3174

CUSTOMER INFORMATION

COMPANY: NTCC LABORATORY
SEND REPORT TO: R. J. WILLIAMS
ADDRESS: 2000 OLD BURK RD
CITY: WICHITA FALLS STATE: TX ZIP: 76304
TELEPHONE: 940-723-5FCF FAX: 940-723-5FF6

BILLING INFORMATION

ADDRESS: (SAME)
CITY: STATE: ZIP:
PO NUMBER: TERMS:

PROJECT INFORAMATION

LOCATION: NORTHLAND OPERATING CO. NUMBER:
CITY: WICHITA FALLS STATE: TX ZIP:
SAMPLER: SIGNATURE:

REQUIRED TURNAROUND TIME: ☐ NORMAL
* expedited service may require surcharge ☐ EXPEDITED *
SHIPMENT METHOD: UPS DATE: 12/15/97
CUSTODY SEALED: YES DATE: 12/15/97
NTCC LABORATORY JOB NUMBER:
COMMENTS:

REQUESTED ANALYSES

NTCC LAB ID	SAMPLE ID AND FIELD DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	TYPE G	TYPE C	PRESERVATIVE	NUMBER OF CONTAINERS	TCLP METALS & ORGANICS	COMMENTS
1R005	TRACT 20-ME	12/1/97	4:34P	SOIL		X	4°C	2	X	

RELINQUISHED BY: DATE: 12/15/97 TIME: RECEIVED BY: DATE: 12/16/97 TIME: 1430
RELINQUISHED BY: DATE: TIME: RECEIVED BY: DATE: TIME:
RELINQUISHED BY: DATE: TIME: RECEIVED BY: DATE: TIME:
RECEIVED IN LABORATORY BY: DATE: TIME:

NTCC
North Texas Chemical Consultants
Laboratory
Environmental & Analytical Services
2000 Old Burk Road Wichita Falls Texas 76304-1714
940-723-5868 / Fax 940-723-5886

Sample Submitted By: Northland Operating
719 Scott Suite 624
Wichita Falls, Texas 76301
Attention: John Rhodes

Report Date: January 6, 1998
Report Number: JR-005
Received Date: December 12, 1997
Received Time: 1324
Chain of Custody #: 3161

SAMPLE ID: Tract 20-NE - December 10, 1997; 1634 Grab						
Parameter	*Method*	*Detection Limit mg/L*	*Analyst*	*Analyzed Date*	*Analyzed Time*	*Results mg/kg/s*
pH (Corrosivity)	120.1	0.02	JQ	12/12	1630	**9.14**
Cyanide (Reactivity)	9010A	0.001	JQ	12/12	1730	**< 0.0001**
Sulfide (Reactivity)	9034	0.001	JQ	12/12	1730	**0.002**
Ignitability (Flash Point)	1010	2 °C	RW	12/20	1660	**> 100 °C**

R.J. Williams, Ph.D.
President

Methods utilized are from "Methods for Chemical Analysis of Water and Wastes" EPA-600/4-79-020,"Test Methods for Evaluating Solid Waste EPA-SW846", and "Standard Methods for the Examination of Water and Wastewater" 18th Edition.

LNS ENVIRONMENTAL SERVICES, INC.

903 North Bowser, Suite 230
Richardson, Texas 75081
(972) 699-3772

Toll Free: 1-800-LNS-9950

Environmental
Specialist
Fax: (972) 699-7501

NORTH TEXAS CHEMICAL CONSULTANTS
2000 Old Burk Rd.
Wichita Falls, TX 76304
ATTN: DR. R.J. WILLIAMS

DATE RECEIVED: 12/16/97
DATE REPORTED: 12/23/97
REPORT NUMBER: 1623-01
DATE ANALYZED: 12/17/97
ANALYST: DKB,GDB

SAMPLE ID: JR 005 12/10/97

TCLP EXTRACT METALS LIST

PARAMETERS	EPA HW NUM	PREPARA-TION METHOD	METHOD	REGULATORY LEVEL mg/l	DETECTION LIMIT mg/l	RESULTS mg/l
Arsenic	D004	3005	6010	5.0	0.10	<0.10
Barium	D005	3005	6010	100.0	0.01	0.33
Cadmium	D006	3005	6010	1.0	0.01	<0.01
Chromium	D007	3005	6010	5.0	0.01	<0.01
Lead	D008	3005	6010	5.0	0.10	<0.10
Mercury	D009	7470	7470	0.2	0.0002	<0.0002
Selenium	D010	3005	6010	1.0	0.10	<0.10
Silver	D011	3005	6010	5.0	0.01	<0.01

EXTRACTION METHOD: 1311

Niranjan Shah
LNS ENVIRONMENTAL SERVICES, INC.

LNS ENVIRONMENTAL SERVICES, INC.

903 North Bowser, Suite 230
Richardson, Texas 75081
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Environmental Specialist
Fax: (972) 699-7501

NORTH TEXAS CHEMICAL CONSULTANTS
2000 Old Burk Rd.
Wichita Falls, TX 76304
ATTN: DR. R.J. WILLIAMS

DATE RECEIVED: 12/16/97
DATE REPORTED: 12/23/97
REPORT NUMBER: 1623-1
DATE ANALYZED: 12/17/97
ANALYST: GK

SAMPLE ID: JR 005 12/10/97

TCLP EXTRACT BNA LIST

PARAMETERS	EPA HW NUM	PREPARA-TION METHOD	METHOD	REGULATORY LEVEL mg/l	DETECTION LIMIT mg/l	RESULTS mg/l
2-Methylphenol(o-Cresol)	D023	3510	8270	200.0	0.010	<0.010
3 & 4-Methylphenol (meta & para Cresol)	D024 D025	3510	8270	200.0	0.010	<0.010
Cresol	D026	3510	8270	200.0	0.010	<0.010
2,4-Dinitrotoluene	D030	3510	8270	0.13	0.010	<0.010
Hexachlorobenzene	D032	3510	8270	0.13	0.010	<0.010
Hexachloro-1,3 butadiene	D033	3510	8270	0.5	0.010	<0.010
Hexachloroethane	D034	3510	8270	3.0	0.010	<0.010
Nitrobenzene	D036	3510	8270	2.0	0.005	<0.005
Pentachlorophenol	D037	3510	8270	100.0	0.050	<0.050
Pyridine	D038	3510	8270	5.0	0.005	<0.005
2,4,5-Trichlorophenol	D041	3510	8270	400.0	0.010	<0.010
2,4,6-Trichlorophenol	D042	3510	8270	2.0	0.010	<0.010

EXTRACTION METHOD: 1311

Niranjan Shah
LNS ENVIRONMENTAL SERVICES, INC

LNS ENVIRONMENTAL SERVICES, INC.

903 North Bowser, Suite 230
Richardson, Texas 75081
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Specialist
Fax: (972) 699-7501

NORTH TEXAS CHEMICAL CONSULTANTS
2000 Old Burk Rd.
Wichita Falls, TX 76304
ATTN: DR. R.J. WILLIAMS

DATE RECEIVED: 12/16/97
DATE REPORTED: 12/23/97
REPORT NUMBER: 1623-1
DATE ANALYZED: 12/18/97
ANALYST: GK

SAMPLE ID: JR 005 12/10/97

TCLP EXTRACT VOA LIST

PARAMETERS	EPA HW NUM	PREPARA-TION METHOD	METHOD	REGULATORY LEVEL mg/l	DETECTION LIMIT mg/l	RESULTS mg/l
Benzene	D018	8260	8260	0.5	0.005	0.031
Carbon Tetrachloride	D019	8260	8260	0.5	0.005	<0.005
Chlorobenzene	D021	8260	8260	100.0	0.005	<0.005
Chloroform	D022	8260	8260	6.0	0.005	<0.005
1,4-Dichlorobenzene	D027	8260	8260	7.5	0.010	<0.010
1,2-Dichloroethane	D028	8260	8260	0.5	0.005	<0.005
1,1-Dichloroethylene	D029	8260	8260	0.7	0.005	<0.005
Methyl ethyl ketone	D035	8260	8260	200.0	0.100	<0.100
Trichloroethylene	D040	8260	8260	0.5	0.005	<0.005
Tetrachloroethylene	D039	8260	8260	0.7	0.005	<0.005
Vinyl chloride	D043	8260	8260	0.2	0.005	<0.005

EXTRACTION METHOD: 1311

Niranjan Shah
LNS ENVIRONMENTAL SERVICES, INC.

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NORTH TEXAS CHEMICAL CONSULTANTS
2000 Old Burk Rd.
Wichita Falls, TX 76304
ATTN: DR. R.J. WILLIAMS

DATE RECEIVED: 12/16/97
DATE REPORTED: 12/23/97
REPORT NUMBER: 1623-01
DATE ANALYZED: 12/22/97
ANALYST: MH

SAMPLE ID: JR 005 12/10/97

TCLP EXTRACT PEST/HERB LIST

PARAMETERS	EPA HW NUM	PREPARATION METHOD	METHOD	REGULATORY LEVEL mg/l	DETECTION LIMIT mg/l	RESULTS mg/l
Chlordane	D020	3510	8080	0.03	0.0005	<0.0005
2,4-D	D016	8150	8150	10.0	0.0001	<0.0001
Endrin	D012	3510	8080	0.02	0.001	<0.001
Heptachlor (& its epoxide)	D031	3510	8080	0.008	0.00005	<0.00005
Lindane	D013	3510	8080	0.4	0.0001	<0.0001
Methoxychlor	D014	3510	8080	10.0	0.00005	<0.00005
Toxaphene	D015	3510	8080	0.5	0.001	<0.001
2,4,5-TP (Silvex)	D017	8150	8150	1.0	0.0001	<0.0001

EXTRACTION METHOD: 1311

Niranjan Shah
LNS ENVIRONMENTAL SERVICES, INC

NORTH TEXAS CHEMICAL CONSULTANTS
2000 Old Burk Rd.
Wichita Falls, TX 76304
ATTN: DR. R.J. WILLIAMS

DATE RECEIVED: 12/16/97
DATE REPORTED: 12/23/97
REPORT NUMBER: 1623-QC

QUALITY CONTROL REPORT TCLP METALS

ANALYSIS:	Arsenic	METHOD: EPA 6010
ANALYST:	DKB	DUPLICATE; DEVIATION: 1%
DATE:	12/17/97	SPIKE RECOVERY: 99%
ANALYSIS:	Barium	METHOD: EPA 6010
ANALYST:	DKB	DUPLICATE; DEVIATION: 1%
DATE:	12/17/97	SPIKE RECOVERY: 98%
ANALYSIS:	Cadmium	METHOD: EPA 6010
ANALYST:	DKB	DUPLICATE; DEVIATION: 1%
DATE:	12/17/97	SPIKE RECOVERY: 98%
ANALYSIS:	Chromium	METHOD: EPA 6010
ANALYST:	DKB	DUPLICATE; DEVIATION: 1%
DATE:	12/17/97	SPIKE RECOVERY: 99%
ANALYSIS:	Lead	METHOD: EPA 6010
ANALYST:	DKB	DUPLICATE; DEVIATION:1%
DATE:	12/17/97	SPIKE RECOVERY: 101%
ANALYSIS:	Mercury	METHOD: EPA 7470
ANALYST:	GDB	DUPLICATE; DEVIATION: <1%
DATE:	12/17/97	SPIKE RECOVERY: 98.0%
ANALYSIS:	Selenium	METHOD: EPA 6010
ANALYST:	DKB	DUPLICATE; DEVIATION:1%
DATE:	12/17/97	SPIKE RECOVERY: 100%
ANALYSIS:	Silver	METHOD: EPA 6010
ANALYST:	DKB	DUPLICATE; DEVIATION: 1%
DATE:	12/17/97	SPIKE RECOVERY: 100%

NORTH TEXAS CHEMICAL CONSULTANTS
2000 Old Burk Rd.
Wichita Falls, TX 76304
ATTN: DR. R.J. WILLIAMS

DATE RECEIVED: 12/16/97
DATE REPORTED: 12/23/97
REPORT NUMBER: 1623-QC

VOLATILE SPIKE/MATRIX 12/18/97

VOLATILE SPIKE COMPOUND	MS% REC	MSD% REC	RPD
1,1-DICHLORETHENE	86	90	5
TRICHLOROETHENE	92	98	6
CHLOROBENZENE	90	96	6
TOLUENE	90	96	6
BENZENE	88	94	7

NORTH TEXAS CHEMICAL CONSULTANTS
2000 Old Burk Rd.
Wichita Falls, TX 76304
ATTN: DR. R.J. WILLIAMS

DATE RECEIVED: 12/16/97
DATE REPORTED: 12/23/97
REPORT NUMBER: 1623-QC

BASE NEUTRAL ACIDS MATRIX SPIKE/MATRIX DUPLICATE RECOVERY 12/17/97

BASE/NEUTRAL SPIKE COMPOUND	MS% REC	MSD% REC	RPD
TRICHLOROBENZENE, 1,2,4-	74	80	8
ACENAPHTHENE	72	70	3
DINITROTOLUENE,2,4-	64	68	6
DI-N-BUTYLPHTHALATE	72	72	0
PYRENE	94	92	2
N-NITROSO-DI-N-PROPYLAMINE	94	92	2
DICHLOROBENZENE, 1,4-	78	80	3
ACIDS			
PENTACHLORPHENOL	60	62	3
PHENOL	74	72	3
CHLOROPHENOL, 2-	74	75	1
CHLORO-4-METHYL, 3-	75	74	1
4-NITROPHENOL	52	58	11

NORTH TEXAS CHEMICAL CONSULTANTS
2000 Old Burk Rd.
Wichita Falls, TX 76304
ATTN: DR. R.J. WILLIAMS

DATE RECEIVED: 12/16/97
DATE REPORTED: 12/23/97
REPORT NUMBER: 1623-QC

PESTICIDES MATRIX SPIKE/MATRIX DUPLICATE RECOVERY 12/15/97

PESTICIDES SPIKE COMPOUND	MS% REC	MSD% REC	RPD
ENDRIN	98	105	7
LINDANE	101	104	3

P.O. Box 1980, Hobbs, NM
District II
P.O. Drawer DD, Artesia, NM 88211
District III
1000 Rio Brazos Rd, Aztec, NM 87410

Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

SUBMIT 1 COPY TO APPROPRIATE DISTRICT OFFICE AND 1 COPY TO SANTA FE OFFICE

(Revised 3/9/94)

PIT REMEDIATION AND CLOSURE REPORT

Operator: Northland Operating Company **Telephone:** 1-214-521-9959

Address: 3500 Oak Lawn , L.B. #31, Dallas, Texas 75219-4398

Facility Or: Well Name Rock Queen Unit Tract 20 Lined Pit

Location: Unit or Qtr/Qtr Sec SE/4, NW/4 **Sec** 30 **T** 13S **R** 32E **County** Lea

Pit Type: Separator___ Dehydrator___ Other Emergency saltwater overflow

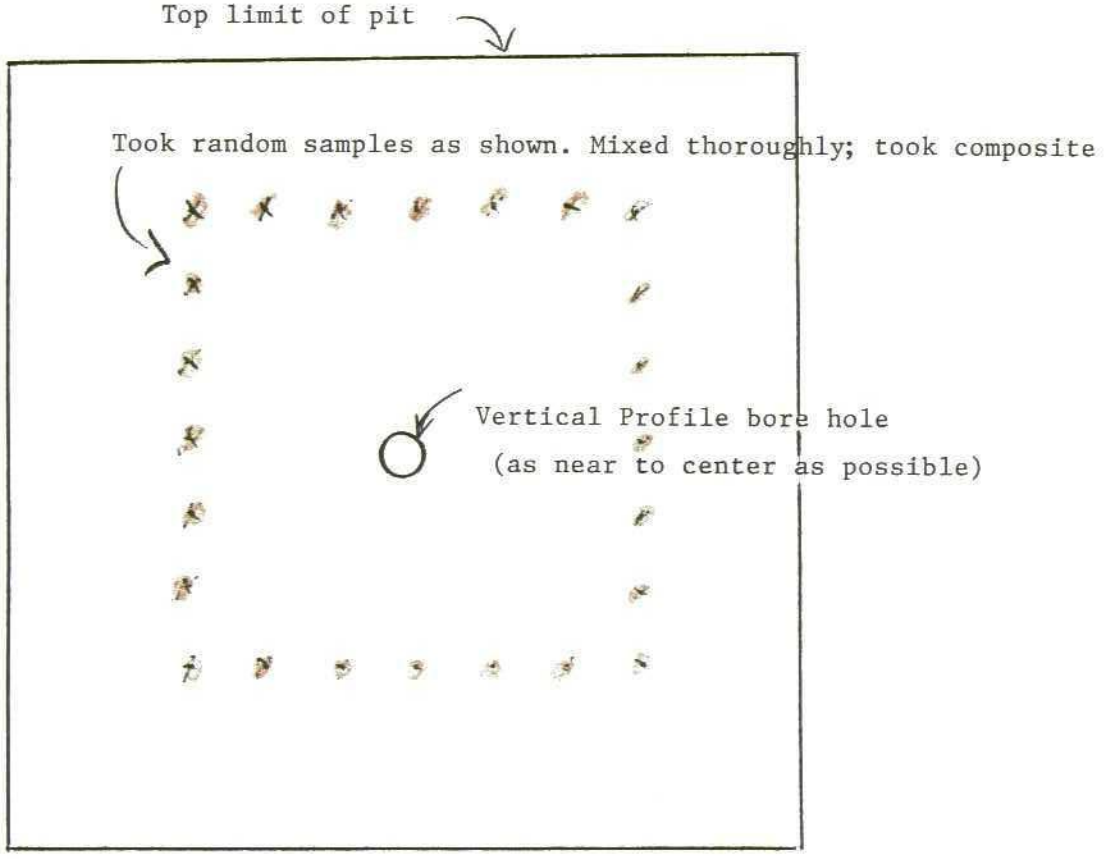
Land Type: BLM___, State XX, Fee ___, Other_____

Pit Location: (Attach diagram)
Pit dimensions: length 100', width 100', depth 7' after excavation
Reference: wellhead___, other _____
Footage from reference: _____
Direction from reference: _____ Degrees ___ East ___ North ___ of ___ West ___ South ___

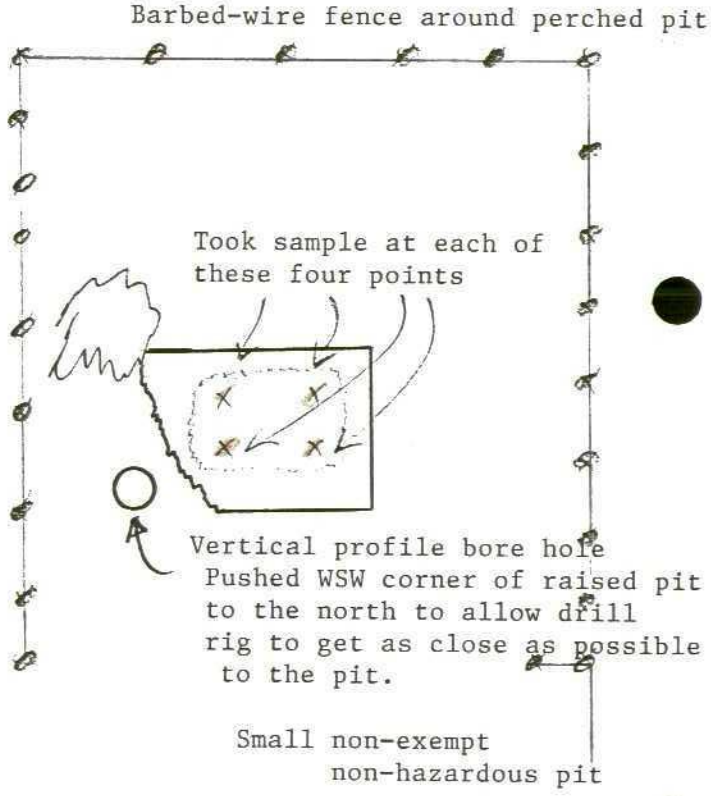
Depth To Ground Water: (Vertical distance from contaminants to seasonal high water elevation of ground water)	Less than 50 feet (20 points) 50 feet to 99 feet (10 points) Greater than 100 feet (0 Points)	0
Wellhead Protection Area: (Less than 200 feet from a private domestic water source, or; less than 1000 feet from all other water sources)	Yes (20 points) No (0 points)	0
Distance To Surface Water: (Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches)	Less than 200 feet (20 points) 200 feet to 1000 feet (10 points) Greater than 1000 feet (0 points)	10
	RANKING SCORE (TOTAL POINTS):	10

Northland Operating Company
Rock Queen Unit Tract 20 Pits
SE/4 NW/4 Section 30 T13S - R32E
Lea County, New Mexico

North
Scale: 1 cm = 10 ft



Exempt lined pit



NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

February 18, 1998

CERTIFIED MAIL
RETURN RECEIPT NO. P-326-936-398

Mr. V. Ed Butler
Northland Operating Company
3500 Oak Lawn
Suite 380
Dallas, TX 75219-4398

RE: Pit Closure Report
Northland Operating Company
SE/4, NW/4, Section 30, Township 13 South, Range 32 East, NMPM
Chaves County, New Mexico

Dear Mr. Butler:

The New Mexico Oil Conservation Division (OCD) has received the Northland Operating Company (Northland) Pit Closure Report dated January 16, 1998 regarding the pit closures at the above referenced location. The OCD has reviewed the information provided by Northland and requires additional information to aid in the review of the closure report. Northland shall submit the following:

1. Chain of custody for the non-exempt pit analysis, sample ID number JR-005;

2. Confirmatory laboratory sample analysis results for **BTEX and chloride** below the lined pit. Information shall include the chain of custody and laboratory analysis report;

3. Completed Pit Remediation And Closure Report Forms. The Form shall stipulate the location to which the contaminated soil was hauled. In addition, all Forms shall have the original date and signature by the appropriate Northland Operating Company representative.

4. Maps that show where all composite samples were taken below the lined pit, where grab samples were taken from the non-exempt pit, and the location of the bore holes.

Final approval of the closure plan for the lined pit and approval to remove waste from the non-exempt pit will be deferred until the requested materials listed above are received and evaluated. Northland shall submit the requested materials to the OCD Santa Fe office and a copy to the Hobbs District office **no later than March 6, 1998**.

If you require any further information please contact me at (505) 827-7153.

Sincerely,

Martyne J. Kieling
Environmental Geologist

xc: Hobbs OCD Office
Jens W. Deichmann, State Land Office
Ed Morney, Field Superintendent, Northland, P.O. Box 119, Maljamar, NM 88264

Martyne Kieling

From: Price, Wayne
Sent: Saturday, January 24, 1998 4:01 PM
To: Martyne Kieling; Bill Olson
Cc: Chris Williams; Roger Anderson
Subject: Northland Operating

Dear Martyne!

Northland operating personnel requested a Meeting with District I. This meeting was held this past Friday. Northland gave us a progress report on their operations and submitted to us two comprehensive pit closure reports for the projects you are working on.

We informed Northland to submit these to you as you are handling the closure on these two pits. Rock queen se/4 nw./4 30-13s-32e and the SWD plant #2 se/4 ne/4 25-13s-31e.

They mentioned the letter from Bill Olson concerning the Playa lake, we informed them to respond to Mr. Olson concerning that issue and cc the District.

We informed them not to close pits until they receive permission for you.

Safety & Environmental Solutions, Inc.

1:00 pm - talked with Martine Keiling of OCD regarding defining vertical extent on the non-exempt pit. She gave verbal approval to the location of the drill hole on the west side of the diked area as near to center as possible.

11:30-1:30 pm - drilled for vertical extent on Middle pit at Rock Queen Salt Water Plant (SWP) #2. Drilling was as close to center of pit as was possible by estimation. Test results are as follows:

Depth	Type of Test Conducted	Result
0-6" (Surface)	TPH	2667ppm
10'	TPH	267 ppm
20'	TPH	Nil (0.007 abs. on 20gm sample)

1:30 - 3:00 pm - drilled for vertical extent on Tract #20 lined pit at Rock Queen Unit. Drilling was as close to center of pit as was possible by estimation. Test results are as follows:

Depth	Type of Test Conducted	Result
0-6" (Surface)	TPH	2000ppm
10'	TPH	20 ppm

3:00 - 5:00 pm - drilled for vertical extent on Tract #20 non-exempt pit at Rock Queen Unit. Drilling was as close to pit as was possible by removing west edge of pit and getting as close to center as possible by estimation. Test results are as follows:

Depth	Type of Test Conducted	Result
0-6" (Surface)	None	Visible contamination obvious
5'	TPH	4000 ppm
10'	TPH	20,000 ppm
38' (bottom)	TPH	75 ppm
38' (bottom)	PID	25 ppm

This pit cleaned up visually between 30 and 38 feet in depth of drilling.

5:15 pm - collected business cards from contractors and from John Rhoads, released Atkins drilling rig, returned to office.

Dyke A. Browning - REM,CEI
12/12/97

Northland Operating Company
3500 Oak Lawn, Suite 380, L.B. #31
Dallas, Texas 75219-4398
214-521-9959; 214-5221-9960 Fax

January 12, 1998

Mr. Chris Williams, Director
New Mexico Oil Conservation Division
P. O. Box 1980
Hobbs, New Mexico 88241

Re: Notice of Violations Dated October 22 and 29, 1997
Emergency Pits on the Rock Queen Unit
Chaves and Lea Counties, New Mexico
Findings and Recommendations

Dear Mr. Williams:

Northland Operating Company ("Northland") has dedicated an enormous effort to address issues raised by the New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division ("OCD") in the Notice of Violations "(NOV") dated October 22, 1997 and October 29, 1997. These NOV's address emergency pits at Rock Queen Unit Tract 20 tank battery and Saltwater Plant (SWP) #2. I wish to share with you our findings to date and to recommend a course of action for completing these pit closures and for future pit closures on these properties.

Liquids were removed and sediments excavated from two unlined pits at SWP #2. Immediately below the bottom of each pit, total petroleum hydrocarbon ("TPH") levels were well below 5000 ppm (see Table 1). Soil borings were taken below the floor of each pit. The north pit was the primary overflow pit and over a period of years had received unmeasured amounts of sediments and skim oil when the saltwater tank over-flowed. The borings determined that vertical migration of hydrocarbons in this soil is extremely limited. In the bottom of the north pit (8' below surrounding ground level), the TPH level was measured as 1870 ppm; at 20' below ground level, TPH concentration measured a mere 13 ppm with a PID measurement of BTEX levels recorded at 12 ppm. An overflow pit to the south of the first pit was likewise tested and yielded similar results: TPH in the bottom of the excavated pit measured 2667 ppm at 6' below ground level and 267 ppm at 10' below ground level. At 20' below ground level, TPH was non-detectable. It is to be noted that these two pits were not lined in any manner.

All liquids and sediments were removed from the Rock Queen Unit Tract 20 exempt pit. This pit had a fiberglass liner, which was also removed. The center of the pit was approximately 7' below ground level after this excavation. A composite sample taken from various spots in the bottom of this pit tested 2000 ppm TPH (See Table 1). Just 3' below the bottom of this pit (10' below ground level), the recorded TPH was 20 ppm.

A second above ground pit at the Tract 20 battery was classified as non-exempt by Ms. Keiling, hydrologist with the New Mexico OCD in Santa Fe. The decision was based on the existence of four plastic buckets in this pit. This necessitated that material in this pit be tested for attributes that would cause the material to be classified as characteristically hazardous. Those tests have now been done and are attached for reference. The sample was tested for TCLP metals, volatiles and semi-volatiles, reactivity, corrosivity and ignitability (see Table 2). The sampled pit material was simply weathered crude oil. The sample was found to contain barium at a level of 0.33 mg/l and benzene at 0.031 mg/l, well below levels of regulatory concern; all other metals, volatiles and semi-volatiles were below detection limits. Tests for reactivity revealed very slight sulfide gas generation (0.002 mg/kg/s). It should be noted that the hydrogen sulfide is present in oil produced from the Queen Sand reservoir. The corrosivity of the sample was measured as a pH of 9.14; ignitability was reported to be in excess of 100 C. Based on these results, we plan to haul the limited amount of material in this pit to Controlled Recovery, Inc. near Hobbs for disposal as a non-hazardous non-exempt material.

Although no material had been removed from this small non-exempt pit, we elected, with the consent of Ms. Keiling, to profile the soil in the vicinity of this non-exempt pit on December 14, 1997. A soil-sampling boring was taken as close as possible to the western edge of this small pit. The results of the drilling lead us to conclude that this small pit is perched on top of a very old pit that was covered decades ago. We found TPH levels of 5000 ppm 5' below ground level (BGL), 20,000 ppm 10' BGL. Drilling continued while the borings were checked both by sight and smell. The soil cleaned up dramatically at 38'. A field analysis of the soil from this depth revealed a TPH of 75 ppm and a PID indication of 25 ppm for BTEX. The laboratory confirmation sample reported 458 ppm TPH.

The above results strongly indicate that vertical migration into the soil of the hydrocarbons produced from the producing reservoir on this property is very slow. Soil and rock conditions under the surface of this land act as an effective barrier to hydrocarbon migration. The asphalt characteristics of this crude oil also significantly impede migration through the soil. Oil that is released quickly weathers and does not demonstrate characteristically hazardous attributes.

The static water level in the windmill 0.4 mile north of our Rock Queen SWP #2 is reported by a Caudill Ranch employee to be at 180' with touchdown below 200'. The closest well in the USGS water survey database is in Section 20, T13S,

R32E (13S.32E.20.411213). Depth to water level in this well was measured at 134.05' on March 12, 1996.

All of the above factors lead us to the conclusion that produced hydrocarbons in the soil in this area represent a very small environmental risk to ground or surface waters. Based on the data we have gathered, we would propose that the remaining pits on these properties be emptied of liquids and sludge and back-filled: This procedure would allow us to close numerous pits quickly and in an environmentally responsible manner.

Please advise if you concur with this conclusion and procedure.

Sincerely,

Ed Butler
Vice President

Enclosures

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

January 12, 1998

CERTIFIED MAIL
RETURN RECEIPT NO. Z-235-437-216

Mr. Robert E. McKnight
Northland Operating Co.
3500 Oak Lawn, Suite 380, LB#31
Dallas, Texas 75219-4398

RE: NORTHLAND PLAYA SPILL
SE/4 NW/4, SECTION 30, T13S, R31E

Dear Mr. McKnight:

The New Mexico Oil Conservation Division (OCD) has reviewed the Northland Operating Co.'s (NOC) November 10. 1997 "UNAUTHORIZED WASTE DISPOSAL PITS, SE/4 OF NW/4, SECTION 30, T13S, R31E, LEA COUNTY, NEW MEXICO". This document contains information on use of unlined pits at the above referenced site and a March 6, 1997 spill of produced water into an adjacent fresh water playa.

The OCD has the following requirements regarding the March 6, 1997 spill:

1. NOC will obtain samples of the water contained in the fresh water playa lake and the produced water from NOC's facility. These waters will be sampled and analyzed for benzene, toluene, ethylbenzene, xylene (BTEX), total dissolved solids (TDS), New Mexico Water Quality Control Commission (WQCC) metals and major cations and anions using EPA approved methods and quality assurance/quality control (QA/QC) procedures.

2. NOC will notify the OCD at least 48 hours in advance of the above required sampling event such that the OCD has the opportunity to witness the event and split samples.

3. By February 13, 1998, NOC will provide to the OCD a report on the investigative and remedial actions regarding the spill and the above required water quality sampling. The report will be provided to the OCD Santa Fe Office with a copy provided to the OCD Hobbs District Office and will contain:

   a. A summary description of the spill and all remedial actions taken after the spill.

b. A summary of all recent and prior water quality sampling of the playa and soil quality sampling in the spill area including copies of the laboratory analytical results and associated QA/QC data.

c. The volume of water removed from the playa and the disposition of the water.

d. Conclusions and recommendations.

If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Wayne Price, OCD Hobbs District Office

MEMORANDUM OF CONVERSATION

^ TELEPHONE ___ PERSONAL TIME 9:38 DATE _____

ORIGINATTING PARTY John Rhodes 940 - 781-6977

OTHER PARTIES Martyn Kicking

DISCUSSION Working on Tract 20 Large lined Pit. For Northland. Asked Question regarding getting Fill Dirt From the Plyan Lake. I told them No. #1, it would take Certificate 404 Form From the US Army Corp. Env & Approval From Env. Dept SWQ Bureau. And Approval From the State land office who owns the land. Northland should get Fill Dirt Elsewhere.

CONCLUSIONS _____

~~CHRIS EUSTICE~~ Martyn Kicking

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

November 24, 1997

CERTIFIED MAIL
RETURN RECEIPT NO. P-326-936-370

Mr. Robert E. McKnight
Northland Operating Company
3500 Oak Lawn
Suite 380
Dallas, TX 75219-4398

RE: Pit Closure
Northland Operating Company
SE/4, NW/4, Section 30, Township 13 South, Range 32 East, NMPM
Lea County, New Mexico

Dear Mr. McKnight:

The New Mexico Oil Conservation Division (OCD) has reviewed Northland Operating Company's. (Northland) November 10, 1997 Pit Closure Plan. This document contains Northland's plan for closure of an unlined pit pursuant to New Mexico Oil Conservation Commission Order R7940-C

The above referenced pit closure plan is approved with the following conditions:

1. All soil samples for verification of completion of remedial activities including the vertical extent of contamination and completion of soil remedial actions will be sampled and analyzed for benzene, toluene, ethylbenzene, xylene and total petroleum hydrocarbons in accordance with the OCD's "Surface Impoundment Closure Guidelines"(attached).

2. The presence of the buckets within the small unlined pit south of the tank battery is cause for the OCD to determine that the waste is **non-exempt** and must be tested for RCRA Hazardous Characteristic according to 40 CFR 261. Analysis of the waste shall include corrosivity, reactivity, ignitability, TCLP metals, TCLP semivolatiles and TCLP volatiles. The OCD Hobbs District office shall be notified 24 hours prior to sampling of the waste material to allow an OCD representative the opportunity to witness the sampling.

3. The OCD Santa Fe Office's Environmental Bureau Chief and the OCD Hobbs District office will be notified within 24 hours of the discovery of ground water contamination related to the pit closure.

4. Upon completion of all closure activities, Northland will submit to the OCD for approval a completed OCD "Pit Remediation and Closure Report" form (attached) which will contain the final results of all pit closure and soil remediation activities including all laboratory or field analytical data sheets for all soil and water quality analysis and copies of all associated quality assurance/quality control data.

5. All waste removed from the site will be disposed of at an OCD approved facility.

6. All documents submitted for approval will be submitted to the OCD Santa Fe Offices with copies provided to the OCD Hobbs Office.

To simplify the approval process for both Northland and OCD, the OCD requests that a final pit closure report be submitted only upon completion of all closure activities.

Please be advised that OCD approval does not relieve Northland of liability should closure activities determine that contamination exists which is beyond the scope of the work plan or if the closure activities fail to adequately investigate or remediate contamination related to the activities at the above referenced pit. In addition, OCD approval does not relieve Northland of responsibility for compliance with any other federal, state, or local laws or regulations.

If you require any further information please contact me at (505) 827-7153.

Sincerely,

Martyne J. Kieling
Environmental Geologist

Attachment

xc without attachment:
Hobbs OCD Office
Ed Morney, Field Superintendent, Northland, P.O. Box 119,Maljamar, NM 88264
Robert Young, State Land Office

MEMORANDUM OF CONVERSATION

X TELEPHONE ___ PERSONAL TIME 10:3 DATE 11/24/97

ORIGINATTING PARTY Martyne Kieling

OTHER PARTIES John Rhodes [For Northland]

DISCUSSION GW Info For the Area would be Found through the State Eng. office. I gave Him the two Phone #s Santa Fe & Roswell Dist.

Requesting to Remove Sediment From the Playa To Fill in Large Windpit Area. The Answer was NO Not Recomended. To Remove Sediment From a wetland Northland would need to get a 404 Permit From the US Army Corp of Eng. This would then Have to be reviewed & certified by the Environment Department Surface Water Bureau. In addition State Land office Approval would be Needed Because the Playa is on State land.

CONCLUSIONS

~~CHRIS BUSTICE~~ Martyne Kieling

NORTHLAND OPERATING CO.

3500 Oak Lawn, Suite 380, LB #31
Dallas, Texas 75219-4398
214-521-9959; 214-521-9960 Fax

NOV 1 1 1997

November 10, 1997

Ms. Martyne J. Kieling, Environmental Geologist
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Re: Unauthorized Waste Disposal Pits
SE/4 of NW/4, Section 30, T13S, R31E
Lea County, New Mexico

Dear Ms. Kieling:

We are in receipt of your letter dated October 29, 1997 regarding the inspection at the referenced site on September 22 and 25, 1997 by yourself and other employees of the OCD, representatives of the U. S. Environmental Protection Agency and the U. S. Fish & Wildlife Commission. This letter is to inform you of the steps we have taken to address the issues raised as a result of that inspection, to respond to your request for information, and to outline our plans for closing the two pits at this location.

The large lined pit southwest of the tank battery at this location has been used as an emergency overflow pit by Northland and previous operators. It was used to capture overflows at the tank battery. In addition there is down-dip secondary containment to the west of the tank battery. This secondary containment was built to provide additional protection against spills reaching the fresh water playa to the west. Given your directive to cease discharges into this pit, Northland Operating is in the process of setting two (2) additional above ground 500 barrel tanks (complete with liners) specifically for emergency overflows. This change will allow us to divert all emergency fluid overflows to tanks, and will allow us to proceed with closure of the pit. Please be advised that we have already added additional secondary containment around the tank battery itself and will provide enhancements to the secondary containment that was already in place west of the tank battery. We have also ordered an alarm system for this tank battery to provide our field personnel with an early warning system for reporting abnormal operational conditions. This system is scheduled to be in place within ten days.

The second pit referenced in your correspondence (the small pit south of the tank battery) has never been used by Northland Operating. There are no operational problems associated with the closure of this small pit that appears to have been used for tank bottoms in the past. We request the opportunity to determine the contents of the buckets in this pit before classifying the waste in this pit as non-exempt. We certainly appreciate the reasons for the "mixture rule", but we expect that these buckets were emptied prior to disposal in this pit.

In response to your request for four pieces of information, the following is submitted:

1) "the names and addresses of all waste generators who are utilizing the pits" -
Northland Operating is the only known current user of the large lined pit, whose address is that noted in the above letterhead. As noted above, Northland has never utilized the small pit. Also, please note that Northland has utilized the large pit only for emergency saltwater overflows.
2) "the names and addresses of all waste transporters;" -
It is our belief that no waste has been placed in either pit by anyone other than operators of this property.
3) "the location of all waste generation (exact well locations);" -
Attached please find a plat (showing the well spots within the section, township and range) of the currently producing wells that produce saltwater into this facility.
4) "the total volume of waste from each location that has gone into the unauthorized pits." -
Northland Operating Company has no records that would allow us to answer this question even for the short period of time we have operated this property. Prior operators likewise did not keep such records.

On March 6, 1997, Northland had a break in a fiberglass pipeline that transported saltwater through the playa lake area. A report detailing this release was filed with the OCD in Hobbs on August 8, 1997. We regret that it was not filed in a timely manner and that we failed to convey this information to the Santa Fe office. Please note that immediately after the release Northland replaced and rerouted this line out of the area of the playa to minimize any impact that may occur as the result of a future release. We cannot quantify the magnitude of the impact of this release against an unknown history of prior releases in this basin by other operators or the natural occurrence of salts in the soil in the basin. During prolonged periods of drought, water in a closed basin will reflect higher levels of salinity than they will during periods of significant rainfall. At the request of OCD, Northland set a pump to remove water from this playa lake when chloride levels reached 13,000 ppm during the dry season. The effort continued until

rains brought chloride content down. Northland respectfully requests that continued monitoring of the chloride level in this lake should dictate if water is to be pumped from the playa for disposal, thus minimizing the volume of water removed from the playa.

An outline of our pit closure plan is also enclosed. Please advise if our plan is deficient in any way or lacks essential elements.

Sincerely,

Robert E. McKnight
Engineer

cc: Mr. Wayne Price, OCD, Hobbs

NORTHLAND OPERATING COMPANY
Pit Closure Outline

November 10, 1997
Rock Queen Unit Tract 20 Tank Battery
Lined Emergency Overflow Pit

Step I: A site assessment for the purposes of establishing a "Total Ranking Score" is to be performed for this pit according to Section II. A. 2. a. of the New Mexico Oil Conservation Division's Unlined Surface Impoundment Closure Guidelines.

Step II: Finish setting two 500-barrel overflow tanks at the site to preclude further saltwater releases to the lined emergency pit.

Step III: Empty the pit of all liquids that can be removed with a vacuum truck. Liquids are to be hauled to CRI in Hobbs.

Step IV: All highly contaminated or saturated soils in the near surface environment will be excavated and hauled to CRI in Hobbs for possible oil reclamation or land farming. Provisions will be taken to ensure that no fluids are lost during transportation. An accounting of all materials removed shall be made and appropriate records kept.

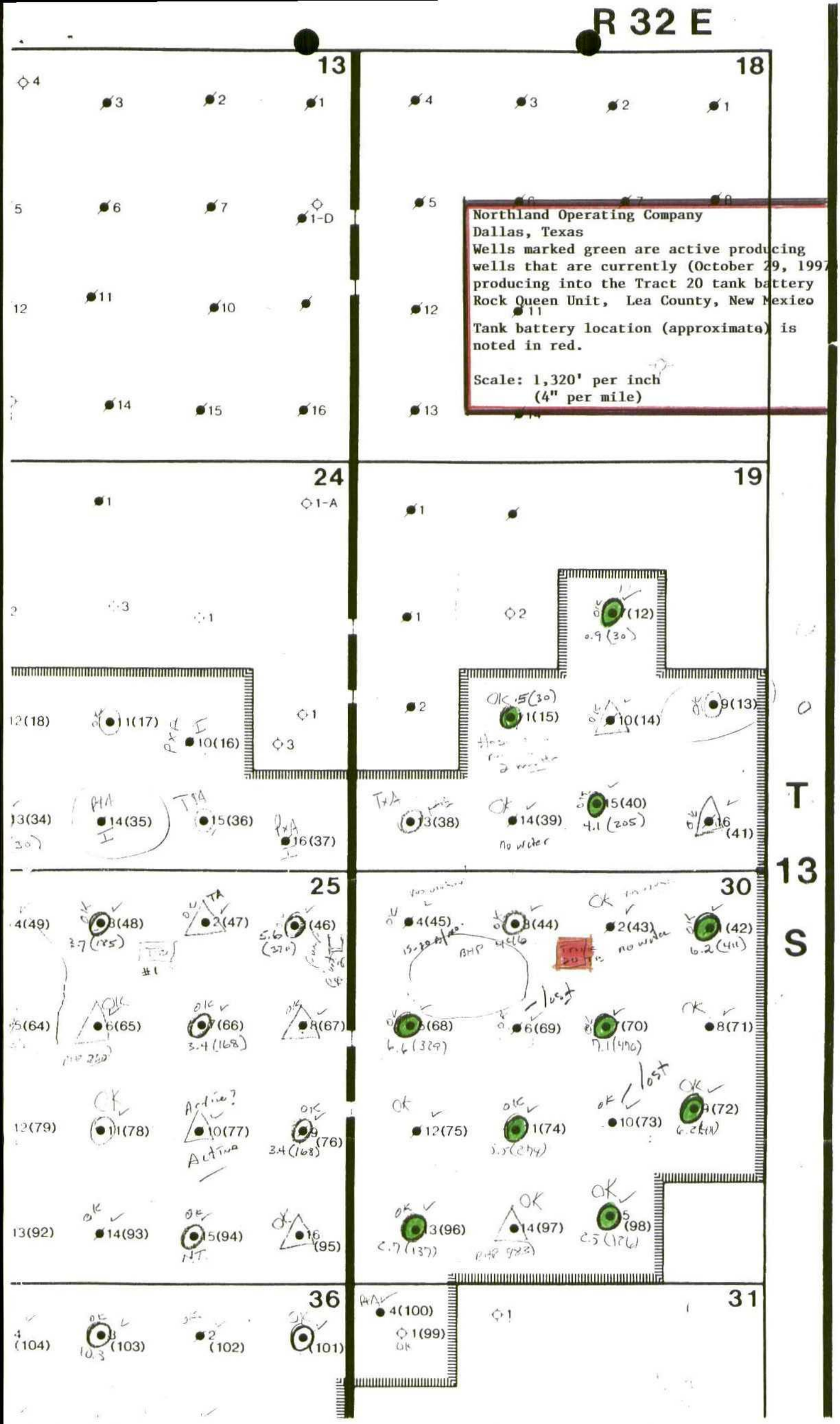
Step V: Soil will be sampled on the down-dip (west) edge of the pit to determine the extent of soil contamination after the highly contaminated soil has been removed. If dictated by the surface sample, vertical profiling will be performed with samples taken at 10' intervals. The detection of TPH, benzene and BTEX will utilize field instrumentation and analysis. The final TPH anaylsis will be confirmed by laboratory analysis.

Step VI: The results of Step V will determine which method of remediation will be most effective for this pit. If feasible, subsurface media contaminated at levels above those of regulatory concern will be excavated to the maximum extent practicable, placed on impervious liners and remediated on-site. It is reported that solid rock is in the near surface; rock may be difficult to 'remediate'. If on-site remediation is not feasible, the operator would like to retain the flexibility to haul material to a licensed disposal facility (tentatively CRI in Hobbs), to blend with other soils or gravel to levels below regulatory concern for use as road material, or to propose a closure protocol that includes contamination plume migration modeling if feasible and allowable at this site.

Step VII: If additional material is needed to fill the pit to grade level as a result of the excavation and hauling of material from the pit, materials will be purchased from a local private source for back-filling these pits. The pit will be brought to or above grade and re-seeded with native or improved dry-land grasses.

Step VIII: The District Office of the OCD will be contacted anytime material is to hauled off-site or when sampling is to be done. Photographs will be taken at appropriate stages during the entire process.

Step IX: A final report documenting all the work performed during the pit closures will be submitted to the New Mexico OCD.


R 32 E
T 13 S
13
18
24
19
25
30
36
31
Northland Operating Company
Dallas, Texas
Wells marked green are active producing wells that are currently (October 29, 1997) producing into the Tract 20 tank battery Rock Queen Unit, Lea County, New Mexico
Tank battery location (approximate) is noted in red.
Scale: 1,320' per inch
(4" per mile)

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

October 29, 1997

CERTIFIED MAIL
RETURN RECEIPT NO. P-326-936-351

Mr. Robert E. McKnight
Northland Operating Company
3500 Oak Lawn
Suite 380
Dallas, TX 75219-4398

RE: NOTICE OF VIOLATION
Unauthorized Waste Disposal Pits
Northland Operating Company
SE/4, NW/4, Section 30, Township 13, Range 32 East, NMPM
Lea County, New Mexico

Dear Mr. McKnight:

On September 22, 1997 The New Mexico Oil Conservation Division (OCD), identified two unauthorized, waste disposal pits one unlined and the other with a badly damaged fiberglass liner located in the SE/4, NW/4, Section 30, Township 13, Range 32 East, NMPM, Lea County, New Mexico (see attached map). These unauthorized pits are owned by Northland Operating Company (Northland).

OCD personnel performed an onsite inspection of the facility on September 22 and 25, 1997 and noted the following:

1. These pits are owned by Northland (see photo 1) and are being utilized on land that according to county records is New Mexico State Trust Land;

2. These pits are accepting oilfield waste (see photos 6, 7 and 8);

3. One pit containing BS&W is unlined and contains buckets causing the waste to be classified as non-exempt (see photo 6);

4. One pit has a fiberglass liner that contains numerous cracks and holes (see photos 7 and 8);

5. There is no leak detection system below either pit;

6. These pits were not screened or netted (see photos 6, 7 and 8);

7. There was evidence of spills form the tank battery and pit area having reached the fresh water playa (see photos 3, 4 and 5);

8. There was evidence of numerous spills, leaks and overflows from the tank battery, piping, valves, and pumps (see photo 2, 9, 10, 11, 12, 13, 14, 15, and 16);

9. There is no secondary containment around the tank battery (see photo 1, 2, 4, 6, 7, 9, 10, 11, 14 and 16) to protect the nearby fresh water playa from leaks, spills, and storm water runoff;

10. All of the pumps have leaked and lack drip pans to catch spills and leaks (see photos 9, 12 and 13);

11. Buckets containing waste oil were stored directly on the ground instead of on impermeable pad and curb type containment;

12. The sump located at the valve has overflowed or leaked (see photo 16).

Surface waste management facilities must be permitted pursuant to Rule 711 (as amended 1-1-96). In addition, pursuant to the OCD Order R-8952, all tanks exceeding 16 feet in diameter and all exposed pits and ponds shall be screened, netted or covered unless rendered non-hazardous to migratory birds. Order R-3221, as amended, prohibits the disposal of water produced in conjunction with the production of oil and gas in unlined pits or ponds where such disposal may impact fresh water supplies of the state of New Mexico. Therefore, all discharges into the unauthorized, unlined pits or pits with damaged liners must cease.

The OCD hearby requires Northland Operating Company to submit the following information: 1) the names and addresses of all waste generators who are utilizing the pits; 2) the names and addresses of all waste transporters; 3) the location of all waste generation (exact well locations); and 4) the total volume of waste from each location that has gone into the unauthorized pits.

In addition, Northland Operating Company must either permit the facility as a waste management facility or close the pits. Regardless of whether the facility is to be permitted or closed, Northland must submit a closure plan to the Santa Fe OCD office and a copy to the Hobbs District office. Included in the closure plan must be a plan for determining the nature and extent of contamination that has left the pits, how far the contamination has migrated and whether the fresh water playa has been impacted. Northland Operating Company is instructed by the OCD not to remove any waste from the unlined pit identified as photo 6 in this NOV until the waste has been tested for RCRA

Hazardous Characteristic according to 40 CFR 261. For your use please find enclosed a copy of the Order amending Rule 711, a form C-137 and OCD's pit closure guidelines. **A response is required by Northland Oil Corporation to these deficiencies by November 12, 1997.**

Failure to respond to this notice of violation by November 12, 1997 may result in a show cause hearing against Northland, requiring Northland to appear and show cause why it should not be ordered to close these pits and why it should not also be assessed civil penalties.

In addition to these violations Northland Operating Company has in the past failed to notify the OCD of pipeline ruptures and leaks. Pursuant to the New Mexico Water Quality Control Commission Regulations and to the OCD Rule 116 a release of any volume which may with reasonable probability be detrimental to water or cause an exceedance of the standards in Rule 19 is a major release and must be reported. A release shall be reported verbally within twenty-four (24) hours of discovery to the Division district office and to the Division's Environmental Bureau Chief. The verbal notification shall provide the information required on the Division Form C-141. In addition, a written notification shall follow within fifteen (15) days to the Division district office and to the Division's Environmental Bureau Chief. Repeated violations of these regulations may result in civil penalties

If you require any further information concerning permitting/closure procedures please contact me at (505) 827-7153.

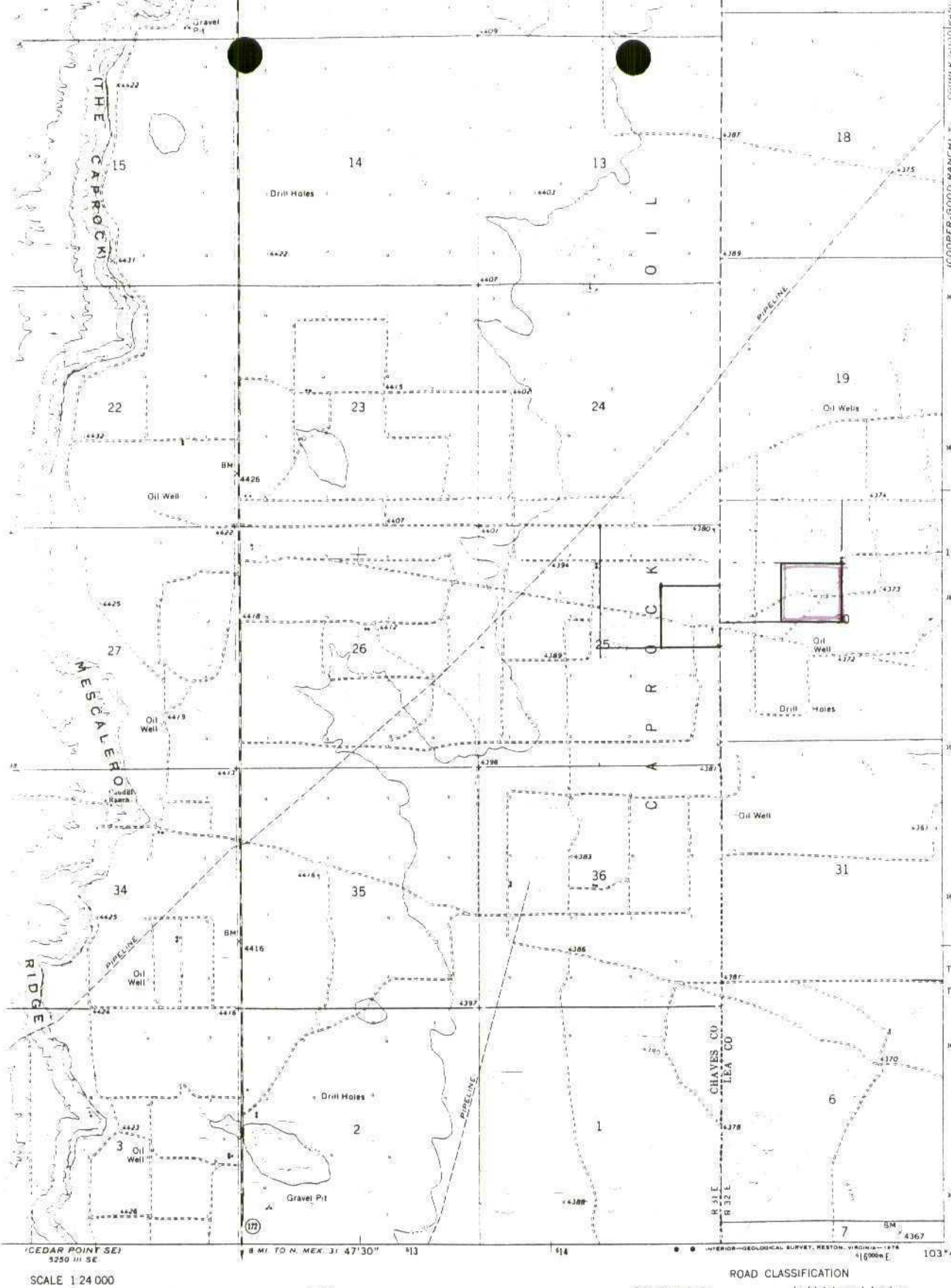
Sincerely,

Martyne J. Kieling
Environmental Geologist

Attachments- location map, photos, Order R-10411-B (Rule 711), Form C-137, pit closure guidelines, Order R-10766 (Rule 116), and Order R-10767-A (Rule 19).

xc:

Hobbs OCD Office
Jami Bailey, State Land Office
Ed Morney, Northland, P.O. Box 119, Maljamar, NM 88264



SCALE 1:24 000

0 1 MILE

0 2000 3000 4000 5000 6000 7000 FEET

0 1 KILOMETRE

CONTOUR INTERVAL 10 FEET
- GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, hard surface — Light-duty road, hard or improved surface

Secondary highway, hard surface — Unimproved road

Interstate Route — U. S. Route — State Route

NEW MEXICO

QUADRANGLE LOCATION

ES WITH NATIONAL MAP ACCURACY STANDARDS
RVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
OGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

CAUDILL RANCH, N. MEX.

N3307.5—W10345/7.5

1973

AMS 5250 III NE—SERIES V881

m72

NORTHLAND OPERATING CO. INSPECTION (PHOTOS BY OCD)
SE/4,NW/4 , SEC 30, T 13 S, R 32 E

PHOTO NO. 1 **DATE: 09/25/97**

PHOTO NO. 2 **DATE: 09/25/97**

NORTHLAND OPERATING CO. INSPECTION (PHOTOS BY OCD)
SE/4,NW/4 , SEC 30, T 13 S, R 32 E

PHOTO NO. 3 DATE:09/25/97

PHOTO NO. 4 DATE:09/25/97

NORTHLAND OPERATING CO. INSPECTION (PHOTOS BY OCD)
SE/4,NW/4 , SEC 30, T 13 S, R 32 E

PHOTO NO. 5 DATE:09/25/97

PHOTO NO. 6 DATE:09/25/97

NORTHLAND OPERATING CO. INSPECTION (PHOTOS BY OCD)
SE/4,NW/4 , SEC 30, T 13 S, R 32 E

PHOTO NO. 7 DATE:09/25/97

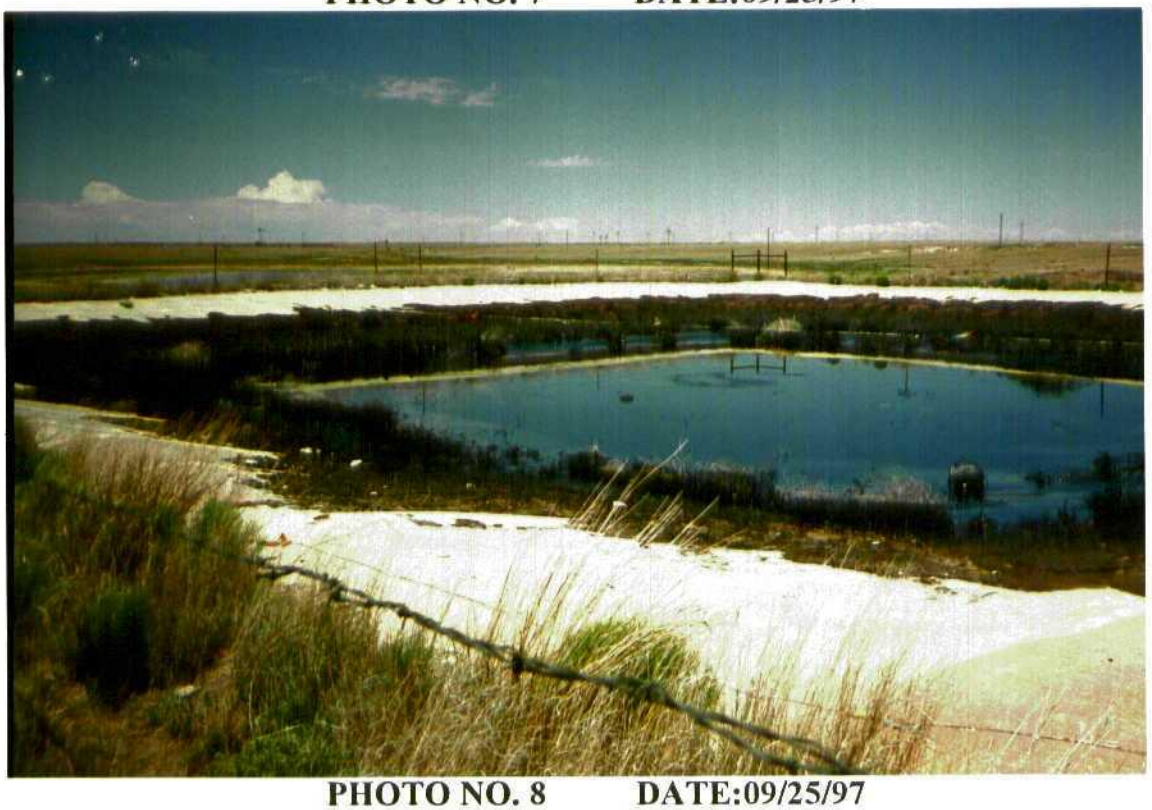


PHOTO NO. 8 DATE:09/25/97

NORTHLAND OPERATING CO. INSPECTION (PHOTOS BY OCD)
SE/4,NW/4 , SEC 30, T 13 S, R 32 E

PHOTO NO. 9 DATE: 09/25/97

PHOTO NO. 10 DATE: 09/25/97

NORTHLAND OPERATING CO. INSPECTION (PHOTOS BY OCD)
SE/4,NW/4 , SEC 30, T 13 S, R 32 E

PHOTO NO. 11 DATE:09/25/97

12 DATE:09/25/97

NORTHLAND OPERATING CO. INSPECTION (PHOTOS BY OCD)
SE/4,NW/4 , SEC 30, T 13 S, R 32 E

PHOTO NO. 13 **DATE:09/25/97**

PHOTO NO. 14 **DATE:09/25/97**

NORTHLAND OPERATING CO. INSPECTION (PHOTOS BY OCD)
SE/4,NW/4 , SEC 30, T 13 S, R 32 E

PHOTO NO. 15 DATE:09/25/97

PHOTO NO. 16 DATE:09/25/97

P. O. Box 1980
Hobbs, NM 88241-1980
District II - (505) 748-1283
811 S. First
Artesia, NM 88210
District III - (505) 334-6178
1000 Rio Brazos Road
Aztec, NM 87410
District IV - (505) 827-7131

New Mexico
Energy Minerals and Natural Resources Department
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

Originated 6/27/97

Submit Original
Plus 1 Copy
to Santa Fe

PIT INVENTORY FORM

Operator: Northland Operating Company

Address: 3500 Oak Lawn, Suite 380, LB #31
Dallas, Texas 75219-4398

Phone Number: 214-521-9959

Previous Operator(s): Circle Ridge (1988-1995)/ Great Western Drilling (original Unit operator)

Is the pit permitted: Yes ☐ No ☒

Unit Letter: B Section: 30 Township: 13S Range: 32E SE/4 of the NW/4

County: Lea

Location Name: Rock Queen Unit Tract 20 Tank battery

Number of wells to the pit: 10 producing wells

Are the wells to the pit operated by one operator ☒ or multiple operators ☐

Total daily volume (in barrels) to the pit: None, except during storage tank overflow

Pit Type: Emergency
(Emergency, Production, Workover, Reserve/Drilling(greater than 6 months old),Flare, Blowdown, Seperator, Dehydrator, Line Drip, BS&W/Tank Bottoms, Compressor, Pigging, Washdown, or other)

What types of wastes are accepted in the pit (Exempt, Non-exempt, Both, None): Exempt

Pit age (years): Greater than 30

Is the pit lined ☒ or unlined ☐

Type of liner (None, Synthetic, Clay) : Fiberglass

Is leak detection present: Yes ☐ No ☒

Is the pit netted: Yes ☐ No ☒

Pit dimensions (LxWxD): 100' x 100' x 8'

CERTIFICATION

I hereby certify that the information submitted is true and correct to the best of my knowledge and belief.

Name: Robert E. McKnight Title: Engineer

Signature: [signature] Date: October 30, 1997

A pit is defined as any below grade or surface feature which receives any materials other than fresh water.

P. O. Box 1980
Hobbs, NM 88241-1980
District II - (505) 748-1283
811 S. First
Artesia, NM 88210
District III - (505) 334-6178
1000 Rio Brazos Road
Aztec, NM 87410
District IV - (505) 827-7131

New Mexico
Energy Minerals and Natural Resources Department
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

Originated 6/27/97

Submit Original
Plus 1 Copy
to Santa Fe

PIT INVENTORY FORM

Operator: Northland Operating Company

Address: 3500 Oak Lawn, Suite 380, LB #31
Dallas, Texas 75219-4398

Phone Number: 214-521-9959

Previous Operator(s): Circle Ridge (1988-1995)/ Great Western Drilling (original Unit operaror)

Is the pit permitted: Yes ☐ No ☒

Unit Letter: G Section: 30 Township: 13S Range: 32E SE/4 of the NW/4

County: Lea

Location Name: Rock Queen Unit Tract 20 Tank battery

Number of wells to the pit: none

Are the wells to the pit operated by one operator ☒ or multiple operators ☐

Total daily volume (in barrels) to the pit: None

Pit Type: Abandoned BS&W pit
(Emergency, Production, Workover, Reserve/Drilling(greater than 6 months old),Flare, Blowdown, Seperator, Dehydrator, Line Drip, BS&W/Tank Bottoms, Compressor, Pigging, Washdown, or other)

What types of wastes are accepted in the pit (Exempt, Non-exempt, Both, None): In the past - exempt

Pit age (years): Greater than 30

Is the pit lined ☐ or unlined ☒

Type of liner (None, Synthetic, Clay) : _____

Is leak detection present: Yes ☐ No ☒

Is the pit netted: Yes ☐ No ☒

Pit dimensions (LxWxD): 20' x 20' x 6'

CERTIFICATION

I hereby certify that the information submitted is true and correct to the best of my knowledge and belief.

Name: Robert E. McKnight Title: Engineer

Signature: [signature] Date: October 30, 1997

A pit is defined as any below grade or surface feature which receives any materials other than fresh water.

John E. Rhoads

719 Scott, Suite 624
Wichita Falls, Texas 76301
940-723-8511
October 13, 1997

Mr. Wayne Price
New Mexico Energy, Minerals and Natural
Resources Department, Oil Conservation Division
1000 West Broadway
Hobbs, New Mexico 88240

Re: Northland Operating Company
Rock Queen Unit, Lea and Chaves County, New Mexico
SPCC Plans for Tract 20 and Saltwater Plant #2

Dear Mr. Price:

Enclosed are the two SPCC Plans I mentioned to you on September 22, 1997. It is unclear to me whether or not these have been sent to you as requested. In the interest of certainty, I will duplicate the effort if it has already been done.

Northland has been removing the liquids from the pits that were inspected. It now appears that there is a diminishing return on efforts to hot oil and remove as liquid the remainder of the sludge. Accordingly, a dirt contractor is in the process of estimating costs and making arrangements for a track-hoe and trucks to remove the remaining sludge.

Respectfully,

John E. Rhoads
For Northland Operating

cc: Mr. Bob McKnight, Northland Operating

SPILL PREVENTION & COUNTERMEASURE PLAN

GENERAL INFORMATION

1. Name of Facility: Rock Queen Unit B, Tract 20 Tank Battery

2. Type of Facility: Crude Oil storage

3. Location of Facility: Lea County, New Mexico
NE/4 of Section 30, T13S-R32E

4. Name and address of owner or operator:

Name : Northland Operating Company

Address: 3500 Oak Lawn, Suite 380, L.B. #31
Dallas, Texas 75219-4398

5. Designated person accountable for oil spill prevention at facility:

Name and title: Ed Marney, Field Superintendent

6. This facility did not experience a reportable oil spill event during the twelve months prior to January 10, 1974 (effective date of 40 CFR, Part 112).

I hereby certify that I have examined the facility , and being familiar with the provisions of 40 CFR, Part 112, attest that this SPCC Plan has been prepared in accordance with good engineering practices.

Ed Butler, Registered Professional Engineer

(Seal) J. Ed Butler
Signature

Date: 7/23/96 Registration No. 54443 State of Texas

==========

MANAGEMENT APPROVAL

This SPCC Plan will be implemented as herein described.

Signature: J. Ed Butler

Name : Ed Butler Title: Vice President

FACILITY DESCRIPTION

The Rock Queen Unit B, Tract 20 Tank Battery facility is described by the attached diagram. The facility includes the following equipment:

Two (2) 500 barrel bolted steel oil production tanks
One (1) 500 barrel bolted steel saltwater tanks
One (1) 10' x 28' heater/treater
One (1) separator (inactive)
There are two earthen pits near the tank battery

FACILITY OPERATION

This facility is for separation of produced oil and water and subsequent storage of the crude oil. Production into this facility approximates 23 barrels of oil per day and 765 barrels of water per day. The water is shipped from the facility to a nearby pump station for subsequent disposal.

FACILITY INSPECTION

The facility was personally inspected during July 1996. All subsequent inspections will follow a written inspection procedure. A written record of these inspections will be kept in the Dallas office. The site description and operations noted during this inspection are as noted above. The following observations and recommendations are hereby recorded:

1. There is secondary containment to the south of this site. It is designed to prevent any spills at this facility from reaching a wet-weather pond or stock tank some 200 yards to the south of the facility. Periodic maintenance of this berm will be required.

POTENTIAL SITE DRAINAGE

Terrain is flat with very little slope in the immediate area. There is a small wet-weather pond approximately 200 yards to the south of this facility. There is a berm to the south of this facility designed to prevent any spills from reaching this water source. As a result, it is not reasonable to expect fluids released from this site to reach this pond. As a result, the facility is deemed NOT subject to the provisions of the Oil Pollution Act of 1990 and no Facility Response Plan is required.

SPILL CONTROL AND COUNTERMEASURE PLANS

All operating personnel will be informed of the requirements for spill prevention and control. Each employee or contract personnel will be provided with instructions and information that will allow him to initiate the appropriate action upon the discovery of a spill or potential spill.

I. SPILL PREVENTION CONTROL PLAN

A. Each lease operator and will be advised that his responsibilities include:

1. A daily inspection of all oil handling and oil treating equipment on each lease to assure proper functioning.
2. A daily inspection of all storage facilities to insure adequate storage volumes. Bypass, drain and pipeline valves should be checked for proper position and for security.
3. A daily inspection of all producing wells will be made to insure proper functioning of stuffing boxes, valves and connections (pumping wells), and chokes (flowing wells) for setting or mechanical integrity.
4. A daily determination of oil production. If shortages or overages occur, an immediate survey shall be conducted to determine the cause of the variance. Flowlines, leaking tanks or separators should be checked in the event of shortages; plugged waterlegs or dump valves on separation equipment that may have caused water to dump to the oil production tanks should be checked; for flowing wells, overages could be due to washed out or broken chokes.
5. Daily reports of leaks and potential problems shall be reported to the lease operator's supervisor.

B. Each production foreman will be advised that his responsibilities include:

1. A daily review of lease operations and operational problems with the lease operator.
2. Periodic inspection of the lease equipment and storage facilities to insure that the lease operator is operating and maintaining equipment in an environmentally acceptable manner as directed by the company. The production foreman will make a concerted effort to determine if corrosion problems or other potential leak sources exist.

3. Immediate reporting of leaks or potential leaks to the Superintendent. In the event the Superintendent is unavailable, the foreman will be authorized to take all actions necessary to stop leakages and to initiate measures to contain and mitigate any spill.

II. SPILL COUNTERMEASURE PLAN

A. Immediate reports of oil spills or leaks shall be made to the proper production personnel. They may contacted as follows:

Ed Marney	1-505-676-2130	site office
	1-505-369-5451	mobile
	1-505-676-6755	residence on site
Bob McKnight	1-214-521-9959	office
	1-972-612-5744	home
Ed Butler	1-214-521-9959	office
	1-214-507-8003	mobile
	1-817-549-2946	home

B. Immediate action shall be initiated to stop any leakage and to contain and remove any oil spillage. For this property, the Company has available on site both personnel and equipment to contain and remove oil and saltwater spills. The equipment includes but is not limited to a bulldozer, a vacuum truck and a backhoe. The company has a roustabout crew that is dedicated to this property and is on call for emergency spills.

C. Any problem relating to the engineering or design of this plan for the control or containment of oil and saltwater spills should be referred to Ed Butler, Vice President of Northland Operating.

D. Every employee needs to be aware of the Company's concern regarding potential spills and the Company's dictate for immediate action in the event of a spill or leak. Each employee shall be encouraged to evaluate potentially hazardous operations and to proceed only after careful consideration of the situation and an evaluation of the available equipment for the particular cleanup operation. The employee is reminded that certain hazardous material (crude oil) cleanup operations may be beyond the capabilities immediately available on the lease and that personnel with proper HAZWOPER training may need to be called for these operations.

E. Any oil spill that has the possibility of entering "navigable waters of the United States" should be reported immediately to the regional office of the United States Environmental Protection Agency in Dallas, Texas.

F. The lease operator needs to be aware of "Reportable Limits" set by regulators. Oil spill volumes above these limits may need to be reported to both the United States Department of Interior, Bureau of Land Management and the Oil Conservation Division, State of New Mexico.

WRITTEN COMMITMENT OF MANPOWER

It is the policy of Northland Operating Company that in the event of a spill, the containment and cleanup effort shall take precedence over all other operations and all necessary employees shall be made available for such effort.

APPLICABLE TELEPHONE NUMBERS

U. S. Department of the Interior, Bureau of Land Management
2909 West Second Street
Roswell, New Mexico 1-505-627-0272

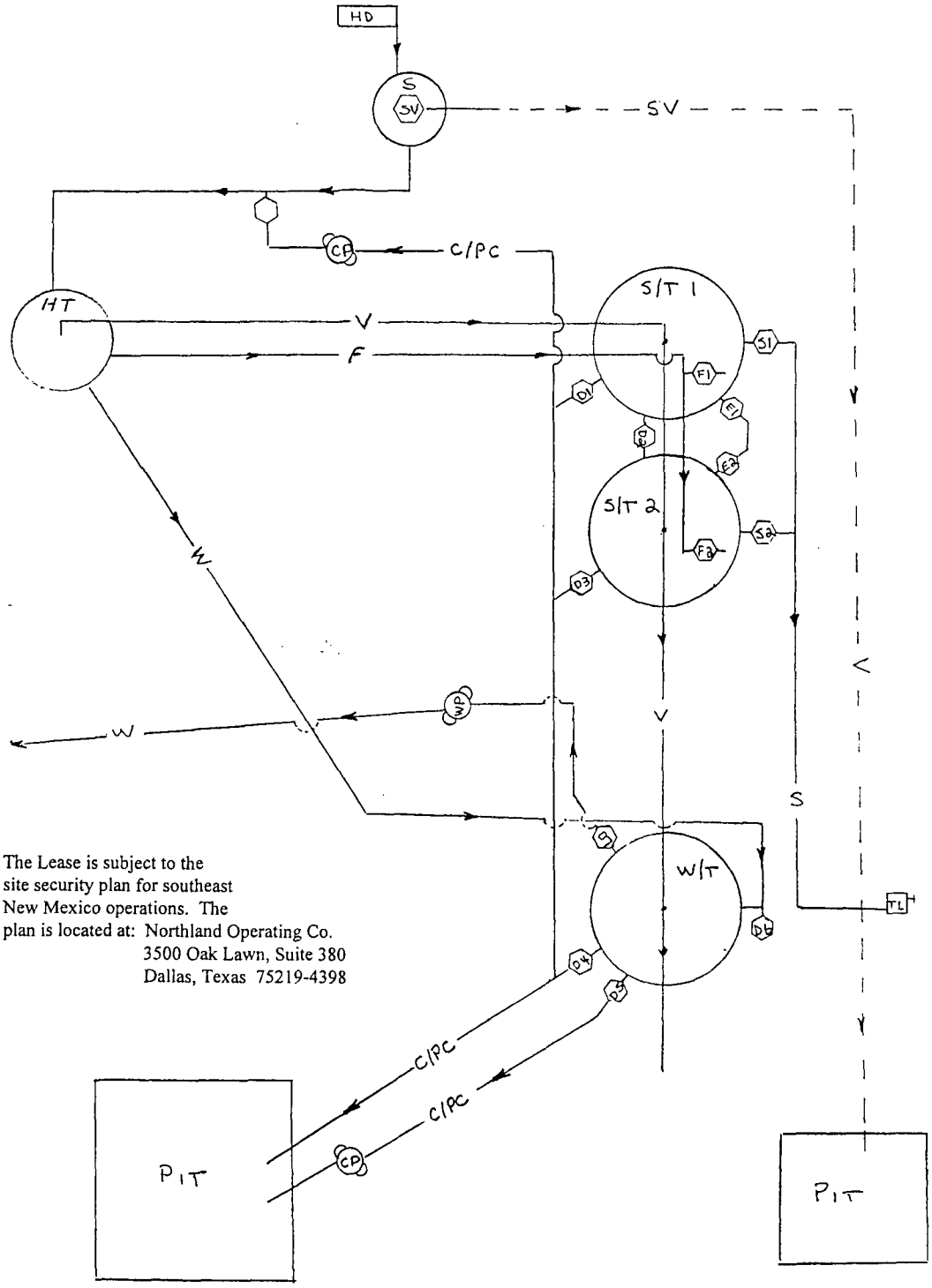
Oil Conservation Division, State of New Mexico
Jerry Sexton, District Supervisor
P. O. Box 1980
Hobbs, New Mexico 1-505-393-6161

United States Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733 214-655-6444

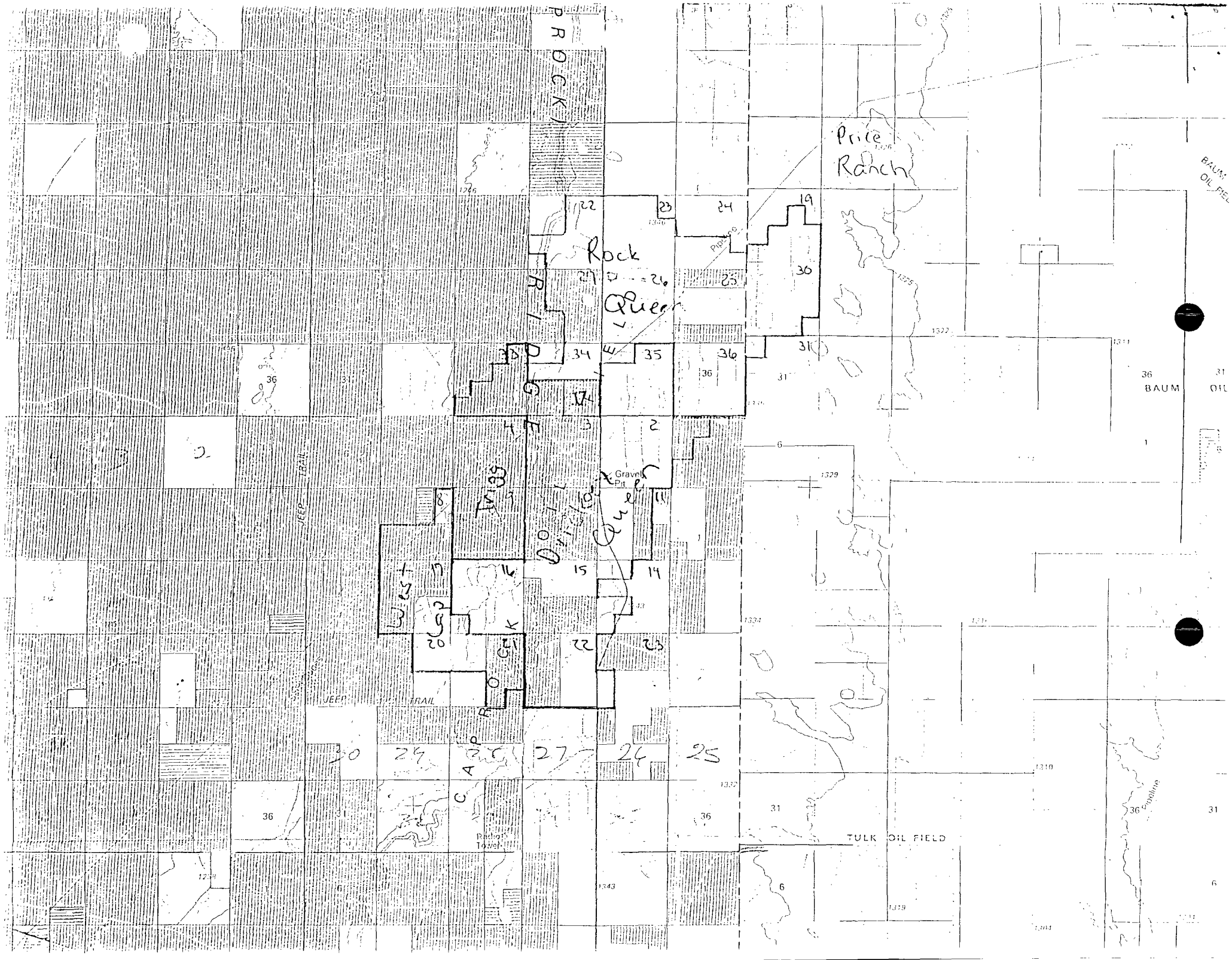
National Response Center (oil on navigable waters only)
1-800-424-8802

Northland Operating Co.

Tract 20 Tank Battery
Unit B- Sec. 30, T 13S, R 32E
Chaves County, New Mexico
Lease: E- 7494



The Lease is subject to the site security plan for southeast New Mexico operations. The plan is located at: Northland Operating Co.
3500 Oak Lawn, Suite 380
Dallas, Texas 75219-4398


Price Ranch
Rock Quarry
BAUM OIL FIELD
TULK OIL FIELD
Gravel Pit
JEEP TRAIL
JEEP TRAIL
Pipeline
Pipeline
Radio Tower

SITE SECURITY PLAN
Tract 20 Unit B Tank Battery
Sec. 30, T 13S, R 32E
Chaves County, New Mexico
Lease E - 7494

1) SELF INSPECTION

Northland Operating Company's field operator will perform daily tank gauges on the active production tank and will record the daily reading on Northland's daily production log. Production tanks that have become filled and are awaiting sales will be isolated by closing off and sealing the fill valves. The field operator will perform daily checks of all sealed valves to insure the integrity of the seals. Monthly records of daily production will be maintained in Northlands field office and in the company headquarters located in Dallas, Texas. Seal changes will be recorded on the daily production report by the field operator.

2) STORAGE AND SALES FACILITIES - SEALS

a) All lines entering or leaving all oil storage tanks shall have valves capable of being effectively sealed in the closed position. During the sales phase, and prior to taking the top gauge, all valves that would allow unmeasured production to enter or leave the sales tank shall be effectively sealed in the closed position. Any equipment needed for effective sealing, excluding the seals, shall be located at the site.
b) Additionally, all valves or combinations of valves and tankage that provide access to the production prior to measurement for sales or lease use will be appropriately sealed.
c) Valves on any tank which contains oil or is connected to the production equipment will be sealed as required in the production or selling phase.

3) REMOVAL OF CRUDE OIL FROM STORAGE FACILITIES

Northland Production Company's field operator will witness all tank gauges at time of sales and will verify by separate gauging, all measurements of the oil Purchaser on the tank run tickets. Northland's field operator will co-sign all run tickets. The field operator will also maintain detail seal records in the company's field office. Copies of run tickets and seal records will be maintained in Northland's field office and in the company headquarters in Dallas, Texas, as specified by the record keeping requirements.

a) Northland Operating Company shall require the transporter / purchaser to record on a run ticket prior to sales or removal of any crude oil from the lease, as a minimum, the following:
    - Name of the Seller
    - Federal lease number(s), or as appropriate, the communitization agreement number or the unit agreement name and number and participating area identification
    - The location of the tank by quarter, quarter section, section, township and range (public land surveys) or by the legal land description
    - A unique number, the date, and the tank number and capacity
    - Opening gauge and temperature
    - Name of gauger and operator representative, if present at time of sale
    - Number of the tank seal removed
b) Northland Operating Company shall require that the run ticket be completed upon the completion of the sales or removal of oil from the lease to show the following:

- Closing gauge (second gauge) and temperature
- Observed gravity and sediment and water (S&W) content
- Number of the seal installed
- Signature of the gauger
- Signature of the operator representative (within 2 business days after the sales or removal).

c) When a single truck load constitutes a completed sale, the driver shall have in his / her possession documentation containing the information required in d. and e. above, during the period of shipment.
d) All valves on lines entering of leaving the sales tank(s) shall be effectively sealed.
e) Once the seals have been broken, the purchaser shall be responsible for the entire contents of the tank until resealed.

4) THEFT OR MISHANDLING OF OIL

In the event theft or mishandling of oil is discovered, Northlands Operating Manager in Dallas will immediately verbally report the theft or mishandling to the authorized officer of the BLM. This oral report will be followed up by a written report from Northland's Operating Manager within ten (10) business days. The incident report will include the following:

a) Company name and name of individual reporting the incident(s)
b) Lease number, communitization agreement number, or unit agreement name and number and participating area, as appropriate
c) Location of facility where the incident occurred by quarter, quarter section, section, township, and range or legal land description
d) The estimated volume of oil or condensate removed
e) The way access was obtained to the production or how the mishandling occurred
f) the individual who discovered the incident
g) Date and time of the discovery of the incident
h) Whether the incident was or was not reported to local law enforcement agencies and company security.

5) BY PASS AROUND METERS OR TANKS

There is no by-pass equipment installed at this facility.

6) RECORD KEEPING

Northland Operating Company shall maintain lease production and seal records for a minimum of six (6) years. These records will be kept in Northlands field office and will be readily available to the authorized BLM officer or authorized representative upon request. The maintained records will include all of the following as a minimum.

a) Documentation of the number of each seal and the valve on which the seal is used, the date of installation or the removal of the seal(s) for each storage tank, including the reason for removal or installation of each such seal.

7) THE LEASES COMPRISING THIS FACILITY ARE LISTED AS FOLLOWS.

a) Lease E-7494
b) This lease included in Rock Queen Unit by Unit Agreement effective October 1, 1959 recorded in book 73, page 55, Lea County, New Mexico.

John E. Rhoads

719 Scott, Suite 624
Wichita Falls, Texas 76301
940-723-8511
October 10, 1997

Mr. Wayne Price
New Mexico Oil Conservation Division
P. O. Box 1980
Hobbs, New Mexico 88241

Re: Northland Operating Company
Rock Queen Unit
Lea/Chaves Counties, New Mexico

Dear Mr. Price:

Enclosed is a better copy of the MSDS for Conoco's Universal Gear Lubricant 80W-90, 85W-140 that is in use at Northland's saltwater plants. You requested the MSDS while we were at the Saltwater Plant #2 during the inspection with EPA and Fish & Wildlife during the late hours of September 22, 1997. I requested that Mr. Bob McKnight with Northland in Dallas send you the SPCC Plans for the two facilities inspected. I will follow-up with that request next week.

Please advise if we can supply you with any additional information.

Respectfully,

John E. Rhoads
for Northland Operating

cc: Martyne Kieling, OCD, Santa Fe ✓

CONOCO®

MSDS
MATERIAL SAFETY DATA SHEET

LUBC0415 | Revised 23-JUL-1997 | Printed 7-OCT-1997

UNIVERSAL GEAR LUBRICANT

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification
Grade 80W-90, 85W-140

Product Use
Automotive Gear Oil

Tradenames and Synonyms
7650, 7651 - Conoco Base Codes
UGL

Company Identification
MANUFACTURER/DISTRIBUTOR
Conoco, Inc.
P.O. Box 2197
Houston, TX 77252

PHONE NUMBERS

Product Information	1-281-293-5550
Transport Emergency	CHEMTREC 1-800-424-9300
Medical Emergency	1-800-441-3637

COMPOSITION/INFORMATION ON INGREDIENTS

#	Components Material	CAS Number	%
	Highly Solvent-Refined Base Oils		>80
	Olefin Sulfide	72162-26-6	<5
	Proprietary Additives		<15

If oil mist is generated, exposure limits apply.

(Continued)

HAZARDS IDENTIFICATION

Potential Health Effects

Primary Routes of Entry: Skin, inhalation

The product, as with many petroleum products, may cause minor skin, eye, and lung irritation, but good hygienic practices can minimize these effects.

Normal use of this product does not result in generation of an oil mist. However if an oil mist is generated, overexposure can cause minor and reversible irritation to the eyes, skin, and especially the lungs. Proper personal protective equipment and sufficient ventilation can provide adequate protection.

Carcinogenicity Information
None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

First Aid
INHALATION

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

Wash skin thoroughly with soap and water. If irritation develops and persists, consult a physician.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

Material poses an aspiration hazard. If swallowed, do not induce vomiting. Immediately give 2 glasses of water. Never give anything by mouth to an unconscious person. Call a physician.

If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration.

Notes to Physicians
Activated charcoal mixture may be administered. To prepare activated charcoal mixture, suspend 50 grams activated charcoal in 400 mL water and mix thoroughly. Administer 5 mL/kg, or 350 mL for an average adult.

(Continued)

FIRE FIGHTING MEASURES

 # Flammable Properties

Flash Point	165 C (329 F) (Minimum) 204 C (399 F) (Typical)
Method	Cleveland Open Cup - COC.
NFPA Classification	Class IIIB Combustible Liquid.

Extinguishing Media

Water Spray, Foam, Dry Chemical, CO2.

Fire Fighting Instructions

Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Remove source of heat, sparks, and flame.

Initial Containment

Dike spill. Prevent material from entering sewers, waterways, or low areas.

Spill Clean Up

Recover free liquid for reuse or reclamation. Soak up with sawdust, sand, oil dry or other absorbent material.

HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing vapors or mist. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Wash contaminated clothing prior to reuse.

Handling (Physical Aspects)

Close container after each use. Do not pressurize, cut, weld, braze, solder, grind, or drill on or near full or empty container. Empty container retains residue (liquid and/or vapor) and may explode in heat of a fire.

Storage

Store in accordance with National Fire Protection Association recommendations. Store away from heat, sparks and flames, oxidizers.

(Continued)

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

VENTILATION
Normal shop ventilation.

Personal Protective Equipment

RESPIRATORY PROTECTION
None normally required except in emergencies or when conditions cause excessive airborne levels of mists or vapors. Select appropriate NIOSH- approved respiratory protection where necessary to maintain exposures below acceptable limits. Proper respirator selection should be determined by adequately trained personnel and based on the contaminant(s), the degree of potential exposure, and published respirator protection factors.

PROTECTIVE GLOVES
Should be worn when the potential exists for prolonged or repeated skin contact. NBR or Neoprene recommended.

EYE/FACE PROTECTION
Safety glasses with side shields if splashing is probable.

OTHER PROTECTIVE EQUIPMENT
Coveralls with long sleeves if splashing is probable.
Launder contaminated clothing before reuse.

Exposure Guidelines

Applicable Exposure Limits

If oil mist is generated, exposure limits apply.

PEL	(OSHA)	5 mg/m3, 8 Hr. TWA
TLV	(ACGIH)	5 mg/m3, 8 Hr. TWA, STEL 10 mg/m3 Notice of Intended Changes (1996) 5 mg/m3, 8 Hr. TWA, (As sampled by method that does not collect vapors)
AEL *	(DuPont)	5 mg/m3, 8 Hr. TWA

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point	Not Available
Vapor Pressure	Nil
Vapor Density	>1 (Air = 1)
% Volatiles	Nil
Evaporation Rate	Nil
Solubility in Water	Insoluble
Odor	Petroleum hydrocarbon (mild)
Form	Viscous Liquid
Color	Dark brown
Specific Gravity	0.89-0.91 @ 60 F (16 C)
Density	7.43-7.62 lb/gal @ 60 F (16 C)

(Continued)

STABILITY AND REACTIVITY

Chemical Stability
Stable.

Conditions to Avoid
Avoid heat, sparks, and flame.

Incompatibility with Other Materials
Incompatible with strong oxidizing materials.

Decomposition
Normal combustion forms carbon dioxide; incomplete combustion may produce carbon monoxide.

Odorous and toxic fumes may form if stored at temperatures above 113 F (45 C) for extended periods of time or if heat sources above 250 F (121 C) are used.

Polymerization
Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data
Mouse skin painting studies have shown that highly solvent-refined petroleum distillates similar to ingredients in this product have not caused skin tumors.

Animal studies have shown that a component of this product can cause skin sensitization.

ECOLOGICAL INFORMATION

Ecotoxicological Information
No specific aquatic data available for this product.

DISPOSAL CONSIDERATIONS

Waste Disposal
Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Do not flush to surface water or sanitary sewer system.

Container Disposal
Empty drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All other containers should be disposed of in an environmentally safe manner.

(Continued)

TRANSPORTATION INFORMATION

Shipping Information
DOT
Not regulated.

ICAO/IMO
Not restricted.

REGULATORY INFORMATION

U.S. Federal Regulations
OSHA HAZARD DETERMINATION
Under normal conditions of use, this material is not known to be hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200.

CERCLA/SUPERFUND
Not applicable; this material is covered by the CERCLA petroleum exclusion.

SARA, TITLE III, 302/304
This material is not known to contain extremely hazardous substances.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : No
Chronic : No
Fire : No
Reactivity : No
Pressure : No

SARA, TITLE III, 313
This material is not known to contain any chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and subject to release reporting requirements.

TSCA
Material and/or components are listed in the TSCA Inventory of Chemical Substances (40 CFR 710).

RCRA
This material has been evaluated for RCRA characteristics and does not meet hazardous waste criteria if discarded in its purchased form. Because of product use, transformation, mixing, processing, etc., which may render the resulting material hazardous, it is the product user's responsibility to determine at the time of disposal whether the material meets RCRA hazardous waste criteria.

CLEAN WATER ACT
The material contains the following ingredient(s) which is considered hazardous if spilled into navigable waters and therefore reportable to the National Response Center (1-800-424-8802).

(Continued)

REGULATORY INFORMATION(Continued)

Ingredient(s)	Petroleum Hydrocarbons
Reportable Quantity	Film or sheen upon, or discoloration of, any water surface

State Regulations (U.S.)

CALIFORNIA "PROP 65"
The material contains ingredient(s) known to the State of California to cause cancer, birth defects, or other reproductive harm. Read and follow all label directions.

Ingredient	Cadmium @ <0.01%
Ingredient	Lead @ <0.01%
Ingredient	Arsenic @ <0.01%
Ingredient	Ethyl acrylate (CAS# 140-88-5) @ <0.01%

PENNSYLVANIA WORKER & COMMUNITY RIGHT TO KNOW ACT
Ingredients subject to Act - None

Canadian Regulations

This is not a WHMIS Controlled Product.

Transport/Medical Emergency Phone Number: 1-613-348-3616

OTHER INFORMATION

NFPA, NPCA-HMIS

NFPA Rating	
Health	0
Flammability	1
Reactivity	0

NPCA-HMIS Rating	
Health	1
Flammability	1
Reactivity	0

Personal Protection rating to be supplied by user depending on use conditions.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS	: MSDS Coordinator
Address	: Conoco Inc.
>	: PO Box 2197
>	: Houston, TX 77252
Telephone	: 1-281-293-5550

# Indicates updated section.

End of MSDS

Northland Operating Company

September 24, 1997

Mr. Roger Anderson
NMOCD Environmental Bureau Chief
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Dear Sir:

This is to advise your office that on March 12, 1997, at our estimated time of 8:00 A.M., a fiber glass saltwater transfer line ruptured when apparently run over by a vehicle. The water transfer line was broken in two places and allowed saltwater with a trace of oil to flow out of the break for approximately four (4) hours into the nearby playa lake. The playa lake is located in the NW ¼ of Section 30, T13S, R32E. The ruptured water line lay on the north side of the lake. The site was near our Section 30 well No. 4, located in the NW ¼ of the NW ¼ Sec. 30. Northland personnel discovered the leak at approximately 12:00 noon on March 12, 1997 and shut off the saltwater flow. It is estimated that a maximum of 600 Bbls water and less than one half barrel of oil escaped from the flow line into the playa lake. Northland immediately repaired the broken line and replaced the water line in a location that would not impact the playa lake should any future leaks occur. The incident was reported to Lieutenant Huspeth at the National Response Center on March 14, 1997. The incident was assigned Report No. 380283 by the National Response Center.

I will be most happy to provide you with any additional information you may require on this situation.

Yours truly,

Robert E. Mc Knight

3500 Oak Lawn, Suite 380, Dallas, Texas 75219-4398 Phone (214) 521-9959 Fax (214) 521-9960

Safety & Environmental Solutions, Inc.

RECEIVED
FEB 06 1998
Environmental Bureau
Oil Conservation Division

Northland Operating Company
3500 Oaklawn LB #31
Dallas, TX 75219-4938

Rock Queen Unit
Salt Water Plant #2
North Pit
Lea County, New Mexico

Safety & Environmental Solutions, Inc.
703 E. Clinton Suite 103
P.O. Box 1613
Hobbs, New Mexico 88240
(505) 397-0510

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I. Physical Description

The legal description of the pit site is in the Southeast 1/4 of the Northeast 1/4 of Section 25, Township 13S, Range 31E, Chaves County, New Mexico. The elevation is approximately 4400 feet above sea level. The abandoned pit site is situated on a relatively level site. (7.5 Minute Quadrangle Map with 1 mile radius) The land is deeded land owned by Mrs. Elizabeth Tulk, owner of the Tulk Ranch. This information was obtained from Mrs. Tulk, and corroborated by Jim Owens, the current proprietor of the Caudill Brothers ranch.

II. Scope

Safety and Environmental Solution, Inc. was contracted to define the vertical extent of contamination and provide consulting services and options to Northland Operating Company.

III. Contaminants and Size of Pit

The pit in question had been used as an emergency overflow pit for several years. In the process, it had become contaminated with brackish water and some hydrocarbon. Prior to the arrival of Safety & Environmental Solutions, Inc. , the bulk of the contaminated soil had been properly classified and hauled to a nearby exempt land farm for proper disposal. The size of the excavation present when SES, Inc. arrived was approximately 20 feet by 30 feet and approximately 8 feet deep.

IV. Vertical and Horizontal Extent of Contamination

On December 10, 1997 a composite sample was analyzed for Total Petroleum Hydrocarbons (EPA Method 418.1). This sample was a surface composite from various areas covering the excavation and gathered using SOPs found in **Environmental Protection Agency, 1984, Characterization of Hazardous Waste Site - A Methods Manual: Vol II.** This sample was representative of the contamination levels after removal of the gross contamination, but before final dressing of the location. Sample results on this surface sample are as follows:

Depth	Type of Test Conducted	Result
0-6" (Surface in bottom of excavation)	TPH	1870 ppm

The regulatory target contaminant levels were derived from **"Guidelines for Remediation of Leaks, Spills and Releases"** *New Mexico Oil Conservation Division* - August 13, 1993. Northland Operating Company is asking approval of a 5000 ppm TPH level from the Oil Conservation Division in ~~Artesia~~ Hobbs and Santa Fe prior to implementing the work plan. The depth to ground water in this area is in excess of 180 feet and the distance to the nearest surface water (playa) is over 1000 feet.

Vertical extent of the contamination was determined by drilling bore holes in the center of the excavation. Atkins Engineering Associates Inc. was used as the drilling contractor, as they have extensive experience in environmental drilling. The pit site was inspected and the nearest place to center of the original pit was chosen to drill to determine vertical extent. The first samples field tested were not taken until the drilling had reached a depth of 20' below surrounding ground surface level. At that depth the TPH showed to be 13 ppm. As confirmation and in addition, PID tests were run on the same sample and the PID reading for volatiles was 12 ppm. Drilling was continued to a bottom hole depth of 28' and the TPH at that depth measured 53 ppm . Once again, PID was performed to verify that vertical extent had been determined and the results of the PID test were 1.4 ppm volatiles. All results follow in table form:

Depth	Type of Test Conducted	Result
0-6" (Surface in bottom of excavation)	TPH	1870 ppm
20' (below ground level)	TPH	13 ppm
28' (bgl - bottom hole)	TPH	53 ppm
20' (below ground level)	PID	12 ppm
28' (bgl - bottom hole)	PID	1.4 ppm

Visual survey of the pit area reveals that the horizontal extent of the contamination is primarily limited to the edges of the excavation, with some

contamination ranging from 2 feet to 6 feet outside the pit area. The horizontal extent of contamination was largely controlled by the contour of the surface.

Final bottom hole grab samples were taken on December 9, 1997 to verify the thoroughness of the field testing and Total Petroleum Hydrocarbon (EPA Method 418.1) was performed with the following results:

Depth	Type of Test Conducted	Result
28'	Laboratory Confirmation (TPH)	< 10 ppm

(See enclosed Lab Analysis labeled North Pit @ 28' Center)

V. Surface Water and Waterways

The distance to the nearest surface water is in excess of 1000 feet. This surface water is a playa which intermittently contains water. On the day the work was done, however, there was no water present in the playa.

VI. Groundwater

The rancher has a windmill to supply his stock with water within ½ mile to the North of the location. He indicated that it was greater than 180 feet to water at that location, and touchdown on the well was well over 200 feet. The nearest water well on record with the New Mexico State Engineer and the United States Geological Survey in Albuquerque is in excess of 1 mile away. It is located at precisely Township 13S Range 32E Section 20.411213. Top of water on this well was measured on March 12, 1996, and was located at 134.05 feet. (USGS Water Level Report)

VII. Soil Information

United States Soil Conservation Service Soil Survey of Chaves County, New Mexico indicates that the soil in the pit area is Kimbrough Gravelly Loam. Mapped areas are narrow and elongated in shape and about 200 to 1500 acres in size. This soil has a profile of being a well drained soil that is very shallow and shallow to indurated caliche. These soils formed in

gravelly aolian and alluvial sediments on the High Plains. Slopes are 0 to 3 percent. Elevation is 4300 to 4400 feet. Vegetation is mainly blue grama, black grama, side-oats grama, three-awn, broom snakeweed, and mesquite. The mean annual precipitation is 14 to 16 inches, and the mean annual soil temperature is 59° to 62° F. The frost free season is 190 to 205 days. In a representative profile the surface layer is brown gravelly fine sandy loam about 6" thick. The underlying material is brown gravelly loam about 5" thick. White indurated caliche is at a depth of 11 inches. The soil profile is moderately calcareous and moderately alkaline. Permeability is moderate, and available water capacity is 1.5 to 2.5 inches. Effective rooting depth to indurated caliche is 7 to 18 inches. These soils are used for grazing, wildlife habitat, and as a source of crushed caliche. The soil in the area of the pit is similar to that of the rest of the series, but it has a surface layer of gravelly loam. Included with this soil in mapping are scattered intermixed areas of Stegall, Slaughter, and Sharvana soils that make up about 20 percent of the mapped areas, These soils are in small rounded depressions. Runoff is medium. The hazard of erosion is slight. For more information, see the Soil Survey of Chaves County, New Mexico, Southern Part published by the USDA.
(Soil Survey Map)

VIII. **Work Performed**

12/09/97
1:00 pm - met with B&H at Maljamar to excavate ramps into pits on Northland property.

2:30 pm - arrived at pits on Northland property, B&H unloaded. Surveyed pits for potential problems, checked bottoms, talked with Ed Marney.

3:30 pm - Returned to office.

12/10/97

9:00 am -Met Mort Bates (of Atkins Engineering) at Hagerman cutoff to lead them into location.

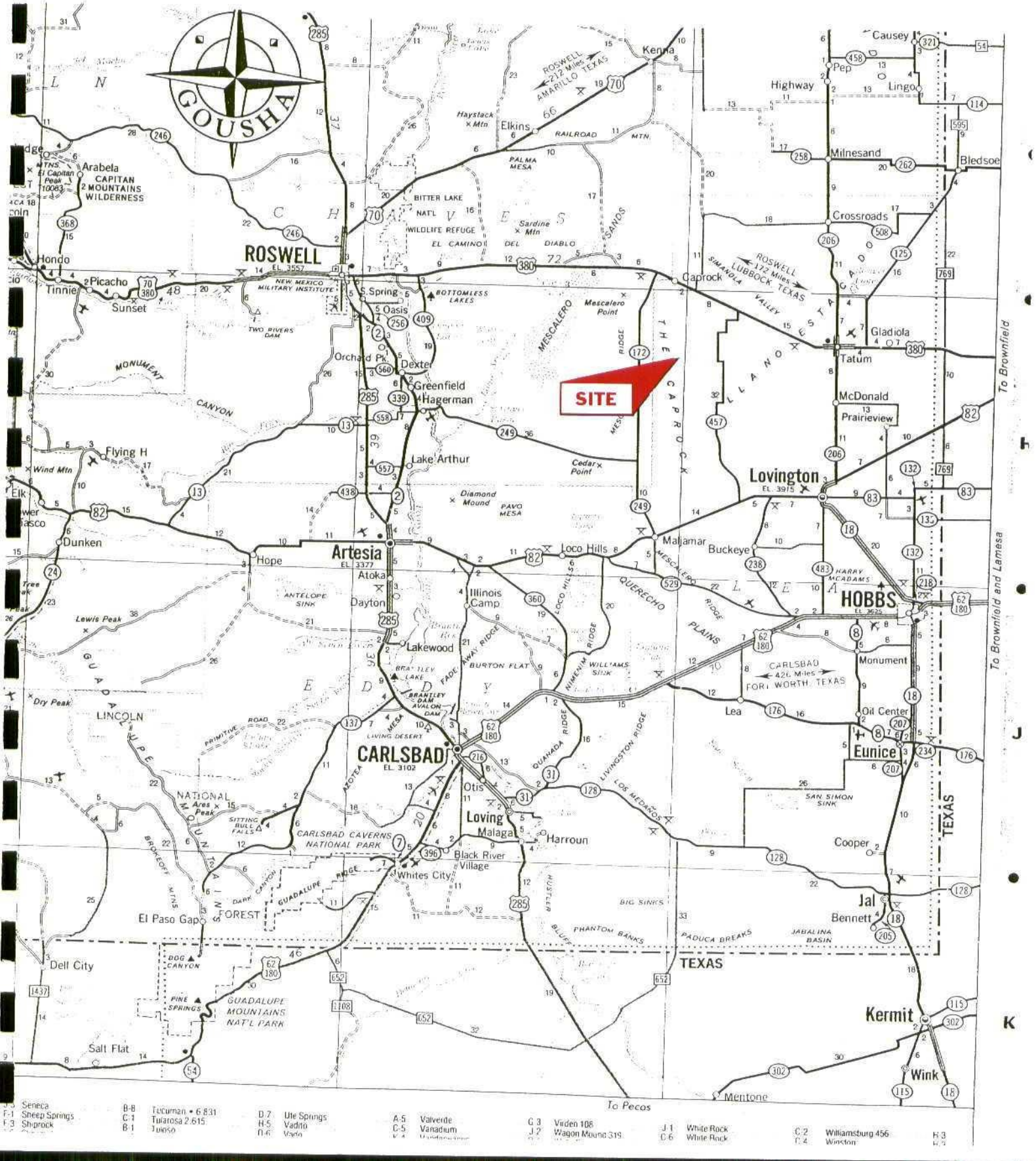
9:30 am - met B & H Dozer operator and John Rhoads at pit location. Began drilling for vertical extent of contamination on Northern Pit at Rock Queen Unit Salt Water Plant #2.

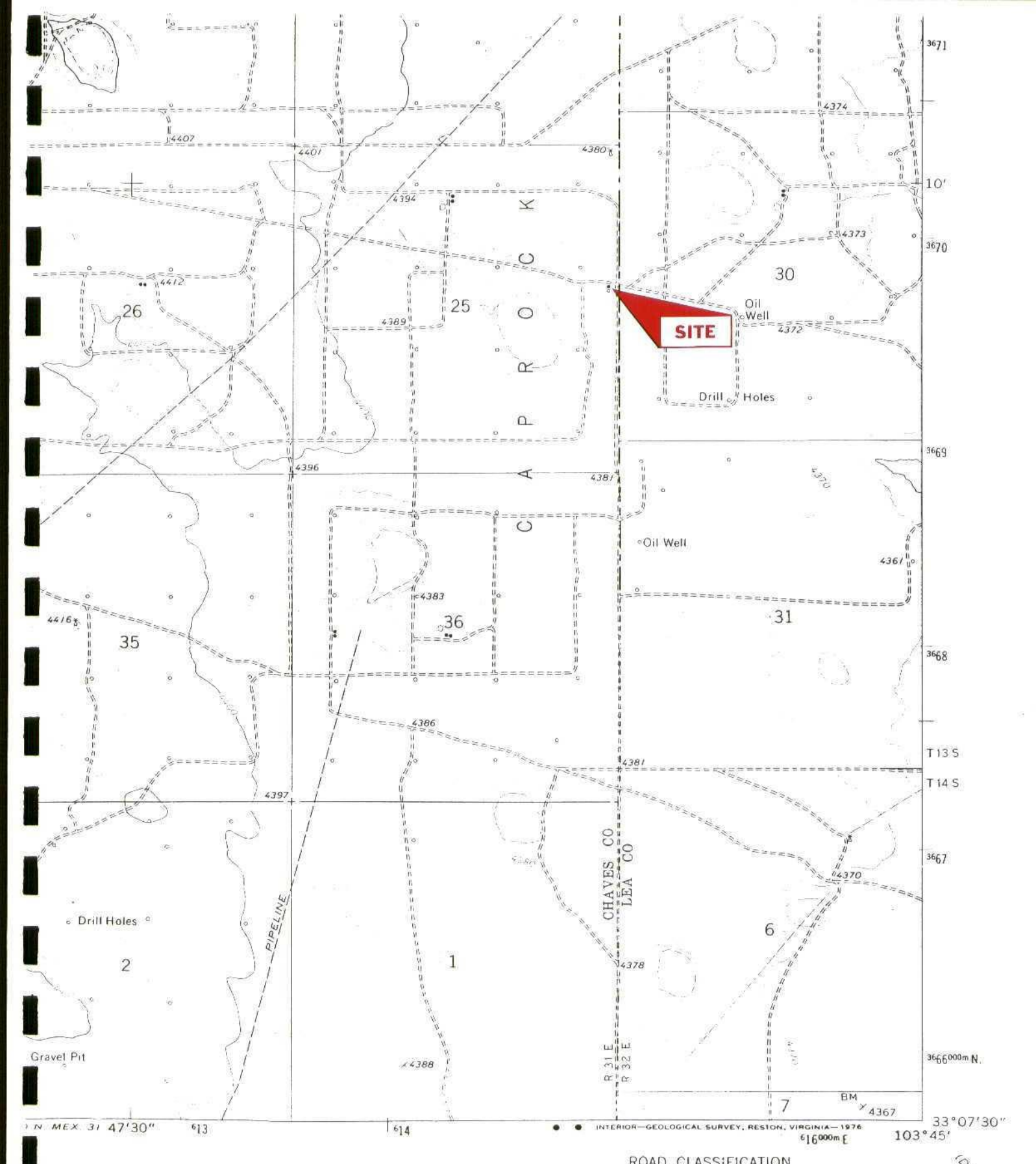
10:30 Tested bottom hole at 28' for TPH, filled out chain of custody, preserved sample for third part confirmation of limit of contamination. Moved to next location (Middle Pit, same location).

IX. Maps and Figures

Vicinity Map
7.5 minute Quadrangle Map
7.5 minute Map with 1 mile radius
Soil Survey Map with Key
Site Plan
Third Party Laboratory Analyticals with Chain of Custody
Atkins Engineering Associates Log of Boring
Photo Key
USGS Water Level Report

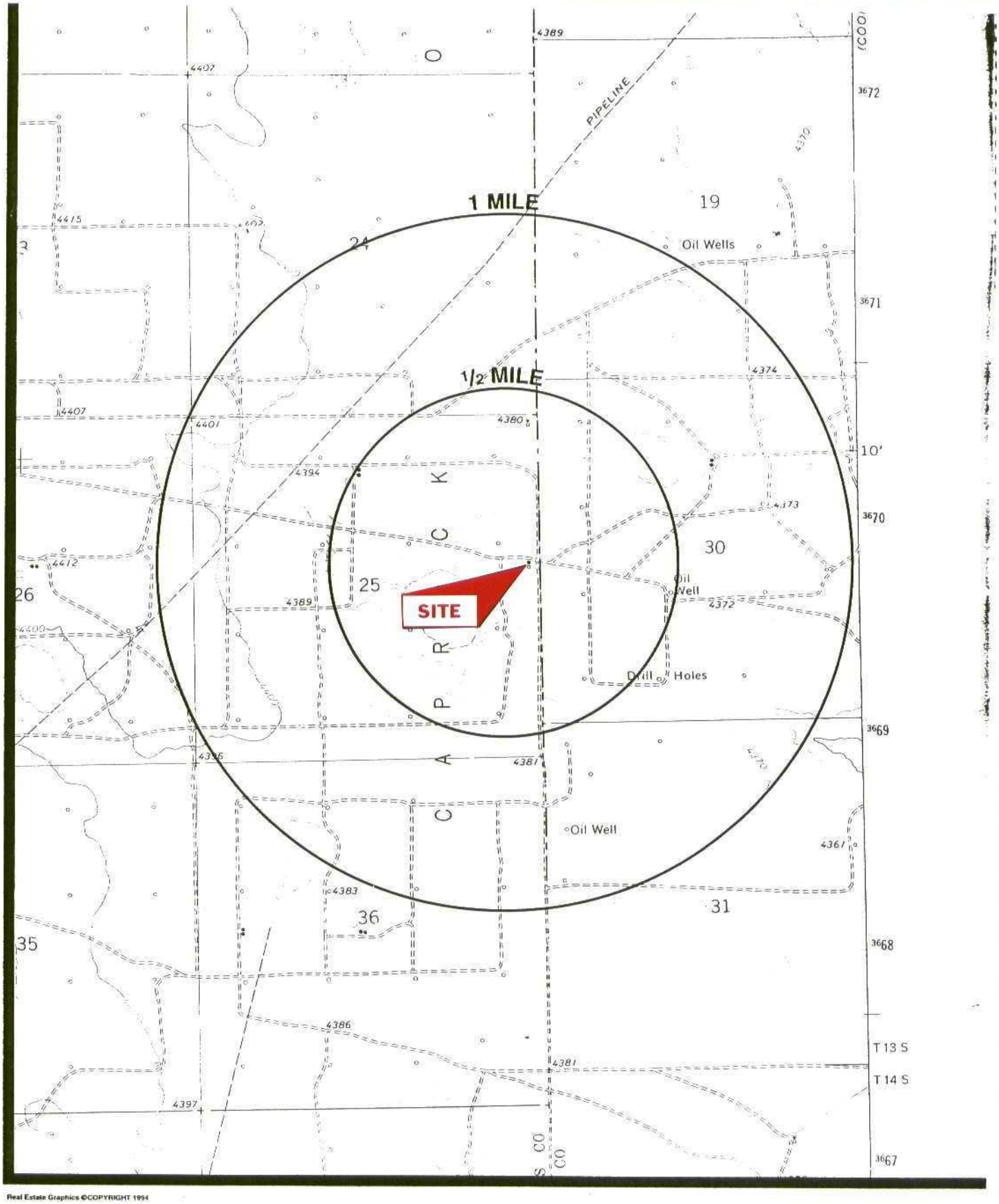
Vicinity Map





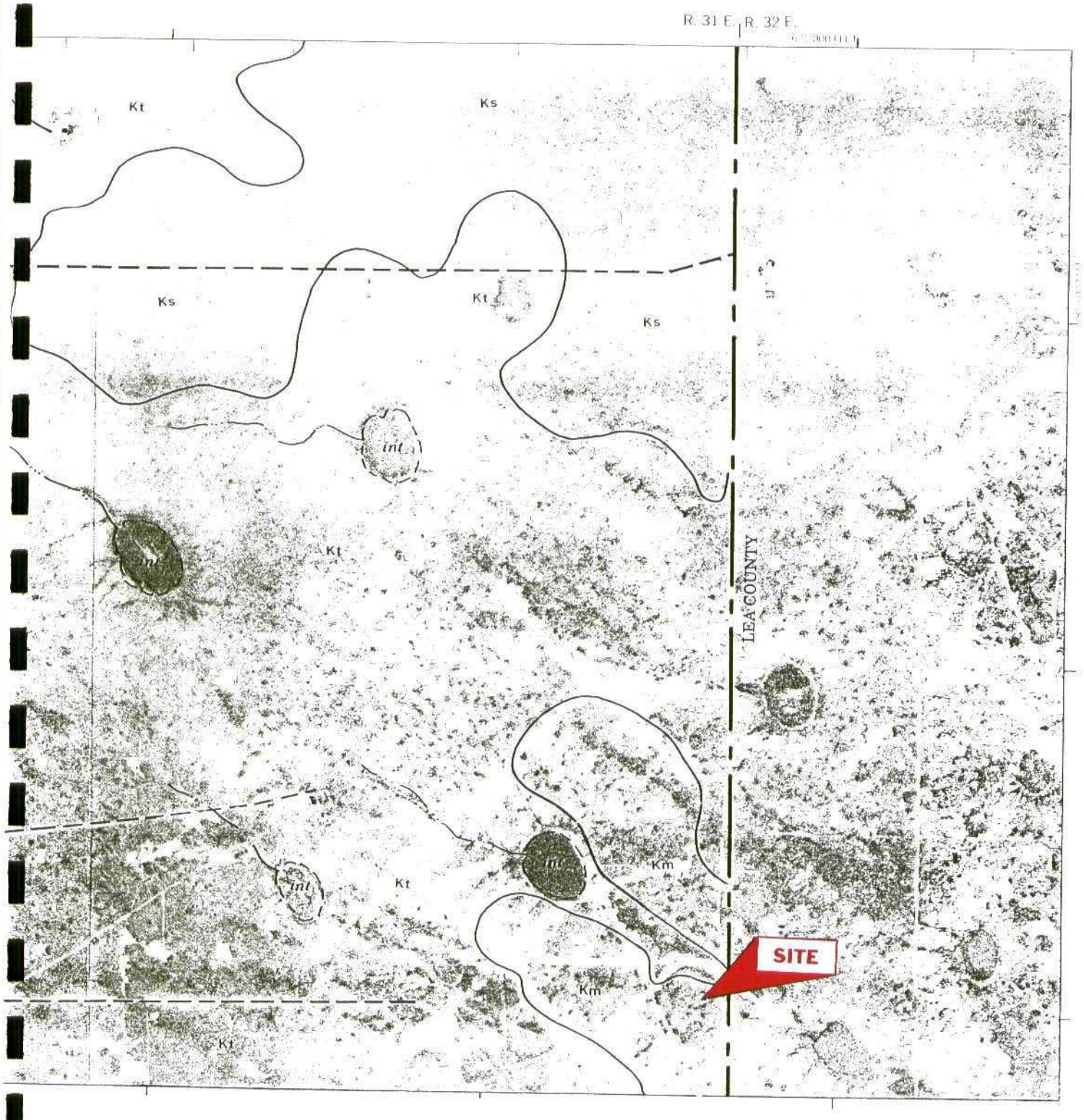
7.5 Minute Quadrangle Map

CAUDILL RANCH, N. MEX.



7.5 Minute Quadrangle Map

Gravel Pit

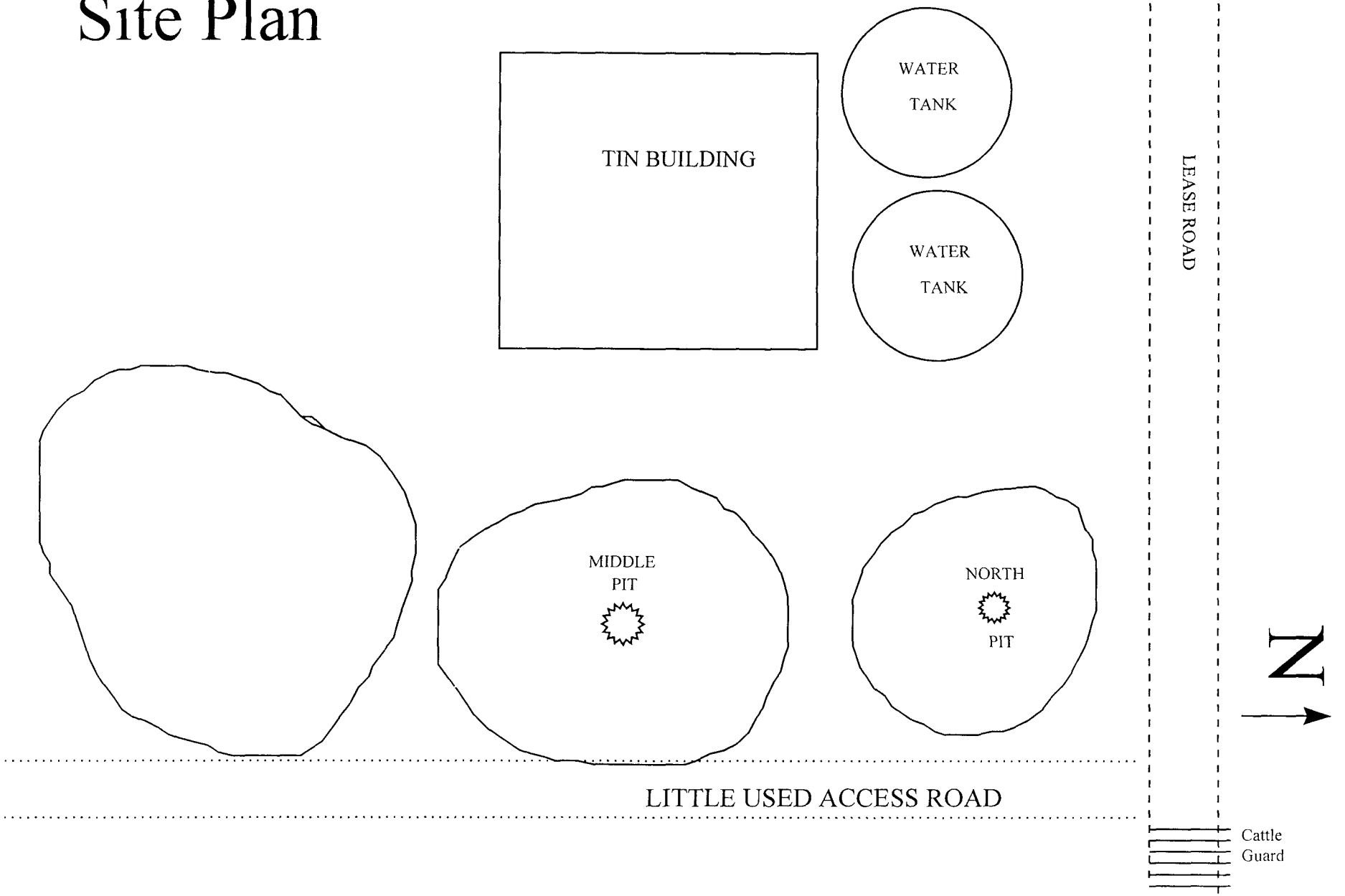


Soil Survey Map

Soil Survey - Chaves County, New Mexico, Southern Part
Soil Type Key

Aa - Alamo loam
AN - Ancho- Penasco association
AtA - Atoka loam, 0 to 1 percent slopes
AtB - Atoka loam, 1 to 3 percent slopes
Ba - Balmorhea loam
Bd - Balmorhea loam, drained
BE - Berino-Cacique association
Bf - Berino-Pintura complex
BgA - Bigetty loam, 0 to 1 percent slopes
BgB - Bigetty loam, 1 to 3 percent slopes
Bh - Bigetty loam, moderately saline
BP - Bigetty-Pecos association
CA - Cuevoland-Ancho association
De - Deama-Rock outcrop complex
DR - Deama-Remunda association
Du - Dune land
EcC - Ector-Rock outcrop complex, 0 to 9 percent slopes
EcD - Ector-Rock outcrop complex, 9 to 30 percent slopes
Fa - Faskin fine sand
FM - Faskin-Malstrom association
Fr - Faskin-Roswell complex
GD - Gabaldon-Dev association
Ge - Glendale fine sandy loam
Gf - Glendale loam
Ho - Holloman loam, thick solum
Hp - Holloman-Gypsum land complex, 0 to 3 percent slopes
HrC - Holloman-Gypsum land complex, 3 to 5 percent slopes
HSE - Holloman-Gypsum land complex, 30 to 50 percent slopes
Im - Ima find sandy loam
Ja - Jal fine sandy loam
Km - Kimbrough gravelly loam
Ks - Kimbrough - Sharvana complex
Kt - Kimbrough-Stegall-Slaughter complex
Lr - Lozier-Reakor complex
Lt - Lozier-Tencee complex
Pa - Pajarito loamy fine sand
Pb - Pajarito-Pintura complex
Pe - Pecos silty clay loam
PfA - Pecos silty clay loam, nonsaline, 0 to 1 percent slopes
PH - Pecos-Dev association
PK - Pena-Penasco association
PL - Penasco-Ancho association
PN - Penasco-Gabaldon association
Ra - Reakor sandy loam
ReA - Reakor loam, 0 to 1 percent slopes
ReB - Reakor loam, 1 to 3 percent slopes
RF - Reakor loam, 0 to 3 percent slopes
Rg - Reakor loam, gravelly subsoil variant
RH - Reakor-Pecos association
RI - Reakor-Tencee association
RkA - Reeves loam 0 to 1 percent slopes
RkB - Reeves loam 1 to 3 percent slopes
RL - Reeves Holloman association
RM - Remunda-Penasco association
Rn - Roswell-Jalmar complex
Ru - Russler silty clay loam
Sh - Shanta silt loam
Sm - Simona fine sandy loam
So - Sotim fine sandy loam
Te - Tencee gravelly sandy loam
TfD - Tencee cobbly loam, 5 to 30 percent slopes
Tg - Tencee-Upton complex
TS - Tencee-Sotim association
TOF - Torriorthents, very steep
UA - Upton- Atoka association
VG - Vinton-Glendale association

Site Plan


TIN BUILDING
WATER TANK
WATER TANK
LEASE ROAD
MIDDLE PIT
NORTH PIT
N
LITTLE USED ACCESS ROAD
Cattle Guard

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DYKE BROWNING
703 E. CLINTON, SUITE 103
HOBBS, NM 88240
FAX TO: 505-393-4388

Receiving Date: 12/11/97
Reporting Date: 12/12/97
Project Number: NORTHLAND OPERATING
Project Name: PIT CLOSINGS
Project Location: 22 MI. N. OF MALJAMAR

Analysis Date: 12/11/97
Sampling Date: 12/10/97
Sample Type: SOIL
Sample Condition: COOL, INTACT
Sample Received By: AH
Analyzed By: BC

LAB NUMBER	SAMPLE ID	TPH (mg/Kg)
H3371-1	N. PIT @ 28' CENTER	<10
H3371-2	MIDDLE PIT @ 20' CENTER	<10
H3371-3	TRACT 20 LINED PIT @ 10' CTR.	<10
H3371-4	TRACT 20 NON-EXEMPT @ 38' DEPTH	458
Quality Control		184
True Value QC		200
% Recovery		92.1
Relative Percent Difference		2.7

METHOD: EPA 418.1, 3510, 3540, or 3550; Infrared Spectroscopy

Chemist

12/12/97
Date

Safety & Environmental Solutions, Inc.

703 E. Clinton, Suite 103, Hobbs, New Mexico 88240
(505)397-0510

H 3371

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Dyke Browning SES, Inc
Phone #: (505) 397-0510
FAX #: (505) 393-4388

Company Name & Address: SES, Inc. (Northland)

Project #: Northland Operating
Project Name: Pit Closures

Project Location: 22 mi N. of Maljamar
Sampler Signature: Dyke Browning

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME	BTEX 8020/602/8240	TPH 418.1	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI
H3371-1	N. Pit @ 25' Center	1			X						X			12/10	10:30		X						
-2	Middle Pit @ 20' Center	1			X						X			12/10	11:30		X						
-3	Tract 20 Lined Pit @ 10' Center	1			X						X			12/10	2:30		X						
-4	Tract 20 Non-Exempt @ 38' depth	1			X						X			12/10	4:15		X						

Relinquished by: Dyke Browning
Date: 12/10/97
Time: ~~10:15~~ 12/11/97 10:15am
Received by: Amy Hill

Relinquished by:
Date:
Time:
Received by:

Relinquished by:
Date:
Time:
Received by Laboratory:

REMARKS: Witnessed by John Rhodes
John E. Rhodes

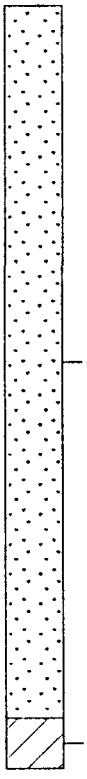
Atkins Engineering Associates, Inc. P.O. Box 3156 Roswell, New Mexico 88202	LOG OF BORING - Test Hole #1 (Page 1 of 1)

Safety Environmental Solutions
c/o EagleEye Monitoring
719 Scott, Suite 624
Wichita Falls, TX 76301
Contact: Mr. John Rhoads Job #97330

Date	: 12-10-97	Site Location	: 22 miles N. of Maljamar, NM
Drill Start	: 9:45 A.M.	Auger Type	: Hollowstem
Drill End	: 11:15 A.M.	Logged by	: Mort Bates
Boring Location	: Rock Queen, S.W.P. #2 N. Pit		

Depth in feet	GRAPHIC	USCS	DESCRIPTION
0			Caliche w/Silty Clay, Brown, Firm, Dry
10			Silty Sandy Clay, Tan, Loose, Damp
30		CL	TD = 30 ft.
50			Note: Test hole inside pit area is 8 ft. below general land surface

Well: TH-1
Elev.:



12-15-1997 c:\mtech46\safetyEnv ctbld2.bor

Northland Operating SWP #2 North Pit - After excavation, looking west towards southwest tank.

East

Water Well Report Data

The information included in this report was compiled from a computerized database supplied by the United States Geological Survey in Albuquerque, New Mexico. This report contains the recorded water wells and the latest water level readings on file with the USGS and the New Mexico State Engineer's office as of December 1997.

CODES FOR WATER-LEVEL STATUS

D - The site was dry (no water level is recorded).
E - The site was flowing recently.
F - The site was flowing, but the head could not be measured (no water level is recorded).
G - A nearby site that taps the same aquifer was flowing.
H - A nearby site that taps the same aquifer had been flowing recently.
I - Injector site (recharge water being injected into the aquifer).
J - Injector site monitor (a nearby site that taps the same aquifer is injecting recharge water).
N - The measurements at this site were discontinued.
O - An obstruction was encountered in the well above the water surface (no water level is recorded).
P - The site was being pumped.
R - The site had been pumped recently.
S - A nearby site that taps the same aquifer was being pumped.
T - A nearby site that taps the same aquifer had been pumped recently.
V - A foreign substance was present on the surface of the water.
W - The well was destroyed.
X - The water level was affected by stage in nearby surface-water site.
Z - Other conditions that would affect the measured water level (explain in remarks).

If no site status is indicated, the inventoried water-level measurement represents a static level.

Location	Date of Recording (Year\Month\Date)	Water Level	Code
13S.32E.02.343344	19960131	128.95	
13S.32E.04.211222	19810206	99.40	
13S.32E.05.23331	19810206	105.86	
13S.32E.06.433343	19810206	126.48	
13S.32E.07.13111	19760421	139.93	

Location	Date of Recording (Year\Month\Date)	Water Level	Code
13S.32E.07.24434	19610323	122.85	
13S.32E.08.311111	19960131	122.97	
13S.32E.09.331131	19810206	133.50	
13S.32E.16.40000	19810206	139.79	
13S.32E.20.411213	**19960312**	**134.05**	
13S.32E.21.332334	19810206	154.54	
13S.32E.22.44223	19710317	136.82	
13S.32E.22.442411	19760421	138.46	
13S.32E.23.43322	19960131	143.46	
13S.32E.24.21411	19810204	143.90	
13S.32E.25.21441	19830104	142.60	
13S.32E.25.21441	19770107	142.62	
13S.32E.28.32000	19810205	163.73	
13S.32E.33.433124	19810205	186.87	
13S.32E.33.433213	19610404	198.57	R
13S.32E.35.14113	19810204	146.83	

***Note: There were no water wells indicated in Range 31 E. These are all of the wells located in Range 32 E, and the bold well is the nearest to the location of the pits.**

NORTHLAND OPERATING COMPANY

ROCK QUEEN UNIT

SALT WATER PLANT #2

PIT CLOSURE

SE/4, NE/4, Section 25, Township 13 South, Range 31 East

Lea County, New Mexico

January 16, 1998

Northland Operating Company
3500 Oak Lawn, Suite 380, L.B. #31
Dallas, Texas 75219-4398
214-521-9959; 214-5221-9960 Fax

January 27, 1998

Ms. Martyne J. Kieling, Environmental Geologist
New Mexico Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Re: Notice of Violations Dated October 22 and 29, 1997
Emergency Pits on the Rock Queen Unit
Chaves and Lea Counties, New Mexico
Findings and Recommendations

Dear Ms. Kieling:

Enclosed are two reports presented to Chris Williams, Director - Hobbs District of the New Mexico Oil Conservation Division ("OCD"), at a meeting in his office Friday, January 23, 1998. These reports contain information regarding the status of the pit closures at the Rock Queen Unit Tract 20 tank battery and Saltwater Plant #2. I understand that you have been provided the sample analysis data, sent directly to you by John Rhoads, as required in your November 6, 1997 and November 24, 1997 letters.

These reports contain all the correspondence, reports, records, test results and analysis completed through January 12, 1998 in closing the pits. Northland Operating Company ("Northland") recommends that we proceed with emptying the non-exempt pit at Tract 20, and back-filling all the pits at Tract 20 and SWP #2. This recommendation is based on the following:

1. No characteristically hazardous attributes were found in the non-exempt pit.
2. Vertical migration of hydrocarbons in the soil is extremely limited.
3. Depth to ground water is estimated to be 150+ feet.
4. Site assessment ranking score is zero (0) for the three pits at SWP #2 and ten (10) for the two pits at Tract 20 (NOTE: ranking of 10 due to distance to surface water).
5. TPH is less than 5000 ppm for all pits at SWP #2.
6. TPH is less than 1000 ppm at 10' below ground level ("BGL") for the lined pit at Tract 20 and at 38' BGL for the non-exempt pit at Tract 20.

At this time, Northland is waiting for OCD approval to proceed with emptying the non-exempt pit and back filling the pits at Tract 20, and at SWP #2. If you need additional information, please contact me at 214-521-9959.

Sincerely,

V. Ed Butler

Enclosures

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Northland Operating Company
3500 Oak Lawn, Suite 380, L.B. #31
Dallas, Texas 75219-4398
214-521-9959; 214-5221-9960 Fax

January 12, 1998

Mr. Chris Williams, Director
New Mexico Oil Conservation Division
P. O. Box 1980
Hobbs, New Mexico 88241

Re: Notice of Violations Dated October 22 and 29, 1997
Emergency Pits on the Rock Queen Unit
Chaves and Lea Counties, New Mexico
Findings and Recommendations

Dear Mr. Williams:

Northland Operating Company ("Northland") has dedicated an enormous effort to address issues raised by the New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division ("OCD") in the Notice of Violations "(NOV") dated October 22, 1997 and October 29, 1997. These NOV's address emergency pits at Rock Queen Unit Tract 20 tank battery and Saltwater Plant (SWP) #2. I wish to share with you our findings to date and to recommend a course of action for completing these pit closures and for future pit closures on these properties.

Liquids were removed and sediments excavated from two unlined pits at SWP #2. Immediately below the bottom of each pit, total petroleum hydrocarbon ("TPH") levels were well below 5000 ppm (see Table 1). Soil borings were taken below the floor of each pit. The north pit was the primary overflow pit and over a period of years had received unmeasured amounts of sediments and skim oil when the saltwater tank over-flowed. The borings determined that vertical migration of hydrocarbons in this soil is extremely limited. In the bottom of the north pit (8' below surrounding ground level), the TPH level was measured as 1870 ppm; at 20' below ground level, TPH concentration measured a mere 13 ppm with a PID measurement of BTEX levels recorded at 12 ppm. An overflow pit to the south of the first pit was likewise tested and yielded similar results: TPH in the bottom of the excavated pit measured 2667 ppm at 6' below ground level and 267 ppm at 10' below ground level. At 20' below ground level, TPH was non-detectable. It is to be noted that these two pits were not lined in any manner.

All liquids and sediments were removed from the Rock Queen Unit Tract 20 exempt pit. This pit had a fiberglass liner, which was also removed. The center of the pit was approximately 7' below ground level after this excavation. A composite sample taken from various spots in the bottom of this pit tested 2000 ppm TPH (See Table 1). Just 3' below the bottom of this pit (10' below ground level), the recorded TPH was 20 ppm.

A second above ground pit at the Tract 20 battery was classified as non-exempt by Ms. Keiling, hydrologist with the New Mexico OCD in Santa Fe. The decision was based on the existence of four plastic buckets in this pit. This necessitated that material in this pit be tested for attributes that would cause the material to be classified as characteristically hazardous. Those tests have now been done and are attached for reference. The sample was tested for TCLP metals, volatiles and semi-volatiles, reactivity, corrosivity and ignitability (see Table 2). The sampled pit material was simply weathered crude oil. The sample was found to contain barium at a level of 0.33 mg/l and benzene at 0.031 mg/l, well below levels of regulatory concern; all other metals, volatiles and semi-volatiles were below detection limits. Tests for reactivity revealed very slight sulfide gas generation (0.002 mg/kg/s). It should be noted that the hydrogen sulfide is present in oil produced from the Queen Sand reservoir. The corrosivity of the sample was measured as a pH of 9.14; ignitability was reported to be in excess of 100 C. Based on these results, we plan to haul the limited amount of material in this pit to Controlled Recovery, Inc. near Hobbs for disposal as a non-hazardous non-exempt material.

Although no material had been removed from this small non-exempt pit, we elected, with the consent of Ms. Keiling, to profile the soil in the vicinity of this non-exempt pit on December 14, 1997. A soil-sampling boring was taken as close as possible to the western edge of this small pit. The results of the drilling lead us to conclude that this small pit is perched on top of a very old pit that was covered decades ago. We found TPH levels of 5000 ppm 5' below ground level (BGL), 20,000 ppm 10' BGL. Drilling continued while the borings were checked both by sight and smell. The soil cleaned up dramatically at 38'. A field analysis of the soil from this depth revealed a TPH of 75 ppm and a PID indication of 25 ppm for BTEX. The laboratory confirmation sample reported 458 ppm TPH.

The above results strongly indicate that vertical migration into the soil of the hydrocarbons produced from the producing reservoir on this property is very slow. Soil and rock conditions under the surface of this land act as an effective barrier to hydrocarbon migration. The asphalt characteristics of this crude oil also significantly impede migration through the soil. Oil that is released quickly weathers and does not demonstrate characteristically hazardous attributes.

The static water level in the windmill 0.4 mile north of our Rock Queen SWP #2 is reported by a Caudill Ranch employee to be at 180' with touchdown below 200'. The closest well in the USGS water survey database is in Section 20, T13S,

R32E (13S.32E.20.411213). Depth to water level in this well was measured at 134.05' on March 12, 1996.

All of the above factors lead us to the conclusion that produced hydrocarbons in the soil in this area represent a very small environmental risk to ground or surface waters. Based on the data we have gathered, we would propose that the remaining pits on these properties be emptied of liquids and sludge and back-filled. This procedure would allow us to close numerous pits quickly and in an environmentally responsible manner.

Please advise if you concur with this conclusion and procedure.

Sincerely,

Ed Butler
Vice President

Enclosures

Table I – Sample Results
Total Petroleum Hydrocarbon (TPH – ppm)

Depth (feet)	SWP #2 North Pit	SWP #2 South Pit	Tract 20 Lined Pit	Tract 20 Non-exempt Pit
Bottom of Pit	1870	2667	2000	N/A
5' BGL	N/A	N/A	N/A	4,000
10' BGL	N/A	267	20	20,000
20' BGL	13	ND	N/A	N/A
28' BGL	53	N/A	N/A	N/A
38' BGL	N/A	N/A	N/A	75 (field) 458 (laboratory)

TPH remediation level 5000 ppm
N/A – sample not taken at this depth
ND – non-detect
All sample results above reflect field measurements except the value labeled as a laboratory result.

Table II – Sample Results
Rock Queen Unit Tract 20
Non-exempt Pit

Constituent or Parameter	Measurement	Regulatory Limit
Barium	0.33 mg/l	100.00 mg/l
Benzene	0.031 mg/l	0.50 mg/l
Reactivity (sulfide)	0.002 mg/l	Detection limit 0.001 mg/l
PH (corrosivity)	9.14	
Ignitability	>212 F	< 140 F
All other metals	ND	
All other volatiles	ND	
All semi-volatiles and herbicides	ND	

ND – non-detect

PIT CLOSURE STATUS REPORT

Rock Queen Unit Saltwater Plant #2
December 19, 1997

On November 18, 19, 20, 21, 25, 26 and 28, 1997, the oil and sludge from the north and middle pits at this location were excavated. The excavated material was hauled to Controlled Recovery Inc. (CRI) near Hobbs, New Mexico. No material was excavated from the third (southern-most) pit at this location. A BTEX soil analysis for a sample (Cardinal Laboratories H3332-1 #1) from the floor of this pit reflected the following: benzene: < 0.002; toluene: < 0.002; ethyl benzene: < 0.002; total xylenes: <0.006 mg/Kg. These levels are well below the 50 ppm BTEX and 10 ppm benzene limits specified in the pit closure guidelines. The test confirmed the visual impression (no visible soil staining) that indicated that this pit had not received any significant quantities of hydrocarbon materials.

The north pit at this location was the primary emergency overflow pit for the facility. Once this pit was filled, overflow from the north pit went to the middle pit. The third (southern-most) pit was the emergency overflow pit for the middle pit. As noted above, the third pit appears not to have been used for some time, if ever.

Middle Pit: A total of 276 yards of material and stained soil was removed from the middle pit and hauled to CRI. After excavation, random soil samples taken from the floor of the pit reflected 2667 ppm TPH (SESI) and 2220 ppm TPH (BBC). Another random soil sample from the pit floor was taken for laboratory BTEX measurements by BBC, International. Cardinal Laboratory (sample H3332-2 #2) reported results for this sample as follows: benzene: < 0.002; toluene: 0.008; ethyl benzene: 0.012; total xylenes: 0.038 mg/Kg. A boring for the purposes of vertically profiling hydrocarbon contamination was made in the bottom of this pit on December 10. At 10' BGL (below ground level), or 4' below the pit floor, TPH in the soil was 267 ppm. At 20' BGL, the TPH in the soil was non-detectable by field measurements, a finding confirmed by Cardinal Laboratory (sample H3371-2: < 10 ppm TPH). Available ground water data from the New Mexico State Engineer's Office in Roswell indicates that groundwater in the area occurs at depths below 160' BGL. The USGS topographical map indicates that surface water is at least 1000' from this pit. Based upon a computed Ranking Score of 0 (see attached score sheet), this pit is ready to be filled.

North Pit: A total of 240 yards of material and stained soil was removed from the north (or primary) pit. A random soil sample from the floor of this pit was taken for BTEX assessment by BBC and submitted to Cardinal Laboratory (sample

H3332-3 #3) with results as follows: benzene: < 0.002; toluene: < 0.002; ethyl benzene: 0.022; total xylenes: 0.089 mg/Kg. Subsequent to this excavation, repairs to the 3000 barrel saltwater storage tank at this facility were deemed necessary and were completed. To facilitate repair to the tank, bottoms from this tank were dumped into the clean pit, mixed with dirt and also hauled to CRI. This resulted in another 300 yards of material being hauled from this pit. A total of 96 yards of sand and 24 yards of cottonseed hulls were hauled into the pit to mix with the tank bottoms so that the material could be loaded and hauled to CRI. Subsequent to this additional work, another soil sample was taken from the new pit floor. The TPH field measurement by SESI was 1870 ppm. A boring for the purposes of vertically profiling hydrocarbon contamination was made in the bottom of this pit on December 10. At 20' BGL (12' below pit floor), a field measurement for TPH yielded 13 ppm; a PID measurement for BTEX yielded 12 ppm. At 28' BGL, these parameters were measured at 53 ppm TPH and 1.4 ppm BTEX via PID. A confirming sample was taken for a laboratory determination of TPH. Cardinal Laboratory (Sample H3371-1) reported less than 10 milligrams/Kg for this sample. This pit is located adjacent to the middle pit described above. Accordingly, the Ranking Score of 0 (see attached ranking score sheet) for this pit implies that it can be covered.

South Pit: Based upon the BTEX analysis of the soil from the floor of this pit and a Ranking Score of 0 (see attached ranking score sheet), this pit is likewise ready to be filled.

Water samples from area sources were also analyzed for the presence of hydrocarbons. Samples were taken from the windmill 0.4 miles north of this facility, from the windmill 2.2 miles south-southeast of this facility and from the fresh water playa to the northeast. The BTEX levels were less than 1.0 micrograms/Liter in all three samples. A check of chlorides and total dissolved solids (TDS) in the water from the fresh water playa revealed chlorides at 5500 ppm, TDS at 9900 ppm.

District I
P.O. Box 1980, Hobbs, NM
District II
P.O. Drawer DD, Artesia, NM 88211
District III
1000 Rio Brazos Rd, Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

SUBMIT 1 COPY TO APPROPRIATE DISTRICT OFFICE AND 1 COPY TO SANTA FE OFFICE

(Revised 3/9/94)

PIT REMEDIATION AND CLOSURE REPORT

Operator: _____ Telephone: _____

Address: _____

Facility Or: _____
Well Name

Location: Unit or Qtr/Qtr Sec_____ Sec___ T___ R____ County_____

Pit Type: Separator___ Dehydrator___ Other_____

Land Type: BLM___, State ___, Fee ___, Other_____

Pit Location: (Attach diagram)
Pit dimensions: length_____, width _____, depth _____
Reference: wellhead___, other _____
Footage from reference: _____
Direction from reference: _____ Degrees ___ East North ___ of ___ West South ___

Depth To Ground Water: (Vertical distance from contaminants to seasonal high water elevation of ground water)	Less than 50 feet (20 points) 50 feet to 99 feet (10 points) Greater than 100 feet (0 Points)	0
Wellhead Protection Area: Less than 200 feet from a private domestic water source, or; less than 1000 feet from all other water sources)	Yes (20 points) No (0 points)	0
Distance To Surface Water: (Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches)	Less than 200 feet (20 points) 200 feet to 1000 feet (10 points) Greater than 1000 feet (0 points)	0
	RANKING SCORE (TOTAL POINTS):	0

ROCK QUEEN SWP #2 PIT CLOSURE

Date	Description of Work	Cost
11/16/97	Haul trailer to location. Take alarm systems	$700
11/17/97	Assembled alarm systems. Photographed and measured pits. SWP #2 South pit - no staining, 72'X66'X9'. Middle pit - fairly empty, 40'X33'X7', North pit - working pit, 24'X33'X?'. Built road into middle pit. Cotton seed hulls on location to line trucks. Took fence down. Picked up cell phones for alarm system.	$1,336
11/18/97	MI track hoe and 20 yd and 14 yd dump trucks. Lined beds w/ plastic. Loaded both trucks and hauled to CRI. Caught water sample @ windmill 0.4 mi N, and 2mi S and .85 mi E of SWP #2, and @ playa lake 1600+' E of SWP #2.	$1,852
11/19/97	Excavated and hauled 102 yds BS from both pits @ SWP #2.	$4,987
11/21/97	Excavated and hauled 76 yds from pits @ SWP #2. Caught soil samples and sent to BBC for TPH and BTEX.	$4,168
11/21/97	Excavated and hauled 226 yds from North pit @ SWP #2. Total hauled, North pit 240 yds, Middle pit 204 yds.	$9,300
11/24/97	Emptied BS from 3000 bbl tank into North pit so tank could be repaired. Will have to remove with trackhoe.	- $250
11/25/97	MI track hoe. Excavated BS from dumped to pit from tank.	$3,000
11/26/97	Excavated and hauled BS 44 yds.	$2,000
11/27/97	SD for Holliday.	
11/28/97	Excavated and hauled 276 yds from North pit and 82 yds from middle pit. Repaired tank. Released equipment. Ready for soil test.	$18,700
12/10/97	Conducted soil borings in North and middle pits.	$3,270
		$49,563

ROCK QUEEN SWP #2 PIT CLOSURE

Date	Description of Work	Cost
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11/17/97	Assembled alarm systems. Photographed and measured pits. SWP #2 South pit - no staining, 72'X66'X9'. Middle pit - fairly empty, 40'X33'X7', North pit - working pit, 24'X33'X?'. Built road into middle pit. Cotton seed hulls on location to line trucks. Took fence down. Picked up cell phones for alarm system.	$1,336
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		$49,563

Safety & Environmental Solutions, Inc.

December 11, 1997

Northland Operating Co.
3500 Oaklawn LB #31
Dallas, TX 75219-4938
Attention: Mr. Bob McKnight

cc: John Rhoads
719 Scott Suite 624
Wichita Falls, TX 76301

12/09/97
1:00 pm - met with Twister of B&H at Maljamar to excavate ramps into pits on Northland property.
2:30 pm - arrived at pits on Northland property, B&H unloaded. (Truck trouble caused lateness).
Surveyed pits for potential problems, checked bottoms, talked with Ed Marlens.
3:30 pm - Returned to office. Mileage to pits is 74 one-way.
12/10/97
9:00 am -Met Mort Bates (of Atkins Engineering) at Hagerman cutoff to lead them into location.
9:30 am - met Twister and John Rhoads at pit location. Surveyed eastern pits and had Twister provide ramp into Tract 20 lined pit, and move westernmost wall of non-exempt pit for drilling for vertical extent.
10:00 am - talked with Martine Keiling of the OCD regarding closure of drill holes. She gave verbal okay to bentonite plug the bottom, then grout the last five feet at surface. She also gave us permission to TCLP sample the non-exempt pit on this date.
10:30 am - talked with Wayne Price at OCD, he indicated that he did not know if he would come out to location or not.
9:30-11:30 am - drilled for vertical extent on North pit at Rock Queen Salt Water Plant (SWP) #2. Drilling was as close to center of pit as was possible by estimation. Test results are as follows:

Depth	Type of Test Conducted	Result
0-6" (Surface)	TPH	1870ppm
20'	TPH	13 ppm
28' (bottom)	TPH	53 ppm
20'	PID	12 ppm
28'	PID	1.4 ppm

Safety & Environmental Solutions, Inc.

1:00 pm - talked with Martine Keiling of OCD regarding defining vertical extent on the non-exempt pit. She gave verbal approval to the location of the drill hole on the west side of the diked area as near to center as possible.

11:30-1:30 pm - drilled for vertical extent on Middle pit at Rock Queen Salt Water Plant (SWP) #2. Drilling was as close to center of pit as was possible by estimation. Test results are as follows:

Depth	Type of Test Conducted	Result
0-6" (Surface)	TPH	2667ppm
10'	TPH	267 ppm
20'	TPH	Nil (0.007 abs. on 20gm sample)

1:30 - 3:00 pm - drilled for vertical extent on Tract #20 lined pit at Rock Queen Unit. Drilling was as close to center of pit as was possible by estimation. Test results are as follows:

Depth	Type of Test Conducted	Result
0-6" (Surface)	TPH	2000ppm
10'	TPH	20 ppm

3:00 - 5:00 pm - drilled for vertical extent on Tract #20 non-exempt pit at Rock Queen Unit. Drilling was as close to pit as was possible by removing west edge of pit and getting as close to center as possible by estimation. Test results are as follows:

Depth	Type of Test Conducted	Result
0-6" (Surface)	None	Visible contamination obvious
5'	TPH	4000 ppm
10'	TPH	20,000 ppm
38' (bottom)	TPH	75 ppm
38' (bottom)	PID	25 ppm

This pit cleaned up visually between 30 and 38 feet in depth of drilling.

5:15 pm - collected business cards from contractors and from John Rhoads, released Atkins drilling rig, returned to office.

Dyke A. Browning - REM,CEI
12/12/97

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DYKE BROWNING
703 E. CLINTON, SUITE 103
HOBBS, NM 88240
FAX TO: 505-393-4388

Receiving Date: 12/11/97
Reporting Date: 12/12/97
Project Number: NORTHLAND OPERATING
Project Name: PIT CLOSINGS
Project Location: 22 MI. N. OF MALJAMAR

Analysis Date: 12/11/97
Sampling Date: 12/10/97
Sample Type: SOIL
Sample Condition: COOL, INTACT
Sample Received By: AH
Analyzed By: BC

LAB NUMBER	SAMPLE ID	TPH (mg/Kg)
H3371-1	N. PIT @ 28' CENTER	<10
H3371-2	MIDDLE PIT @ 20' CENTER	<10
H3371-3	TRACT 20 LINED PIT @ 10' CTR.	<10
H3371-4	TRACT 20 NON-EXEMPT @ 38' DEPTH	458
Quality Control		184
True Value QC		200
% Recovery		92.1
Relative Percent Difference		2.7

METHOD: EPA 418.1, 3510, 3540, or 3550; Infrared Spectroscopy

Chemist

12/12/97
Date

H3371XLS

Safety & Environmental Solutions, Inc.

703 E. Clinton, Suite 103, Hobbs, New Mexico 88240
(505)397-0510

H 3371

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Dyke Browning SES, Inc
Phone #: (505) 397-0510
FAX #: (505) 393-4358

Company Name & Address: SES, Inc (Northland)

Project #: Northland Operating
Project Name: Pit Closures

Project Location: 22 mi N. of Maljamar
Sampler Signature: Dyke Browning

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME	ANALYSIS REQUEST: TPH 418.1	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI
H3371-1	N. Pit @ 28' Center	1			X						X			12/10	10130	X						
-2	Middle Pit @ 20' Center	1			X						X			12/10	1130	X						
-3	Tract 20 Lined Pit @ 10' Center	1			X						X			12/10	2130	X						
-4	Tract 20 Non-Exempt Pit @ 38' depth	1			X						X			12/10	4:15	X						

Relinquished by:	Date:	Time:	Received by:
Dyke Browning	12/10/97	~~10:15~~ 12/11/97 10:15am	Amy Hill
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by: Laboratory:

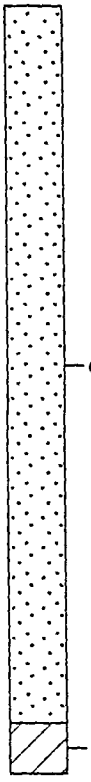
REMARKS: Witnessed by John Rhodes
John E. Rhodes

DEC-19-97 FRI 10:37 Safety & Environmental S P.04

Atkins Engineering Associates, Inc. P.O. Box 3156 Roswell, New Mexico 88202	LOG OF BORING - Test Hole #1 (Page 1 of 1)
Safety Environmental Solutions c/o EagleEye Monitoring 719 Scott, Suite 624 Wichita Falls, TX 76301 Contact: Mr. John Rhoads Job #97330	Date : 12-10-97 Site Location : 22 miles N. of Maljamar, NM Drill Start : 9:45 A.M. Auger Type : Hollowstem Drill End : 11:15 A.M. Logged by : Mort Bates Boring Location : Rock Queen, S.W.P. #2 N. Pit

Depth in feet	GRAPHIC	USCS	DESCRIPTION
0			Caliche w/Silty Clay, Brown, Firm, Dry
10			Silty Sandy Clay, Tan, Loose, Damp
30		CL	TD = 30 ft.
50			Note: Test hole inside pit area is 8 ft. below general land surface

Well: TH-1
Elev.:



12-15-1997 c:\mitech46\safetyEnv odbid2.bor

Atkins Engineering Associates, Inc. P.O. Box 3156 Roswell, New Mexico 88202	LOG OF BORING - Test Hole #2 (Page 1 of 1)

Safety Environmental Solutions
c/o EagleEye Monitoring
719 Scott, Suite 624
Wichita Falls, TX 76301
Contact: Mr. John Rhoads Job #97330

Date	: 12-10-97	Site Location	: 22 miles N. of Maljamar, NM
Drill Start	: 12:00 Noon	Auger Type	: Hollowstem
Drill End	: 1:55 P.M.	Logged by	: Mort Bates
Boring Location	: Rock Queen, S.W.P. #2 middle Pit		

Well: TH-2
Elev.:

Depth in feet	GRAPHIC	USCS	DESCRIPTION
0			Caliche w/Silty Clay, Brown, Firm, Dry
5			Caliche w/Silty Sandy Clay, Tan, Loose, Dry
			Caliche Rock, Hard, Dry
10			Silty Sandy Clay, Tan, Loose, Dry
15		CL	
20			
			TD = 22 ft.
25			
30			
35			
40			
45			
50			

Grouted top 5 ft.
Backfilled w/drill cuttings
Bentonite seal last 2 ft.

Note: Test hole inside pit area is 6 ft. below general land surface

12-15-1997 c:\vntech46\safetyEnv ath\id3.bor

State Engineers Office District II
Roswell, New Mexico
December 1, 1997

Data regarding water well records was necessary to establish the risk factor (ranking) necessary to establish the requisite TPH levels during closure of pits operated by Northland Operating Company in Lea and Chaves County, New Mexico. The data found in the offices referenced above follow.

Lea County
T13S, R32E

Tract 20, Rock Queen Unit Pit Closures (two pits)

Section	Spot	Elevation (feet)	Depth (feet)
8	311111	4364.8	190
20	411213	4335.2	170
21	332334	4336.1	234
22	44223	4305.7	not given
22	442411	4306	205
23	43322	4309	185
24	21411	4304.7	not given
25	21441	4297.4	170
28	32000	4344	227
33	433213	4340	273
33	433124	4341	260
35	14113	4299	not given

Chaves County
T13S, R31E

Tract 20 and Saltwater Plant #2 (three pits)

Section	Spot	Elevation (feet)	Depth (feet)	
2	242443	4411	196	Only well found of record in T13S, R31E in printout (see below)

Chaves County
T14S, R31E

Section	Spot	Elevation (feet)	Depth (feet)	Highest recorded
13	222214	4364.4		222.95
14	134432	4302.9	165	
23	42144	4395.0	292	255.8
24	13214	4382.8	n/a	250.12
24	222111	4377.4	n/a	230
24	44242	4369.6	n/a	204
25	4124334	4375.8	350	240
26	31431	4399.9	n/a	259.29
28	44323	4312.2	n/a	168.46
30	11313	4070.1	n/a	263
33	13231	4311.5	n/a	170

35	333331	4395	374	266

The above data came from the USGS printout reports. The following data was gleaned from the reports filed by water well drillers, data that evidently has not been entered into the computer system.

Chaves County, New Mexico
T13S, R31E

Section	Total depth	Spot	Strata	Comments
1	280'	SE/4 NE/4 SW/4	140-220	Brown quick sand
1	190'	SE/4 NE/4 SW/4	142-150	Brown sand
			165-188	Dirty
1	220'	SE/4 SW/4 SE/4	140-220	Brown quick sand
1	217'	NE/4 NE/4	180-216	Fairly clean brwn sd
2	196'	SE/4 NE/4	152-195	Brown Sand
2	216	SE/4 SE/4 SE/4	150-216	Course whte sand
15		42000; dry hole drilled by Great Western on N. Central Cap Oil Unit 15, well #9, 1980' FSL & 660' FEL; 4421' elevation		
34	182.5'	22444; dry hole drilled by Johnny Owen; no elevation		

Chaves County, New Mexico
T14S, R31E

Section	Total Depth	Spot	Strata	Comments
12	340'	12444; dry hole (7/57) Cities Service Oil - red beds		
13	322'	444; dry hole (8/57) Cities Service Oil - plugged holes by filling with 'rubble'.		
23	301'	242	270-301	Clyde Zimmerman
23	340'	420	258-290	Bill Zimmerman
			304-328	
23	292'	421	250-260 & 276-280	
24	300'	132	255-290 & 290-300	Kerby & Sons
24	336'	310	264-270 & 280-312	Cities Service (8/60)
24	340'	320	260-334	Cities Service (4/60)
25	350'	410	278-314, 326-338 & 343-345	Union Oil
33	324'	4 (SE/4)	288-324	KBIM-TV
34	290'	230	260-290	Conoco
34	350	444413	260-324	O'Neil Oil Co.
36	343'	214	282-341	John Trigg

5

CARDINAL LABORATORIES

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

Soil

ANALYTICAL RESULTS FOR
BBC INTERNATIONAL
ATTN: JOE FRANK DEAN
P.O. BOX 297
HOBBS, NM 88240
FAX TO: 505-397-0397

Receiving Date: 11/21/97
Reporting Date: 11/24/97
Project Number: NOT GIVEN
Project Name: NORTHERN OPERATION
Project Location: NOT GIVEN

Analysis Date: 11/21/97
Sampling Date: 11/21/97
Sample Type: SOIL
Sample Condition: COOL, INTACT
Sample Received By: AH
Analyzed By: AH

LAB NUMBER	SAMPLE ID	TPH (mg/Kg)
H3328-1		2220
Quality Control		212
True Value QC		200
% Recovery		106
Relative Percent Difference		0.6

METHOD: EPA 418.1, 3510, 3540, or 3550; Infrared Spectroscopy

middle Pit
SNP #2
under 5000
in ranking scheme
(1) more than 1000' from playa water (edge?)
(2) depth to fresh water 160' (highest)

Chemist

11/24/97
Date

CARDINAL LABORATORIES

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

Soil

ANALYTICAL RESULTS FOR
BBC INTERNATIONAL
ATTN: JOE FRANK DEAN
P.O. BOX 297
HOBBS, NM 88241-0297
FAX TO: 505-397-0397

Receiving Date: 11/24/97
Reporting Date: 12/01/97
Project Number: NOT GIVEN
Project Name: NORLAND OPERATING
Project Location: SALT WATER PIT #2

Sampling Date: 11/24/97
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: JS
Analyzed By: BC

SWP #2
Pit:

LAB NUMBER	SAMPLE ID	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)	
ANALYSIS DATE		11/25/97	11/25/97	11/25/97	11/25/97	
H3332-1	#1	<0.002	<0.002	<0.002	<0.006	← South
H3332-2	#2	<0.002	0.008	0.012	0.036	← middle
H3332-3	#3	<0.002	<0.002	0.022	0.089	← North
Quality Control		0.101	0.090	0.094	0.276	
True Value QC		0.100	0.100	0.100	0.300	
% Accuracy		101	90	94	92	
Relative Percent Difference		0.9	11.1	6.4	0.5	

METHOD: EPA SW 846-8020, 5030, Gas Chromatography

Chemist

12/1/97
Date

Swp #2

Water from { windmill 0.4mi N / windmill 2.2mi SE / Playa lake

SUMMARY REPORT

CLIENT : North Texas Chemical Consultants Le JOB NUMBER : D97-14250
PROJECT : JR-000 REPORT DATE : 30-NOV-1997

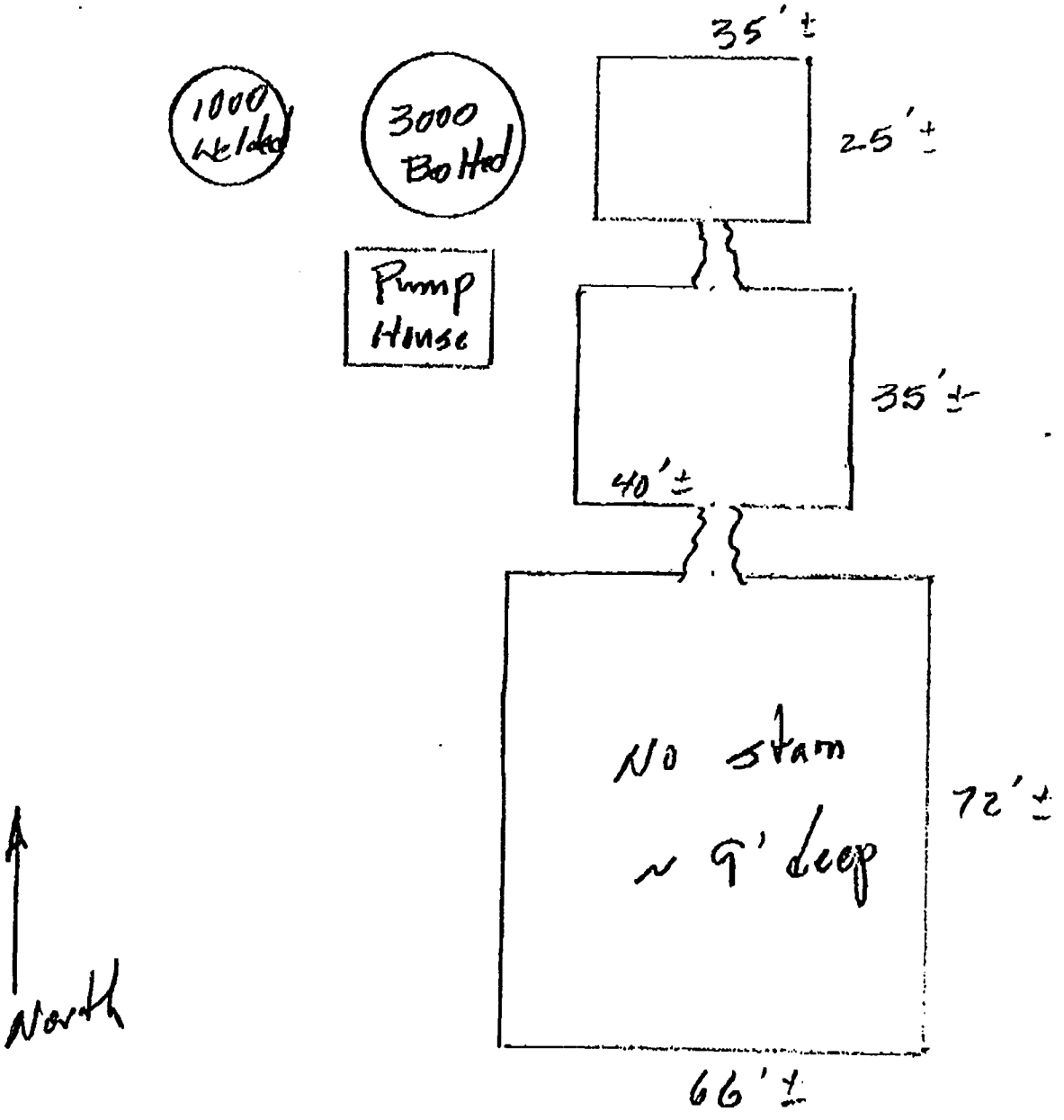
SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	JR001	Water	21-NOV-1997
2	JR002	Water	21-NOV-1997
3	JR003	Water	21-NOV-1997

BTEX ANALYSIS, EPA 8020B			1 1.4mile N		2 2.2mile SE		3 Playa
Benzene	ug/L	<	1.0	<	1.0	<	1.0
Toluene	ug/L	<	1.0	<	1.0	<	1.0
Ethyl benzene	ug/L	<	1.0	<	1.0	<	1.0
Xylenes	ug/L	<	1.0	<	1.0	<	1.0
BTEX (total)	ug/L	<	1.0	<	1.0	<	1.0
Bromofluorobenzene	%		99.6		99.1		101

No detectable BTEX in any water samples

Note: TDS for playa about 9980 ppm — cc 5500 ppm at upper limit

Pits - Saltwater Plant ±2



Scale: 1 cm = 10 ft.

JER 11/19/97

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

November 6, 1997

CERTIFIED MAIL
RETURN RECEIPT NO. P-326-936-364

Mr. Robert E. McKnight
Northland Operating Company
3500 Oak Lawn
Suite 380
Dallas, TX 75219-4398

RECEIVED
11-11-97

RE: Pit Closure
Northland Operating Company
SE/4, NE/4, Section 25, Township 13 South, Range 31 East, NMPM
Chaves County, New Mexico

Dear Mr. McKnight:

The New Mexico Oil Conservation Division (OCD) has received the Northland Operating Company (Northland) letter dated October 30, 1997 regarding the pit closures at the above referenced location. According to the information supplied by Northland and the fact that there were no drums, buckets or containers in the pits at the above referenced location the OCD agrees with Northland's determination that the waste is exempt oilfield waste.

In addition, The concepts proposed in the Northland pit closure outline are hearby tentatively approved. However, final approval of the closure plan will be deferred until sample analysis are received and evaluated from Step IV, proposed in the pit closure outline. At such time Northland shall clarify Step V of the pit closure plan. Northland may proceed with Steps I-IV and VII proposed in the pit closure outline. Northland shall submit the sample analysis data and clarification to Step V to the OCD Santa Fe office and a copy to the Hobbs District office **no later than January 20, 1998**.

If you require any further information concerning closure procedures please contact me at (505) 827-7153.

Sincerely,

Martyne J. Kieling
Environmental Geologist

xc: Hobbs OCD Office
Ed Morney, Field Superintendent, Northland, P.O. Box 119, Maljamar, NM 88264

Final Copy

NORTHLAND OPERATING CO.

3500 Oak Lawn, Suite 380, LB #31
Dallas, Texas 75219-4398
214-521-9959; 214-521-9960 Fax

October 30, 1997

Ms. Martyne J. Kieling, Environmental Geologist
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Re: Unauthorized Waste Disposal Pits
SE/4 of NE/4, Section 25, T13S, R31E
Chaves County, New Mexico

Dear Ms. Kieling:

We are in receipt of your letter dated October 22, 1997 regarding the inspection on September 22, 1997 by yourself and other employees of the OCD, representatives of the U. S. Environmental Protection Agency and the U. S. Fish & Wildlife Commission. This letter is to inform you of the steps we have taken to address the issues raised as a result of that inspection, to respond to your request for information, and to outline our plans for closing the three pits at this location.

As was evident during your inspection, the north and middle pits of the three small pits just east of the saltwater facility have been used as emergency overflow pits for the single saltwater storage tank at this site. We did not feel that it would be prudent to close these pits before providing emergency storage for the operational mishaps that occur from time to time. Without emergency storage, we would be faced with an *un-contained* release of saltwater to the surface of the land. Accordingly, we have already set a tank for the collection of the fluids coming from the operation of the saltwater pump at this facility. This tank will be equipped with a sump pump to transfer any such fluids back into the storage tanks. We have arranged for an additional 1000 barrel emergency overflow tank to be set (complete with a liner and secondary containment) to the west of the existing tank. This tank will be operational within the next few days. We have ordered an alarm system for this facility to provide our operational personnel with an early warning when abnormal operational conditions occur. The alarm system is scheduled to be in place within ten days.

Answers to the four questions posed at the top of the second page of your letter are as follows:

1) "the names and addresses of all waste generators who are utilizing the pits" -
Northland Operating is the only known current user of these pits, whose address is that noted in the above letterhead.

2) "the names and addresses of all waste transporters;" -
It is assumed on our part that you are asking if waste is hauled into and disposed of in these pits by others. No other waste is placed in these pits other than produced water (occasionally skim oil and miniscule amounts of lube oil) from wells operated by Northland on the Rock Queen Unit.

3) "the location of all waste generation (exact well locations);" -
Attached please find a plat (showing the well spots within the section, township and range) of the currently producing wells that generate saltwater for disposal by this facility.

4) "the total volume of waste from each location that has gone into the unauthorized pits." -
Northland Operating company has no records that would allow us to answer this question even for the short period of time we have operated this property. Prior operators likewise did not keep such records.

An outline of our pit closure plan is also enclosed. Please advise if our plan is deficient in any way or lacks essential elements.

Sincerely,

Robert E. McKnight
Engineer

cc: Mr. Wayne Price, OCD, Hobbs

NORTHLAND OPERATING COMPANY
Pit Closure Outline
October 30, 1997

Step I: Finish setting overflow tank at the site to preclude further saltwater releases to the emergency pit.

Step II: Empty the north-most and the middle pit of all liquids that can be pulled with a vacuum truck. Liquids (predominately produced saltwater) will to be hauled to CRI in Hobbs.

Step III: With 'track-hoe', excavate sludge material and haul to CRI in Hobbs for possible oil reclaimation or land farming. Provisions will be taken to ensure that no fluids are lost during transportation. An accounting of all materials removed shall be made and appropriate records kept.

Step IV: Starting with the south-most pit, core samples will be taken at the southeast edge of each pit to determine the vertical extent of contamination. Samples will be taken at 10' intervals and detection of TPH and BTEX will utilize field instrumentation for screening purposes. Once the field instrumentation indicates TPH and BTEX levels at or below levels of regulatory concern, confirmation samples will be sent to a laboratory for testing in compliance with EPA standards and protocols.

Step V: The results of the vertical profiling will determine which method of remediation will be most effective for each of the three pits at this site. If feasible, subsurface media contaminated at levels above those of regulatory concern will be brought to the surface, placed on impervious liners and remediated on-site. It is reported that solid rock is in the near surface; rock may be difficult to 'remediate'. If on-site remediation is not feasible, the operator would like to retain the flexibility to haul material to a licensed disposal facility (tentatively CRI in Hobbs), to blend with other soils or gravel to levels below regulatory concern for use as road material, or to propose a closure protocol that includes contamination plume migration modeling if feasible and allowable.

Step VI: If additional material is needed to fill these pits to grade level as a result of the excavation and hauling of material from these pits, materials will be purchased from a local private source for back-filling these pits. Pits will be brought to or above grade and re-seeded with native or improved dry-land grasses.

Step VII: The District Office of the OCD will be contacted anytime material is to to hauled off-site or when sampling is to be done. Photographs will be taken at appropriate stages during the entire process.

Northland Operating Company
Pit Closure Outline
October 30, 1997

Step VIII: A final report documenting all the work performed during the pit closures will be submitted to the New Mexico OCD.


Range 31 East
Range 32 East
24
19
25
30
36
31
Northland Operating Company
Dallas, Texas
Wells marked green are active producing wells at this time (October 29, 1997) that produce saltwater that is ultimately disposed via the facilities at Rock Queen Unit Saltwater Plant #2 (noted in red).
Chaves and Lea Counties
New Mexico
Scale: 1,320' per inch
(4" per mile)

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

October 22, 1997

CERTIFIED MAIL
RETURN RECEIPT NO. P-326-936-350

Mr. Robert E. McKnight
Northland Operating Company
3500 Oak Lawn
Suite 380
Dallas, TX 75219-4398

RE: NOTICE OF VIOLATION
Unauthorized Waste Disposal Pits
Northland Operating Company
SE/4, NE/4, Section 25, Township 13 South, Range 31 East, NMPM
Chaves County, New Mexico

Dear Mr. McKnight:

On September 22, 1997 The New Mexico Oil Conservation Division (OCD), identified three unauthorized, unlined waste disposal pits located in the SE/4, NE/4, Section 25, Township 13 South, Range 31 East, NMPM, Chaves County, New Mexico (see attached map). These unauthorized pits are owned by Northland Operating Company (Northland).

OCD personnel performed an onsite inspection of the facility on September 22, 1997 and noted the following:

1) These unlined pits owned by Northland are being utilized on land that according to county records is private land;
2) These pits are accepting oilfield waste;
4) These pits were not screened or netted;
5) Thirty-six birds were collected within one pit by the US Fish and Wildlife.

Surface waste management facilities must be permitted pursuant to Rule 711 (as amended 1-1-96). In addition, pursuant to the OCD Order R-8952, all tanks exceeding 16 feet in diameter and all exposed pits and ponds shall be screened, netted or covered unless rendered non-hazardous to migratory birds. Order R-3221, as amended, prohibits the disposal of water produced in conjunction with the production of oil and gas in unlined pits or ponds where such disposal may impact fresh water supplies of the state of New Mexico. Therefore, all discharges into the unauthorized, unlined pits must cease.

The OCD hearby requires Northland Operating Company to submit the following information: 1) the names and addresses of all waste generators who are utilizing the pits; 2) the names and addresses of all waste transporters; 3) the location of all waste generation (exact well locations); and 4) the total volume of waste from each location that has gone into the unauthorized pits.

In addition, Northland Operating Company must either permit the facility as a waste management facility or close the pits. Regardless of whether the facility is to be permitted or closed, Northland must submit a closure plan to the Santa Fe OCD office and a copy to the Hobbs District office. Included in the closure plan must be a plan for determining the nature and extent of contamination that has left the pits, how far the contamination has migrated. For your use please find enclosed a copy of the Order amending Rule 711, a form C-137 and OCD's pit closure guidelines. **A response is required by Northland Oil Corporation to these deficiencies by November 3, 1997.**

Failure to respond to this notice of violation by November 3, 1997 may result in a show cause hearing against Northland, requiring Northland to appear and show cause why it should not be ordered to close these pits and why it should not also be assessed civil penalties.

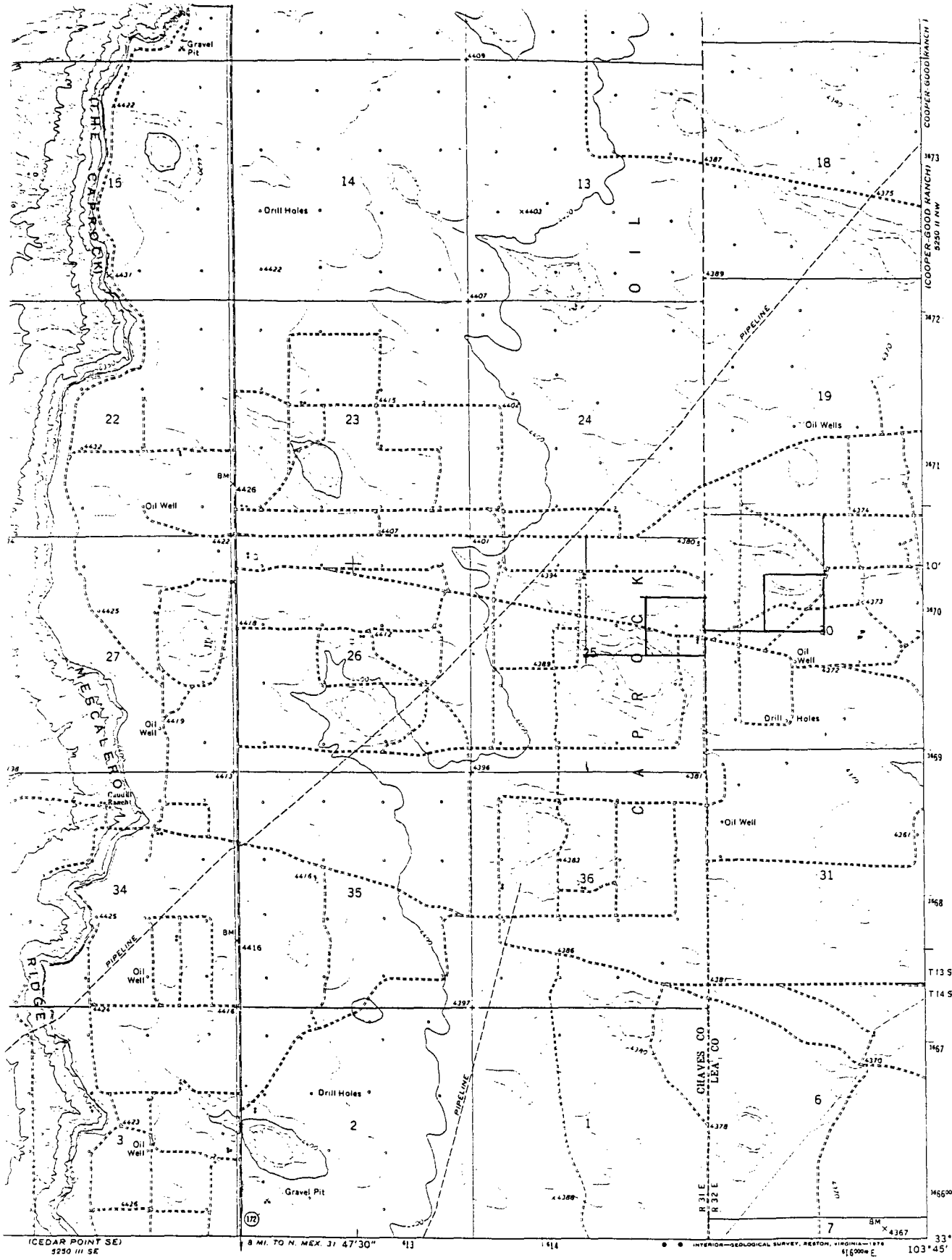
If you require any further information concerning permitting/closure procedures please contact me at (505) 827-7153.

Sincerely,

Martyne J. Kieling
Environmental Geologist

Attachments- location map, Order R-10411-B (Rule 711), Form C-137, and pit closure guidelines.

xc: Hobbs OCD Office
Ed Morney, Field Superintendent, Northland, P.O. Box 119, Maljamar, NM 88264



SCALE 1:24 000

0 1 MILE

2000 3000 4000 5000 6000 7000 FEET

0 1 KILOMETRE

CONTOUR INTERVAL 10 FEET

DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, hard surface — Light-duty road, hard or improved surface

Secondary highway, hard surface — Unimproved road

Interstate Route U. S. Route State Route

NEW MEXICO

QUADRANGLE LOCATION

ES WITH NATIONAL MAP ACCURACY STANDARDS
URVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
OGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

CAUDILL RANCH, N. MEX.

N3307.5—W10345/7.5

1973

AMS 5250 III NE—SERIES V881

m98

FIELD INSPECTION NOTES **J Rhoads**
ROCK QUEEN UNIT

Joint Inspection September 22, 1997 by:

U.S. Fish and Wildlife - Nick, El Paso Office
U.S. Environmental Protection Agency - Greg, Denver Office
Contractor/trainee for EPA - Denver (?)
State of New Mexico, Santa Fe - Roger Anderson
Environmental Bureau Chief
505-827-7152 ; facsimile 505-827-8177
State of New Mexico, Santa Fe - Martyne, hydrogeologist
State of New Mexico (OCD), Hobbs - Wayne Price, Field Inspector
505-393-6161; fax 505-363-0720
Northland Operating - Ed Marney - 505-369-5451 (cell); -672-2130 (office)
John Rhoads, Wichita Falls, Texas 940-723-8511; 940-781-6977(cellular)

The joint inspection by the above personnel started shortly after 5 PM. The inspection appears to have been prompted by aerial photos reviewed by the U. S. Fish and Wildlife. The review identified pits without nets, covered with hydrocarbons, that might contain 'trapped' birds. Any birds caught in oil on these pits would obviously be a violation of the terms of the Migratory Bird Treaty Act of 1917. Greg (EPA) took some notes and asked a few questions, but in general had very little to say. It was apparent that he had very little oil and gas field experience. The contractor/trainee with the EPA employee offered no comments during this inspection.

The first pit at Saltwater plant #2 revealed no birds; however the over-flow pit just to the south (middle pit) contained at least 30 birds. Nick pulled and bagged as many as he could find to be forwarded to the ornithological forensic 'expert' at the Fish & Wildlife lab. The birds will be identified to establish that they were in fact "migratory" birds and the cause of death will be determined. It was Nick's opinion that they most certainly would be "migratory", since "99.9% of all birds in the area were migratory". If deemed 'migratory', then the offense will be turned over to the U. S. Attorney General's office for a "Notice of Violation" or for criminal prosecution. Fines can be assessed up to $10,000 per bird; it was related to us that if the operator takes active steps to prevent a recurrence of dead birds in his pits, the fine could be as little as $100 per bird for the offense, on a good day a flat $100. Both Roger Anderson and Wayne Price with noted and commented on the "active discharge" into the first pit. The sump from the saltwater pump at this plant drains into the first pit, bringing water and lube oil with it. When the pit is closed, provisions will need to be made to collect and dispose of this discharge. Also noted was the lack of secondary containment around the saltwater storage tank at this site. It was pointed out that the SPCC regulations do not require this, but that Northland had prepared a plan anyway. Wayne asked that a copy of the plan by sent to him. A copy of the book containing *all* the SPPC for this property was shown to Wayne when we returned to the office. He requested a copy of the SPCC for the

saltwater plant #2 and for the Tract 20 tank battery. He also requested a copy of the MSDS for the lube oil being used at the saltwater plant; since it was a part of the "active discharge", OCD wanted to make certain the 'mixture' rule did not apply to the contents of the pit and that the pit contents could retain the oil and gas exemption for this waste. [A copy (of a copy of a copy) of the Conoco Universal Gear Lubricant MSDS was received from P & D Petroleum and was faxed to Wayne at OCD in Hobbs; an original MSDS has been ordered from Conoco in Houston and will be sent to OCD when available]. Further discussions at this site included the 'news' that centralized saltwater facilities would soon see new rule that would dictate *LINERS* as well as secondary containment. Also mentioned as probabilities were annual *interior* inspections of steel tank bottoms if the tank was not sitting on a liner, necessitating an annual emptying and cleaning of such tanks. As to production flow lines and gathering lines, the real probability of periodic pressure testing was mentioned by Roger.

After the birds were bagged, daylight was fading, but the group made it's way to the Tract 20 tank battery. Nick (USF&W) took a quick trip around the large pit without his 'gathering stick' to see if he could spot any birds in the pit. He "thought" he could see one or two, but he did not try to recover any. He announced that he would return on Thursday September 25 during daylight hours to inspect the pit.

Other notes: Mr. Anderson (old Dowell employee) insisted that the two pits inspected "would be closed in 30 days". It is apparent that the Environmental Bureau is concerned regarding the sole source Ogalala fresh water reservoir below the surface of this land. Emergency pits *can* be permitted, but the existing pits are oily and cannot be permitted. New permitted pits will be monitored very closely; any release to an emergency pit must be removed within 24 hours.

Both New Mexico and EPA are concerned with the total petroleum hydrocarbons (TPH) and the BTEX series in contaminated soil, and the concentration of those constituents in relation to their proximity to fresh water aquifers. The standard *appears* to be 5,000 ppm TPH (about 0.5% by weight), 10 ppm for benzene and 50 ppm for BTEX. *IF* fresh waters are closer than 100', the standards are more stringent. Mr. Anderson has *NO* problem with Northland continuing to haul the liquids and sludge from these pits to CRI in Hobbs. This is highly recommended although the cost is high ($3.25/bbl plus trucking). A definition of the vertical extent of pollution caused by these pits must be established prior to closing. We were advised *NOT* to drill and sample in the pit; rather to 'directionally' drill from the side of the pit.

It was related to us that the State of New Mexico assumes purchasers of oil and gas properties are 'sophisticated buyers' and as such, all pollution liabilities attendent to a given property belong to the purchaser. Hence, historical practices on a given property are denied as a defense.

During the waiting period for the inspectors to arrive, Ed Marney showed me most if not all of the pits operated by Northland in the area. Photographs were taken and are enclosed, appropriately labeled. It was very obvious even before the inspection that nets were a critical missing element. Ed informed me that they had been ordered. There has been some work done around some of the tank batteries to provide secondary containment. Capacity at some of these sites is not sufficient; there is only marginal secondary containment down-dip of the Tract 20 tank battery (there is no dike *per se* around the tanks). In addition, a 3" steel line extending under the small dike was draining rainwater out of the catchment area! A closer look revealed that the inadvertent 'drain line' was an old abandoned line that had a hole in it on the up-dip side of the berm. A wooden plug was stuck in it to slow down the drainage; the line needs to be removed. Dip from this area is to the west directly into the freshwater playa that has already been impacted by a saltwater release. More containment is definitely needed at this battery to minimize risk of spills into the playa.

The closure of the pits at these facilities will put great pressure on the reliability of the disposal systems for the produced saltwater. It appears that there is not one facility in this area that can hold a full 24 hours of saltwater through-put. In short, insufficient tank volumes in combination with no emergency pits could easily lead to future non-contained spills. The solution is to construct plants with adequate secondary containment with impermeable liners under the facilities *OR* permitted (new) emergency pits. An interim aid is to install alarm systems, as is being considered.

Two vendors have 'searched us out' regarding the closure of these pits, with a third having called: Whole Earth Environmental in Houston (Mike Griffin, President - 1-800-854-4358); Western Environmental Consultants (associated with CSI - Constructive Solutions, Inc.(Allen Hodge - 505-392-4498; fax 505-397-2597); and Bob Allen (505-397-0510). Whole Earth is to submit a turn key bid for closure of the pits that were inspected. A cost estimate is also expected from Allen Hodge. A common element found in discussions with both of these parties is that mixing and blending any contaminated soil is the most cost effective method of closing these pits. Whole Earth "models" (with API's VADSAT model) the 'probability' of contaminants reaching water resources as a function of time after an impermeable liner has been placed in the bottom of the excavated pit and the pit has been backfilled with blended soil. This allows soils to be returned to the lined pit with higher TPH and BTEX levels than would otherwise be the case. However, the OCD will not accept "modeling" if ground water is within 100' of the surface.

Western has a much better cost per yard estimate for these projects (using the mix and blend approach) than Whole Earth. Western has seen costs as little as $4/yard; Whole Earth was talking $8 to $10/yard with haul-off costs of up to $35/yard. On-site remediation of contaminated soils was approximated at $15/yard by Whole Earth. Total cost per pit obviously depends on the vertical extent of the pollution. If these pits were opened with dynamite, the vertical distance to 'clean' soil could be quite deep. In fact, contaminants could possibly have reached the aquifer. If this is the case, draw-down wells to remove water containing these contaminants *may* have to be drilled and operated.

At the suggestion of Mr. McKnight, George Kenamore at Maljamar (505-396-3331) was contacted regarding rental of a track-hoe to excavate these pits. Kenamore does not have this type of equipment, but with some assurances of a reasonable pay period, he would be willing to arrange for a rental for these purposes. It is assumed that Mr. Kenamore would also have an operator for the track-hoe.

Both Western and Whole Earth are suggesting that excavation at these pits could reach as much as 25 to 30' in depth. Given the size of the lined pit at the Tract 20 tank battery (estimated at 200' x 200'), the volume of dirt to be handled could be as much as 37,000 yards. It is genuinely hoped that the liner in this pit will make this pessimistic approximation extremely incorrect.

Suggested Plan of Action:

1. Empty the pits that were inspected of all liquids; haul those liquids to CRI for proper reclaimation or disposal. *Keep a very clear paper trail of all loads hauled out.*
2. If <u>all</u> pits operated by Northland are not to be closed, <u>at a minimum</u>, nets should be installed over the pits that will continue to be used for the near term. Northland and its officers are too much at risk to the provisions of the Migratory Bird Treaty Act to do anything less. Fines and actions that may be taken in regard to this first inspection cannot be taken as an indicator of future actions that Fish & Wildlife may suggest to the U.S. General's office. Northland need not run the risk of another dead bird on this property.
3. Remove the semi-solid sludge from these pits by excavation and loading into lined trucks (to prevent leakage while in transit). This may require the use of a track-hoe with a liquid 'tite' bucket. Dispose of sludge at an approved land farm operation. Make certain that title to the sludge passes to the land farm operator (at least attempt) to limit future liability.
4. Once the pits are clear of liquids and sludge, the vertical extent of the TPH and BTEX will need to be defined by borings. As noted above, we can set up outside the old pits and drill 'directionally' under the pit area.

5. After a determination of the vertical extent of contamination has been made, arrange for excavation of the contaminated soil for blending and mixing at the surface. Arrangements will need to be made for rights to use the limited amount of surface soil available on the caprock. A less desirable option would be to sort the soil on the basis of contaminant level and place on different liners at the surface for bio-remediation. This latter approach will involve more time and effort to 'stir' and water over a 90 day period.

6. The fiberglass liner in the Tract 20 pit will need to be disposed. In the author's mind, it is a non-hazardous waste. If the liner 'cleans up', it can be cut up and disposed in a land-fill.

7. The sump drain at the SW Plant #2 needs to be caught in a drum or sump tank so as to stop the on-going discharge noted by OCD. A plastic tank (about 500 gallon capacity) might be buried for this purpose at this site. It needs to be equipped with an electrified sump pump so that collected fluids can be pumped back into the water tank. The sump tank will need to be placed on and buried with sand or sifted soil (free of rock) to avoid rock punctures.

8. All anticipated actions should be thoroughly communicated to the New Mexico OCD, and if possible, actions taken only after their approval.

9. A plan to close *all* pits should be prepared and submitted to OCD.

10. Plans should be made to install additional tankage at all of the central water handling facilities, taking the opportunity to install liners and secondary containment when these additions are made.

UNLINED

SURFACE IMPOUNDMENT

CLOSURE

GUIDELINES

(FEBRUARY 1993)

New Mexico Oil Conservation Division
State Land Office Building
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

TABLE OF CONTENTS

PREFACE

The following document does not require that currently operating or permitted unlined surface impoundments be closed. This document is to be used only as a guide when closing unlined surface impoundments used for the containment of exploration, production, processing and storage wastes regulated by the New Mexico Oil Conservation Division (OCD).

OCD requires submission and approval of plans and procedures for closure prior to the actual closure of any unlined surface impoundment. Procedures may deviate from the following guidelines if it can be shown that the proposed procedure will remove or isolate contaminants in such a manner that fresh waters, public health and the environment will not be impacted by remaining contaminants. Specific constituents and/or requirements for soil and ground water analysis and/or remediation may vary depending on site specific conditions.

If a number of unlined impoundments are to be closed by a single company, the company may submit one area-wide plan stating the specific location of each unlined impoundment to be closed, along with the procedures to be used during closure. Deviations from approved plans will require OCD notification and approval.

INTRODUCTION

These guidelines are intended to provide guidance for closure of unlined surface impoundments in a manner that assures protection of fresh waters, public health and the environment.

The New Mexico State Engineer has designated fresh waters as all surface waters and ground waters of the state containing 10,000 milligrams per liter or less of total dissolved solids (TDS) for which there is a present or reasonably foreseeable beneficial use. As stated in New Mexico Oil Conservation Commission (OCC) Order No. R-3221-D, "reasonably foreseeable" generally has been taken to mean a time period of not less than 200 years into the future. An unlined surface impoundment is defined as any unlined below grade feature which receives anything other than fresh water. The term "unlined surface impoundment" includes but is not limited to the following types of unlined features: produced water pits, dehydrator pits, blowdown pits, tank drain pits, pipeline drip collector pits, compressor scrubber pits, flare pits, and all other unlined pits which receive exploration, production and processing wastes regulated by the OCD. Excluded from this definition are pits constructed exclusively for drill cuttings and drilling fluids which are regulated under OCD Rule 105.

Prior to commencing closure of an unlined surface impoundment, a closure plan must be submitted to and approved by OCD. A closure plan may apply to more than one unlined impoundment. At a minimum, a closure plan should include the following elements:

1. The locations of all pits to be closed by township, range, section, unit letter and footages or other OCD approved methods.

2. The procedures which will be used to conduct the soil and ground water assessments and the circumstances under which an assessment of ground water will be conducted.

3. The procedures which will be used to manage, remediate, or dispose of contaminated soil and ground water.

I. SITE ASSESSMENT

Prior to final closure (Section VI), the party responsible for an unlined surface impoundment should perform an assessment to determine the extent to which soils and/or ground water may have been impacted by the operation of the impoundment. Assessment results will form the basis of any required remediation. The sites will be assessed for the severity of contamination and potential environmental and public health threats using a risk based ranking system.

The following characteristics must be determined in order to evaluate a sites potential risks, the need for remedial action and, if necessary, the level of cleanup required at the site:

A. GENERAL SITE CHARACTERISTICS

1. Depth To Ground Water

The operator should determine the depth to ground water at each site. The depth to ground water is defined as the vertical distance from the lowermost contaminants to the seasonal high water elevation of the ground water. If the exact depth to ground water is unknown, the ground water depth can be estimated using either local water well information, published regional ground water information, data on file with the New Mexico State Engineer Office or the vertical distance from adjacent ground water or surface water.

2. Wellhead Protection Area

The operator should determine the horizontal distance from all water sources and private, domestic water sources. A water source shall mean wells, springs or other sources of fresh water extraction. Private, domestic water sources shall mean those water sources used by less than five households for domestic or stock purposes.

3. Distance To Nearest Surface Water Body

The operator should determine the horizontal distance to all downgradient surface water bodies. Surface water bodies are defined as perennial rivers, streams, creeks, irrigation canals and ditches, lakes and ponds.

B. SOIL/WASTE CHARACTERISTICS

Soils/wastes within and beneath the unlined surface impoundment should be evaluated to determine the type and extent of contamination at the site. In order to assess the level of contamination at the unlined impoundment, observations should be made of the soils at the surface and a

sample of the potentially impacted soils should be taken from the interval at least 3 feet into the undisturbed native soils beneath the bottom of the pit. Samples should be obtained according to the sampling procedures in Sections III.A. and III.B. This may be accomplished using a backhoe, drill rig, hand auger, shovel or other means.

Initial assessment of soil contaminant levels is not required if an operator proposes to determine the final soil contaminant concentrations after a soil removal or remediation pursuant to section IV.A.

Varying degrees of contamination described below may co-exist at an individual site. The following sections describe the degrees of contamination that should be documented during the assessment of the level of soil contamination:

1. Highly Contaminated/Saturated Soils

Highly contaminated/saturated soils are defined as those soils which contain a free liquid hydrocarbon phase or exhibits gross hydrocarbon staining.

2. Unsaturated Contaminated Soils

Unsaturated contaminated soils are those soils which are not highly contaminated or saturated, as described above, but contain measurable concentrations of benzene, toluene, ethylbenzene and xylenes (BTEX) and total petroleum hydrocarbons (TPH). Sampling and analytical methods for determining contaminant concentrations are described in detail in Section III.A. and III.B.

(NOTE: The above definitions apply only to oilfield contaminated soils which are exempt from federal RCRA Subtitle C hazardous waste provisions. Unlined impoundments receiving non-exempt wastes are subject to evaluation for RCRA hazardous waste characteristics.)

C. GROUND WATER QUALITY

If ground water is encountered during the soil/waste characterization of the impacted soils, a sample should be obtained to assess potential impacts on ground water quality. Ground water samples should be obtained using the sampling procedures in Section III.C. If there is a reasonable probability of ground water contamination based upon the level of contaminants in the soils directly beneath the pit or the extent of soil contamination defined during remedial activities, monitor wells may be required to assess potential impacts on ground water and the extent of ground water contamination.

II. SOIL AND WATER REMEDIATION LEVELS

A. SOILS

1. Highly Contaminated/Saturated Soils

Highly contaminated/saturated soils should be remediated insitu or excavated to the maximum extent practicable and remediated using techniques described in Section IV.A.

2. Unsaturated Contaminated Soils

The general site characteristics obtained during the site assessment (Section I.A.) will be used to determine the appropriate soil remediation levels using a risk based approach. Soils which are contaminated by petroleum constituents will be scored according to the ranking criteria below to determine their relative threat to public health, fresh waters and the environment.

a. Ranking Criteria

Depth To Ground Water	Ranking Score
<50 feet	20
50 - 99	10
>100	0

Wellhead Protection Area

<1000 feet from a water source,or; <200 feet from private domestic water source	
Yes	20
No	0

Distance To Surface Water Body

<200 horizontal feet	20
200 - 1000 horizontal feet	10
>1000 horizontal feet	0

b. Recommended Remediation Level

The total ranking score determines the level of remediation that may be required at any given site. The total ranking score is the sum of all four individual ranking criteria listed in Section II.A.2.a. The table below lists the remediation level that may be required for the appropriate total ranking score.

(NOTE: The OCD retains the right to require remediation to more stringent levels than those proposed below if warranted by site specific conditions (ie. native soil type, location relative to population centers and future use of the site or other appropriate site specific conditions.)

	Total Ranking Score		
	>19	10 - 19	0 - 9
Benzene(ppm)*	10	10	10
BTEX(ppm)*	50	50	50
TPH(ppm)**	100	1000	5000

* A field soil vapor headspace measurement (Section III.B.1) of 100 ppm may be substituted for a laboratory analysis of the Benzene and BTEX concentration limits.

** The contaminant concentration for TPH is the concentration above background levels.

B. GROUND WATER

Contaminated ground water is fresh ground water which contains free phase products, measurable concentrations of dissolved phase volatile organic constituents or other dissolved constituents in excess of the natural background water quality. Ground water contaminated in excess of the New Mexico Water Quality Control Commission (WQCC) ground water standards or natural background water quality will require remediation.

III. SOIL AND WATER SAMPLING PROCEDURES

Below are the sampling procedures for soil and ground water contaminant investigations of unlined surface impoundments that have received RCRA Subtitle C exempt oil field exploration and

production wastes. Unlined surface impoundments that have received non-exempt RCRA wastes will be required to be tested to demonstrate that the wastes are not characteristically hazardous according to RCRA regulations.

A. HIGHLY CONTAMINATED OR SATURATED SOILS

The following method is used to determine if soils are highly contaminated or saturated:

1. Physical Observations

Study a representative sample of the soil for observable free petroleum hydrocarbons or immiscible phases and gross staining. The immiscible phase may range from a free hydrocarbon to a sheen on any associated aqueous phase. A soil exhibiting any of these characteristics is considered highly contaminated or saturated.

B. UNSATURATED CONTAMINATED SOILS

The following methods may be used for determining the magnitude of contamination in unsaturated soils:

1. Soil Sampling Procedures for Headspace Analysis

A headspace analysis may be used to determine the total volatile organic vapor concentrations in soils (ie. in lieu of a laboratory analysis for benzene and BTEX but not in lieu of a TPH analysis). Headspace analysis procedures should be conducted according to OCD approved industry standards or other OCD-approved procedures. Accepted OCD procedures are as follows:

a) Fill a 0.5 liter or larger jar half full of sample and seal the top tightly with aluminum foil or fill a one quart zip-lock bag one-half full of sample and seal the top of the bag leaving the remainder of the bag filled with air.

b) Ensure that the sample temperature is between 15 to 25 degrees Celsius (59-77 degrees Fahrenheit).

c) Allow aromatic hydrocarbon vapors to develop within the headspace of the sample jar or bag for 5 to 10 minutes. During this period, the sample jar should be shaken vigorously for 1 minute or the contents of the bag should be gently massaged to break up soil clods.

d) If using a jar, pierce the aluminum foil seal with the probe of either a PID or FID organic vapor meter (OVM), and then record the highest (peak) measurement. If using a bag, carefully open one end of the bag and insert the probe of the OVM into

the bag and re-seal the bag around the probe as much as possible to prevent vapors from escaping. Record the peak measurement. The OVM must be calibrated to assume a benzene response factor.

2. Soil Sampling Procedures For Laboratory Analysis

a. Sampling Procedures

Soil sampling for laboratory analysis should be conducted according to OCD approved industry standards or other OCD-approved procedures. Information on specific industry standards may be obtained from the OCD. Accepted OCD soil sampling procedures and laboratory analytical methods are as follows:

i) Collect samples in clean, air-tight glass jars supplied by the laboratory which will conduct the analysis or from a reliable laboratory equipment supplier.

ii) Label the samples with a unique code for each sample.

iii) Cool and store samples with cold packs or on ice.

iv) Promptly ship sample to the lab for analysis following chain of custody procedures.

v) All samples must be analyzed within the holding times for the laboratory analytical method specified by EPA.

b. Analytical Methods

All soil samples must be analyzed using EPA methods, or by other OCD approved methods and must be analyzed within the holding time specified by the method. Below are laboratory analytical methods commonly accepted by OCD for analysis of soil samples analyzed for petroleum related constituents. Additional analyses may be required if the impoundment has been used for anything other than petroleum based fluids or produced water.

i) Benzene, toluene, ethylbenzene and xylene

- EPA Method 602/8020

ii) Total Petroleum Hydrocarbons

- EPA Method 418.1, or;
- EPA Method Modified 8015

C. GROUND WATER SAMPLING

If an investigation of ground water quality is deemed necessary, it should be conducted according to OCD approved industry standards or other OCD-approved procedures. Information concerning specific industry standards may be obtained from the OCD. The following methods are standard accepted OCD methods which can be used to sample and analyze ground water at RCRA exempt sites (Note: The installation of monitor wells is not required if the OCD approves of an alternate ground water investigation or sampling technique):

1. Monitor Well Installation/Location

One monitor well should be installed adjacent to and hydrologically down-gradient from the unlined surface impoundment to determine if protectable fresh water has been impacted by the disposal activities. Additional monitor wells, located up-gradient and down-gradient of the impoundment, may be required to delineate the full extent of ground water contamination if ground water near the pit has been found to be contaminated.

2. Monitor Well Construction

a) Monitor well construction materials should be:

   i) selected according to industry standards;

   ii) chemically resistant to the contaminants to be monitored; and

   iii) able to be installed without the use of glues or adhesives.

b) Monitor wells should be constructed according to OCD approved industry standards to prevent migration of contaminants along the well casing, and with a minimum of five feet of well screen above the water table to accommodate seasonal fluctuations in the static water table.

3. Monitor Well Development

When ground water is collected for analysis from monitoring wells, the wells should be developed prior to sampling. The objective of monitor well development is to repair damage done to the formation by the drilling operation so that the natural hydraulic properties of the formation are restored and to remove any fluids introduced into the formation that could compromise the integrity of the sample. Monitoring well development is accomplished by purging fluid from the well until the pH and specific conductivity have stabilized and turbidity has been reduced to the greatest extent possible.

4. Sampling Procedures

Ground water should be sampled according to OCD accepted standards or other OCD approved methods. Samples should be collected in clean containers supplied by the laboratory which will conduct the analysis or from a reliable laboratory equipment supplier. Samples for different analyses require specific types of containers. The OCD or the laboratory can provide information on the types of containers required for sample collection. The following procedures are accepted by OCD as standard sampling procedures:

a) Monitor wells should be purged of a minimum of three well volumes of ground water using a clean bailer prior to sampling to ensure that the sample represents the quality of the ground water in the formation and not stagnant water in the well bore.

b) Collect samples in appropriate sample containers containing the appropriate preservative for the analysis required. No bubbles or headspace should remain in the sample container.

c) Label the sample containers with a unique code for each sample.

d) Cool and store samples with cold packs or on ice.

e) Promptly ship sample to the lab for analysis following chain of custody procedures.

f) All samples must be analyzed within the holding times for the laboratory analytical method specified by EPA.

5. Ground Water Laboratory Analysis

Samples should be analyzed for potential ground water contaminants contained in the waste stream, as defined by the New Mexico Water Quality Control Commission (WQCC). All ground water samples must be analyzed using EPA methods, or by other OCD approved methods and must be analyzed within the holding time specified by the method. Below are OCD accepted laboratory analytical methods for analysis of ground water samples analyzed for petroleum related constituents. Additional analyses may be required if the impoundment has been used for anything other than petroleum based fluids or produced water.

a. <u>Analytical Methods</u>

i.) Benzene, Toluene, Ethylbenzene and Xylene

- EPA Method 602/8020

ii.) Major Cations and Anions

- Various EPA or standard methods

iii.) Heavy Metals

- EPA Method 6010, or;
- Various EPA 7000 series methods

iv.) Polynuclear Aromatic Hydrocarbons

- EPA Method 8100

IV. REMEDIATION

The following discussion summarizes alternatives for remediation of contaminated soil and ground water as defined in Section II.A. and II.B. All procedures used are to be approved by OCD prior to commencement of remediation activities. Separate OCD-approval for remediation is not required if OCD has approved a closure plan which includes the site remediation technique for a particular site. All procedures which deviate from the closure plan, however, must be approved by OCD prior to commencement of remediation activities.

In lieu of remediation, OCD may accept an evaluation of risk which demonstrates that the remaining contaminants will not pose a threat to present or foreseeable beneficial use of fresh waters, public health and the environment.

A. SOIL REMEDIATION

When RCRA exempt or RCRA nonhazardous petroleum contaminated soil requires remediation, it should be remediated and managed according to the criteria described below or by other OCD approved procedures which will remove, treat, or isolate contaminants in order to protect fresh waters, public health and the environment.

1. Contaminated Soils

Highly contaminated/saturated soils and unsaturated contaminated soils exceeding the standards described in Section II.A.2.b. should be either:

a) Excavated from the ground until a representative sample from the walls and bottom of the excavation is below the contaminant specific remediation level listed in Section II.A.2.b or an alternate OCD approved remediation level, or;

b) Excavated to the maximum depth and horizontal extent practicable. Upon reaching this limit a sample should be taken from the walls and bottom of

the excavation to determine the remaining levels of soil contaminants, or;

c) Treated in place, as described in Section IV.A.2.b.ii. - Treatment of Soil in Place, until a representative sample is below the contaminant specific remediation level listed in Section II.A.2.b, or an alternate OCD approved remediation level, or;

d) Managed according to an OCD-approved alternate method.

2. Soil Management Options

All soil management options must be submitted to and approved by OCD prior to commencement of remediation activities. The following is a list of options for either on-site treatment and off-site treatment and/or disposal of contaminated soils:

a. Disposal

Excavated soils may be disposed of at an off-site OCD-approved facility.

b. Soil Treatment and Remediation Techniques

i. Landfarming

Onetime applications of contaminated soils may be landfarmed on location by spreading the soil in an approximately six inch lift within a bermed area. Only soils which do not contain free liquids can be landfarmed. The soils should be disced regularly to enhance biodegradation of the contaminants. If necessary, upon approval by OCD, moisture and nutrients may be added to the soil to enhance aerobic biodegradation.

In some high risk areas an impermeable liner may be required to prevent leaching of contaminants into the underlying soil.

Landfarming sites that will receive soils from more than one location are considered centralized sites and must be approved separately by OCD prior to operation.

ii. Insitu Soil Treatment

Insitu treatment may be accomplished using vapor venting, bioremediation or other OCD approved treatment systems.

iii. Alternate Methods

The OCD encourages alternate methods of soil remediation including, but not limited to, active soil aeration, composting, bioremediation, solidification, and thermal treatment. Use of alternate methods must be approved by OCD prior to implementation.

B. GROUND WATER REMEDIATION

1. Remediation Requirements

Ground water remediation activities will be reviewed and approved by OCD on a case by case basis prior to commencement of remedial activities. When contaminated ground water exceeds WQCC ground water standards, it should be remediated according to the criteria described below.

a. Free Phase Contamination

Free phase floating product should be removed from ground water through the use of skimming devices, total-fluid type pumps, or other OCD-approved methods.

b. Dissolved Phase Contamination

Ground water contaminated with dissolved phase constituents in excess of WQCC ground water standards can be remediated by either removing and treating the ground water, or treating the ground water in place. If treated waters are to be disposed of onto or below the ground surface, a discharge plan must be submitted and approved by OCD.

c. Alternate Methods

The OCD encourages other methods of ground water remediation including, but not limited to, air sparging and bioremediation. Use of alternate methods must be approved OCD prior to implementation.

V. TERMINATION OF REMEDIAL ACTION

Remedial action may be terminated when the criteria described below have been met:

A. SOIL

Contaminated soils requiring remediation should be remediated so that residual contaminant concentrations meet the recommended soil remediation level for a particular site as specified in Section II.A.2.b. Termination of remedial action will be approved by OCD upon a demonstration of completion of remediation as described above.

If soil action levels cannot practicably be attained, an evaluation of risk may be performed and provided to OCD for approval showing that the remaining contaminants will not pose a threat to present or foreseeable beneficial use of fresh water, public health and the environment.

B. GROUND WATER

A ground water remedial action may be terminated if all recoverable free phase product has been removed, and the concentration of the remaining dissolved phase contaminants in the ground water does not exceed New Mexico WQCC water quality standards or background levels. Termination of remedial action will be approved by OCD upon a demonstration of completion of remediation as described in above.

If the water quality standards cannot practicably be attained, an evaluation of risk may be performed and provided to OCD for approval showing that the remaining contaminants will not pose a threat to present or foreseeable beneficial use of fresh waters, human health and the environment.

VI. FINAL CLOSURE

Upon termination of any required soil remedial actions (Section V.) an unlined surface impoundment may be closed by backfilling, contouring to provide drainage away from the site and revegetating the site.

VII. CLOSURE REPORTS

Closure plans should provide a schedule for reporting the results of all closure activities.

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District III
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Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
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Santa Fe, New Mexico 87504-2088

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(Revised 3/9/94)

PIT REMEDIATION AND CLOSURE REPORT

Operator: _____ **Telephone:** _____

Address: _____

Facility Or: Well Name _____

Location: Unit or Qtr/Qtr Sec_____ Sec___ T___ R____ County_____

Pit Type: Separator___ Dehydrator___ Other_____

Land Type: BLM___, State ___, Fee ___, Other_____

Pit Location: (Attach diagram)
Pit dimensions: length_____, width _____, depth _____
Reference: wellhead___, other _____
Footage from reference: _____
Direction from reference: _____ Degrees ___ East North ___ of ___ West South ___

Depth To Ground Water: (Vertical distance from contaminants to seasonal high water elevation of ground water)	Less than 50 feet (20 points) 50 feet to 99 feet (10 points) Greater than 100 feet (0 Points)	____
Wellhead Protection Area: (Less than 200 feet from a private domestic water source, or; less than 1000 feet from all other water sources)	Yes (20 points) No (0 points)	____
Distance To Surface Water: (Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches)	Less than 200 feet (20 points) 200 feet to 1000 feet (10 points) Greater than 1000 feet (0 points)	____
	RANKING SCORE (TOTAL POINTS):	____

Date Remediation Started: _____ **Date Completed:** _____

Remediation Method: (Check all appropriate sections)
Excavation ___ Approx. cubic yards _____
Landfarmed ___ Insitu Bioremediation ___
Other _____
_____

Remediation Location: (ie. landfarmed onsite, name and location of offsite facility)
Onsite___ Offsite _____
_____

General Description Of Remedial Action: _____

_____

_____

_____

_____

_____

Ground Water Encountered: No ___ Yes ___ Depth _____

Final Pit:
Closure Sampling: (if multiple samples, attach sample results and diagram of sample locations and depths)
Sample location _____
_____
Sample depth _____
Sample date _____ Sample time _____
Sample Results
Benzene(ppm) _____
Total BTEX(ppm) _____
Field headspace(ppm) _____
TPH _____

Ground Water Sample: Yes ___ No ___ (If yes, attach sample results)

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF

DATE

SIGNATURE PRINTED NAME AND TITLE

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PIT REMEDIATION AND CLOSURE REPORT

Operator: Northland Operating Company **Telephone:** 1-214-521-9959

Address: 3500 Oak Lawn , L.B. #31, Dallas, Texas 75219-4398

Facility Or: Rock Queen Unit Saltwater Plant #2 - North (primary) pit
Well Name

Location: Unit or Qtr/Qtr Sec SE/4, NE/4 Sec 25 T 13S R 31E County Chaves

Pit Type: Separator ___ Dehydrator ___ Other Emergency saltwater overflow

Land Type: BLM ___, State ___, Fee ___, Other Private

Pit Location: (Attach diagram)
Pit dimensions: length 35', width 25', depth 8' after excavation
Reference: wellhead x, other _____
Footage from reference: _____
Direction from reference: ____ Degrees ___ East North ___ of : West South :

Depth To Ground Water: (Vertical distance from contaminants to seasonal high water elevation of ground water)	Less than 50 feet (20 points) 50 feet to 99 feet (10 points) Greater than 100 feet (0 Points)	0
Wellhead Protection Area: Less than 200 feet from a private domestic water source, or; less than 1000 feet from all other water sources)	Yes (20 points) No (0 points)	0
Distance To Surface Water: Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches)	Less than 200 feet (20 points) 200 feet to 1000 feet (10 points) Greater than 1000 feet (0 points)	0
	Ranking Score (total points):	0

Date Remediation Started: Nov. 18, 1997 **Date Completed:** Nov. 28, 1997

Remediation Method: (Check all appropriate sections)
Excavation xx Approx. cubic yards 240 yards *
Landfarmed ___ Insitu Bioremediation ___
Other * plus additional 320 yards from tank cleaning

Remediation Location: (ie. landfarmed onsite, name and location of offsite facility)
Onsite___ Offsite Hauled all material to Controlled Recovery, Inc.

General Description Of Remedial Action: Hauled

Ground Water Encountered: No xx Yes ___ Depth ___

Final Pit: Closure Sampling: (if multiple samples, attach sample results and diagram of sample locations and depths)

Sample location Multiple samples, see attached

Sample depth ___

Sample date ___ Sample time ___

Sample Results

Benzene(ppm) ___

Total BTEX(ppm) ___

Field headspace(ppm) ___

TPH ___

Ground Water Sample: Yes ___ No ___ (If yes, attach sample results)

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF

DATE

SIGNATURE

PRINTED NAME AND TITLE

NORTHLAND OPERATING COMPANY
Rock Queen Unit Saltwater Plant #2
North (primary) pit
Sample Results

Sample location or depth below ground level (BGL)		
Random in bottom of pit (BBC International, November 24, 1997 - Cardinal Laboratories H3332-3 #3)	BTEX: benzene	< 0.002 ppm (mg/Kg)
	toluene	< 0.002 ppm
	ethyl benzene	0.022 ppm
	total xylenes	0.089 ppm

The above sample was taken prior to repair work on the saltwater tank at this location. That work resulted in this pit being used for drainage from the tank so that repairs could be made.

Random in bottom of pit after repairs (SESI, field sample, December 10, 1997)	Total Petroleum Hydrocarbon: TPH 1870 ppm
Vertical Profile samples December 10, 1997	
19' BGL (field sample, SESI)	TPH: 13 ppm BTEX: 12 ppm by PID
28' BGL (field sample, SESI)	TPH: 53 ppm BTEX: 1.4 ppm by PID
28' BGL (Cardinal Laboratories H3371-1, confirming sample)	TPH: < 10 ppm (mg/Kg)

Depth of pit: approximately 8' BGL

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PIT REMEDIATION AND CLOSURE REPORT

Operator: Northland Operating Company **Telephone:** 1-214-521-9959

Address: 3500 Oak Lawn, L.B. #31, Dallas, Texas 75219-4398

Facility Or: Rock Queen Unit Saltwater Plant #2 - middle pit
Well Name

Location: Unit or Qtr/Qtr Sec SE/4, NE/4 Sec 25 T 13S R 31E County Chaves

Pit Type: Separator ___ Dehydrator ___ Other Secondary emergency overflow

Land Type: BLM ___, State ___, Fee ___, Other Private

Pit Location: (Attach diagram)

Pit dimensions: length 35', width 40', depth 6' after excavation

Reference: wellhead ___, other ___

Footage from reference: ___

Direction from reference: ___ Degrees ___ East North ___ of ___ West South ___

Depth To Ground Water: (Vertical distance from contaminants to seasonal high water elevation of ground water)	Less than 50 feet (20 points) 50 feet to 99 feet (10 points) Greater than 100 feet (0 Points)	0
Wellhead Protection Area: (Less than 200 feet from a private domestic water source, or; less than 1000 feet from all other water sources)	Yes (20 points) No (0 points)	0
Distance To Surface Water: (Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches)	Less than 200 feet (20 points) 200 feet to 1000 feet (10 points) Greater than 1000 feet (0 points)	0
	RANKING SCORE (TOTAL POINTS):	0

Date Remediation Started: November 18, 1997 **Date Completed:** November 20, 1997

Remediation Method: (Check all appropriate sections) Excavation XX Approx. cubic yards 286

Landfarmed ___ Insitu Bioremediation ___

Other _____

Remediation Location: (ie. landfarmed onsite, name and location of offsite facility) Onsite___ Offsite _____

General Description Of Remedial Action: Hauled

Ground Water Encountered: No XX Yes ___ Depth _____

Final Pit:
Closure Sampling: (if multiple samples, attach sample results and diagram of sample locations and depths)

Sample location Multiple samples, see attached

Sample depth _____

Sample date _____ Sample time _____

Sample Results

Benzene(ppm) _____

Total BTEX(ppm) _____

Field headspace(ppm) _____

TPH _____

Ground Water Sample: Yes ___ No ___ (If yes, attach sample results)

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF

DATE

SIGNATURE PRINTED NAME AND TITLE

NORTHLAND OPERATING COMPANY
Rock Queen Unit Saltwater Plant #2
Middle pit
Sample Results

Sample location or depth below ground level (BGL)		
Random sample from bottom of pit (BBC International, November 24, 1997 - Cardinal Laboratories H3332-2 #2)	BTEX: benzene:	< 0.002 ppm(mg/Kg)
	toluene:	0.008 ppm
	ethyl benzene:	0.012 ppm
	total xylenes:	0.038 ppm
BBC - field sample November 24	Total Petroleum hydrocarbon: TPH:	2220 ppm

The above sample was taken for establishing the results of work done to that point in time. Hauled additional material from this pit on November 28 in order to reduce further the TPH level.

Random sample from the bottom of the pit December 10, 1997, field sample, SESI	TPH:	2667 ppm
Vertical Profile samples December 10, 1997		
10' BGL (field sample, SESI) (4' below pit floor)	TPH:	267 ppm
20' BGL (field sample, SESI)	TPH:	non-detect
20' BGL (Cardinal Laboratories H3371-2)	TPH:	< 10 ppm (mg/Kg)

Bottom of pit 6' below ground level after final excavation

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PIT REMEDIATION AND CLOSURE REPORT

Operator: Northland Operating Company **Telephone:** 1-214-521-9959

Address: 3500 Oak Lawn, L.B. #31, Dallas, Texas 75219-4398

Facility Or Well Name: Rock Queen Unit Saltwater Plant #2 - South (never used) pit

Location: Unit or Qtr/Qtr Sec SE/4, NE/4 Sec 25 T 13S R 31E County Chaves

Pit Type: Separator ___ Dehydrator ___ Other Never used, intended as overflow

Land Type: BLM ___, State ___, Fee ___, Other Private

Pit Location: (Attach diagram)

Pit dimensions: length 66', width 72', depth 9'

Reference: wellhead ___, other ___

Footage from reference: ___

Direction from reference: ___ Degrees ___ East ___ North ___ of ___ West ___ South

Depth To Ground Water: (Vertical distance from contaminants to seasonal high water elevation of ground water)	Less than 50 feet (20 points) 50 feet to 99 feet (10 points) Greater than 100 feet (0 Points)	0
Wellhead Protection Area: (Less than 200 feet from a private domestic water source, or; less than 1000 feet from all other water sources)	Yes (20 points) No (0 points)	0
Distance To Surface Water: (Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches)	Less than 200 feet (20 points) 200 feet to 1000 feet (10 points) Greater than 1000 feet (0 points)	0
	RANKING SCORE (TOTAL POINTS):	0

Date Remediation Started: n/a **Date Completed:** n/a

Remediation Method: (Check all appropriate sections)
Excavation ___ Approx. cubic yards none
Landfarmed ___ Insitu Bioremediation ___
Other _____

Remediation Location: (ie. landfarmed onsite, name and location of offsite facility)
Onsite___ Offsite n/a

General Description Of Remedial Action: Tested soil in bottom of pit to see if any action was necessary. See sample results below.

Ground Water Encountered: No XX Yes ___ Depth _____

Final Pit: Closure Sampling: (if multiple samples, attach sample results and diagram of sample locations and depths)

Sample location Random sample in bottom of pit

Sample depth Pit bottom surface sample

Sample date November 24, 1997 Sample time _____

Sample Results

Benzene(ppm) 0.002 ppm (mg/Kg)

Total BTEX(ppm) see attached

Field headspace(ppm) _____

TPH _____

Ground Water Sample: Yes ___ No ___ (If yes, attach sample results)

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF

DATE

SIGNATURE PRINTED NAME AND TITLE

NORTHLAND OPERATING COMPANY
Rock Queen Unit Saltwater Plant #2
South (never used) pit
Sample Results

Sample location or depth below ground level (BGL)		
Random in bottom of pit (BBC International, November 24, 1997 - Cardinal Laboratories H3332-1 #1	BTEX: benzene	< 0.002ppm
	toluene	< 0.002ppm
	ethyl benzene	< 0.002 ppm
	total xylenes	< 0.006 ppm

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PIT REMEDIATION AND CLOSURE REPORT

Operator: _____ Telephone: _____

Address: _____

Facility Or: _____
Well Name

Location: Unit or Qtr/Qtr Sec_____ Sec___ T___ R____ County_____

Pit Type: Separator___ Dehydrator___ Other_____

Land Type: BLM___, State ___, Fee ___, Other_____

Pit Location: (Attach diagram)
Pit dimensions: length_____, width _____, depth _____
Reference: wellhead___, other _____
Footage from reference: _____
Direction from reference: _____ Degrees ___ East North ___ of ___ West South ___

Depth To Ground Water: (Vertical distance from contaminants to seasonal high water elevation of ground water)	Less than 50 feet (20 points) 50 feet to 99 feet (10 points) Greater than 100 feet (0 Points)	____
Wellhead Protection Area: (Less than 200 feet from a private domestic water source, or; less than 1000 feet from all other water sources)	Yes (20 points) No (0 points)	____
Distance To Surface Water: (Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches)	Less than 200 feet (20 points) 200 feet to 1000 feet (10 points) Greater than 1000 feet (0 points)	____
	RANKING SCORE (TOTAL POINTS):	____

Date Remediation Started: _____ **Date Completed:** _____

Remediation Method: (Check all appropriate sections)
Excavation ___ Approx. cubic yards _____
Landfarmed ___ Insitu Bioremediation ___
Other _____
_____

Remediation Location: (ie. landfarmed onsite, name and location of offsite facility)
Onsite___ Offsite _____
_____

General Description Of Remedial Action: _____
_____
_____
_____
_____
_____

Ground Water Encountered: No ___ Yes ___ Depth_____

Final Pit:
Closure Sampling:
(If multiple samples, attach sample results and diagram of sample locations and depths)

Sample location _____
_____
Sample depth _____
Sample date _____ Sample time _____
Sample Results
Benzene(ppm) _____
Total BTEX(ppm) _____
Field headspace(ppm) _____
TPH _____

Ground Water Sample: Yes ___ No ___ (If yes, attach sample results)

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF

SIGNATURE PRINTED NAME AND TITLE

QSR
Queen Sand Resources, Inc.

Tatum New Mexico
Rock Queen Unit
Pit Closure Project

Whole Earth Environmental
19606 San Gabriel
Houston, Tx. 77084

NORTHLAND OPERATING COMPANY

RECEIVED
MAY 2 9 1998
Environmental Bureau
Oil Conservation Division

May 22, 1998

Ms. Martyne Kieling
Environmental Geologist
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division – Environmental Bureau
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Re: Rock Queen Unit Tract 20 Lined Pit / Non-hazardous Pit
SE/4 NW/4 Section 30 T13S R32E Lea County, New Mexico

Dear Ms. Kieling:

Enclosed is a closure procedure for both the non-exempt pit and the lined pit at this location. As you know from your inspection at this site on May 18 and previous correspondence, the lined pit has been excavated. The total petroleum hydrocarbon (TPH) level in the bottom of this pit approximates 2,400 ppm, based on tests of two different soil samples. The chloride level in the soil from the bottom of the lined pit was measured at 15,800 mg/Kg; BTEX levels were all well below levels of concern. The closure procedure involves modeling for both pits. Questions regarding this proposal should be directed to Mr. Ed Butler.

Respectfully,

John E. Rhoads
Agent for Northland Operating

cc: Mr. Wayne Price, OCD (including proposal)

Happy Belated Birthday!

John

Hope all goes well.

3500 OAKLAWN, L. B. #31 • DALLAS, TEXAS • 75219-4398
PHONE: 214-521-9959 • FAX: 214-521-9960

Northland Consultant

↖ Roger Anderson ↗

915-338-4506

Mobile

11-30-98

Martyn

To begin Work

QSR

QUEEN SAND RESOURCES, INC.

Kenoth H. Flournoy

Vice President

3500 Oak Lawn
Suite 380, L.B. #31
Dallas, TX 75219-4398

Tel: (214) 521-9959
Fax: (214) 521-9960
Cell: (214) 762-3906

Site Profiles

Overview

Two pits lie immediately adjacent to one another at the site of a fluid transfer and storage station located atop the caprock approximately 22 miles north of Maljamar in Lea County, New Mexico at SE 4 / NW 4 / Section 30, Tract 13S, Range 32E. (See attached plat map).

The depth to groundwater is estimated at a distance of approximately 160' bgl. based on existing wells in the area. According to Atkins Engineering who has had extensive experience in drilling both water and monitoring wells within the region, the local variation in depth to the vadose zone is no more than 30'. The enclosed models are based on contaminant concentrations of 20,000 ppm TPH, 10 ppm benzene and 10,000 ppm soluble chlorides at a maximum separation distance of 100'.

A dry playa bed is located approximately 370' west of the location. Care has been taken within the attached closure protocols to insure that no surface contaminant migration from the site will ever reach the playa bed.

The area has a negative precipitation / evaporation index rate of approximately 90" per year[(1)], thus providing a scant hydrostatic driver for contaminant migration from the pits. With no additional discharge into the pits, the future migration direction for NaCl will be vertically through capillary action. The sub-surface soil morphology is described as intermittent bands of caliche and dense clays providing significant vertical migration barriers to the pits[(2)].

Lined Pit

This pit is describes as having the approximate original dimensions of 100' X 100' X 5' deep. The pit was lined with fiberglass and used for emergency saltwater overflow from immediately adjacent storage tanks. All fluids were immediately removed after each upset occurrence and recycled within the system. No evidence exists that the storage pit ever overflowed its capacity.

Remediation History

The pit was recently dismantled and excavated to a depth of approximately 7' bgl. All contaminated soils and the fiberglass liner were transported to CRI in Hobbs, NM for disposal. Field tests reveal the present pit bottom (7' bgl) to contain an average TPH concentration of 2,200 ppm tapering off to a concentration of 20 ppm at a depth of 10' bgl. The laboratory confirmation of the 10' bgl. sample revealed a concentration of <10 ppm TPH[(3)]. Composite average soluble chloride concentrations were measured at 15,800 ppm at 7' bgl.

Proposed Remediation Protocol
We plan to continue the excavation of this pit until we achieve a TPH concentration of <1,000 ppm and BTEX concentrations of <10 ppm benzene and <50 ppm total BTEX in accordance with the standard OCD Closure Guidelines. The excavated materials will be mixed and blended with additional topsoils taken from the immediate area and re-deposited within the pit. Laboratory confirmation samples will be provided to the OCD for each sidewall, the pit bottom and a composite average of the fill material. We will additionally deposit a minimum of 4' of fresh, uncontaminated soils as a top cover to prevent any potential vertical capillary migration of salts to the surface in accordance with the guidelines defined within *API 4663, Remediation of Salt Affected Soils at Oil and Gas Production Facilities*, Section 7-11, October 1997.

6' layer of sand & gypsum revegetation Ferted topsoil

Non-Exempt Pit

The history of the non-exempt pit is unknown. Based on excavation and coring results, the pit appears to be situated atop a previously unidentified pit site probably used as an unlined emergency saltwater overflow impoundment constructed by a previous owner of the property. The present pit dimensions are approximately 30' X 20' X 5' above ground level (perched pit).

Remediation History
Remedial efforts at this location have been limited to an attempt to characterize the nature and vertical extent of the contamination. Extensive testing for RCRA 8 metals, VOAs, BNAs, pesticides / herbicides, corrosivity, reactivity and ignitability revealed no contaminant concentration exceeding exemption parameters[4].

Hn2

Vertical coring results indicate a contamination profile of 4,000 ppm TPH at 5' bgl, 20,000 ppm at 10' and 458 ppm at 38' bgl. No vertical profile exists for chlorides. BTEX concentrations are nominal at all depths[5].

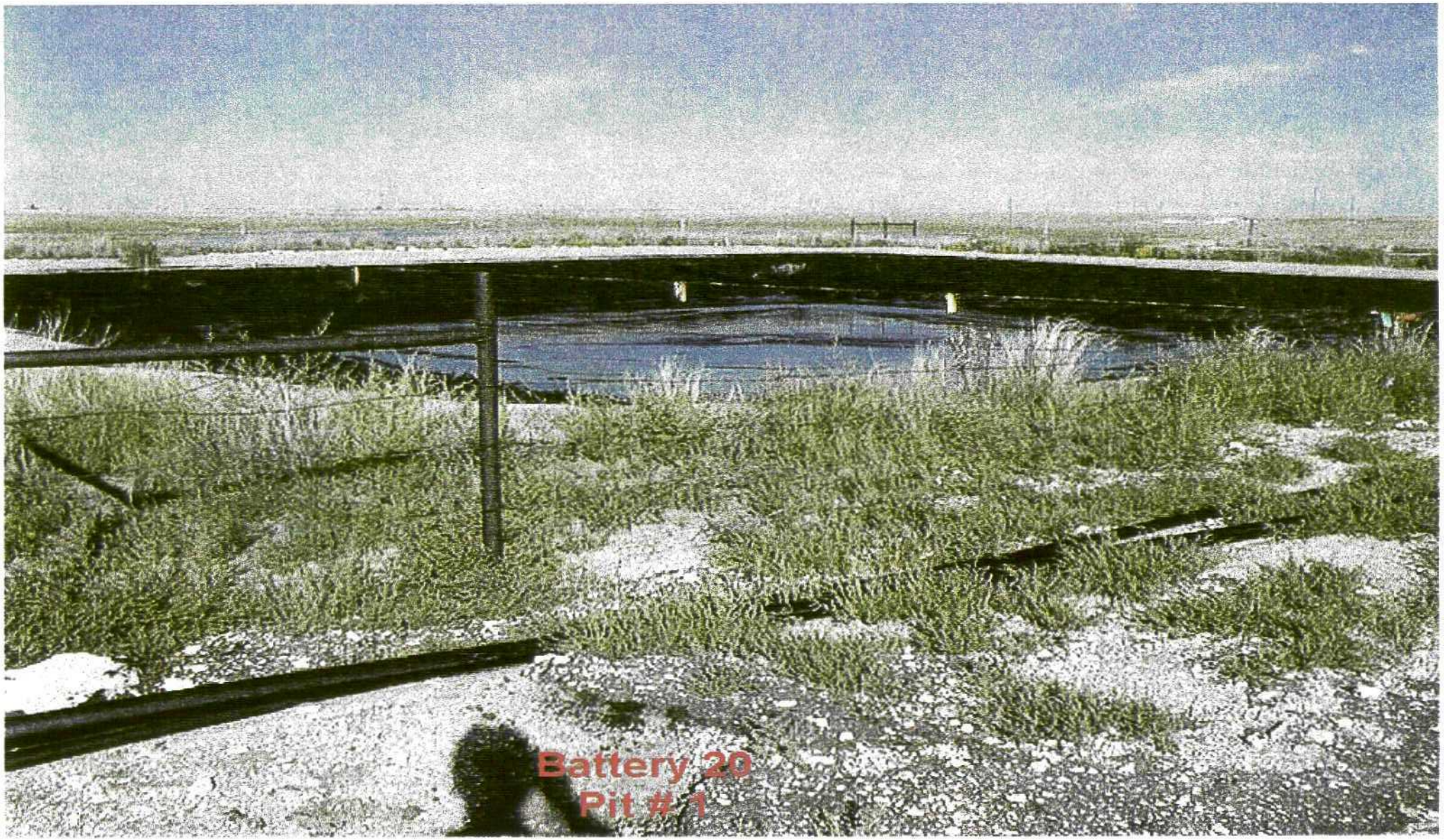
Proposed Remediation Protocol
In accordance with your instruction of April 15, we have prepared a contaminant migration model for both benzene (the most mobile of the BTEX compounds) and NaCl using VADSAT. The model demonstrates that even at TPH concentrations of 20,000 ppm and soluble chloride concentrations of 10,000 ppm with a separation distance to the vadose zone of only 50', a pit liner will insure that **no** contaminants will reach the water table within seventy-five years.

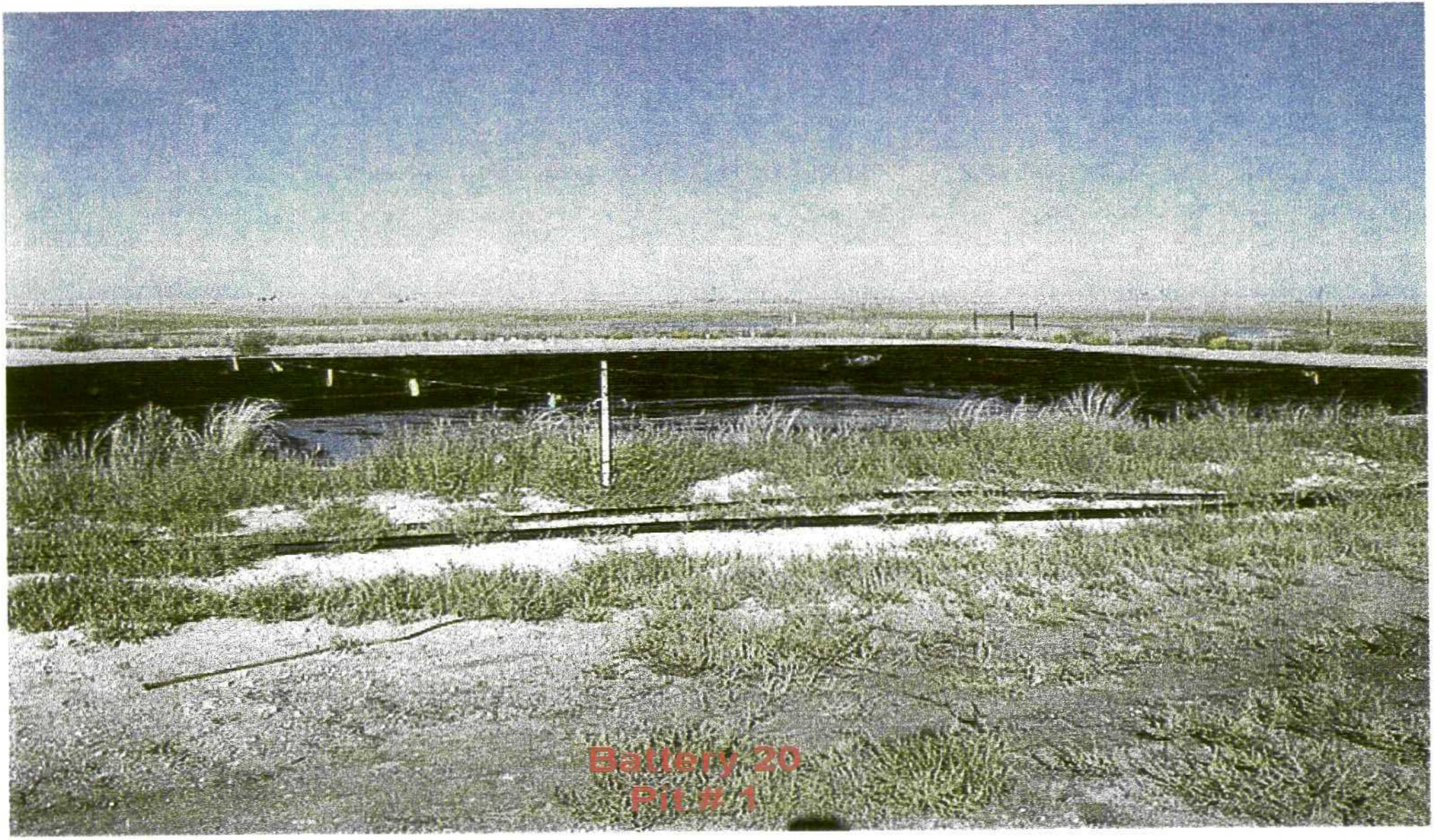
Foreseeable Future.

We therefore propose to excavate the pit contents to these concentrations, install a 30 mil polyethylene liner extending to within 3' of the surface, aerate and dilute the excavated materials with additional topsoils to the excavation concentrations and cover the area to a minimum depth of 4' with fresh fill.

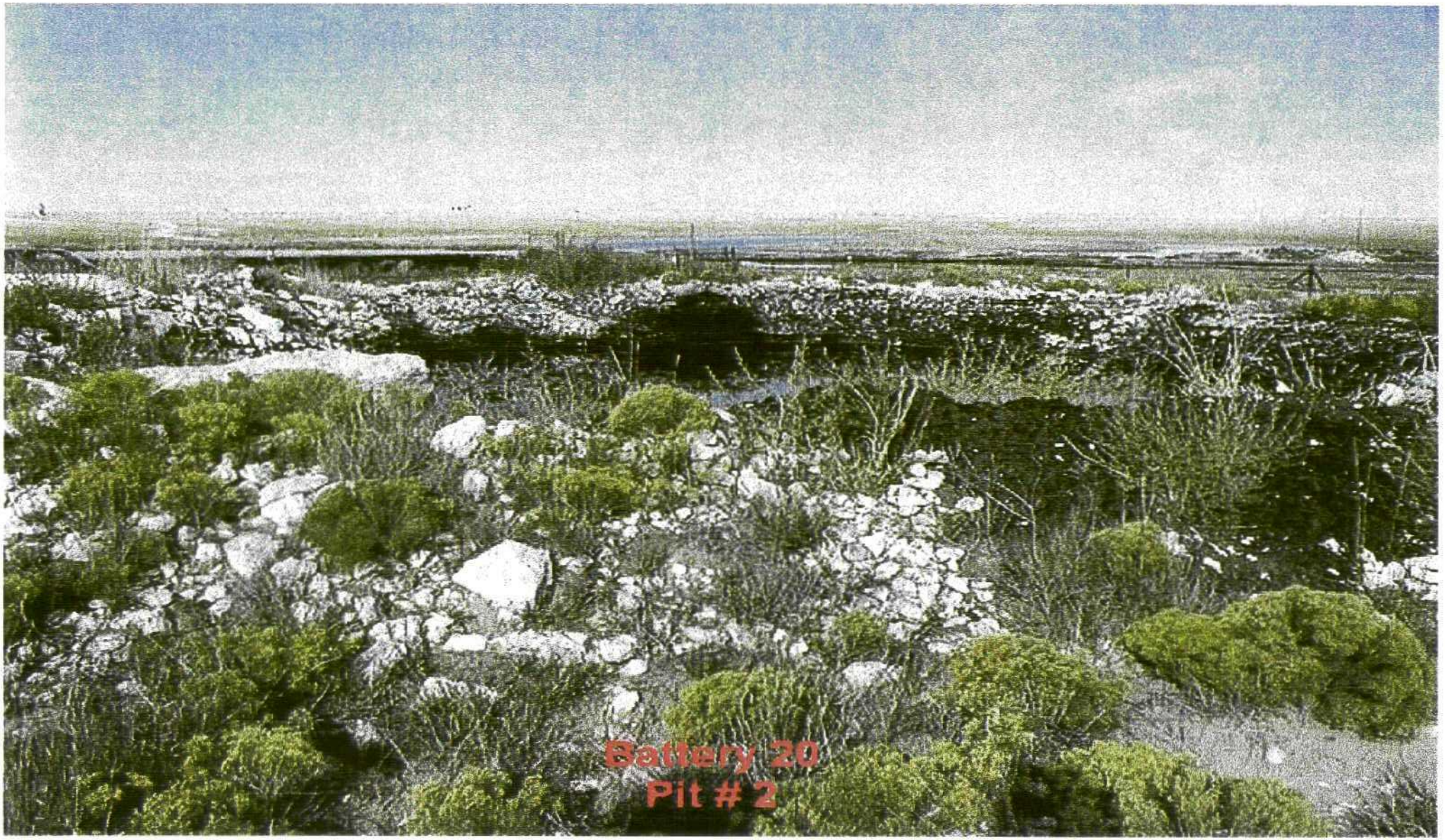
References

1. U.S. Dept of Commerce rainfall / evaporation maps (enclosed).
2. Log of Boring Atkins Engineering Test Hole # 2 (enclosed).
3. Cardinal Laboratories report H3371-3 (previously submitted).
4. NTCC Laboratory report JR-005 (previously submitted).
5. Intertek Testing Services report nos. D98-2002-1 & 2 (previously submitted).


Battery 20
Pit # 1


Battery 20
Pit # 1


Battery 20
Pit # 2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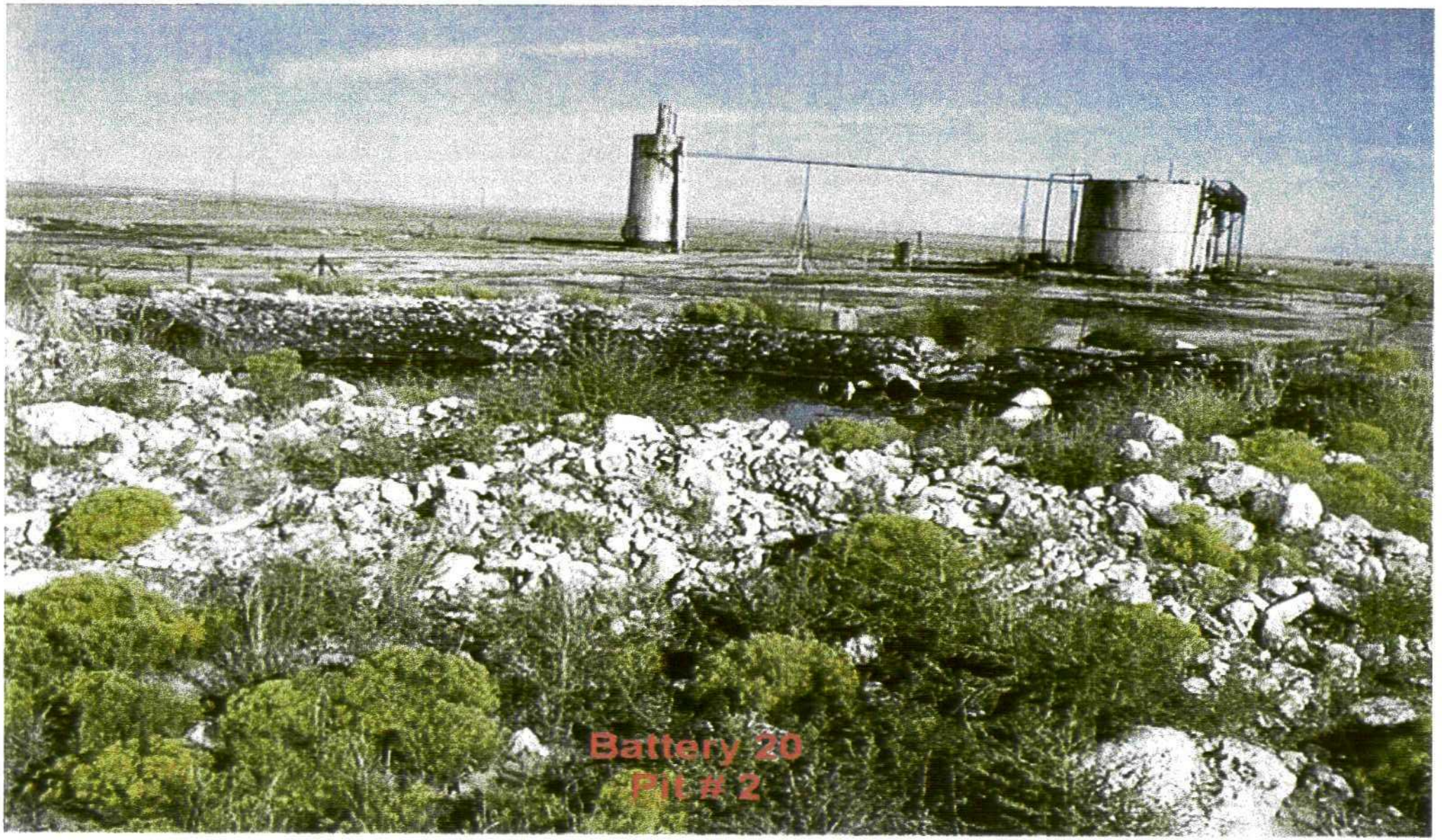
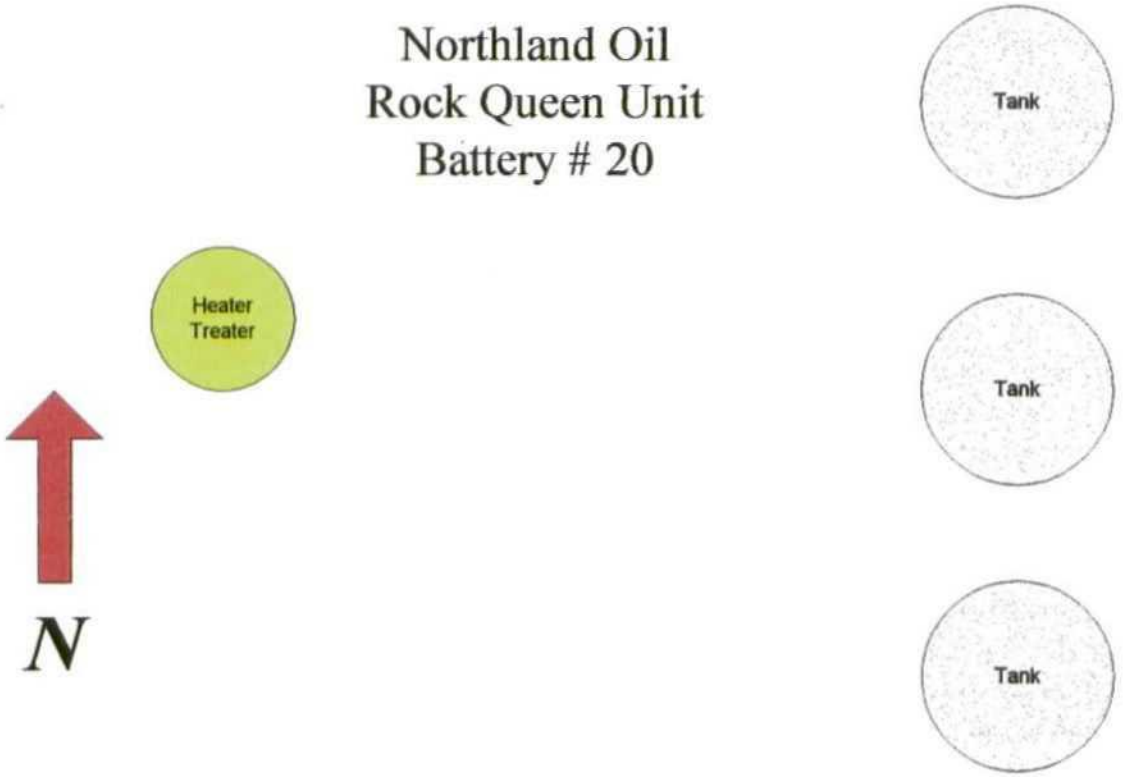
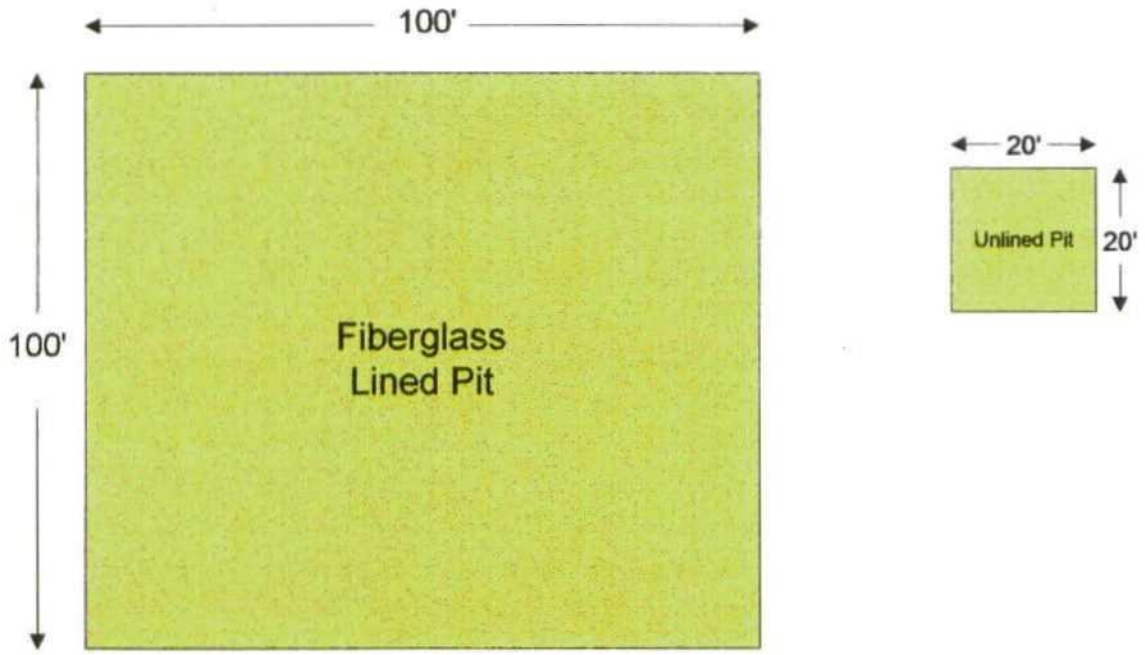
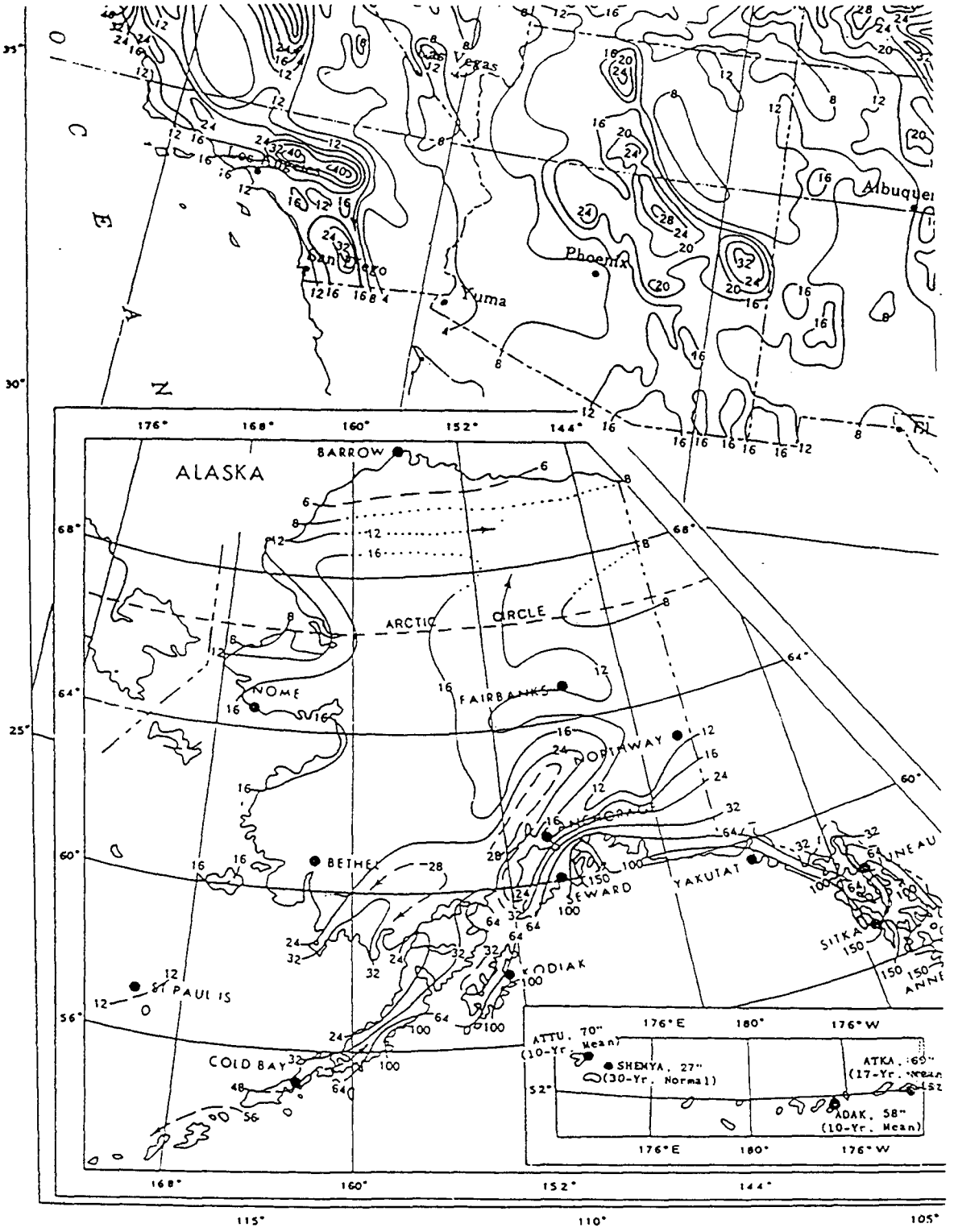
Pit # 2


Battery 20
Pit # 2

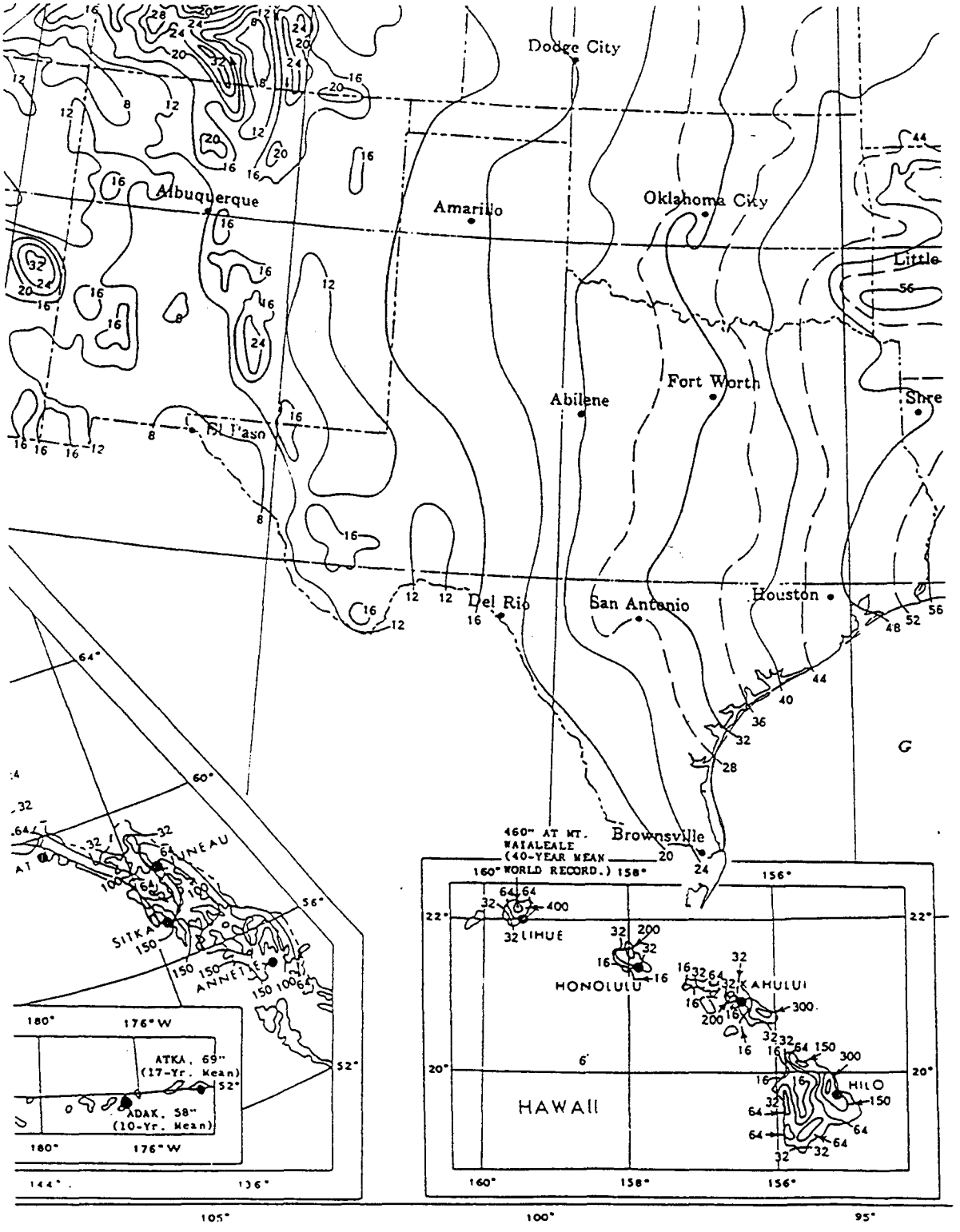
Northland Oil
Rock Queen Unit
Battery # 20





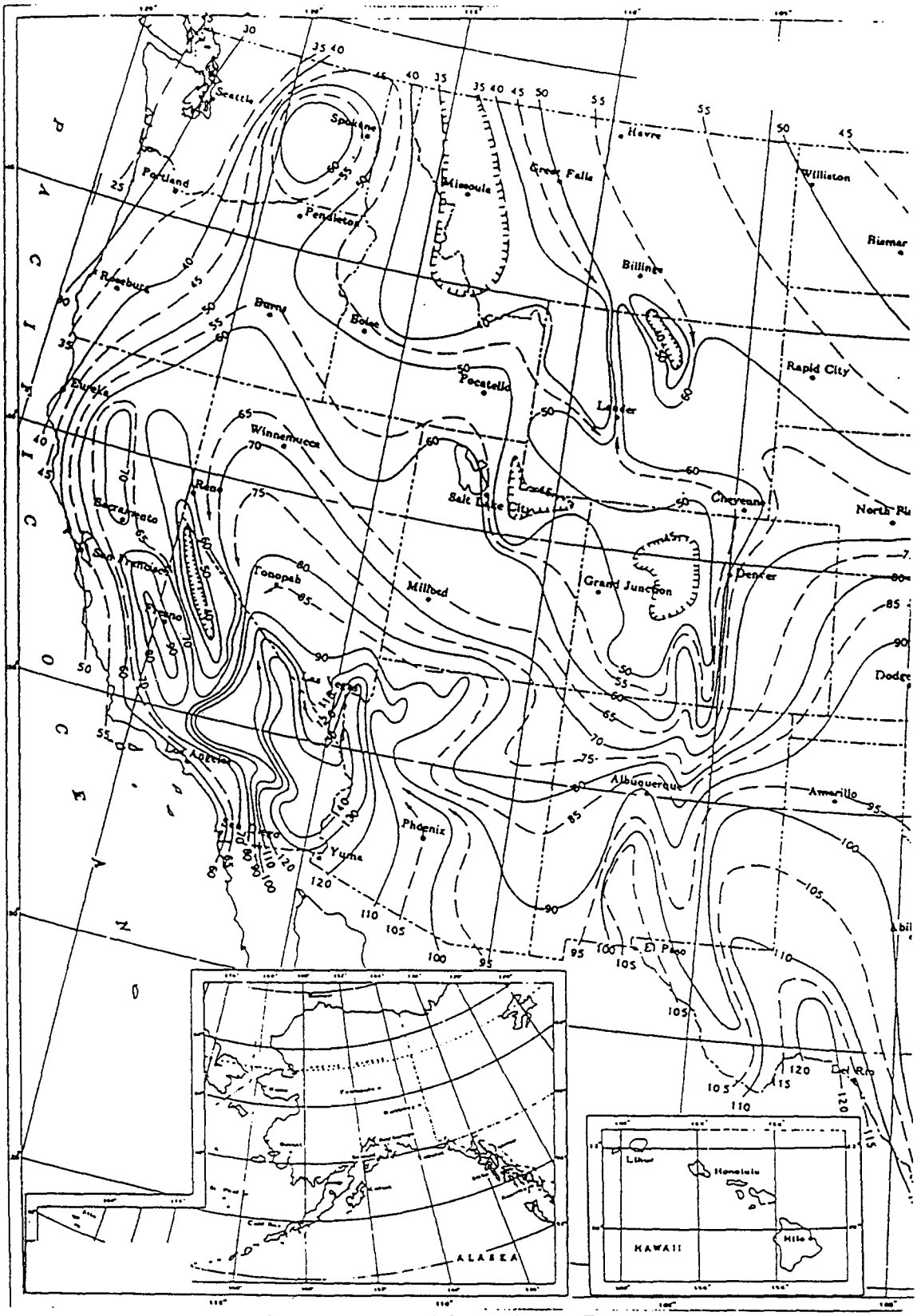


Southwest USA Normal Annual Total Precipitation Map

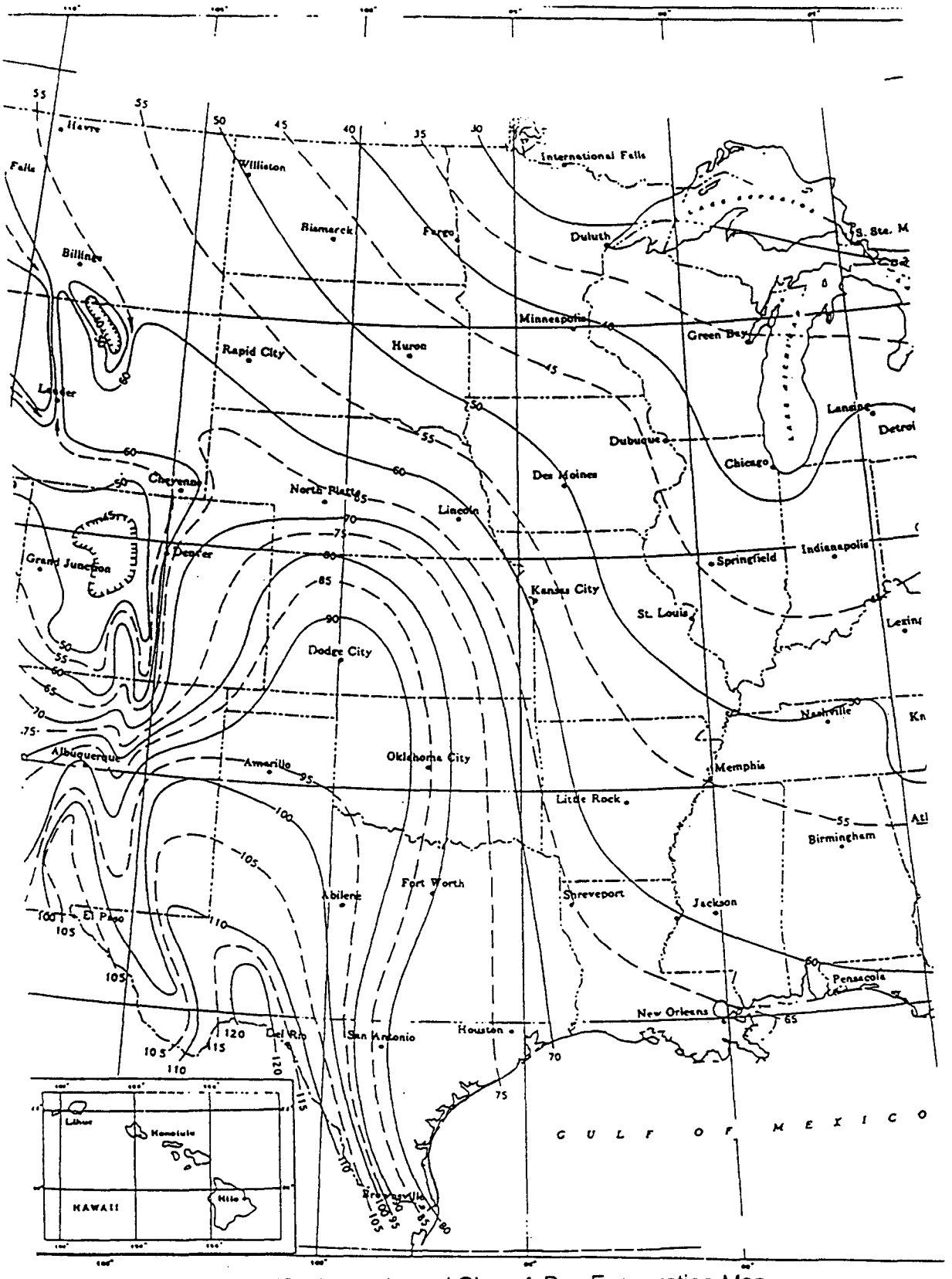


Central Southwest USA Normal Annual Total Precipitation Map

105
- 12



Western USA Mean Annual Class A Pan Evaporation Map



Central USA Mean Annual Class A Pan Evaporation Map

Atkins Engineering Associates, Inc.
P.O. Box 3156
Roswell, New Mexico 88202

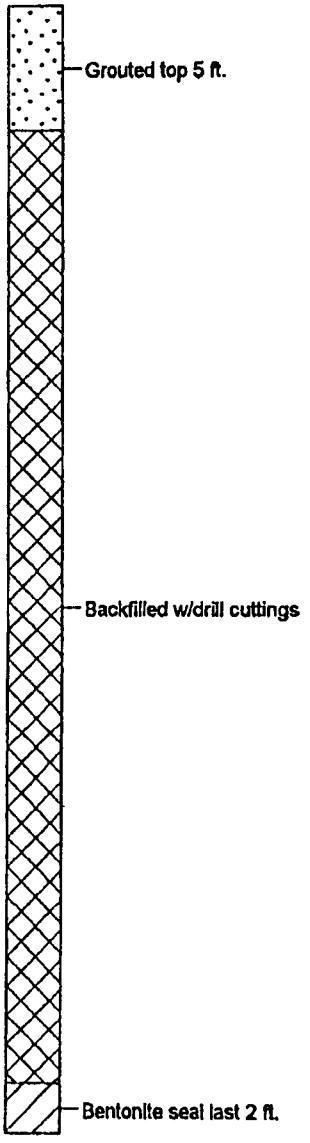
LOG OF BORING - Test Hole #2

Safety Environmental Solutions
c/o EagleEye Monitoring
719 Scott, Suite 624
Wichita Falls, TX 76301
Contact: Mr. John Rhoads Job #97330

Date	: 12-10-97	Site Location	: 22 miles N. of Maljamar, NM
Drill Start	: 2:50 P.M.	Auger Type	: Hollowstem
Drill End	: 4:30 P.M.	Logged by	: Mort Bates
Boring Location	: Tract 20 - unexempt		

Depth in feet	GRAPHIC	USCS	DESCRIPTION
0			Caliche w/Silty Clay, Brown, Stiff, Dry
5		CL	Sandy Clay w/Gravel, Gray, Firm, Damp
10			
15		CL	Silty Sandy Clay, Gray, Loose, Dry
20			
25			Caliche w/Silty Sandy Clay, Gray, Firm, Dry
30			
35			
40		CL	Sandy Clay, Tan, Loose, Dry
45			TD = 45 ft.
50			

Well: TH-2
Elev.:



c:\mbach\safetyEnv
12-15-1997

Protocols

This section contains copies of the remediation protocols we plan to use in closing the two pits within the Rock Queen Unit.

Pit Remediation Protocol
Northland Queen Sand Unit Lined Pit

1.0 Purpose

This protocol is to provide a detailed outline of the steps to be employed in the remediation and final closure of the Northland Queen Rock Unit Lined Pit

2.0 Scope

This protocol is site specific for the above stated site.

3.0 Preliminary

Prior to any field operations, Whole Earth Environmental shall conduct the following activities:

3.1 Client Review

3.1.1 Whole Earth shall meet with cognizant personnel within Northland to review this protocol and make any requested modifications or alterations prior beginning any work.

3.1.2 Changes to this protocol will be documented and submitted for final review by Northland prior to work commencement.

4.0 Safety

4.1 Prior to work on the site, Whole Earth shall obtain the location and phone numbers of the nearest emergency medical treatment facility. We will review all safety-related issues with the appropriate Northland personnel, sub-contractors and exchange phone numbers.

4.2 A tailgate safety meeting shall be held and documented each day. All sub-contractors must attend and sign the daily log-in sheet.

4.3 Anyone allowed on to location must be wearing sleeved shirts, steel-toed boots, and long pants. Each vehicle must be equipped with two-way communication capabilities.

4.4 Prior to any excavation, the area shall be surveyed with a line finder. If lines are discovered within the area to be excavated, they shall be marked with pin flags on either side of the line at maximum five-foot intervals. The area will be photographed prior to any excavation or fluid removal.

4.5 Each pit area will be swept with a Ludlam 2350 to determine if NORM is present in concentrations greater than 40µr / hr.

5.0 Excavation & Remediation

5.1 The site shall be excavated to a minimum depth of 7'. All excavated materials will be deposited immediately adjacent to the pit site.

5.2 The bottom of the pit and all four side walls will be tested for TPH and BTEX concentrations using WEQP-06 and WEQP-19. Excavation will continue until such concentrations are <1,000 ppm TPH, <10 ppm benzene and <50 ppm BTEX.

of Cl levels

on Cl 15,600 @ 7' BGS

5.3 Upon reaching the required depth and side wall dimensions, the bottom of the pit will be made as smooth as possible with excavation equipment.

5.4 The excavated materials will be mixed and blended with additional topsoils obtained from the area immediately adjacent to the pit until the hydrocarbon and conductivity concentrations fall below the maximum limits as described in Paragraph 5.2 of this protocol. The remediated materials will then be replaced into the excavated area and compacted. The pit will then be covered with a minimum of 4' of fresh topsoil to provide a capillary barrier and the surface contoured to provide for positive drainage.

Cl +

6' / Gravel / Sand / Gypsum 5' / Clean soil 4'-6" Topsoil 1-0 / vegi

6.0 Documentation & Reporting

6.1 At the conclusion of the pit remediation project, Whole Earth will prepare a closure report to include the following information:

- A plat map of the location showing the exact location of the pit, the dimensions prior to excavation and the actual excavated dimensions.
- Photographs of the pit prior to excavation, at the point of maximum excavation and after final closure
- Field Sampling Report to include the side wall and pit bottom TPH and BTEX concentrations after excavation.
- Field Sampling Report to include TPH and BTEX concentrations of all remediated materials deposited into the pit. — 9 C1
- Daily calibration records of each testing instrument
- Shipping manifests
- Chain of Custody form for laboratory confirmation samples
- Laboratory confirmation results

7' to 10' 2,200 - 20ppm TPH

7' C1 15,800 ppm

Pit Remediation Protocol
Northland "Non-Exempt" Pit

1.0 Purpose

This protocol is to provide a detailed outline of the steps to be employed in the remediation and final closure for pits requiring risk assessment modeling.

2.0 Scope

This protocol is site specific.

3.0 Preliminary

Prior to any field operations, Whole Earth Environmental shall conduct the following activities:

3.1 Client Review

3.1.1 Whole Earth shall meet with cognizant personnel within Northland to review this protocol and make any requested modifications or alterations prior to submittal to the State of New Mexico Oil Conservation Division.

3.1.2 Changes to this protocol will be documented and submitted for final review by Northland prior to submittal to the Oil Conservation Division.

3.2 Oil Conservation Division Review

3.2.1 Upon client approval, this protocol and associated modeling results will be submitted to the New Mexico Oil Conservation Division for review and comment. Recommended changes will be reviewed by the client prior to implementation.

3.2.2 Any recommended changes effecting costs will require a revised quotation to be issued to the client for approval prior to the commencement of any on-site remediation activity.

4.0 Safety

4.1 Prior to work on the site, Whole Earth shall obtain the location and phone numbers of the nearest emergency medical treatment facility. We will review all safety related issues with the appropriate Client personnel, sub-contractors and exchange phone numbers.

4.2 A tailgate safety meeting shall be held and documented each day. All sub-contractors must attend and sign the daily log-in sheet.

4.3 Anyone allowed on to location must be wearing sleeved shirts, steel-toed boots, and long pants. Each vehicle must be equipped with two-way communication capabilities.

4.4 Prior to any excavation, the area shall be surveyed with a line finder. If lines are discovered within the area to be excavated, they shall be marked with pin flags on either side of the line at maximum five-foot intervals.

5.0 Fluid Removal

Prior to any excavation, the pit fluids and all available soils containing a TPH concentration of ≥100,000 ppm shall be removed by vacuum truck and transported to a licensed disposal facility. A shipping manifest and O.C.D. Form C-117-A shall be prepared for each load and included within the final closure report.

6.0 Excavation & Remediation

6.1 The site shall be excavated to a minimum depth of 10'. All excavated material will be deposited immediately adjacent to the pit site.

6.2 The bottom of the pit and all four side walls will be tested for TPH and BTEX concentrations using WEQP-06 and WEQP-19. Excavation will continue until such concentrations are <10,000 ppm TPH, <10 ppm benzene and <50 ppm total BTEX.

6.3 Upon reaching the required depth and side wall dimensions, the bottom of the pit will be made as smooth as possible with excavation equipment. Sand will be deposited in the bottom of the pit in a minimum thickness of 6".

6.4 A polyethylene liner of a minimum thickness of 30 mils will be spread atop the sand to the pit edge and an additional 6" of sand deposited above it.

6.5 The excavated materials will be mixed and blended with additional topsoils obtained from the area immediately adjacent to the pit until the hydrocarbon concentrations fall below the maximum limits as described in Paragraph 6.2 of this protocol. The remediated materials will then be replaced into the excavated area, compacted and the surface contoured to provide for positive drainage.

6.6 The top two feet of the excavation shall be covered in remediated materials having a maximum TPH concentration of <100 ppm and benzene concentrations of <2 ppm.

7.0 Documentation & Reporting

7.1 At the conclusion of the pit remediation project, Whole Earth will prepare a closure report to include the following information:

- A plat map of the location showing the exact location of the pit, the dimensions prior to excavation and the actual excavated dimensions.
- Photographs of the pit prior to excavation, at the point of maximum excavation and after final closure
- Field Sampling Report to include the side wall and pit bottom TPH and BTEX concentrations after excavation.
- Field Sampling Report to include TPH and BTEX concentrations of all remediated materials deposited into the pit deposited into the pit.
- Daily calibration records of each testing instrument
- Shipping manifests and OCD Form C-117-A
- Risk assessment model and supporting documentation
- M.S.D.S. and permeability certification of liner materials
- Chain of Custody forms for laboratory confirmation samples
- Laboratory confirmation results including QA / QC data

Modeling

This section contains the calculated results of a VADSAT contamination model for TPH, benzene and sodium chloride for Northland's "non-exempt" pit. The model is based on a 50' separation between the bottom of a lined impoundment and the upper vadose zone of the aquifer.

The modeled contaminant concentrations are based on 20,000 ppm TPH, 10,000 ppm soluble chlorides and 10 ppm benzene. The actual separation distance is at least 100' and the actual benzene concentrations are <2 ppm. The time span is 75 years.

Modeling Data Entry
Northland "Non-Exempt" Pit
TPH / Benzene

Control Data	Entry	U / M
Deterministic	Yes	
Monte Carlo	No	
Evaporation	No	
Biodecay	No	
Low Permeability Layer Below Contamination	No	

Source Data		
Waste Zone Thickness	8	meters
Waste Zone Area	57	sq. meters
Ratio of Length to Width	1.5:1	
Soil Thickness Above Waste Zone	1	meter
Contaminant Concentration in Soil / Waste Zone	10	ppm
Hydrocarbon Concentration in Soil / Waste Zone	20,000	ppm

Benzene
TPH

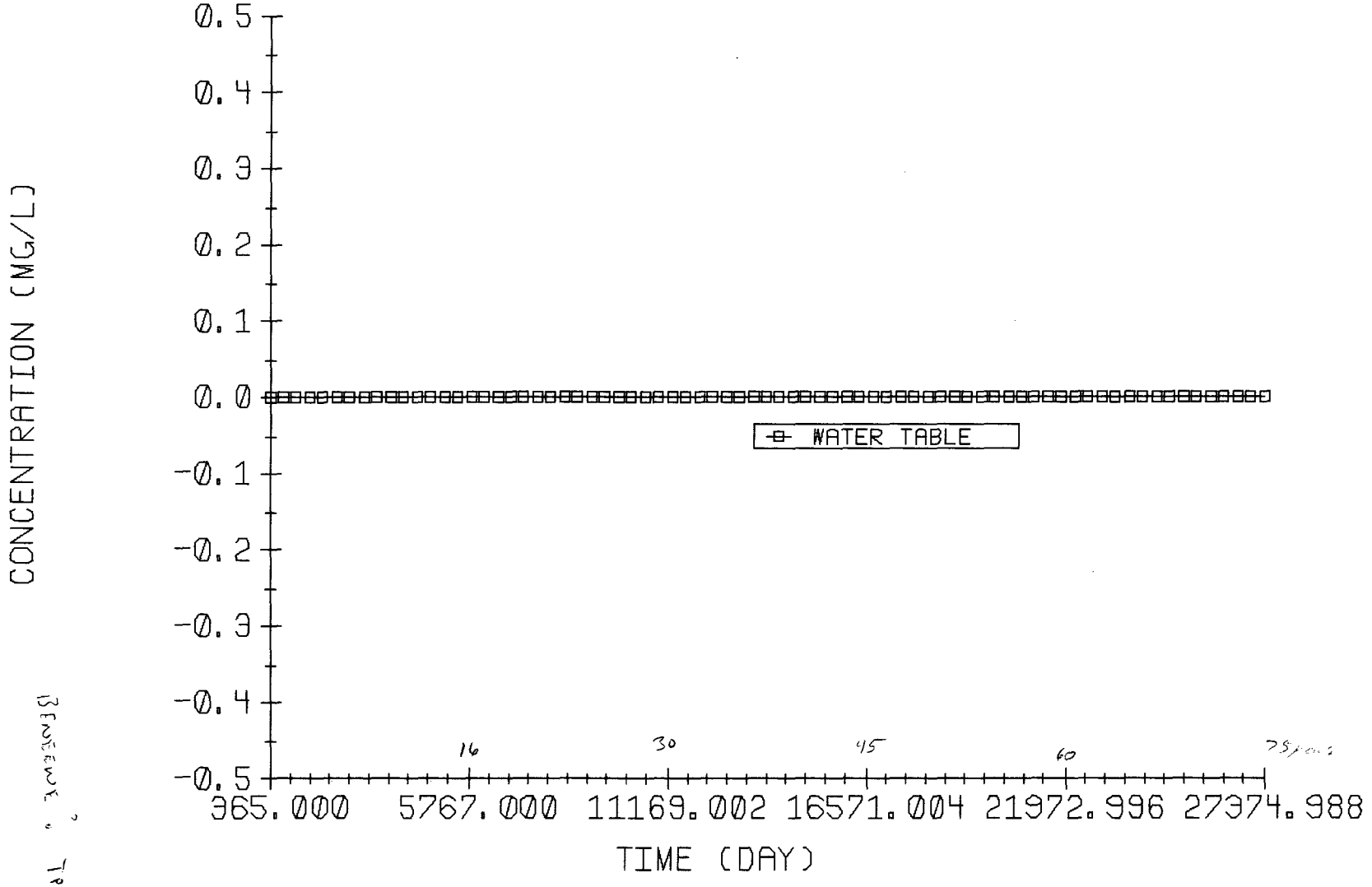
Chemical Data	
Benzene	Yes

Unsaturated Zone		
Biodecay Cooefficient	0	
Organic Carbon Fraction	0	
Soil Database	**Clay**	
Hydrological Database	Sedimentary	
Unsaturated Zone Thickness	50	feet
Soil Database	**Clay**	
van Genuchten n	1.09	(Default)
Residual Water Content	0.01001	
Unsaturated Zone Dispersivity	0	**Internally**

Saturated Zone		
Biodecay Cooefficient	0	
Aquifer Porosity	0.2	(Default)
Organic Carbon Fraction	0	**Internally**
Longitudinal Dispersivity	0	**Internally**
Ratio of Long. / Trans. Dispersivities	3	
Ratio of Trans. / Vert. Dispersivities	3	
Hydrological Database	Sedimentary	
Aquifer Thickness	10	meters
Aquifer Gradient	0.00357	
Saturated Hydraulic Conductivity	0.13	meters / day

Net Infiltration Rate	0.00001	ft. / day

CONCENTRATION VS. TIME



Modeling Data Entry
Northland "Non-Exempt" Pit
NaCl

Control Data	Entry	U / M
Deterministic	Yes	
Monte Carlo	No	
Evaporation	No	
Biodecay	No	
Low Permeability Layer Below Contamination	No	

Source Data		
Waste Zone Thickness	8	meters
Waste Zone Area	57	sq. meters
Ratio of Length to Width	1.5:1	
Soil Thickness Above Waste Zone	1	meter
Contaminant Concentration in Soil / Waste Zone	20,000	ppm
Soluable Concentration in Soil / Waste Zone	20,000	ppm

Cl: 19,000
Cl: 19,000

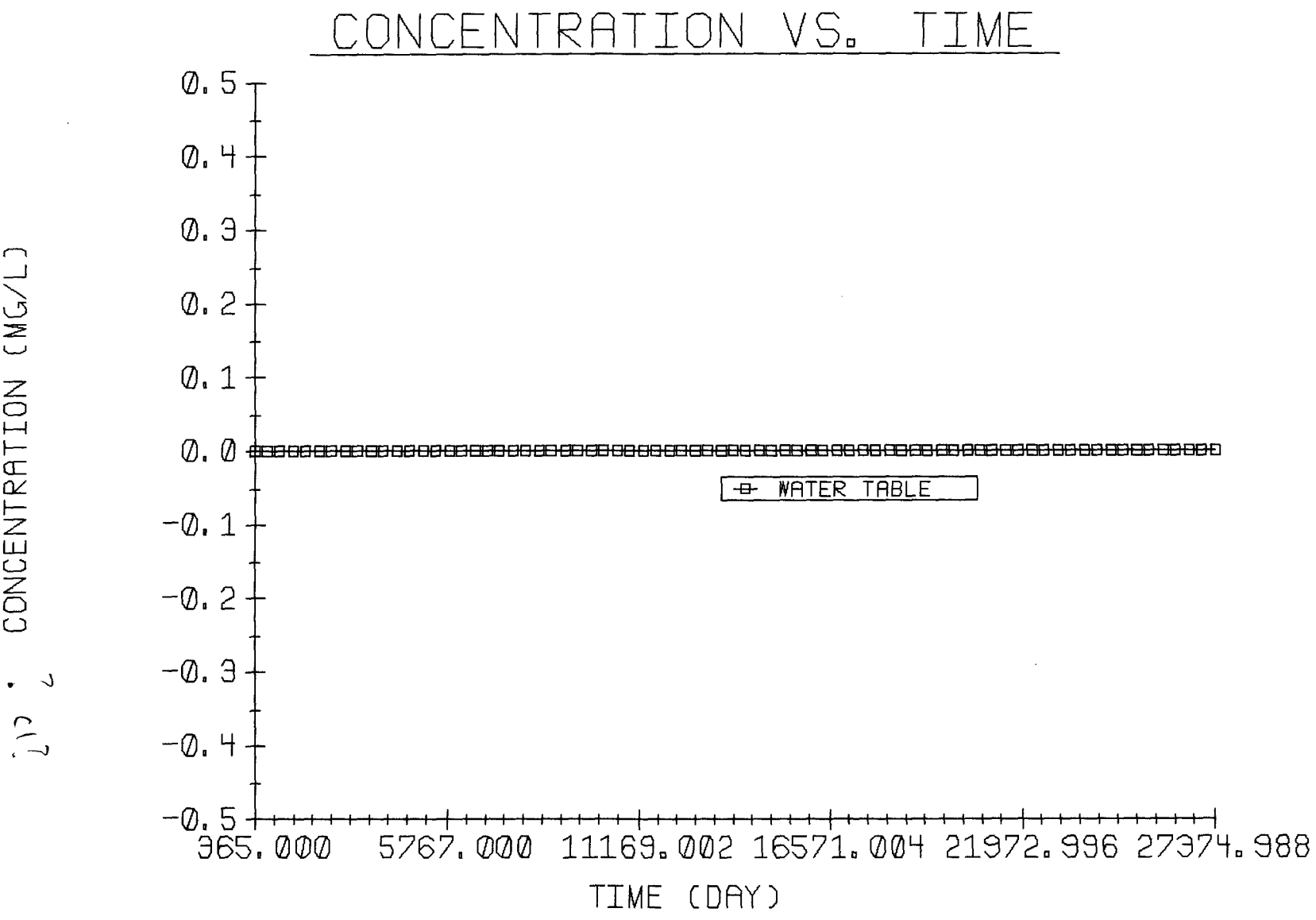
At 7' bgs Cl 15,800 ppm

Chemical Data	
NaCl	Yes

Unsaturated Zone		
Biodecay Cooefficient	0	
Organic Carbon Fraction	0	
Soil Database	**Clay**	
Hydrological Database	Sedimentary	
Unsaturated Zone Thickness	50	feet
Soil Database	**Clay**	
van Genuchten n	1.09	(Default)
Residual Water Content	0.01001	
Unsaturated Zone Dispersivity	0	**Internally**

Saturated Zone		
Biodecay Cooefficient	0	
Aquifer Porosity	0.2	(Default)
Organic Carbon Fraction	0	**Internally**
Longitudinal Dispersivity	0	**Internally**
Ratio of Long. / Trans. Dispersivities	3	
Ratio of Trans. / Vert. Dispersivities	3	
Hydrological Database	Sedimentary	
Aquifer Thickness	10	meters
Aquifer Gradient	0.00357	
Saturated Hydraulic Conductivity	0.13	meters / day

Net Infiltration Rate	0.00001	ft. / day


CONCENTRATION VS. TIME
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
CONCENTRATION (MG/L)
WATER TABLE
365.000
5767.000
11169.002
16571.004
21972.996
27374.988
TIME (DAY)

Procedures

This section contains copies of the detailed procedures we plan to employ in support of the closure protocols for the Rock Queen Unit.

QP-06 Rev. C

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Procedure for Conducting Field TPH Analysis

Completed By:	Approved By:	Effective Date: 02/15/97

1.0 Purpose

To define the procedure to be used in conducting total percentage hydrocarbon testing in accordance with EPA Method 418.1 (modified) using the "MEGA" TPH Analyzer.

2.0 Scope

This procedure is to be used for field testing and on site remediation information.

3.0 Procedure

3.1 The G.A.C. "MEGA" TPH analyzer is an instrument that measures concentrations of aliphatic hydrocarbons by means of infra-red spectrometry. It is manufactured to our specifications and can accurately measure concentrations from two parts per million through 100,000 parts per million. The unit is factory calibrated however minor calibration adjustments may be made in the field. Quality Procedure 25 defines the field calibration methods to be employed.

3.2 Prior to taking the machine into the field, insert a 500 ppm and 5,000 ppm calibration standard into the sample port of the machine. Zero out the Range dial until the instrument records the exact standard reading.

3.3 Once in the field, insert a large and small cuvette filled with clean Freon 113 into the sample port of the machine. Use the range dial to zero in the reading. If the machine does not zero, do not attempt to adjust the span dial. Immediately implement Quality Procedure 25 .

3.4 Place a 100 g. weight standard on the field scale to insure accuracy. Zero out the scale as necessary.

3.5 Tare a clean 100 ml. sample vial with the Teflon cap removed. Add 10 g. (+/- .01 g), of sample soil into the vial taking care to remove rocks or vegetable matter from the sample to be tested. If the sample is wet, add up to 5 g. silica gel or anhydrous sodium sulfate to the sample after weighing.

3.6 Dispense 10 ml. Freon 113 into the sample vial.

3.7 Cap the vial and shake for five minutes.

3.8 Carefully decant the liquid contents of the vial into a filter/desiccant cartridge and affix the cartridge cap. Recap the sample vial and set aside.

3.9 Insert the metal tip of the pressure syringe into the cap opening and slowly pressurize. **WARNING: APPLY ONLY ENOUGH PRESSURE ON THE SYRINGE TO EFFECT FLOW THROUGH THE FILTERS. TOO MUCH PRESSURE MAY CAUSE THE CAP TO SEPARATE FROM THE BODY OF THE CARTRIDGE.** Once flow is established through the cartridge direct the flow into the 5 cm. cuvette until the cuvette is full. Reverse the pressure on the syringe and remove the syringe tip from the cartridge cap. Set the cartridge aside in vertical position.

3.10 The cuvette has two clear and two frosted sides. Hold the cuvette by the frosted sides and carefully insert into the sample port of the machine. Read the right hand digital read-out of the instrument. If the reading is less than 1,000 ppm. the results shall be recorded in the field Soil Analysis Report. If the result is higher than 1,000 ppm, continue with the dilution procedure.

4.0 Dilution Procedure

4.1 When initial readings are greater than 1,000 ppm using the 5 cm. cuvette, pour the contents of the 5 cm. cuvette into a 1 cm. cuvette. Insert the 1. cm cuvette into the metal holder and insert into the test port of the instrument.

4.1 Read the left hand digital read-out of the machine. If the results are less than 10,000 ppm, record the results into the field Soil Analysis Report. If greater than 10,000 ppm, continue the dilution process. **Concentrations >10,000 ppm are to be used for field screen purposes only.**

4.2 Pour the contents of the small cuvette into a graduated glass pipette. Add 10 ml. pure Freon 113 into the pipette. Shake the contents and pour into the 1cm. cuvette. Repeat step 4.2. adding two zeros to the end of the displayed number. If the reported result is greater than 100,000 ppm. the accuracy of further readings through additional dilutions is extremely questionable. **Do not use for reporting purposes.**

4.4 **Pour all sample Freon into the recycling container**.

5.0 Split Samples

5.1 Each tenth test sample shall be a split sample. Decant approximately one half of the extraction solvent through a filter cartridge and insert into the instrument to obtain a concentration reading. Clean and rinse the cuvette and decant the remainder of the fluid to obtain a second concentration reading from the same sample. If the second reading varies by more than 1% from the original, it will be necessary to completely recalibrate the instrument.

QP-19

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Sampling and Testing Protocol
BTEX Speciation in Soil

Completed By: Approved By: Effective Date: / /

1.0 Purpose

This procedure is to be used to determine the concentrations of Benzene, Toluene, Ethyl-Benzene and Xylene (BTEX) in soils.

2.0 Scope

This procedure is to be used as the standard field measurement for soil BTEX concentrations. It is not to be used as a substitute for full spectrographic speciation of organic compounds.

3.0 Procedure

3.1 Sample Collection and Preparation

3.1.1 Collect at least 500 g. of soil from the sample collection point. Take care to insure that the sample is representative of the general background to include visible concentrations of hydrocarbons and soil types. If necessary, prepare a composite sample of soils obtained at several points in the sample area. Take care to insure that no loose vegetation, rocks or liquids are included in the sample(s).

3.1.2 The soil sample(s) shall be immediately inserted into a one quart or larger polyethylene freezer bag and sealed. When sealed, the bag should contain a nearly equal space between the soil sample and trapped air.

3.1.3 The sealed samples shall be allowed to set for a minimum of five minutes at a minimum temperature of 70^{0}F.

3.1.4 The sealed sample bag should be massaged to break up any clods, and to provide the soil sample with as much exposed surface area as practically possible.

3.2 Sampling Procedure

3.2.1 The instrument to be used in conducting VOC concentration testing shall be a Photovac Ion-chromatograph with BTEX Module. Prior to use the instrument shall be zeroed out in accordance with QP-55.

3.2.2 Carefully open one end of the collection bag and insert the probe tip into the bag taking care that the probe tip not touch the soil sample or the side walls of the bag. If VOC analysis was conducted on the sample prior to BTEX analysis, care should be taken to insure that a sufficient air volume exists in the bag to provide accurate results. **If the available air space within the bag is insufficient to run a full analysis, the sample shall be discarded.**

3.2.3 Set the instrument to retain the highest result reading value. Record the reading onto the Field Analytical Report Form and additionally enter the location code into the instrument data logger.

4.0 After testing, the soil samples shall be returned to the sampling location, and the bags collected for off-site disposal. **IN NO CASE SHALL THE SAME BAG BE USED TWICE. EACH SAMPLE CONTAINER MUST BE DISCARDED AFTER EACH USE.**

QP-25

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Procedure for Instrument Calibration and Quality Assurance Analysis for General Analysis "MEGA" TPH Analyzer

Completed By: Approved By: Effective Date: / /

1.0 Purpose

This procedure outlines the methods to be employed in calibrating the GAC MEGA TPH analyzer and for determining and reporting of accuracy curves.

2.0 Scope

This procedure shall be followed each day that the instrument is used.

3.0 Procedure

3.1 Turn the instrument on and allow to warm up with no cuvette in the receptacle. The instrument will take between five and ten minutes to come to equilibrium as can be determined by the concentration display readings moving a maximum of 5 ppm on the low scale. If the instrument continues to display erratic readings greater than 5 ppm, remove the cover and check both the mirrors and chopper to insure cleanliness.

3.2 All TPH standards shall be purchased form Environmental Resources Corporation and as a condition of their manufacture subject to independent certification by third party laboratories. Each standard is received with a calibration certificate.

3.3 Insert the low range (100 ppm) calibration standard into the receiving port and note the result on the right hand digital display. If the displayed reading is less than 98 ppm or greater than 102 ppm, remove the circuit board cover panel and zero out the instrument in accordance with QP-26.

(Note: Except in New Mexico, set the span to read 105% of actual standard).

3.4 Repeat the process with the mid range (500 ppm) calibration standard. If the displayed reading is less than 490 ppm or greater than 510 ppm zero out the span as described in QP-26.

3.5 Repeat the process again with the 1,000 and 5,000 ppm calibration standards.

3.6 Pour clean Freon 113 into a filter cartridge and extract into 10 ml cuvette. Insert the cuvette into the receiving port and zero out the instrument reading using the far right adjustment knob on the instrument. Repeat using the 1 ml cuvette and the left hand zero dial.

4.0 Determining & Reporting Instrument Accuracy

4.1 After making the fine adjustment with the zero dials reinsert each calibration standard into the instrument and note the concentration values. ***If <u>any</u> concentration value exceeds 2% of the standard set point, repeat all steps in section 3.0 of this Procedure.*** Note the actual concentration values displayed by the instrument after each calibration standard.

4.2 The four calibration standards shall be used in reporting span deviation as follows:

Standards Range			
100 ppm	**500 ppm**	**1,000 ppm**	**5,000 ppm**
0-250 ppm	251-750 ppm	751-2,500 ppm	2,501-10,000 ppm

4.3 Divide the actual instrument reading value of each calibration sample by the concentration shown on the standard (e.g.. 501 ppm instrument reading / 500 ppm standard = 1.002%). These readings shall be reported for each test performed.

5.0 Re-calibration

5.1 If any sample exceeds the concentration of 1,000 ppm on the 10 ml cuvette or 10,000 ppm on the 1 ml cuvette, the cuvette must be thoroughly rinsed with clean Freon and the instrument re-zeroed in accordance with 3.6 of this procedure.

Pit Remediation Protocol
Pits Requiring Modeling

1.0 Purpose

This protocol is provide a detailed outline of the steps to be employed in the remediation and final closure of pits requiring risk assessment modeling.

2.0 Scope

This protocol is not site specific.

3.0 Preliminary

Prior to any field operations, Whole Earth Environmental shall conduct the following activities:

3.1 Client Review

3.1.1 Whole Earth shall meet with cognizant personnel within Client to review this protocol and make any requested modifications or alterations prior to submittal to the State of New Mexico Oil Conservation Division.

3.1.2 Changes to this protocol will be documented and submitted for final review by Client prior to submittal to the Oil Conservation Division.

3.2 Oil Conservation Division Review

3.2.1 Upon client approval, this protocol and associated modeling results will be submitted to the New Mexico Oil Conservation Division for review and comment. Recommended changes will be reviewed by the client prior to implementation.

3.2.2 Any recommended changes effecting costs will require a revised quotation to be issued to the client for approval prior to the commencement of any on-site remediation activity.

4.0 Safety

4.1 Prior to work on the site, Whole Earth shall obtain the location and phone numbers of the nearest emergency medical treatment facility. We will review all safety related issues with the appropriate Client personnel, sub-contractors and exchange phone numbers.

4.2 A tailgate safety meeting shall be held and documented each day. All sub-contractors must attend and sign the daily log-in sheet.

4.3 Anyone allowed on to location must be wearing sleeved shirts, steel toed boots, and long pants. Each vehicle must be equipped with two way communication capabilities.

4.4 Prior to any excavation, the area shall be surveyed with a line finder. If lines are discovered within the area to be excavated they shall be marked with pin flags on either side of the line at maximum five foot intervals.

5.0 Fluid Removal

Prior to any excavation, the pit fluids shall be removed by vacuum truck and transported to a licensed disposal facility. A shipping manifest and O.C.D. Form C-117-A shall be prepared for each load and included within the final closure report.

6.0 Excavation & Remediation

6.1 The site shall be excavated to a minimum depth of 10'. All excavated material will be deposited immediately adjacent to the pit site.

6.2 The bottom of the pit and all four side walls will be tested for TPH and BTEX concentrations using WEQP-06 and WEQP-19. Excavation will continue until such concentrations are <10,000 ppm TPH, <10 ppm benzene and <50 ppm total BTEX.

6.3 Upon reaching the required depth and side wall dimensions, the bottom of the pit will be made as smooth as possible with excavation equipment. Sand will be deposited in the bottom of the pit in a minimum thickness of 6".

6.4 A polyethylene liner of a minimum thickness of 20 mils will be spread atop the sand to the pit edge and an additional 6" of sand deposited above it.

6.5 The excavated materials will be mixed and blended with additional topsoils obtained from the area immediately adjacent to the pit until the hydrocarbon concentrations fall below the maximum limits as described in Paragraph 6.2 of this protocol. The remediated materials will then be replaced into the excavated area, compacted and the surface contoured to provide for positive drainage.

6.6 The top two feet of the excavation shall be covered in remediated materials having a maximum TPH concentration of <100 ppm and benzene concentrations of <2 ppm.

7.0 Documentation & Reporting

7.1 At the conclusion of the pit remediation project, Whole Earth will prepare a closure report to include the following information:

- A plat map of the location showing the exact location of the pit, the dimensions prior to excavation and the actual excavated dimensions.
- Photographs of the pit prior to excavation, at the point of maximum excavation and after final closure
- Field Sampling Report to include the side wall and pit bottom TPH and BTEX concentrations after excavation.
- Field Sampling Report to include TPH and BTEX concentrations of all remediated materials deposited into the pit deposited into the pit.
- Daily calibration records of each testing instrument
- Shipping manifests and OCD Form C-117-A
- Risk assessment model and supporting documentation
- M.S.D.S. and permeability certification of liner materials

QP-55

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Procedure for Instrument Calibration and Quality Assurance Analysis for Photovac Gas Chromatograph

Completed By: Approved By: Effective Date: / /

1.0 Purpose

This procedure outlines the methods to be employed in calibrating the Photovac analyzer in the BTEX mode and for determining and reporting of accuracy curves.

2.0 Scope

This procedure shall be followed each day that the instrument is used.

3.0 Procedure

Start-up

3.1 Turn the instrument on and press the Battery button. A battery status report will appear on the screen. If the charge level is less than 8.0, either charge the battery or insert a fresh battery pack.

3.2 Open carrier gas valve on right side of instrument. The instrument is now tuning the lamp. If any "boot" problems occur during warm-up, the "chck" symbol will appear on the screen. Pressing TUTOR will prompt the instrument to provide details. The instrument will not progress beyond the start-up mode until all prompts are cleared.

3.3 The next screen display will be "purj" and will last approximately ten minutes. The instrument is purging the column.

Calibrate

3.4 Connect the regulator to cylinder of calibration gas. Connect calibration adapter and tee assembly to both the regulator and instrument. **DO NOT FORCE ANY CONNECTION!**

3.5 Inspect the open end of the tee vent to insure unobstructed flow.

3.6 Enter CAL on the key pad. The instrument will query "benzene?". Following the prompts and using the key pad, set the concentrations to those defined on the calibration gas bottle. Follow the same procedure for toluene, ethyl-benzene and xylene. After each compound, the instrument will read that the next analysis will be a calibration.

3.7 Press ENTER on key pad. The instrument will calibrate itself for the concentrations specified.

Confirmation Sample

3.8 After each calibration, run the calibration gas through the instrument once again. The display readings should be **exactly** those of the concentrations displayed on the calibration gas bottle. **If they are not, the instrument needs factory calibration; do not use.**

4.0 Re-calibration

4.1 The instrument is designed with software that prompts you to recalibrate each day, each thirty minutes of use, and after running a sample with high concentrations of one or more of the detected compounds.

5.0 Reporting Instrument Accuracy

5.1 The instrument accuracy as certified by the factory is 15% within one decade of instrument set point. Lower detection limits are 0.1 ppm for benzene and 1.0 ppm for toluene, ethylbenzene and xylene.

5.2 These standards and detection limits must be shown on all reports in which the instrument is used.

QP-76 (Rev. A)

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Procedure for Obtaining Water Samples (Cased Wells) Using One Liter Bailer

Completed By: Approved By: Effective Date: / /

1.0 Purpose

This procedure outlines the methods to be employed in obtaining water samples from cased monitoring wells.

2.0 Scope

This procedure shall be used for developed, cased water monitoring wells. It is not to be used for standing water samples such as ponds or streams.

3.0 Preliminary

3.1 Obtain sterile sampling containers from the testing laboratory designated to conduct analyses of the water. The shipment should include a Certificate of Compliance from the manufacturer of the collection bottle or vial and a Serial Number for the lot of containers. Retain this Certificate for future documentation purposes.

3.2 The following table shall be used to select the appropriate sampling container, preservative method and holding times for the various elements and compounds to be analyzed.

Compound to be Analyzed	Sample Container Size	Sample Container Description	Cap Requirements	Preservative	Maximum Hold Time
BTEX	40 ml.	VOA Container	Teflon Lined	HCl	7 days
TPH	1 liter	clear glass	Teflon Lined	HCl	28 days
PAH	1 liter	clear glass	Teflon Lined	Ice	7 days
Cation / Anion	1 liter	clear glass	Teflon Lined	None	48 Hrs.
Metals	1 liter	HD polyethylene	Any Plastic	Ice / HNO_3	28 Days
TDS	300 ml.	clear glass	Any Plastic	Ice	7 Days

4.0 Chain of Custody

4.1 Prepare a Sample Plan. The plan will list the well identification and the individual tests to be performed at that location. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.

4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.

4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label). Affix the labels to the jars.

5.0 Bailing Procedure

5.1 Identify the well from the site schematics. Place pre-labeled jar(s) next to the well. Remove the bolts from the well cover and place the cover with the bolts nearby. Remove the plastic cap from the well bore by first lifting the metal lever and then unscrewing the entire assembly.

5.2 The well may be equipped with an individual 1 liter bailing tube. If so, use the tube to bail a volume of water from the well bore equal to 10 liters for each 5' of well bore in the water table. (This assumes a 2" dia. Well bore).

5.3 Take care to insure that the bailing device and string do not become cross-contaminated. A clean pair of rubber gloves should be used when handling either the retrieval string or bailer. The retrieval string should not be allowed to come into contact with the ground.

6.0 Sampling Procedure

6.1 Once the well has been bailed in accordance with 5.2 of this procedure, a sample may be decanted into the appropriate sample collection jar directly from the bailer. The collection jar should be filled to the brim. Once the jar is sealed, turn the jar over to detect any bubbles that may be present. Add additional water to remove all bubbles from the sample container.

6.2 Note the time of collection on the sample collection jar with a fine Sharpie.

6.3 Place the sample directly on ice for transport to the laboratory. The preceding table shows the maximum hold times between collection and testing for the various analyses.

6.4 Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

7.0 Documentation

7.1 The testing laboratory shall provide the following minimum information:

A. Client, Project and sample name.
B. Signed copy of the original Chain of Custody Form including data on the time the sample was received by the lab.
C. Results of the requested analyses
D. Test Methods employed
E. Quality Control methods and results

QP-77

WHOLE EARTH ENVIRONMENTAL
QUALITY PROCEDURE

Procedure for Obtaining Soil Samples for Transportation to a Laboratory

Completed By: Approved By: Effective Date: / /

1.0 Purpose

This procedure outlines the methods to be employed when obtaining soil samples to be taken to a laboratory for analysis.

2.0 Scope

This procedure shall be used for developed, cased water monitoring wells. It is not to be used for standing water samples such as ponds or streams.

3.0 Preliminary

3.1 Obtain sterile sampling containers from the testing laboratory designated to conduct analyses of the soil. The shipment should include a Certificate of Compliance from the manufacturer of the collection bottle or vial and a Serial Number for the lot of containers. Retain this Certificate for future documentation purposes.

3.2 If collecting TPH, BTEX, RCRA 8 metals, cation / anions or O&G, the sample jar may be a clear 4 oz. container with Teflon lid. If collecting PAH's, use an amber 4 oz. container with Teflon lid.

4.0 Chain of Custody

4.1 Prepare a Sample Plan. The plan will list the number, location and designation of each planned sample and the individual tests to be performed on the sample. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.

4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.

4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label). Affix the labels to the jars.

5.0 Sampling Procedure

5.1 Go to the sampling point with the sample container. If not analyzing for ions or metals, use a trowel to obtain the soil. Do not touch the soil with your bare hands. Use new latex gloves with each sample to help minimize any cross-contamination.

5.2 Pack the soil tightly into the container leaving the top slightly domed. Screw the lid down tightly. Enter the time of collection onto the sample collection jar label.

5.3 Place the sample directly on ice for transport to the laboratory.

5.4 Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

7.0 Documentation

7.1 The testing laboratory shall provide the following minimum information:

A. Client, Project and sample name.
B. Signed copy of the original Chain of Custody Form including data on the time the sample was received by the lab.
C. Results of the requested analyses
D. Test Methods employed
E. Quality Control methods and results