3R - 90

GENERAL CORRESPONDENCE

YEAR(S):

2004 - 1994

3R90

Souder, Miller & Associates ♦ 1201 Parkway Drive ♦ Santa Fe, NM 87507-7258
(505) 473-9211 ♦ fax (505) 471-6675

February 3, 2004

#5114223

Mr. William C. Olson
Environmental Bureau
Oil Conservation Division
New Mexico Energy, Minerals & Natural Resources Department
1220 South St. Francis Dr.
Santa Fe, NM 87505

RE: PLAN FOR FUTURE WORK, CONOCOPHILLIPS NELL HALL #1

Dear Mr. Olson:

Souder, Miller & Associates (SMA) has prepared this letter on behalf of ConocoPhillips to confirm the results of the January 27, 2004 meeting between ConocoPhillips and the Oil Conservation Division (OCD). The meeting established a plan for future work on the ConocoPhillips Nell Hall #1 site. ConocoPhillips and SMA understand that the plan consists of:

1. Installation of three (3) new monitoring wells in locations agreed to at the meeting. The wells shall be completed with 2 inch inside diameter PVC casing and screened from approximately 5-35 feet below ground surface.
2. Sample the three new monitoring wells quarterly for benzene, toluene, ethylbenzene and total xylenes by EPA Method 8021B and for biodegradation parameters for the first year. Monitor all site wells for ground water elevation data during the first year.
3. Prepare a year end summary report of site activities. The report will recommend a monitoring program and abandonment of out of service wells. The monitoring program will likely consist of once annual monitoring of any impacted wells until the concentration of contaminants in impacted wells is below New Mexico Water Quality Control Commission standards. At that time, the impacted wells will be monitored quarterly until four quarters of below standard data are achieved. Other site wells will be monitored in the final, fourth quarter to verify site closure.

If this is not OCD's understanding of the plan for future work, please inform me within 10 business days (505-473-9211, rsa@soudermiller.com). ConocoPhillips and SMA appreciated the opportunity to meet with you and establish a path towards closure for this project.

Sincerely,

SOUDER, MILLER & ASSSOCIATES

Reid S. Allan
Vice President/Senior Scientist

Cc: Mr. Neal Goates, ConocoPhillips

SMA
CIVIL/ENVIRONMENTAL
SCIENTISTS & ENGINEERS

RECEIVED

FEB 28 2003

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

February 26, 2003

Bill Olsen,
New Mexico Oil Conservation Division
1200 S. St. Francis Drive
Santa Fe, NM 87505

RE: Conoco Groundwater Report Summary

On behalf of ConocoPhillips ***Souder Miller and Associates***, is submitting the enclosed 2002 Annual Groundwater report for five (5) locations. Salmon #1 is included on this table although no Annual Report is being submitted.

LOCATION NAME	LEGAL DESCRIPTION	RECOMMENDATION
Farmington B Com 1	Unit H, S 12, T29N, R12W	BTEX has been at or below NMWQCC standards, for four quarters: need to sample for closure during March 2003, and submit Pit Closure forms to OCD.
Nell-Hall # 1	Unit M, S 07, T30N, R11W	Continue to monitor as required in NMCOD letter dated September, 1998.
Farmington C Com 1	Unit L, S 15, T29N, R13W	BTEX has been at or below NMWQCC standards, for four quarters: closure sampling has been accomplished, Pit Closure Forms are attached.
Farmington B Com 1E	Unit O, S 15, T29N, R13W	Free product is still present in MW-1. Sampling stopped at this time IAW NMOCD direction, more aggressive recovery program being investigated.
Salmon # 1	Unit P, S 30, T29N, R11W	Site has been closed and monitoring wells have been properly plugged and abandoned.
S&K # 1	Unit L, S 29, T29N, R11W	MW-NE and SB 12 have high Benzene levels all others at or below NMWQCC standards, continue monitoring of MW-NE and SB 12.

If there are any questions or concerns on this matter, feel free to contact me at (505) 325-5667.
Thank you for your time and considerations.

Respectfully submitted,

John Hagstrom
Environmental Technician
Souder Miller and Associates

CC:
Neal Goates, RM&R Site Manager, ConocoPhillips, PO Box 2197, Houston, TX 77252-2197
Denny Foust, New Mexico Oil Conservation Division, 1000 Rio Brazos, Aztec, NM 87410
Bill Liess, BLM, 1235 La Plata Hwy., Farmington, NM 87401
Michael Nelson, ConocoPhillips, PO Box 2197, Houston, TX 77252-2197
File

Tel. (505) 325-5667 Fax (505) 327-1496
P. O. BOX 2606 • FARMINGTON, NM 87499
-TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT-

JR90

ON SITE
TECHNOLOGIES, LTD.

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FEB 25 2002

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

February 22, 2002

Bill Olson
New Mexico Oil Conservation Division
1220 South St. Francis Drive.
Santa Fe, New Mexico 87505

RE: Conoco Groundwater Report Summary

On behalf of Conoco ***On Site Technologies Limited Partnership***, is submitting the enclosed 2001 Annual Groundwater report for Ten (10) sites.

LOCATION NAME	LEGAL DESCRIPTION	RECOMMENDATION
Farmington B Com 1	Unit H, S 12, T29N, R12W	WSP-1 still has high BTEX, all other at or below NMWQCC standards, continue monitoring of WSP #1
Nell-Hall#1	Unit M, S 07, T30N, R11W	Continue to monitor as required in NMCOD letter dated September, 1998
Farmington C Com 1	Unit L, S 15, T29N, R13W	Continue to monitor as required in NMCOD letter dated September, 1998
Farmington B Com 1E	Unit O, S 15, T29N, R13W	Free product is still present in MW-1. Sampling stopped at this time IAW NMOCD direction, more aggressive recovery program being investigated.
Salmon # 1	Unit P, S 30, T29N, R11W	DG#2 has had BTEX levels below NMWQCC standards for the last six quarters. Close site and properly plug and abandon monitoring wells.
S&K1	Unit L, S 29, T29N, R11W	SB 12 still has high BTEX, all others at or below NMWQCC standards, continue monitoring of SB 12.

If there are any questions or concerns on this matter, feel free to contact me at (505) 325-5667.

Thank you for your time and considerations.

Respectfully submitted,

John Hagstrom
Environmental Technician
On Site Technologies Limited Partnership

CC:
Gary Ledbetter, SHEAR, Conoco Inc., 3315 Bloomfield HWY, Farmington, NM 87401
Bill Liess, BLM 1235 La Plata HWY, Farmington, NM 87401
Denny Foust, NMOCD 1000 Rio Brazos, Aztec, NM 87410
John Cofer, Sr. Environmental Specialist, Conoco Inc., 3315 Bloomfield HWY, Farmington, NM 87401
File

PO Box 2606
Farmington, NM 87499

505-325-5667

FAX: 505-327-1496

90

ON SITE
TECHNOLOGIES, LTD.

RECEIVED
MAR 22 2001
OIL CONSERVATION DIVISION

February 27, 2001

Mr. Bill Olson
New Mexico Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505

RE: Conoco Groundwater Report Summary

On behalf of Conoco ***On Site Technologies Limited Partnership***, is submitting the enclosed 2000 Annual Groundwater report for Ten (10) sites.

LOCATION NAME	LEGAL DESCRIPTION	RECOMMENDATION
Farmington B Com 1	Unit H, S 12, T29N, R12W	WSP-1 still has high BTEX, all other at or below NMWQCC standards, continue monitoring of WSP #1
Nell-Hall#1	Unit M, S 07, T30N, R11W	Continue to monitor as required in NMCOD letter dated September, 1998
Farmington C Com 1	Unit L, S 15, T29N, R13W	Continue to monitor as required in NMCOD letter dated September, 1998
Farmington B Com 1E	Unit O, S 15, T29N, R13W	Free product is still present in MW-1. Sampling stopped at this time IAW NMOCD direction, more aggressive recovery program being investigated.
Salmon # 1	Unit P, S 30, T29N, R11W	DG#2 still has high BTEX, Continue monitoring in accordance with NMOCD letter dated September, 1998.
San Juan 28-7#126	Unit M, S 1, T27N, R7W	Research is being done to complete and submit the Pit closure forms and final reports
San Juan 28-7#219	Unit N, S 20, T28N, R7W	Research is being done to complete and submit the Pit closure forms and final reports
S&K1	Unit L, S 29, T29N, R11W	Research is being done to complete and submit the Pit closure forms and final reports
San Juan 28-7#19	Unit G, S 25, T28N, R7W	research is being done to complete and submit the Pit closure forms and final reports
San Juan 28-7#47	Unit A, S 20, T28N, R7W	Research is being done to complete and submit the Pit closure forms and final reports
Farmington Com #1	Unit P, Sec 11, T29N, R13W	Monitoring wells and piezometer plug and abandoned IAW NMOCD Letter dated December 13, 2000
Shephard & Kelsey #1E	Unit D, Sec. 29, T29N, R11W	Monitoring wells plug and abandoned IAW NMOCD Letter dated December 14, 2000

PO Box 2606
Farmington, NM 87499

505-325-5667 FAX: 505-327-1496

If there are any questions or concerns on this matter, feel free to contact me at (505) 325-5667.

Thank you for your time and considerations.

Respectfully submitted,

Larry Trujillo, CHMM
Environmental Specialist
On Site Technologies Limited Partnership

CC:
Gary Ledbetter, SHEAR, Conoco Inc., 3315 Bloomfield HWY, Farmington, NM 87401
John Cofer, Sr. Environmental Specialist, Conoco Inc., 3315 Bloomfield HWY, Farmington, NM 874
Denny Foust, NMOCD 1000 Rio Brazos, Aztec, NM 87410
Bill Liess, BLM 1235 La Plata HWY, Farmington, NM 87401
File

ON SITE
TECHNOLOGIES, LTD.

SEP - 1999

August 9, 1999

Mr. Wm. "Bill" Olsen, Hydrologist
NMOCD
2040 S. PACHECO ST
Santa Fe, NM, 87505

RE: Conoco Groundwater Report Summary

On behalf of Conoco Inc., ***On Site Technologies Limited Partnership*** requests a status of approval for the corrective actions on the following list of well locations.

Location Name	Legal Description	Recommendation
Recommend	**Continued**	**Monitoring**
Farmington B Com 1	Unit H, S 12, T29N, R12W	WSP-1 still has high BTEX, all other at or below NMWQCC standards, continue monitoring of WSP #1
San Juan 28-7#19	Unit G, S 25, T28N, R7W	Continue monitoring, BTEX levels still above NMWQCC standards
San Juan 28-7#47	Unit A, S 20, T28N, R7W	Continue monitoring, BTEX levels still above NMWQCC standards
Nell-Hall#1	Unit M, S 07, T30N, R11W	Continue to monitor as required in NMCOD letter dated September, 1998
Farmington C Com 1	Unit L, S 15, T29N, R13W	Continue to monitor as required in NMCOD letter dated September, 1998
Farmington B Com 1E	Unit O, S 15, T29N, R13W	Continue to monitor as required in NMCOD letter dated September, 1998
Salmon # 1	Unit P, S 30, T29N, R11W	DG#2 still has high BTEX, Continue monitoring in accordance with NMOCD letter dated September, 1998
Recommend	**Closure**	
San Juan 28-7#126	**Unit M, S 1, T27N, R7W**	**4 quarters of sampling below NMWQCC standards, recommend closure**
San Juan 28-7#219	**Unit N, S 20, T28N, R7W**	**4 quarters of sampling below NMWQCC standards, recommend closure**
S&K1	**Unit L, S 29, T29N, R11W**	**4 quarters of sampling below NMWQCC standards recommend closure.**
Farmington Com 1	**Unit P, S 11, T29N, R13W**	**Contamination level in MW 1 below OCD action levels for the last four quarters, MW2 and MW3 historically have not had any contamination above NMWQCC standards. Recommend closure of the location.**
S&K1E	**Unit D, S 29, T29N, R11W**	**4 quarters of sampling below OCD action levels recommend closure.**

PO Box 2606
Farmington, NM
505-325-5667
FAX: 505-327-1496

Recommendations listed above were included in the 1997 and 1998 Conoco Annual Ground Water Reports. Please advise ***On Site*** and Conoco of NMOCD's approval, as we are only scheduling the sites requiring continued monitoring.

If there are any questions or concerns on this matter, feel free to contact me at (505) 325-5667.

Thank you for your time and considerations.

Respectfully submitted,

Larry Trujillo CHMM
Senior Environmental Technician
On Site Technologies Limited Partnership

CC:

Shirley Ebert, SHEAR, Conoco Inc., Farmington Office
Neal Goates, Sr. Environmental Specialist, Conoco Inc.

ON SITE
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FEB 19 1999
ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Letter of Transmittal

ATTENTION:

DATE: February 17, 1999

Mr. Bill Olson
New Mexico Oil Conservation Division.
2040 South Pacheco
Santa Fe, New Mexico 87505

RE: Conoco's 1998 Annual Groundwater Report

Dear Mr. Olson:
On behalf of Conoco ***On Site Technologies Limited Partnership***, is submitting the enclosed 1998 Annual Groundwater report for ten (10) sites.

Number of Originals	Description
1	Shephard & Kelsey #1E Unit D, Sec. 29, T29N, R11W
1	Shephard & Kelsey #1 Unit L, Sec. 29, T29N, R11W
1	Salmon #1 Unit P, Sec. 30, T29N, R7W
1	Nell-Hall #1 Unit, M, Sec 7, T30N, R11W
1	San Juan 28-7-19 Unit G, Sec. 25, T28N, R7W
1	San Juan 28-7-47 Unit A, Sec. 20, T28N, R7W
1	Farmington Com #1 Unit P, Sec 11, T29N, R13W
1	Farmington B Com #1 Unit H, T29N R13W
1	Farmington C Com 1 Unit L, Sec. 15, T29N, R13W
1	Farmington B Com 1E Unit O, Sec 15, T29, R13W

Thank you,

Larry Trujillo
Sr. Environmental Technician

CC:
Shirley Ebert
Neal Goates
Denny Foust
File

PO Box 2606
Farmington, NM

505-325-5667

FAX: 505-327-1496

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

June 5, 1998

CERTIFIED MAIL
RETURN RECEIPT NO. Z-235-437-284

Ms. Shirley Ebert
Conoco, Inc.
3315 Bloomfield Hwy.
Farmington, New Mexico 87401

RE: GROUND WATER INVESTIGATIONS
SAN JUAN BASIN PIT CLOSURES

Dear Ms. Ebert:

The New Mexico Oil Conservation Division (OCD) has completed a review of Conoco, Inc.'s (Conoco) February 4, 1998 "CONOCO'S 1997 ANNUAL GROUNDWATER REPORT" which was received by the OCD on February 27, 1998. This document, which was submitted on behalf of Conoco by their consultant On Site Technologies, Ltd., contains the results of Conoco's investigation, remediation and monitoring at 12 unlined oil and gas production pit sites with resulting ground water contamination.

Upon a review of the above referenced documents, the OCD has the following comments and requirements:

1. The data in the reports for the sites listed below show that the complete extent of ground water contamination has not been determined. The OCD requires that Conoco complete the definition of the extent of ground water contamination at these sites pursuant to Conoco's prior approved ground water investigation and remediation plan for the San Juan Basin.

- Farmington B Com #1	Unit H, Sec. 12, T29N, R12W.
- Farmington C Com #1	Unit L, Sec. 15, T29N, R13W.
- Farmington Com #1	Unit P, Sec. 11, T29N, R13W.
- Nell-Hall #1	Unit M, Sec. 07, T30N, R11W.
- Salmon #1	Unit P, Sec. 30, T29N, R11W.

2. The ground water metals data for the site listed below shows that the concentrations of barium, chromium and lead in ground water are above the New Mexico Water Quality Control Commission (WQCC) ground water standards. The OCD requires that Conoco conduct additional metals sampling at this site

- Farmington Com #1	Unit P, Sec. 11, T29N, R13W.

3. Some of the report site maps do not show the former locations of the pits, the excavated areas nor the locations of all monitor wells (former and current) . The OCD requires that Conoco include this information in future reports.

4. Some of the reports do not contain quarterly ground water potentiometric maps. The OCD requires that Conoco's future reports include ground water potentiometric maps for each sampling event. The maps will be created using the water table elevation in all site monitor wells.

5. Some of the report summary tables do not contain the results of all past water quality sampling. It is difficult for the OCD to evaluate remedial progress at a site without this data. The OCD requires that Conoco's future reports include summary tables that contain the results of all past and present water quality sampling.

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

Sincerely,

William C. Olson
Hydrologist
Environmental Bureau

xc: Denny Foust, OCD Aztec District Office
Larry Trujillo, On Site Technologies, Ltd.

On Site Technologies, Ltd.

RECEIVED

FEB 27 1998

Environmental Bureau
Oil Conservation Division

Letter of Transmittal

ATTENTION:

DATE: February 4, 1998

Mr. Bill Olson
New Mexico Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505

RE: Conoco's 1997 Annual Groundwater Report.

REMARKS:

Dear Mr. Olson:

On behalf of Conoco, ***On Site Technologies Limited Partnership***, is submitting the enclosed 1997 Annual Groundwater report for the twelve (12) sites

We are sending you:

No. Originals	No. Copies	Description
1		Farmington B Com 1, Unit H, Sec. 12, T29N, R12W
1		San Juan 28-7-19, Unit G, Sec. 25, T28N, R7W
1		San Juan 28-7-47, Unit A, Sec.20, T28N, R7W
1		San Juan 28-7-126, Unit M, Sec.1, T27N, R7W
1		San Juan 28-7-219, Unit N, Sec. 20, T28N, R7W
1		Shephard & Kelsey #1, Unit L, Sec. 29, T29N, R11W
1		Nell-Hall #1, Unit , Sec. 1, T30N, R11W
1		Farmington Com #1, Unit P, Sec. 11, T29N, R13W
1		Farmington C Com #1, Unit L, Sec. 15, T29N, R13W
1		Farmington B Com #1E, Unit O, Sec. 15, T29N, R13W
1		Salmon #1, Unit P Sec. 30, T29N, R11W
1		Shephard & Kelsey 1E, Unit D, Sec. 29, T29W, R11W

SIGNATURE:

Larry Trujillo
Sr. Environmental Technician
cc:

Denny Foust
Shirley Ebert
Neal Goates

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

July 28, 1997

CERTIFIED MAIL
RETURN RECEIPT NO. P-410-431-198

Mr. Neal Goates
Conoco, Inc.
10 Desta Dr., Suite 100W
Midland, Texas 79705-4500

RE: ANNUAL PIT CLOSURE SUMMARY AND GROUND WATER IMPACTS

Dear Mr. Goates:

The New Mexico Oil Conservation Division (OCD) has reviewed Conoco's undated "ANNUAL PIT CLOSURES AND GROUND WATER IMPACT UPDATES, STATE OF NEW MEXICO, 1996" which was received by the OCD on May 20, 1997. This document contains the results of Conoco's recent work on the investigation and remediation of contamination from unlined production pits in the San Juan Basin. The document also contains Conoco's recommendations for future remedial actions.

The recommendations as contained in the above referenced document are approved with the following conditions:

1. General Conditions

   a. The ground water reports for each site do not include the cations/anions, metals and PAH ground water sample analyses that were supposed to be taken at each site. The OCD requires that Conoco conduct this sampling pursuant to Conoco's March 24, 1995 San Juan Basin ground water assessment plan which was conditionally approved by the OCD on April 5, 1995. The results of these analyses will be included in subsequent annual reports.

b. Upon review of Conoco's file, the OCD noted that Conoco does not have a long term ground water monitoring plan nor a ground water remediation plan for pit closure sites with ground water contamination. The OCD requires that Conoco submit a comprehensive ground water remediation plan and long term ground water monitoring plan to the OCD by October 10, 1997.

c. All future annual ground water reports will be submitted to the OCD by March 1 of each respective year. The ground water reports will present the information on each site as a separate case. Each ground water case report will contain:

I. A brief summary of all ground water remediation and monitoring activities which occurred during the prior calendar year.

ii. Summary tables of all past and present ground water quality sampling analytical results and copies of the laboratory analytical data sheets for samples taken during the last year.

iii. A site map showing the locations of relevant site features (ie. wellhead, pit, monitor wells, etc.)

iv. A quarterly ground water potentiometric map using the water table elevation in all site monitor wells.

v. A geologic log and well completion diagram for each monitor well.

2. <u>Farmington Com #1, Farmington C Com #1, Farmington B Com #1E and Farmington B Com #1</u>

Due to the potential for public impacts from soil and ground water contamination at these sites, the OCD requires that Conoco conduct the following actions:

a. By August 29, 1997, Conoco will complete the remediation of contaminated soils at each site according to Conoco's previously approved pit closure plan. Final reports containing the results of the soil remedial actions will be submitted to the OCD by September 26, 1997.

b. By August 29, 1997, Conoco will submit a ground water remediation work plan for each site to the OCD. The work plan will include information on how Conoco plans to remediate the contaminated ground water, a long term ground water monitoring plan, an implementation schedule and, if not already completed, a plan to define the full extent of ground water contamination at each site.

3. Shepherd & Kelsey #1E (Separator pit)

The report recommends no further actions except additional ground water monitoring for this site. However, a review of the report data shows that the extent of ground water contamination at this site has not been determined. Therefore, the OCD requires that Conoco investigate the extent of ground water contamination pursuant to Conoco's March 24, 1995 San Juan Basin ground water assessment plan which was conditionally approved by the OCD on April 5, 1995.

To simplify the approval process for both Conoco and OCD, the OCD requests that future annual reports only address the ongoing actions related to ground water investigation, remediation and monitoring. Pit closure actions involving only contaminated soils need to be reported to the OCD only upon completion of all pit soil remedial actions when Conoco submits a final pit closure report to the OCD for approval. Pit closure actions involving only contaminated soils do not need to be reported to the OCD on an interim basis.

Please be advised that OCD approval does not relieve Conoco of liability if remaining contaminants pose a future threat to surface water, ground water, human health or the environment. In addition, OCD approval does not relieve Conoco of responsibility for any federal, state, tribal, or local laws and/or regulations.

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

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Denny Foust, OCD Aztec District Office
Bill Liess, BLM Farmington District Office
John Andersen, Conoco, Inc.
Robert J. Bowie, City of Farmington

ANNUAL SUMMARY

PIT CLOSURES
AND
GROUND WATER IMPACT UPDATES

STATE OF NEW MEXICO
1996

RECEIVED

MAY 2 0 1997

Environmental Bureau
Oil Conservation Division

Each site filed under seperate case files

Midland Division
Exploration Production

Conoco Inc.
10 Desta Drive, Suite 100W
Midland, TX 79705-4500
(915) 686-5400

Certified Mail
P 895 104 872

April 25, 1997

Mr. Denny Fouts
New Mexico Oil Conservation Commission
1000 Rio Brazos Rd.
Aztec, NM 87410

Dear Mr. Fouts:

Re: NMOCD letters P-471-215-177, P-471-215-178 and P-471-215-179

Reference NMOCD letters of February 18, 1997 (P-471-215-177 and P-471-215-178) directed to Conoco Inc. and NMOCD letter of February 18, 1997 (P-471-215-179) directed to Merrion Oil and Gas Corporation.

This letter is intended to update NMOCD on the progress made to date to evaluate the alleged environmental contamination identified in the subject NMOCD letters. Evaluation work was timely commenced at all sites under Conoco's supervision. Initial results are being documented and evaluated. Where appropriate, possible remediation plans are being considered. As you are aware, ownership of the sites have changed hands several times, and we are in the process of developing proposed plans consistent with the contractual obligations of the successive owners. As soon as reasonably possible, NMOCD will be advised of proposed remediation plans where appropriate, to resolve the environmental matters addressed in the subject NMOCD letters.

Regards,

Carl J. Coy
Field SHEAR Specialist

cc: Merrion
Mesa
Bill Olson - NMOCD Santa Fe

Table of Contents

ON SITE
TECHNOLOGIES, LTD.

Revised: May 15, 1997

Conoco, Inc., Midland Division
Exploration and Production, North America
10 Desta Drive, Suite 100W
Midland, Texas 79705-4500

Attn.: Mr. Neal Goates, Senior Environmental Specialist

RE: Transmittal of Information for 1996 Annual NMOCD Reporting

Per your request and at Mr. C. John Coy's (Farmington Office) direction, we have compiled the attached information to assist you with the annual reporting to NMOCD. The information listed in Table 1 is included.

If there are any questions regarding this status report, please contact either Cindy Gray or Myke Lane at On Site Technologies, (505) 325-5667. Thank you for considering On Site to assist you with this matter.

Respectfully submitted,
On Site Technologies Limited Partnership

Michael K. Lane, P.E.
Senior Engineer

Enclosures: Table 1 & Listed Attachments

CC: C. John Coy (w/o attachments)
MKL/mkl

file: 41303.doc

PO Box 2606
Farmington, NM
PHONE: 505-325-5667 FAX: 505-327-1496

TABLE 1: CONOCO SUMMARY
Transmittal of Information for 1996 Annual NMOCD Reporting

On Site Technologies Limited Partnership
May 15, 1997

Project: 4-1303

Well	Date	Documents	Comments
Farmington Com #1	Apr. 18, 97	Site Assessment Brief w/ lab and QA/QC	Corrective Action to address soil and/or ground water contamination pending negotiations with former lease operator.
Farmington C Com #1	Apr. 22, 97	Site Assessment Brief w/ lab and QA/QC	Corrective Action to address soil and/or ground water contamination pending negotiations with former lease operator.
Farmington B Com #1E	Apr. 22, 97	Site Assessment Brief w/ lab and QA/QC	Corrective Action to address soil and/or ground water contamination pending negotiations with former lease operator.
Smith #1 & Drip Pit	Apr. 22, 97	Site Assessment Brief w/ lab and QA/QC	Corrective Action to address soil and/or ground water contamination pending negotiations with former lease operator.
Shepherd & Kelsey #1	Mar. 21, 97 July 18, 96 Mar. 20, 97	Summary of Monitor Well Install & Map Sample Results w/ QA/QC (IML) Sample Results w/ QA/QC (On Site)	Continue ground water monitoring for 3 additional quarters to verify RBCA.
Shepherd & Kelsey #1E (Dehy/Sep Pit)	Apr. 16, 97	Pit Assessment & Remediation Summary w/ lab and QA/QC	No further reclamation efforts recommended, and propose continued ground water monitoring until four consecutive sample events are "clean".
Shepherd & Kelsey #1E (Production Tank Spill)	Apr. 28, 97	Spill Assessment & Remediation Summary w/ lab and QA/QC	No further corrective action, with plug and abandonment of monitor well proposed.
Farmington B Com #1	Apr. 16, 97	Investigation & Remediation Summary w/ lab and QA/QC	No further reclamation efforts recommended, and propose continued ground water monitoring until four consecutive sample events are "clean".
Federal Com #15	Apr. 28,97	Site Assessment Summary	No further action.
Salmon #1	May 12, 97 July 17, 96 Mar. 18, 96 Mar. 26, 97	Corrective Action Proposal (On Site) Lab Reports & QA/QC (IML) Lab Reports & QA/QC (On Site) Lab Reports & QA/QC (On Site)	Additional excavation and treatment of contaminated soil down-gradient of original pit proposed.

TABLE 1: CONOCO SUMMARY
Transmittal of Information for 1996 Annual NMOCD Reporting

On Site Technologies Limited Partnership
May 15, 1997

Project: 4-1303

Well	Date	Documents	Comments
Nell Hall #1	June 14, 97 June 28, 96 July 12, 96 Apr. 1, 97	Lab Reports & QA/QC (IML) Lab Reports & QA/QC (IML) Lab Reports & QA/QC (IML) Letter regarding no water (On Site)	Due to seasonal low water table, propose annual sampling to be scheduled in June to Aug. with closure once two consecutive sample events show "clean".
SJ 28-7 #19	Mar. 12, 96 July 17, 96 Mar. 19, 97 Apr. 21, 97	Lab Reports & QA/QC (IML) Lab Reports & QA/QC (IML) Lab Reports & QA/QC (On Site) Lab Reports & QA/QC (On Site)	Continue ground water monitoring for four additional quarters.
SJ 28-7 #47	Mar. 12, 96 Apr. 15, 96 July 17, 96 Mar. 19, 97 Apr. 21, 97	Lab Reports & QA/QC (IML) Lab Reports & QA/QC (IML) Lab Reports & QA/QC (IML) Lab Reports & QA/QC (On Site) Lab Reports & QA/QC (On Site)	Continue ground water monitoring for four additional quarters.
SJ 28-7 #126	Mar. 12, 96 July 17, 96 Mar. 26, 97	Lab Reports & QA/QC (IML) Lab Reports & QA/QC (IML) Lab Reports & QA/QC (On Site)	Continue ground water monitoring for an additional quarter.
SJ 28-7 #219	Mar. 12, 96 July 17, 96 Mar. 26, 97	Lab Reports & QA/QC (IML) Lab Reports & QA/QC (IML) Lab Reports & QA/QC (On Site)	Continue ground water monitoring for two additional quarters.

'NEW MEXICO PIT DATA
'CONOCO INC.

TYPES OF PITS	
SEP: Separator Pit	BDP: Blowdown Pit
DHP: Dehydrator Pit	FGP: Fiberglass Tank Pit
CSP: CompressorScrubberPit	LDHP: Lined Dehy Pit
TDP: Tank Drip Pit	DRP: Drilling Reserve Pit
LDP: Line Drip Pit	NONE: No Pits

#	WELL NAME AND NUMBER	FEDERAL, STATE INDIAN CONTRACT NO. OR FEE	LOCATION	TYPES OF PITS	PIT SIZE	VULN. AREA	EXPANDED VULN. AREA	NON-VULN. AREA	OTHER PARTY PIT	DATE STOPPED FLOW TO PIT	DATE PIT REMED-IATION STARTED	DATE PIT CLOSED
	SENSITIVE AREA PITS - JICARILLA											
1	Apache No. 1	Contract #98	Unit D, Sec. 18-26N-3W	SEP	30' x 24' x 4'		X			Unknown		05/06/96
2	Apache No. 3E	Contract #98	Unit H, Sec. 19-26N-3W	TDP	18' x 17' x 3'		X			Unknown		04/25/96
3	Apache No. 7	Contract #98	Unit D, Sec. 20-26N-3W	SEP	44' x 30' x 6'		X			Unknown		04/25/96
4	AXI Apache J No. 22	Contract #147	Unit L, Sec. 6-25N-5W	SEP	37' x 36' x 3'		X			09/10/96		09/30/96
5	AXI Apache N No. 14	Contract #121	Unit C, Sec. 1-25N-4W	SEP	19' x 19' x 4'		X			03/27/96		04/15/96
6	AXI Apache N No. 16A	Contract #121	Unit C, Sec.12-25N-4W	DHP	18'X18'X3'		X			03/18/96		03/26/96
7	Jicarilla No. 3	Contract #12	Unit D, Sec. 31-26N-4W	SEP	28' x 22' x 4'		X			Unknown		08/05/96
8	Jicarilla No. 4	Contract #12	Unit L, Sec. 31-26N-4W	TDP	10' x 8' x 3'		X			Unknown		08/05/96
9	Jicarilla No. 8	Contract #12	Unit L, Sec. 32-26N-4W	SEP	35' x 27' x 4'		X			Unknown		08/15/96
10	Jicarilla No. 11	Contract #12	Unit G, Sec. 30-26N-4W	SEP	21' x 20' x 4'		X			Unknown		08/15/96
11	Jicarilla No. 11	Contract #12	Unit G, Sec. 30-26N-4W	TDP	22' x 22' x 4'		X			Unknown		08/15/96
12	Jicarilla No. 13	Contract #12	Unit G, Sec. 31-26N-4W	TDP	18' x 16' x 4'		X			Unknown		08/05/96
13	Jicarilla No. 14	Contract #12	Unit P, Sec. 31-26N-4W	SEP	19' x 18' x 3'		X			Unknown		08/07/96
14	Jicarilla No. 14	Contract #12	Unit P, Sec. 31-26N-4W	TDP	18' x 17' x 4'		X			Unknown		08/15/96
15	Jicarilla No. 17	Contract #12	Unit B, Sec. 32-26N-4W	SEP	17' x 16' x 4'		X			Unknown		08/15/96
16	Jicarilla No. 17	Contract #12	Unit B, Sec. 32-26N-4W	TDP	19' x 17' x 4'		X			Unknown		08/15/96
17	Jicarilla No. 18	Contract #12	Unit I, Sec. 32-26N-4W	SEP	28' x 22' x 4'		X			Unknown		08/15/96
18	Jicarilla No. 18	Contract #12	Unit I, Sec. 32-26N-4W	TDP	25' x 25' x 4'		X			06/26/96		07/25/96
19	Jicarilla A No. 8	Contract # 105	Unit E, Sec 23-26N-4W	SEP	20'x20'x3'		X			05/15/96		05/22/96
20	Jicarilla A No. 9	Contract # 105	Unit C, Sec 14-26N-4W	TDP	10'x10'x5'		X			06/11/96		06/26/96
21	Jicarilla A No. 10	Contract # 105	Unit D, Sec 23-26N-4W	SEP	16'x16'x4'		X			05/08/96		05/15/96
22	Jicarilla A No. 13	Contract # 105	Unit E, Sec 13-26N-4W	TDP	16'x16'x4'		X			Unknown		07/25/96
23	Jicarilla B No. 2	Contract # 106	Unit K, Sec 25-26N-4W	BDP	15'x25'x3'		X			06/06/96		06/26/96
24	Jicarilla B No. 8	Contract # 106	Unit K, Sec 25-26N-4W	SEP	10'x15'x3'		X			05/22/96		05/31/96
25	Jicarilla B No. 9	Contract # 106	Unit K, Sec 26-26N-4W	SEP	15'x15'x2'		X			06/10/96		08/15/96
26	Jicarilla B No. 9A	Contract # 106	Unit D, Sec 26-26N-4W	SEP	18'x18'x3'		X			03/27/96		03/29/96
27	Jicarilla B No. 13	Contract # 106	Unit M, Sec 36-26N-4W	SEP	16'x18'x4'		X			03/29/96		03/29/96
28	Jicarilla B No. 15	Contract # 106	Unit J, Sec 36-26N-4W	SEP	12'x12'x2'		X			04/04/96		04/15/96
29	Jicarilla D No. 11	Contract # 100	Unit A, Sec 29-26N-3W	TDP	12'x14'x4'		X			04/09/96		04/15/96
30	Jicarilla D No. 17	Contract # 100	Unit D, Sec 29-26N-3W	TDP	16'x18'x3'		X			04/12/96		04/15/96
31	Jicarilla D No. 18	Contract # 100	Unit A, Sec 30-26N-3W	SEP	15'x15'x2'		X			07/29/96		08/15/96
32	Jicarilla E No. 6	Contract # 104	Unit B, Sec 21-26N-4W	TDP	18'x18'x3'		X			06/05/96		06/21/96
33	Jicarilla E No. 8	Contract # 104	Unit C, Sec 15-26N-4W	TDP	10'x10'x3'		X			03/25/96		06/05/96
34	Jicarilla E No. 14	Contract # 104	Unit D, Sec 15-26N-4W	CSP	10'x12'x3'		X			Unknown		09/24/96
35	Jicarilla K No. 12E	Contract No. 145	Unit M, Sec 02-25N-5W	SEP	12'x14'x3'		X			08/26/96		09/03/96
36	Jicarilla K No. 15	Contract No. 145	Unit I, Sec 01-25N-5W	SEP	14'x16'x2'		X			Unknown		10/02/96
37	Jicarilla K No. 22	Contract No. 145	Unit M, Sec 02-25N-5W	SEP	12'x14'x4'		X			Unknown		09/24/96
38	Jicarilla K No. 22A	Contract No. 145	Unit O, Sec 02-25N-5W	SEP	10'x10'x01'		X					

39	Tribal No. 2	Fed. 6090001150	Unit L, Sec. 9-26N-3W	SEP	30' x 24' x 6'		X			Unknown		05/06/96
40	Tribal No. 2	Fed. 6090001150	Unit L, Sec. 9-26N-3W	TDP	24' x 17' x 4'		X			Unknown		05/06/96

NON - SENSITIVE AREA PITS - JICARILLA

1	AXI Apache N No. 11A	Contract #121	Unit B, Sec. 12-25N-4W	SEP	22' x 19' x 3'			X		Unknown		03/22/96
2	AXI Apache N No. 12A	Contract #121	Unit L, Sec. 11-25N-4W	SEP	21' x 21' x 4'			X		03/22/96		03/29/96
3	AXI Apache N No.14A	Contract #121	Unit K, Sec. 1-25N-4W	SEP	19'x19'x3'			X		Unknown		03/22/96
4	AXI Apache N No. 12	Contract #121	Unit C, Sec. 11-25N-4W	SEP	20' x 18' x 3'			X		03/25/96		03/26/96
5	AXI Apache N No. 13	Contract #121	Unit G, Sec. 2-25N-4W	SEP	22' x 21' x 3'			X		03/25/96		03/29/96
6	AXI Apache O No. 10	Contract #122	Unit J, Sec. 3-25N-4W	SEP	23' x 21' x 3'			X		03/20/96		03/25/96
7	Jicarilla D No. 11A	Contract # 100	Unit P, Sec 29-26N-3W	TDP	16'x16'x3'			X		04/19/96		04/22/96
8	Jicarilla D No. 13	Contract # 100	Unit A, Sec 32-26N-3W	TDP	15'x15'x2'			X		04/16/96		04/22/96
9	Jicarilla D No. 13A	Contract # 100	Unit P, Sec 32-26N-3W	SEP	20'x20'x2'			X		04/15/96		04/22/96
10	Jicarilla D No. 19	Contract # 100	Unit I, Sec 31-26N-3W	TDP	25'x28'x2'			X		04/25/96		05/03/96
11	Jicarilla D No. 20	Contract # 100	Unit N, Sec 31-26N-3W	TDP	20'x30'x4'			X		04/25/96		05/03/96

OFF: (505) 325-5667

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-1556

April 1, 1997

Mr. C. John Coy, SHEAR Specialist
CONOCO, Inc.
Bloomfield Highway
Farmington, NM 87401

RE: Quarterly Monitor Well Sampling
Nell-Hall #1
San Juan County, NM

Project No: 4-1363

On March 27, 1997, Heidi Reese, of On Site Technologies, attempted to sample the three monitoring wells located at Nell-Hall #1. Monitoring well #1 and #2 had approximately 0.25 ft. of water in them prior to purging and monitoring well #3 was completely dry. The first two wells failed to recharge after the first bail so insufficient water was available to collect samples.

For this quarter, we were unable to collect any water samples for Nell Hall #1.

Please contact Mike Lane or myself at (505)325-5667 if you have any questions or need additional information. Thanks for the opportunity to be of service.

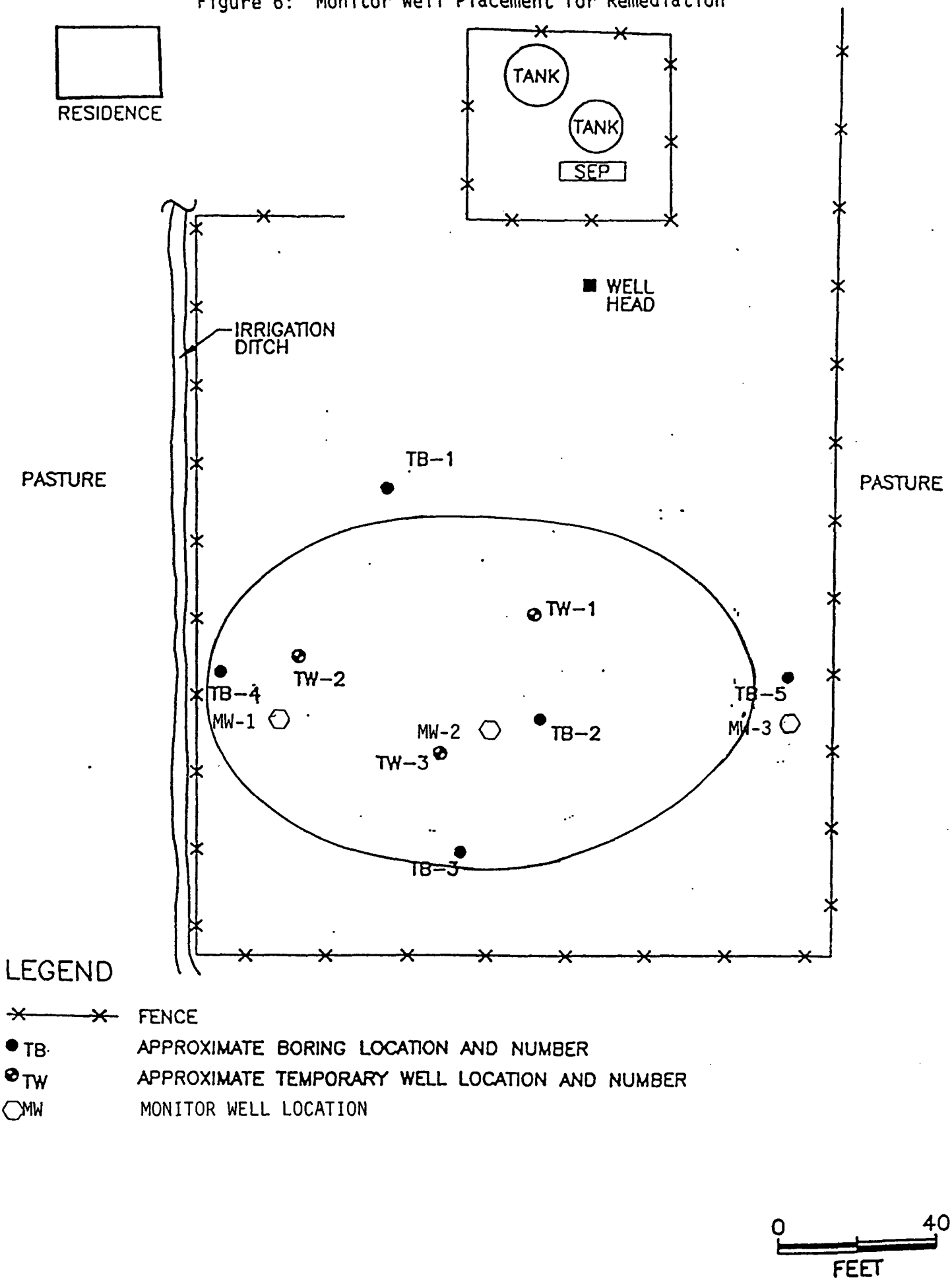
Respectfully submitted,
On Site Technologies, Ltd.

Heidi Reese

Heidi Reese
Staff Chemist

HNR/hnr: 41363rpt.doc

Figure 6: Monitor Well Placement for Remediation



Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Nell Hall #1	Report Date:	07/25/96
Sample ID:	MW 1	Date Sampled:	07/12/96
Lab ID:	03960G01336	Date Received:	07/12/96
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	07/15/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	10.0
Toluene	15.2	10.0
Ethylbenzene	168	10.0
m,p-Xylenes	ND	10.0
o-Xylene	ND	10.0

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	100.9%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Nell Hall #1	Report Date:	07/25/96
Sample ID:	MW 2	Date Sampled:	07/12/96
Lab ID:	0396G01337	Date Received:	07/12/96
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	7/15-25/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	0.5	0.2
Toluene	ND	0.2
Ethylbenzene	1.7	0.2
m,p-Xylenes	0.8	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	89.8%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Nell Hall #1	Report Date:	07/25/96
Sample ID:	MW 3	Date Sampled:	07/12/96
Lab ID:	0396G01338	Date Received:	07/12/96
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	7/15-24/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	0.2
Toluene	0.3	0.2
Ethylbenzene	ND	0.2
m,p-Xylenes	ND	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	88.9%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

conoco

Environmental Sample Chain of Custody and Log

Research and Engineering

No. 10809

Project Number

Type or Print Data

Facility Name	Telephone Number	Transporter Name	Telephone Number
CONOCO INC.	(505) 324-5813	SAME	( ) -

Facility Address: 3315 BLOOMFIELD HWY, FARMINGTON, NM 87401

Transporter Address:

Facility Supervisor: CJ Coy

Method of Shipping: HAND DELIVER

Process Producing Sample: BTEX / NITRATE

Special Shipping Instructions:

Employee(s) Sampling: CJC

Remarks:

Other Employee(s) Handling: DAVID HARTMAN

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	No.	Analysis Req. ▶ Preservative	WTR BTEX	WTR NITRATE
1 } MW 1	7-12-96	1:20 PM	BTEX	40 ml	GLASS	1	1:1 HCL	1	
2 } MW 1	" "	1:20 PM	NITRATE	" "	"	1	ND		1
3 } MW 2	" "	2:00 PM	BTEX	" "	"	1	1:1 HCL	1	
4 } MW 2	" "	2:00 PM	NITRATE	" "	"	1	ND		1
5 } MW 3	" "	2:20 PM	BTEX	" "	"	1	1:1 HCL	1	
6 } MW 3	" "	2:20 PM	NITRATE	" "	"	1	ND		1

Cool + intact

Signatures

	Date/Time		Date/Time	
Bottles Relinquished by: David E. Hartman	7-12-96 3:00 PM	Bottles Received by: Chris Raymer	7-12-96 1500	Condition of Samples Upon Arrival at Final Destination
Relinquished by	Date/Time	Received by	Date/Time	
Relinquished by	Date/Time	Received by	Date/Time	Signature / Date
Relinquished by	Date/Time	Received by	Date/Time	Temp. of Samples on Arrival (Temp. sensitive analysis only)
Relinquished by	Date/Time	Received by	Date/Time	
Relinquished by	Date/Time	Received by	Date/Time	Signature / Date

5-157 X3, 10-91

ANALYZING LAB COPY

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Quality Control / Quality Assurance

Known Analysis

BTEX

Client: Conoco, Inc.
Project:

Date Reported: 07/16/96
Date Analyzed: 07/15/96

Known Analysis

Parameter	Found Concentration (ppb)	Known Concentration (ppb)	Percent Recovery	Acceptance Limits
Benzene	8.4	9.0	**94%**	70-130%
Toluene	7.9	9.0	**88%**	70-130%
Ethylbenzene	8.9	9.0	**99%**	70-130%
m+p-Xylene	18.2	18.0	**101%**	70-130%
o-Xylene	8.9	9.0	**99%**	70-130%

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	102.0%	75-125%

Reference: Method 5030, Purge and Trap: Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Reported by _____

Reviewed by _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS
QUALITY CONTROL REPORT

Method Blank Analysis

Sample Matrix: Water
Lab ID: 0396G01272

Report Date: 07/16/96
Date Analyzed: 07/15/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	0.2
Toluene	ND	0.2
Ethylbenzene	ND	0.2
m,p-Xylenes	ND	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	89.3%	75-125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS
QUALITY CONTROL REPORT

Matrix Spike Analysis

Lab ID: 0396G01338
Sample Matrix: Water
Condition: Cool/Intact

Report Date: 07/22/96
Date Analyzed: 07/15/96

Target Analyte	Spiked Sample Result in ppb	Sample result in ppb	Spike Added (ppb)	% Recovery	Acceptance Limits (%)
Benzene	362	4.84	300	119.2%	70-130
Toluene	391	17.5	300	124.5%	70-130
Ethylbenzene	332	ND	300	110.8%	70-130
m,p-Xylenes	564	ND	600	94.0%	70-130
o-Xylene	340	ND	300	113.5%	70-130

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.

Quality Control:	Surrogate	Percent Recovery	Acceptance Limits
	Bromofluorobenzene	98.5%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS
QUALITY CONTROL REPORT

Duplicate Analysis

Lab ID: 0396G01272
Sample Matrix: Water
Condition: Cool/Intact

Report Date: 07/16/96
Date Analyzed: 07/15/96

Target Analyte	Duplicate Concentration (ppb)	Original Concentration (ppb)	% Difference
Benzene	ND	ND	NA
Toluene	ND	ND	NA
Ethylbenzene	ND	ND	NA
m,p-Xylenes	ND	ND	NA
o-Xylene	ND	ND	NA

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.

Quality Control:	Surrogate	Percent Recovery	Acceptance Limits
	Bromofluorobenzene	88.7%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Not Given	Report Date:	07/05/96
Sample ID:	Nell Hall MW #1	Date Sampled:	06/28/96
Lab ID:	0396G01208	Date Received:	06/28/96
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	07/01/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	40.0
Toluene	42.0	40.0
Ethylbenzene	720	40.0
m,p-Xylenes	14,040	40.0
o-Xylene	ND	40.0

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	85.5%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	**Conoco Inc.**
Project:	Not Given
Sample ID:	Nell Hall #1 MW 1
Laboratory ID:	0396G01208
Sample Matrix:	Water
Condition:	Cool / Intact

Date Reported:	07/05/96
Date Sampled:	06/28/96
Time Sampled:	10:15 AM
Date Received:	06/28/96

Parameter	Analytical Result	Units
Nitrate Nitrogen.....	<0.05	mg/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Reported by _____

Reviewed by _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Not Given	Report Date:	07/05/96
Sample ID:	Nell Hall MW #2	Date Sampled:	06/28/96
Lab ID:	0396G01209	Date Received:	06/28/96
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	07/01/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	0.2
Toluene	0.4	0.2
Ethylbenzene	1.6	0.2
m,p-Xylenes	0.4	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	84.7%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	Conoco Inc.		
Project:	Not Given	Date Reported:	07/05/96
Sample ID:	Nell Hall #1 MW 2	Date Sampled:	06/28/96
Laboratory ID:	0396G01209	Time Sampled:	10:45 AM
Sample Matrix:	Water	Date Received:	06/28/96
Condition:	Cool / Intact		

Parameter	Analytical Result	Units
Nitrate Nitrogen.....	5.12	mg/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Reported by _____ Reviewed by _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Not Given	Report Date:	07/05/96
Sample ID:	Nell Hall MW #3	Date Sampled:	06/28/96
Lab ID:	0396G01210	Date Received:	06/28/96
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	07/01/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	0.2
Toluene	ND	0.2
Ethylbenzene	ND	0.2
m,p-Xylenes	ND	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	76.3%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	Conoco Inc.		
Project:	Not Given	Date Reported:	07/05/96
Sample ID:	Nell Hall #1 MW 3	Date Sampled:	06/28/96
Laboratory ID:	0396G01210	Time Sampled:	11:15 AM
Sample Matrix:	Water	Date Received:	06/28/96
Condition:	Cool / Intact		

Parameter	Analytical Result	Units
Nitrate Nitrogen.....	<0.05	mg/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Reported by dk

Reviewed by SB

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Quality Control / Quality Assurance

Known Analysis
BTEX

Client: **Conoco, Inc.**
Project: Not Given

Date Reported: 07/05/96
Date Analyzed: 07/01/96

Known Analysis

Parameter	Found Concentration (ppb)	Known Concentration (ppb)	Percent Recovery	Acceptance Limits
Benzene	5.9	6.0	**98%**	70-130%
Toluene	7.0	6.0	**116%**	70-130%
Ethylbenzene	6.9	6.0	**114%**	70-130%
m+p-Xylene	14.6	12.0	**122%**	70-130%
o-Xylene	7.1	6.0	**118%**	70-130%

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	85.4%	75-125%

Reference: Method 5030, Purge and Trap: Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Reported by _____

Reviewed by _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS
QUALITY CONTROL REPORT

Matrix Spike Analysis

Lab ID: 0396G01209
Sample Matrix: Water
Condition: Cool/Intact

Report Date: 07/05/96
Date Analyzed: 07/01/96

Target Analyte	Spiked Sample Result in ppb	Sample result in ppb	Spike Added (ppb)	% Recovery	Acceptance Limits (%)
Benzene	4.69	ND	6.0	78.1%	70-130
Toluene	5.35	0.37	6.0	83.0%	70-130
Ethylbenzene	6.53	1.62	6.0	81.8%	70-130
m,p-Xylenes	11.1	0.42	12.0	88.7%	70-130
o-Xylene	5.36	ND	6.0	89.4%	70-130

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.

Quality Control:	Surrogate	Percent Recovery	Acceptance Limits
	Bromofluorobenzene	79.4%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS
QUALITY CONTROL REPORT

Duplicate Analysis

Lab ID: 0396G01209
Sample Matrix: Water
Condition: Cool/Intact

Report Date: 07/05/96
Date Analyzed: 07/01/96

Target Analyte	Duplicate Concentration (ppb)	Original Concentration (ppb)	% Difference
Benzene	ND	ND	NA
Toluene	0.3	0.4	28.6
Ethylbenzene	1.5	1.6	6.5
m,p-Xylenes	0.4	0.4	0.0
o-Xylene	ND	ND	NA

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.

Quality Control:	Surrogate	Percent Recovery	Acceptance Limits
	Bromofluorobenzene	89.6%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

conoco

Environmental Sample Chain of Custody and Log

Research and Engineering

No. 10811

Project Number

Type or Print Data

Facility Name: Conoco Inc	Telephone Number: (505) 324-5813	Transporter Name: SAME	Telephone Number: ( ) -
Facility Address: 3315 Bloomfield Hwy, Farmington NM, 87401		Transporter Address:	
Facility Supervisor: C.J. Coy		Method of Shipping: Hand Deliver	
Process Producing Sample: BTEX / Nitrate	Special Shipping Instructions:		
Employee(s) Sampling: CJ Coy	Remarks:		
Other Employee(s) Handling:			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Analysis Req. ▶ Preservative	WTR. BTEX	WTR. NITRATE
1 Nell Hall 1 MW1	6/28/96	10:15 AM	BTEX	40 ml	Glass	1	1:1 HCl	1	
2 Nell Hall 1 MW1	"	10:15	Nitrate	"	"	1	None		1
3 Nell Hall 1 MW2	"	10:45	BTEX	"	"	1	1:1 HCl	1	
4 Nell Hall 1 MW2	"	10:45	Nitrate	"	"	1	None		1
5 Nell Hall 1 MW3	"	11:15	BTEX	"	"	1	1:1 HCl	1	
6 Nell Hall 1 MW3	"	11:15	Nitrate	"	"	1	None		1

Signatures

Bottles Relinquished by: Carl J Coy	Date/Time: 6/28/96 12:10 PM	Bottles Received by: Anna Schauer	Date/Time: 6/28/96 1210	Condition of Samples Upon Arrival at Final Destination
Relinquished by	Date/Time	Received by	Date/Time	
Relinquished by	Date/Time	Received by	Date/Time	Signature / Date
Relinquished by	Date/Time	Received by	Date/Time	Temp. of Samples on Arrival (Temp. sensitive analysis only)
Relinquished by	Date/Time	Received by	Date/Time	
Relinquished by	Date/Time	Received by	Date/Time	Signature / Date

5 157 X3 10-91

ANALYZING LAB COPY

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Not Given	Report Date:	06/21/96
Sample ID:	Nell Hall #1 MW 1	Date Sampled:	06/14/96
Lab ID:	0396G01016	Date Received:	06/14/96
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	06/20/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	26.6	10.0
Toluene	27.7	10.0
Ethylbenzene	757	10.0
m,p-Xylenes	9,310	10.0
o-Xylene	ND	10.0

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	101.4%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	Conoco Inc.		
Project:	Not Given	Date Reported:	06/21/96
Sample ID:	Nell Hall #1 MW 1	Date Sampled:	06/14/96
Laboratory ID:	0396G01016	Time Sampled:	12:45 PM
Sample Matrix:	Water	Date Received:	06/14/96
Condition:	Cool / Intact		

Parameter	Analytical Result	Units
Nitrate Nitrogen.....	< 0.05	mg/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Reported by _____

Reviewed by _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Not Given	Report Date:	06/21/96
Sample ID:	Nell Hall #1 MW 2	Date Sampled:	06/14/96
Lab ID:	0396G01017	Date Received:	06/14/96
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	06/20/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	9.0	1.0
Toluene	1.6	1.0
Ethylbenzene	26.1	1.0
m,p-Xylenes	1.1	1.0
o-Xylene	ND	1.0

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	86.1%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	Conoco Inc.		
Project:	Not Given	Date Reported:	06/21/96
Sample ID:	Nell Hall #1 MW 2	Date Sampled:	06/14/96
Laboratory ID:	0396G01017	Time Sampled:	1:15 PM
Sample Matrix:	Water	Date Received:	06/14/96
Condition:	Cool / Intact		

Parameter	Analytical Result	Units
Nitrate Nitrogen.....	2.16	mg/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Reported by _____

Reviewed by _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Not Given	Report Date:	06/21/96
Sample ID:	Nell Hall #1 MW 3	Date Sampled:	06/14/96
Lab ID:	0396G01018	Date Received:	06/14/96
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	06/20/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	31.3	1.0
Toluene	ND	1.0
Ethylbenzene	ND	1.0
m,p-Xylenes	ND	1.0
o-Xylene	ND	1.0

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	83.3%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	**Conoco Inc.**		
Project:	Not Given	Date Reported:	06/21/96
Sample ID:	Nell Hall #1 MW 3	Date Sampled:	06/14/96
Laboratory ID:	0396G01018	Time Sampled:	1:45 PM
Sample Matrix:	Water	Date Received:	06/14/96
Condition:	Cool / Intact		

Parameter	Analytical Result	Units
Nitrate Nitrogen.....	5.35	mg/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Reported by _____

Reviewed by _____

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS
QUALITY CONTROL REPORT

Duplicate Analysis

Lab ID: 0396G01017
Sample Matrix: Water
Condition: Cool/Intact

Report Date: 06/21/96
Date Analyzed: 06/20/96

Target Analyte	Duplicate Concentration (ppb)	Original Concentration (ppb)	% Difference
Benzene	7.4	9.0	19.5
Toluene	1.9	1.6	17.1
Ethylbenzene	22.6	26.1	14.4
m,p-Xylenes	1.4	1.1	24.0
o-Xylene	ND	ND	NA

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	78.1%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS
QUALITY CONTROL REPORT

Matrix Spike Analysis

Lab ID: 0396G01018
Sample Matrix: Water
Condition: Cool/Intact

Report Date: 06/21/96
Date Analyzed: 06/20/96

Target Analyte	Spiked Sample Result in ppb	Sample result in ppb	Spike Added (ppb)	% Recovery	Acceptance Limits (%)
Benzene	43.5	31.3	15.0	81.1%	70-130
Toluene	14.4	0.50	15.0	92.7%	70-130
Ethylbenzene	13.6	0.46	15.0	87.4%	70-130
m,p-Xylenes	26.4	0.58	30.0	86.2%	70-130
o-Xylene	14.8	0.35	15.0	96.5%	70-130

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	76.5%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS
QUALITY CONTROL REPORT

Method Blank Analysis

Sample Matrix: Water
Lab ID: Method Blank

Report Date: 06/21/96
Date Analyzed: 06/20/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	0.2
Toluene	ND	0.2
Ethylbenzene	ND	0.2
m,p-Xylenes	ND	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	87.3%	75-125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review

. Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Quality Control / Quality Assurance

Known Analysis

BTEX

Client: **Conoco, Inc.**
Project: Not Given

Date Reported: 06/21/96
Date Analyzed: 06/20/96

Known Analysis

Parameter	Found Concentration (ppb)	Known Concentration (ppb)	Percent Recovery	Acceptance Limits
Benzene	3.6	3.0	**121%**	70-130%
Toluene	3.7	3.0	**123%**	70-130%
Ethylbenzene	3.8	3.0	**125%**	70-130%
m+p-Xylene	7.2	6.0	**120%**	70-130%
o-Xylene	3.8	3.0	**127%**	70-130%

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	84.3%	75-125%

Reference: Method 5030, Purge and Trap: Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Reported by _____

Reviewed by _____

CONOCO

Environmental Sample Chain of Custody and Log

Research and Engineering

Project Number 10813

Type or Print Data

Facility Name: CONOCO INC.	Telephone Number: (505) 324-5813	Transporter Name: SAME	Telephone Number: ( ) -
Facility Address: 3315 BLOOMFIELD HWY, FARMINGTON, NM, 87401		Transporter Address: "	
Facility Supervisor: C J Coy		Method of Shipping: HAND DELIVER	
Process Producing Sample: WTR BTEX & NITRATE	Special Shipping Instructions: —		
Employee(s) Sampling: C.J. Coy, DAVID HARTMAN	Remarks: —		
Other Employee(s) Handling: —			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Analysis Req. ▶ Preservative	WTR BTEX	WTR NITRATE
1. NELL HALL #1 MW1	6-14-96	12:45pm	BTEX	40 ml	GLASS	1	1:1 HCL	1	
2 NELL HALL #1 MW1	"	12:45pm	NITRATE	"	"	1	NO		1
3 NELL HALL #1 MW2	"	1:15pm	BTEX	"	"	1	1:1 HCL	1	
4 NELL HALL #1 MW2	"	1:15pm	NITRATE	"	"	1	NO		1
5 NELL HALL #1 MW3	"	1:45pm	BTEX	"	"	1	1:1 HCL	1	
6 NELL HALL #1 MW3	"	1:45pm	NITRATE	"	"	1	NO		1

Signatures

Bottles Relinquished by: C J Coy	Date/Time: 6/14/96 3:30 PM	Bottles Received by: Anna Schaeer	Date/Time: 6/14/96 3:30pm	Condition of Samples Upon Arrival at Final Destination
Relinquished by	Date/Time	Received by	Date/Time	
Relinquished by	Date/Time	Received by	Date/Time	Signature / Date
Relinquished by	Date/Time	Received by	Date/Time	Temp. of Samples on Arrival (Temp. sensitive analysis only)
Relinquished by	Date/Time	Received by	Date/Time	
Relinquished by	Date/Time	Received by	Date/Time	Signature / Date

5 157 >3, 10-91

Midland Division
Exploration Production

Conoco Inc.
10 Desta Drive, Suite 100W
Midland, TX 79705-4500
(915) 686-5400

August 26, 1995

Mr. William C. Olson
Environmental Bureau
New Mexico Oil Conservation Division
Post Office Box 3088
Santa Fe, NM 87504

Dear Mr. Olson:

GROUNDWATER TREATMENT PLAN ADDENDUM, Nell Hall #1

Enclosed is the nutrient enhancement needed for BTEX biodegradation. Upon site assessment, the area is found to be nitrogen deficient. Please add the following, "Nutrient Enhancement for Nell Hall #1" to section 9 of our proposed Bio-Air Sparging Remediation Project designed by BioRem Environmental Consultants. Should you have any questions or comments, please call me at (915)686-5488.

Yours very truly

R.N. Goates
Environmental Specialist

cc: Mr. Denny Foust
NM Oil Conservation Division
1000 Rio Brazos Road
Aztec, NM 87410

John Coy (w/o enclosure)

Nutrient Enhancement for Nell Hall #1

In order to stimulate bacterial growth and BTEX biodegradation, nutrient balance at the remediation site must be maintained. In general, a C:N:P ratio of 100-5-2 has been shown to keep bacteria biodegradation and cell growth near maximum rates under the existing environmental conditions. Although both nitrogen and phosphorous are required for a balanced C:N:P nutrient ratio, the most limiting nutrient appears to be nitrogen. When appropriate nutrients are supplied, the time required to obtain site closure is significantly reduced.

In this bio-air sparging process (PC BioRem process), the nitrogen is supplied as nitrous oxide (N_2O). Nitrous oxide is soluble in water, is a nonflammable gas, and nontoxic. For bio-air sparging, a non-certified grade is utilized. The non-certified grade is a cost-effective nitrogen source.

The nitrous oxide can be purchased as a mixed gas with nitrogen gas as the gas carrier. Cost of the non-certified nitrous oxide is approximately $75.00 to $100.00 per A-sized cylinder (209 cu. ft.).

Nitrous oxide can also be purchased as 99% liquid-phase material. The technical grade (99.0%) should be used for the bio-air sparging process. The A-sized cylinder contains 60 lbs. of nitrous oxide. Cost of the A-sized cylinder is approximately $162.00.

To deliver the nitrous oxide, a flow meter and a two-stage regulator are needed.

- Flow meter delivery range: 0.01 to 0.1 cfm
  Cost: Approximately $85.00

- Two-stage regulator with 1-50 psig delivery pressure range
  Cost: Approximately $226.00

When using super-critical fluid (liquid nitrous oxide), a regulator heater may be considered. Cost of a regulator heater is approximately $164.00

The amount of N_2O required for nutrient balance at the Nell Hall lease is 6-8 lbs. of nitrous oxide. This 6-8 lbs. is approximately equal to 4 ppm nitrogen.

Midland Division
Exploration Production

Conoco Inc.
10 Desta Drive, Suite 100W
Midland, TX 79705-4500
(915) 686-5400

August 17, 1995

Mr. William C. Olson
Environmental Bureau
New Mexico Oil Conservation Division
Post Office Box 3088
Santa Fe, NM 87504

Dear Mr. Olson:

GROUNDWATER TREATMENT PLAN, NELL HALL 1, S07-30N-11W

Enclosed is the Bio Air Sparging Remediation Project Plan for this site. We have incorporated the sparging well design into the plan in Section 6. Should you have any questions, please call me at (915) 686-5488.

Yours very truly

R.N. Goates
Environmental Specialist

cc: Mr. Denny Foust
NM Oil Conservation Division
1000 Rio Brazos Road
Aztec, NM 87410

John Coy (w/o enclosure)

CONTENTS

Bio-Air Sparging Remediation Project for Nell Hall No. 1

CONOCO INC.
Midland Division
Farmington, New Mexico

Designed
by

BioRem Environmental Consultants

August 1995

(405) 767-1653
(405) 762-3805
(405) 765-6818 [fax]

Bio-Air Sparging

Introduction

When designed and operated properly "Bio-Air Sparging" is a cost-effective in situ remediation process. The bio-air sparging process is best suited for the remediation of volatile and semi-volatile organic compounds in groundwater and soil environments. The design of bio-air sparging can take many forms depending on the required application. The basic system includes a surface air injection system, properly placed injection wells, bacterial nutrient stimulation when required, and a reliable monitoring program.

However, it should be noted, site evaluation and analysis, system design, insulation, operation, and monitoring are not trivial processes. In fact, soil is the most complex component of the ecosystem. Soil is hard to evaluate, analyze, and remediate. From a remediation point we are dealing with sand, silt, clay, and water which are physically, chemically, and biologically interactive.

Bio-air sparging is a remediation technology which is relatively inexpensive to implement, operate, and maintain. The technology is best applied to contaminants in relatively permeable soil. In addition, the water phase should not contain large amounts of non-aqueous phase liquids (NAPL). Free hydrocarbons must be recovered before bio-air sparging is applied. The application of bio-air sparging must be evaluated on a case-by-case basis.

The major advantage of bio-air sparging over other more costly remediation processes is that contaminants can be removed from both the soil and water phases. The remediation is accomplished by physical, chemical, and biological processes. The bio-air sparging process removes both dissolved and adsorbed phases. Mass transfer in bio-air sparging employs several advantageous mechanisms to remove contaminants from the saturated and interface zones. Therefore, bio-air sparging exhibits a "lower" asymptotic behavior as compared to vapor extraction and pump-and- treat methods. Remediation goals with bio-air sparging are obtained in less time and with reduced costs when compared to current available remediation technology. Bio-air sparging is an environmentally safe remediation process.

The bio-air sparging process does not produce a secondary waste stream which would require additional treatment or disposal. The secondary waste stream may have a major environmental impact as well as additional handling, permitting, and cost. When required, bio-air sparging can be combined with other remediation technology.

Contaminant biodegradation is a very important part of the bio-air sparging technology. The hydrocarbon biodegradation must be balanced with the physical and chemical processes. All three processes operate simultaneously although they are controlled by different parameters. An understanding of soil science, hydrology, chemistry, and microbiology is necessary for a successful remediation project.

Past experience has shown that the unsaturated and saturated zones contain a variety of indigenous microorganisms capable of biodegrading organic carbon contaminants. Air sparging increases the oxygen content of the groundwater and soil. In many environments, the oxygen content is the primary limiting parameter for the biodegradation of an overbalance of hydrocarbon contamination. The groundwater and soil above the groundwater are now large chemostats for the biodegradation of the contaminants. The chemostat area is astronomically larger in volume and surface area as compared to the contaminant. This bioreaction area rapidly and efficiently biodegrades the organic contaminant to CO_2, H_2O, and cell mass. In cases of large volumes of organic contaminants, other nutrients (nitrogen and phosphorous) may be required. Oxygen concentrations of 0.3 mg/l are considered sufficient to biodegrade petroleum constituents. The rate of biodegradation can be significantly enhanced by optimizing the nutrient requirements of the microorganism ecosystem.

As in all remediation projects, accurate site characterization is essential for the success of the remediation. The site investigation must utilize delineation applicable to the design of bio-air sparging technology. Although there are key design parameters which can be utilized, a majority of the case studies do not include many design parameters. Therefore professional judgment and experience based on site characterization (soil type, soil layering, hydrology, and biodegradation) are a major part of a successful bio-air sparging system.

Sampling and Analysis

Site assessment was conducted by Philip Environmental, 4000 Monroe Road, Farmington, New Mexico. The Nell Hall No. 1 is located in the San Juan Basin, New Mexico. The site formerly contained a dehydrator and an unlined discharge pit. The dehydrator was removed and discharge ceased in May 1994. In August 1994, hydrocarbon-impacted soil from the pit was partially excavated and the pit was backfilled with clean soil. Site assessment of the Nell hall No. 1 was initiated June 1, 1995. See Philip Technical Memorandum (TM) project 14449 for more detail (page 1-5).

A total of 8 soil borings were completed using a 4.25-inch hollow-stem auger to delineate the BTEX contamination. Three of the wells, TW-1,2, and 3 were completed as temporary wells.

A photoionization detector (PID) was used in the field soil boring operation to scan soil samples. Additional analyses were conducted by Analytica Laboratories, Farmington, New Mexico, for benzene, toluene, ethylbenzene, and xylenes (BTEX) and for total petroleum hydrocarbons (TPH).

The following analytical methods were used during the site assessment:

BTEX soil	USEPA Method 8020
TPH	USEPA Method 418.1
BTEX water	USEPA Method 602
Phosphorous	USEPA Method 365.2
Nitrates	USEPA Method 353.2
PAHs	USEPA Method 8310

Particle size analysis from samples collected in the aquifer were conducted. From grain-size distribution curves, the hydraulic conductivity was calculated. See page 4 and attachment 5 of Philip Environmental TM #14449.

In addition, pH, electrical conductivity, temperature, and soil boring profile analyses were conducted on samples from the Nell Hall site.

Evaluation of Contaminated Site

The Nell Hall No. 1 was contaminated with BTEX from the glycol dehydrator operation. The dehydrator was removed from the site and discharge ceased. The HC-contaminated soil was removed from the site and the pit was backfilled with clean soil.

The site was assessed by Philip Environmental Services and reported in Technical Memorandum #14449 (TM). This evaluation is based on the findings in the TM for the purpose of remediation. The site will be remediated using a special Bio-Air Sparging technique designed by BioRem Environmental Consultants, Ponca City, Oklahoma.

The site measures 140 ft. by 90 ft. (12,600 sq.ft.) in an elliptical shape. Figure 1 from the TM shows the BTEX concentration and zone of contamination. Table 1 from the TM shows BTEX groundwater concentration of the 3 TW and 5 TB. The highest BTEX concentration was found in TB-2 with 16,319 μg/L and the lowest BTEX concentration was found in TB-4 with 56.5 μg/L. TB-5 was found to be ND. Majority of the contamination is associated with the lower south part of the elliptically-shaped zone (see Table 1).

The BTEX contamination is primarily associated in the saturated zone (groundwater). Nevertheless, it would be expected some BTEX contamination would be associated with the capillary fringe area. From limited data, it is estimated that 20% to 25% of the BTEX contamination is associated with the capillary fringe. The capillary fringe area is defined as the intermediate area between the unsaturated and saturated zones. It should be noted irrigation activity on both sides of the lease (pasture land) dramatically affects the groundwater level.

It appeared that the BTEX plume started gravitational movement from the pit and pancaked out at groundwater level in a southeasterly direction. Equal forces of gravity and groundwater gradient were exerted on the BTEX plume. Very little movement down-gradient was evidence at this point in time. It is possible surface water intrusion could keep the contamination plume in a stationary position.

In June 1995, when Philip Environmental conducted the site assessment, groundwater was encountered at the 22-foot to 23-foot level. However, in 1994 preliminary site evaluation indicated water levels of 18 feet to 19 feet in September. Changes in groundwater levels are due to irrigation activity in the pasture areas adjacent to the lease.

A majority of the BTEX contamination (80%) is confined to the saturated zone. Groundwater level in the June evaluation was found at the 22-foot to 23-foot depth and confined with a clay layer starting at the 25 foot to 26.5-foot depth. The aquifer thickness is 3-4 feet as determined from measurement in the 3 temporary wells (TW 1, 2, and 3). For remediation design purposes, the aquifer thickness of 4 feet (at low irrigation influence) will be used.

Groundwater from temporary well TW2 was analyzed for polynuclear aromatic hydrocarbons (PAHs) (see Table 2). One PAH, acenaphthylene, was found (55.6 μg/l) in a water sample from TW2 (see Table 2). No other PAH was detected in the analysis. It is unusual to find PAH contamination in this type of site and very unusual to find only one base-neutral extractable.

Acenaphthylene is biodegradable and will be resampled and analyzed following completion of the bio-air sparging remediation.

One soil sample from TW2 found the presence of total petroleum HC (TPH). The one sample from TW2 showed 88.6 mg of TPH per kg of soil. Presence of TPH is not expected to be associated with glycol dehydrator volatile HC contamination. The TPH will be subject to biodegradation during the BTEX bio-air sparging remediation process.

For remediation purposes, I have shifted the zone of contamination approximately 10 feet south and 10 feet west (see Figure 2). In addition, the air sparging remediation wells will be concentrated on the lower one-half of the elliptical zone of contamination.

Grain-size analysis from samples collected in the aquifer were conducted by Philip Environmental (see Attachment 5). A majority of the grain size distribution was a medium sand (from particle size analysis curve 55%). The medium grain size ranged from 0.4 to 2 mm. This type of aquifer would be an acceptable candidate for Bio-Air Sparging remediation. In TW-1 and TW-3, clayey material was also reported.

From the particle analysis, hydraulic conductivity was determined:

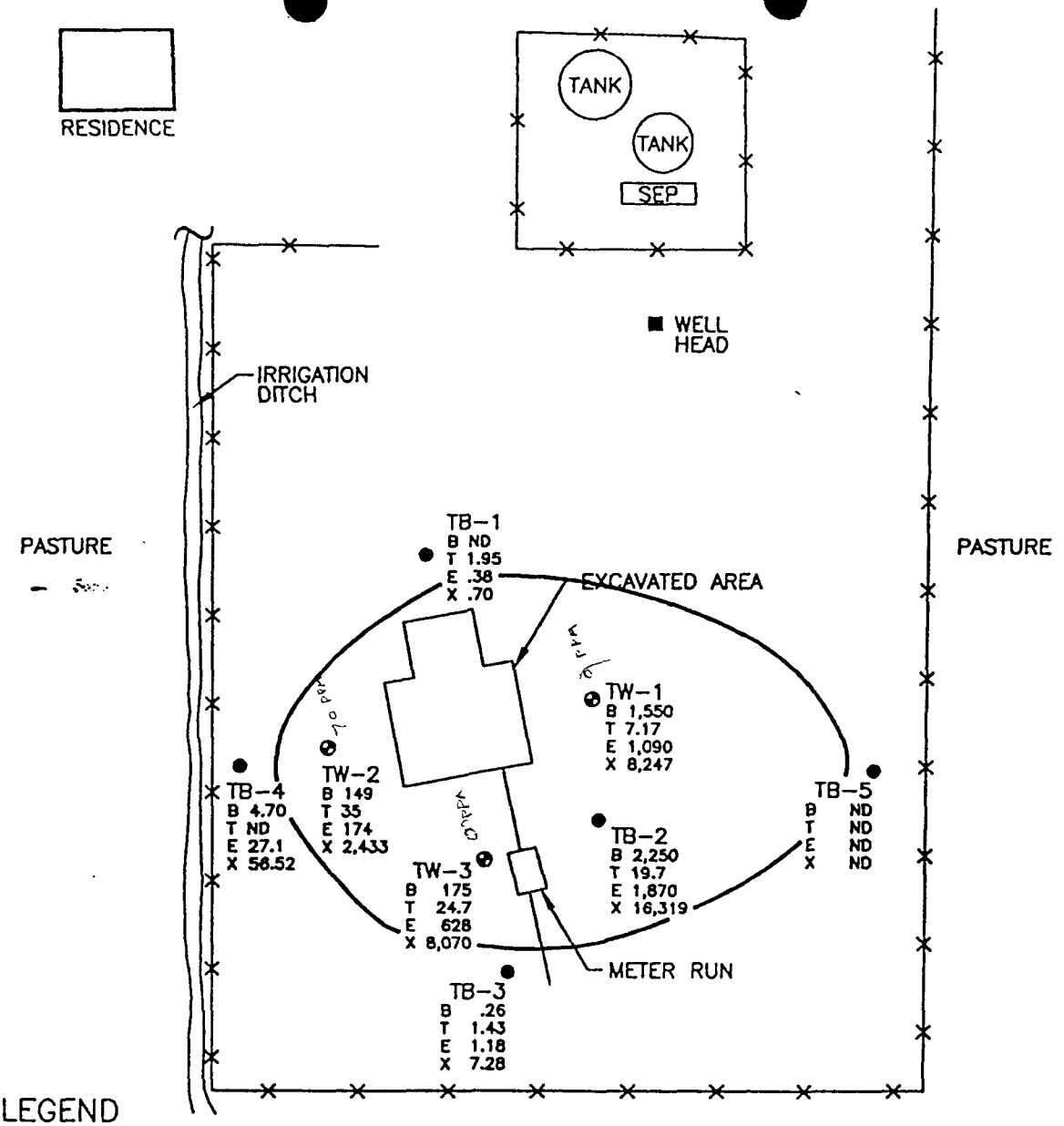
TW-1	540 gallons per day/ft.^{2}
TW-2	850 gallons per day/ft.^{2}
TW-3	475 gallons per day/ft.^{2}

Depth of Groundwater and Relative Elevation from TM page 4:

	Depth	Relative Elevation
TW-1	24.75	74.67
TW-2	25.41	76.37
TW-3	25.72	75.32

The site assessment data indicate Bio-Air Sparging would be the most cost-effective remediation for the Nell Hall No. 1 site.

Figure 1: Zone of BTEX Contamination



LEGEND

×——×	FENCE
● TB-1	APPROXIMATE BORING LOCATION AND NUMBER
⊕ TW-1	APPROXIMATE TEMPORARY WELL LOCATION AND NUMBER
———	100 PARTS PER BILLION BENZENE IN GROUNDWATER
B 1,550	BENZENE (ug/L)
T 7.17	TOLUENE (ug/L)
E 1,090	ETHYLBENZENE (ug/L)
X 8,247	TOTAL XYLENES (ug/L)
ug/L	MICROGRAMS PER LITER ppb

0 40
FEET

N

*NOTE: Results are of groundwater samples only.

PHILIP ENVIRONMENTAL	TITLE: Boring and Temporary Monitoring Well Locations with Groundwater, BTEX Results	SCALE 1=40	DATE	PROJECT NO: 14449
		DWN: TMM	7/6/95	CONOCO NELL HALL NO. 1 AZTEC, NM
		DES:		
		CHKD:		FIGURE 1 REV:
		APPD:		

001
COL 14

TABLE 1

LABORATORY ANALYTICAL RESULTS OF SOIL AND GROUNDWATER ANALYSIS, NELL HALL NO.1, JUNE, 1995

		Benzene	Toluene	Ethylbenzene	Total Xylenes	Orhto-Phosphorous	Nitrate	Total Petroleum Hydrocarbons
TW-1	Soil 20' - 22'	37.1 (8.32)	8.51 (8.32)	62.0 (8.32)	600 (16.6)			ND (25)
	Groundwater	1,550 (50.0)	7.17 (2.50)	1,090 (50.0)	8,247 (100)	24.9	<1.0	
TW-2	Soil 22.5' - 24.5'	ND (9.56)	ND (9.56)	42.9 (9.56)	706 (19.1)			88.6 (24.6)
	Groundwater	149 (12.5)	35.0 (12.5)	174 (12.5)	2,433 (50.0)	1.52	<0.32	
TW-3	Soil 22.5' - 24.5'	ND (9.09)	ND (9.09)	ND (9.09)	45.4 (18.2)			ND (24.0)
	Groundwater	175 (12.5)	24.7 (12.5)	628 (12.5)	8,070 (250)	1.14	<0.32	
TB-1	Groundwater	ND (0.20)	1.95 (0.20)	0.38 (0.20)	0.70 (0.20)			
TB-2	Groundwater	2,250 (100)	19.7 (10)	1,870 (100)	16,319 (200)			
TB-3	Groundwater	0.26 (0.20)	1.43 (0.20)	1.18 (0.20)	7.28 (0.40)			
TB-4	Groundwater	4.70 (4.00)	ND (4.00)	27.1 (4.00)	56.5 (8.00)			
TB-5	Groundwater	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.00)			

BTEX results are in micrograms per liter for groundwater and micrograms per kilograms for soil

O-phosp and Nitrate results are in milligrams per liter

Detection limits are shown in parentheses

ND - Analyte not detected at the stated detection limit.

ANALYTICA
ENVIRONMENTAL LABORATORY

Polyaromatic Hydrocarbons
EPA Method 8310

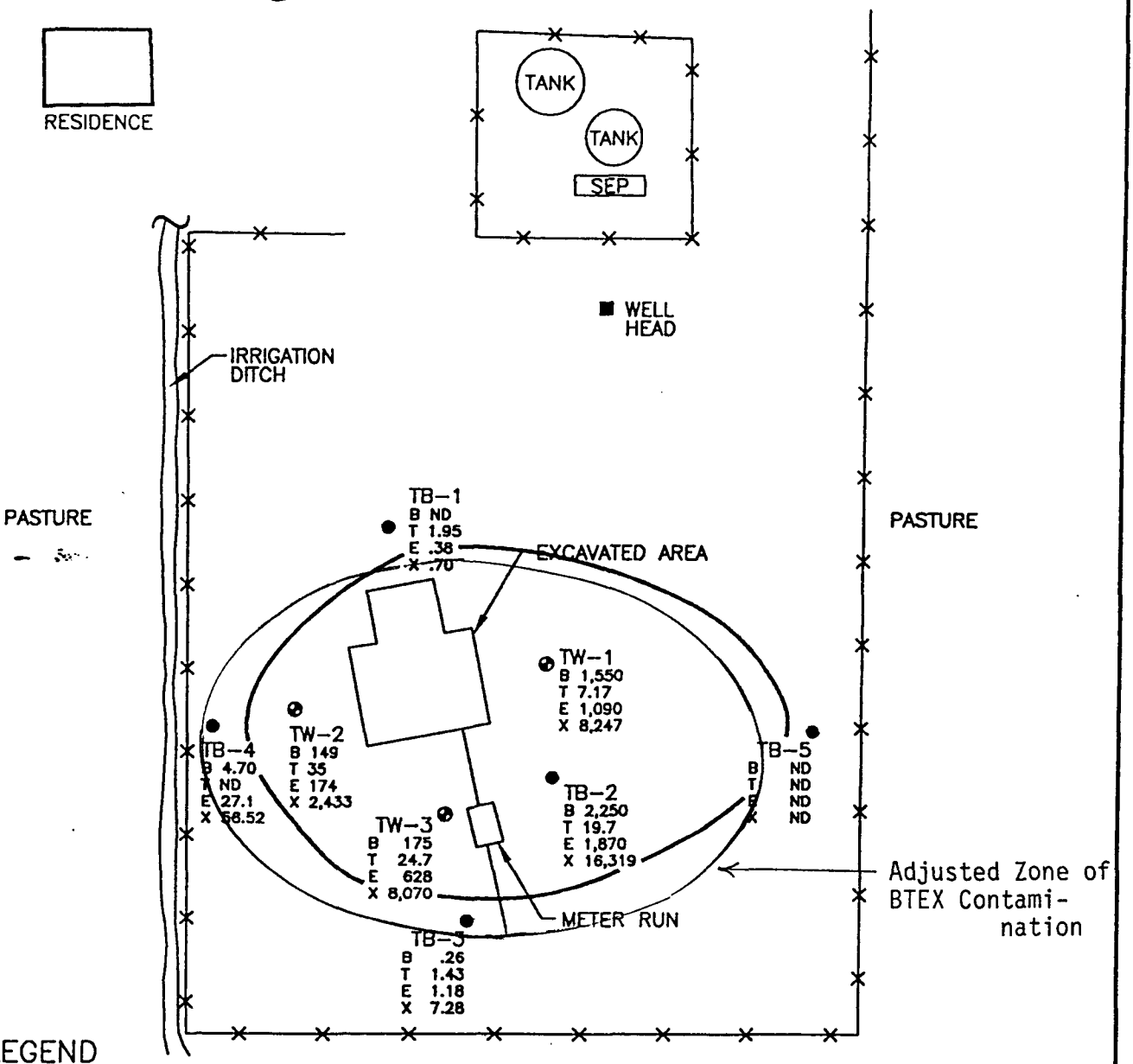
Philip Environmental

Project ID:	Conoco Nell Hall No. 1	Report Date:	06/21/95
Sample ID:	TW - 2	Date Sampled:	06/03/95
Lab ID:	1097	Date Received:	06/03/95
Sample Matrix:	Water	Date Analyzed:	06/08/95
Preservative:	Cool		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Acenaphthene	< 3.74	3.74
Acenaphthylene	**55.6**	**2.13**
Anthracene	< 1.49	1.49
Benzo(a)anthracene	< 0.88	0.88
Benzo(a)pyrene	< 0.39	0.39
Benzo(b)fluoranthene	< 0.19	0.19
Benzo(k)fluoranthene	< 0.34	0.34
Benzo(ghi)perylene	< 1.23	1.23
Chrysene	< 0.88	0.88
Dibenzo(a,h)anthracene	< 0.72	0.72
Fluoranthene	< 0.15	0.15
Fluorene	< 1.29	1.29
Indeno(1,2,3-cd)pyrene	< 1.05	1.05
Naphthalene	< 5.82	5.82
Phenanthrene	< 1.22	1.22
Pyrene	< 0.13	0.13

Review

Figure 2: Zone of BTEX Contamination Used For Bio-Air Sparging



LEGEND

×——×	FENCE
● TB-1	APPROXIMATE BORING LOCATION AND NUMBER
⊕ TW-1	APPROXIMATE TEMPORARY WELL LOCATION AND NUMBER
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T 7.17	TOLUENE (ug/L)
E 1,090	ETHYLBENZENE (ug/L)
X 8,247	TOTAL XYLENES (ug/L)
ug/L	MICROGRAMS PER LITER

0 40
FEET

N

*NOTE: Results are of groundwater samples only.

PHILIP ENVIRONMENTAL	TITLE: Boring and Temporary Monitoring Well Locations with Groundwater, BTEX Results	SCALE 1=40	DATE	PROJECT NO: 14449	
		DWN: TMM	7/6/95	CONOCO NELL HALL NO. 1 AZTEC, NM	
		DES:			
		CHKD:		FIGURE 1	REV:
		APPD:			

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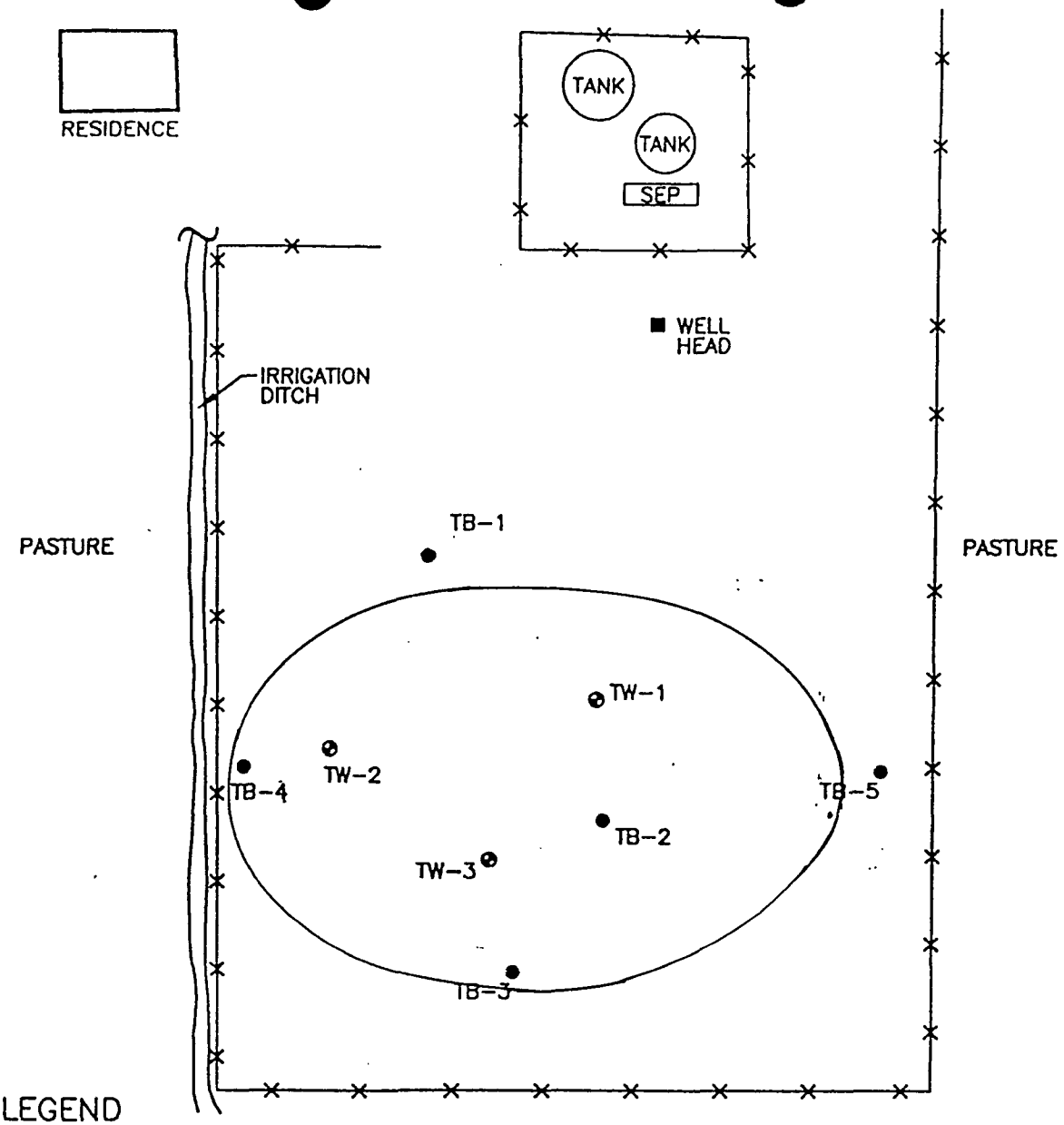
Figure 3: Zone of BTEX Contamination



LEGEND

×——×	FENCE
● TB-1	APPROXIMATE BORING LOCATION AND NUMBER
⊕ TW-1	APPROXIMATE TEMPORARY WELL LOCATION AND NUMBER
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ug/L	MICROGRAMS PER LITER

0 40
FEET

N

*NOTE: Results are of groundwater samples only.

PHILIP ENVIRONMENTAL

TITLE: Boring and Temporary Monitoring Well Locations with Groundwater, BTEX Results

SCALE	1=40	DATE	
DWN:	TMM	7/6/95	
DES:			
CHKD:			
APPD:			

PROJECT NO: 14449
CONOCO NELL HALL NO. 1
AZTEC, NM

FIGURE 1

REV:

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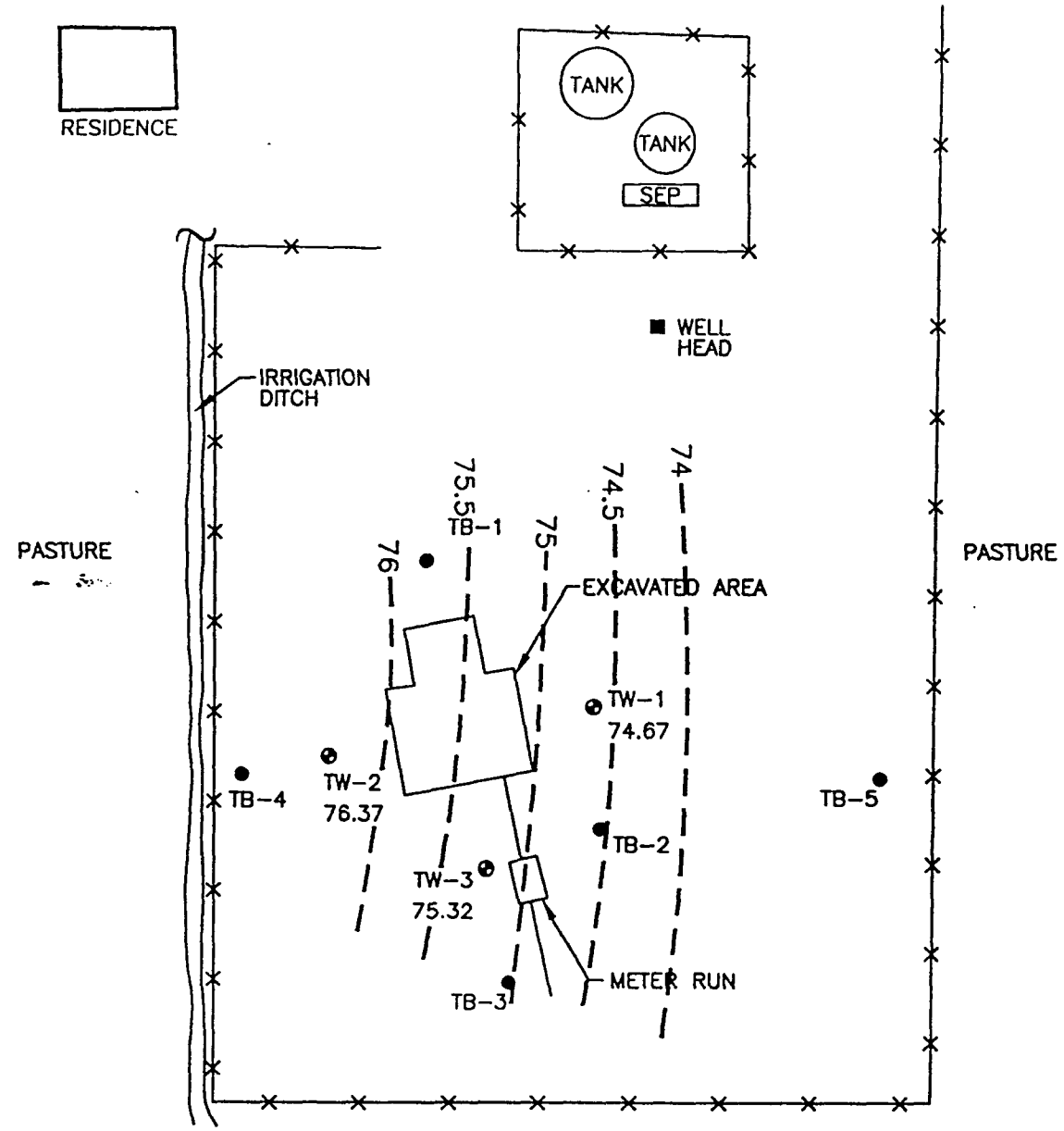
COL 14

Figure 4: Groundwater Contours



LEGEND

- FENCE
- TB-1 APPROXIMATE BORING LOCATION AND NUMBER
- TW-1 APPROXIMATE TEMPORARY WELL LOCATION AND NUMBER
- --74--- POTENTIOMETRIC SURFACE CONTOUR

0 40
FEET

N

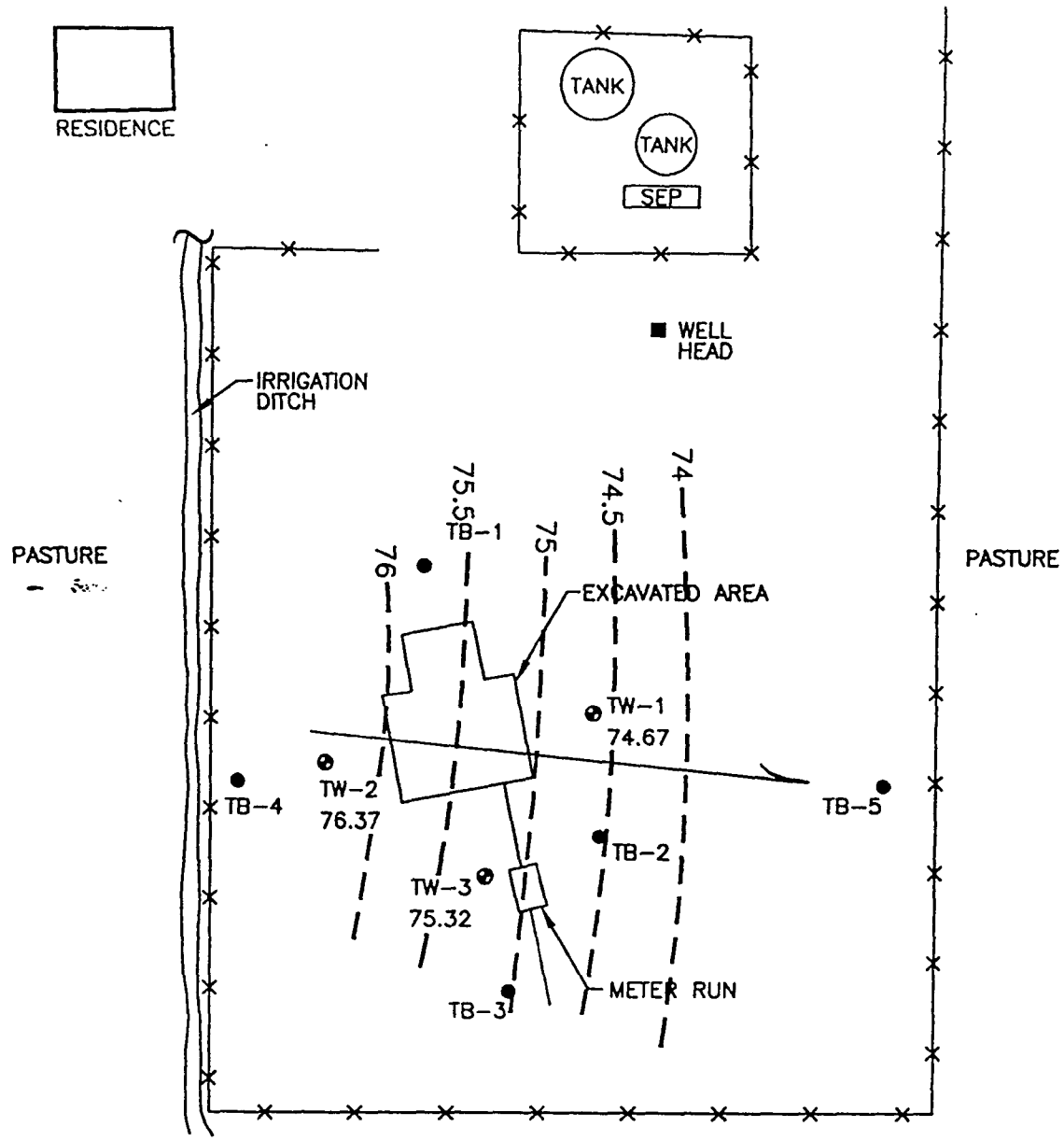
PHILIP ENVIRONMENTAL

TITLE: Potentiometric Surface Map

SCALE 1=40	DATE	PROJECT NO: 14449	
DWN: TMM	7/6/95	CONOCO NELL HALL NO. 1 AZTEC, NM	
DES:			
CHKD:		FIGURE 2	REV:
APPD:			

COL. 14449A

Figure 5: Estimated Groundwater Flow



LEGEND

- FENCE
- TB-1 APPROXIMATE BORING LOCATION AND NUMBER
- TW-1 APPROXIMATE TEMPORARY WELL LOCATION AND NUMBER
- --74--- POTENTIOMETRIC SURFACE CONTOUR

0 40
FEET

N

PHILIP ENVIRONMENTAL

TITLE: Potentiometric Surface Map

SCALE 1=40	DATE	PROJECT NO: 14449	
DWN: TMM	7/6/95	CONOCO NELL HALL NO. 1 AZTEC, NM	
DES:			
CHKD:		FIGURE 2	REV:
APPD:			

COL 14449

Monitoring and Closure

In order to monitor progress of the bio-air sparging remediation and to apply the closure standards, the sampling and analysis procedure will utilize the method sighted in the sampling and analytical protocol.

Three monitoring wells, MW 1, 2, and 3, will be used for water quality monitoring during remediation. The monitoring schedule will be flexible and depend somewhat on the rate of cleanup. Baseline contamination levels will be established by sampling MW 1, 2, and 3 24 hours prior to bio-air sparging startup. Water samples will be analyzed for BTEX.

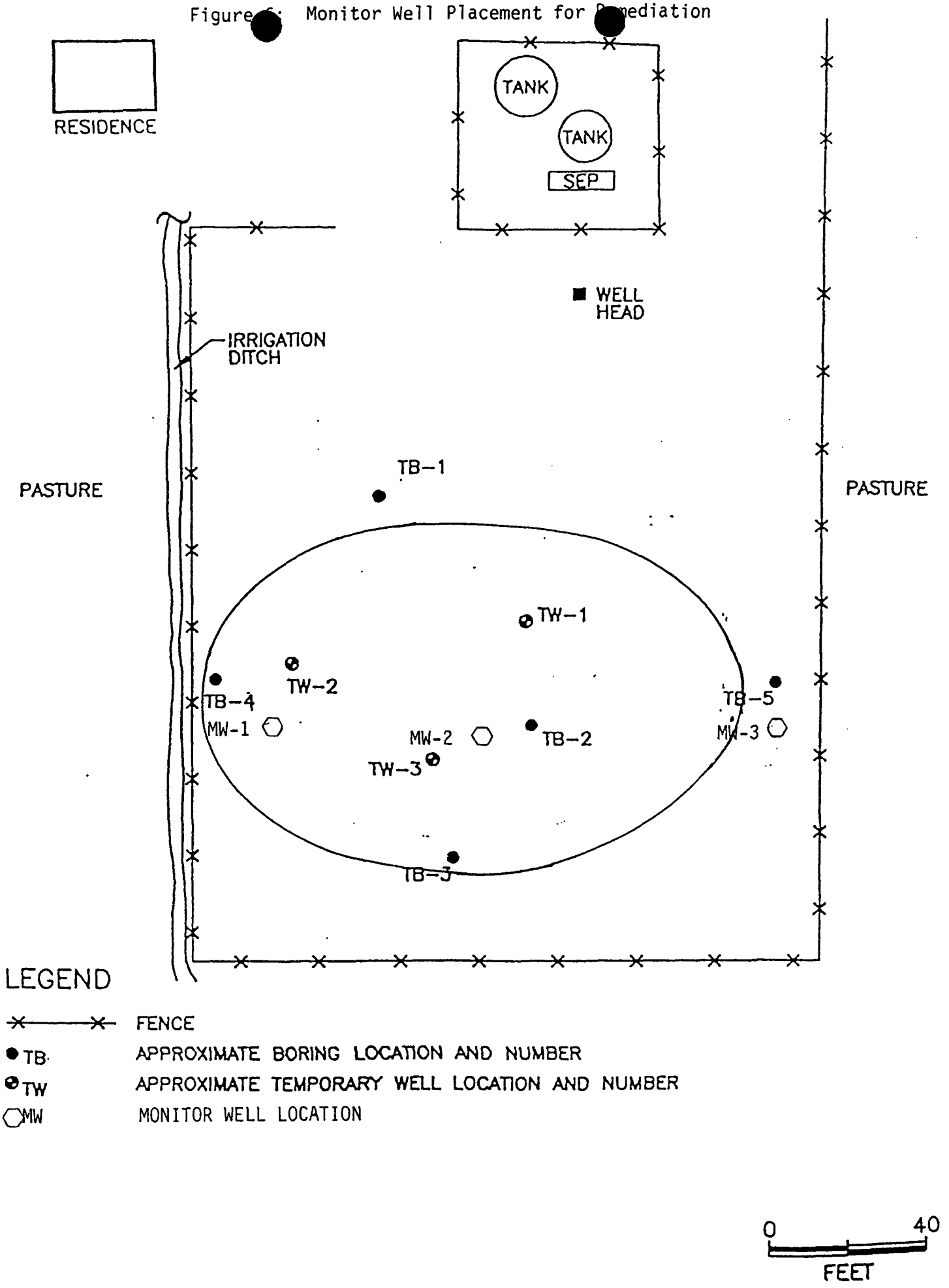
Before an individual water sample is obtained for analysis, a volume of water equal to the stagnant volume of the well must be removed from the well and the well allowed to recharge.

In addition to BTEX analysis in water samples, nitrogen analysis will be conducted. The nitrogen analysis will monitor nutrient nitrogen addition. Nutrient nitrogen supplement is required due to the low levels of nitrogen in the BTEX contaminated site.

Initial monitoring	MW 1, 2, and 3	BTEX, NO_3
2 weeks monitoring	MW 1, 2, and 3	BTEX, NO_3

Additional monitoring will be determined by progress of the remediation. Monitoring wells MW 1, 2, and 3 are shown in Figure 6.

Figure 6: Monitor Well Placement for Remediation



Monitoring Well Design

Monitoring wells 1, 2, and 3 (MW1, 2, and 3) will be installed transect to the lower part of the ellipse at the Nell Hall lease (Figure 6). The monitoring wells will be two inches in diameter. The well construction material is PVC with screened and unscreened sections. The screened PVC should use a 0.01-inch slotted screen (#10 slot screen). The screened section should be completed as to have 3 feet below the surface of the water table and 1 foot above the water table.

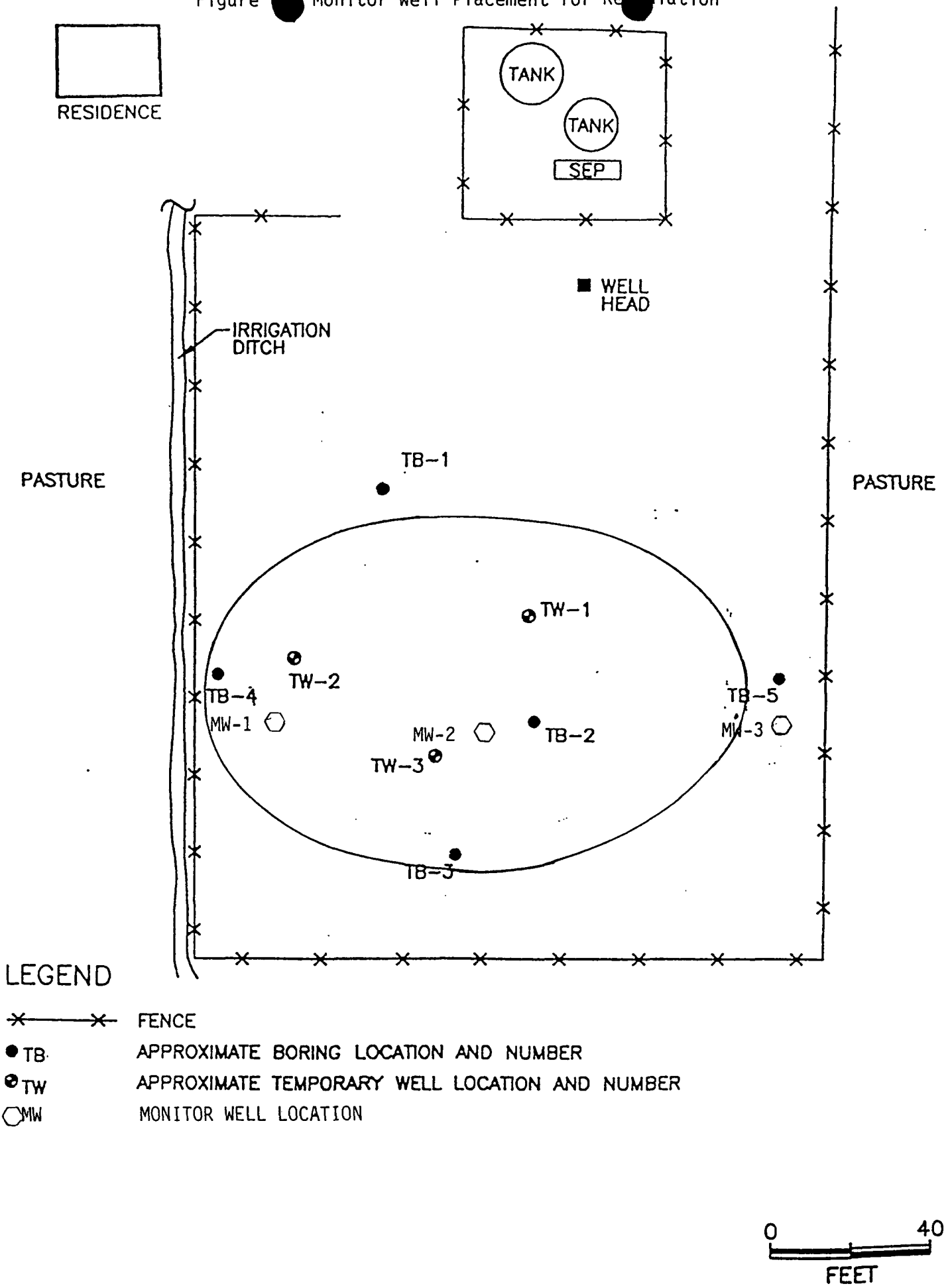
Monitor wells MW1, MW2, and MW3 will be completed to an identical design with the slight modification in total depth. In the area of the monitoring wells, the water table is approximately at the 3-foot level. The 4-foot screen section will be used to cover 1 foot of the unsaturated zone and 3 feet of the saturated zone. The screen section should be completed with a cone point for easy installation.

The annulus screen area of the well is completed with local gravel material or Colorado Environmental Spec 30 fill material or similar material 1.5 feet above the screen section. The fill material is secured by a 1.5-foot hydrated bentonite plug. The well is backfilled with soil and 5% bentonite and sealed to the surface with a 1.5-foot hydrated bentonite plug. The bentonite plugs will prevent surface-to-groundwater communication. The well can be installed using a 4.25-inch inside-diameter hollow-stem auger or appropriate equipment. It should be noted when the remediation is complete, the injection wells can be used as monitoring wells.

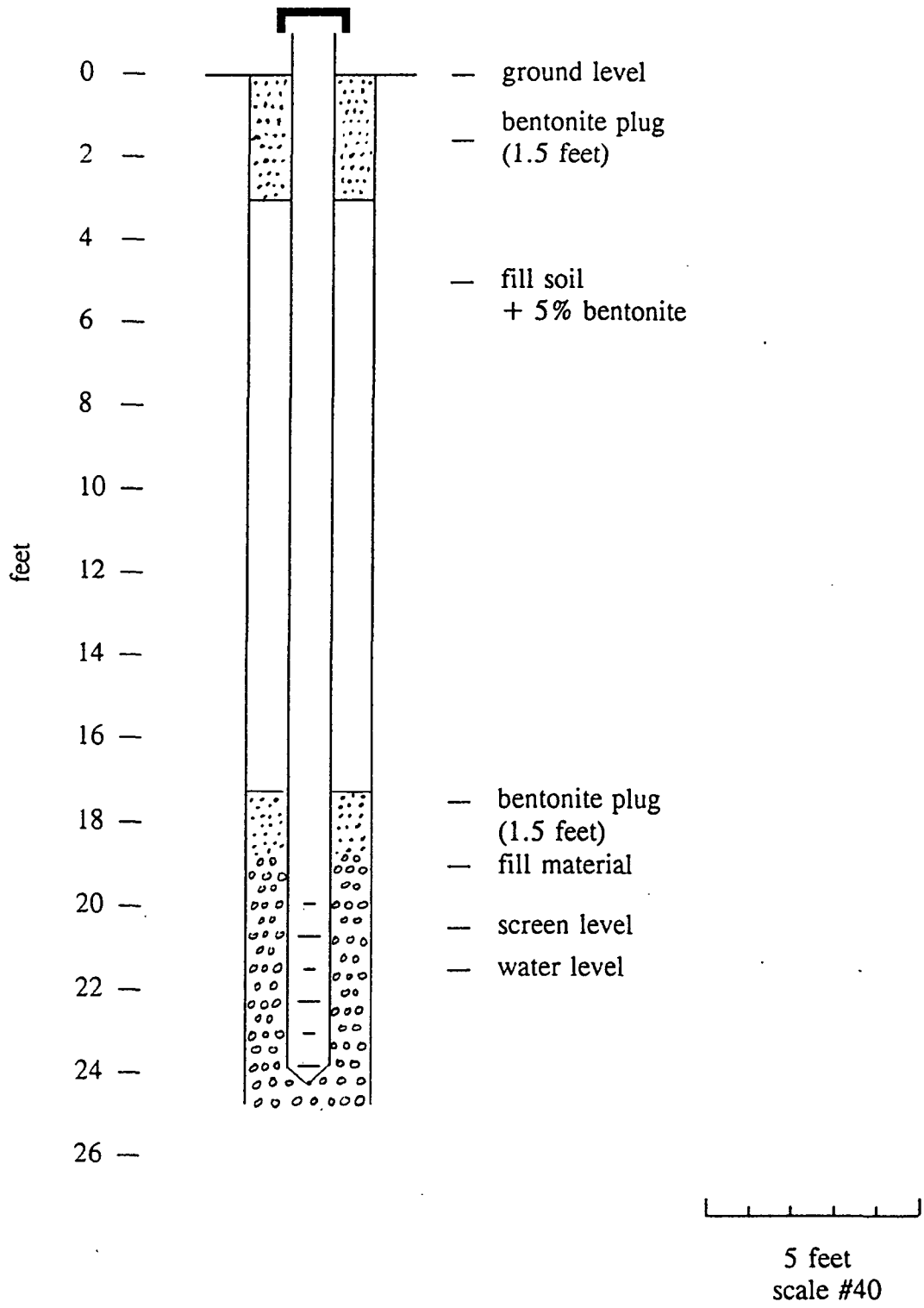
The PVC well riser should be completed with a screw cap for security and easy access for sampling. (See attached detailed drawings of the monitoring wells.)

Monitor Well #1	Total depth:	24.5 feet (from ground level)
	Top of screen:	20.5 feet
	Fill material level:	19.0 feet
	Bentonite plug level:	17.5 feet
Monitor Well #2	Total depth:	25.0 feet (from ground level)
	Top of screen:	21.0 feet
	Fill material level:	19.5 feet
	Bentonite plug level	18.0 feet
Monitor Well #3	Total depth:	26.0 feet (from ground level)
	Top of screen:	22.0 feet
	Fill material level:	20.5 feet
	Bentonite plug level:	19.0 feet

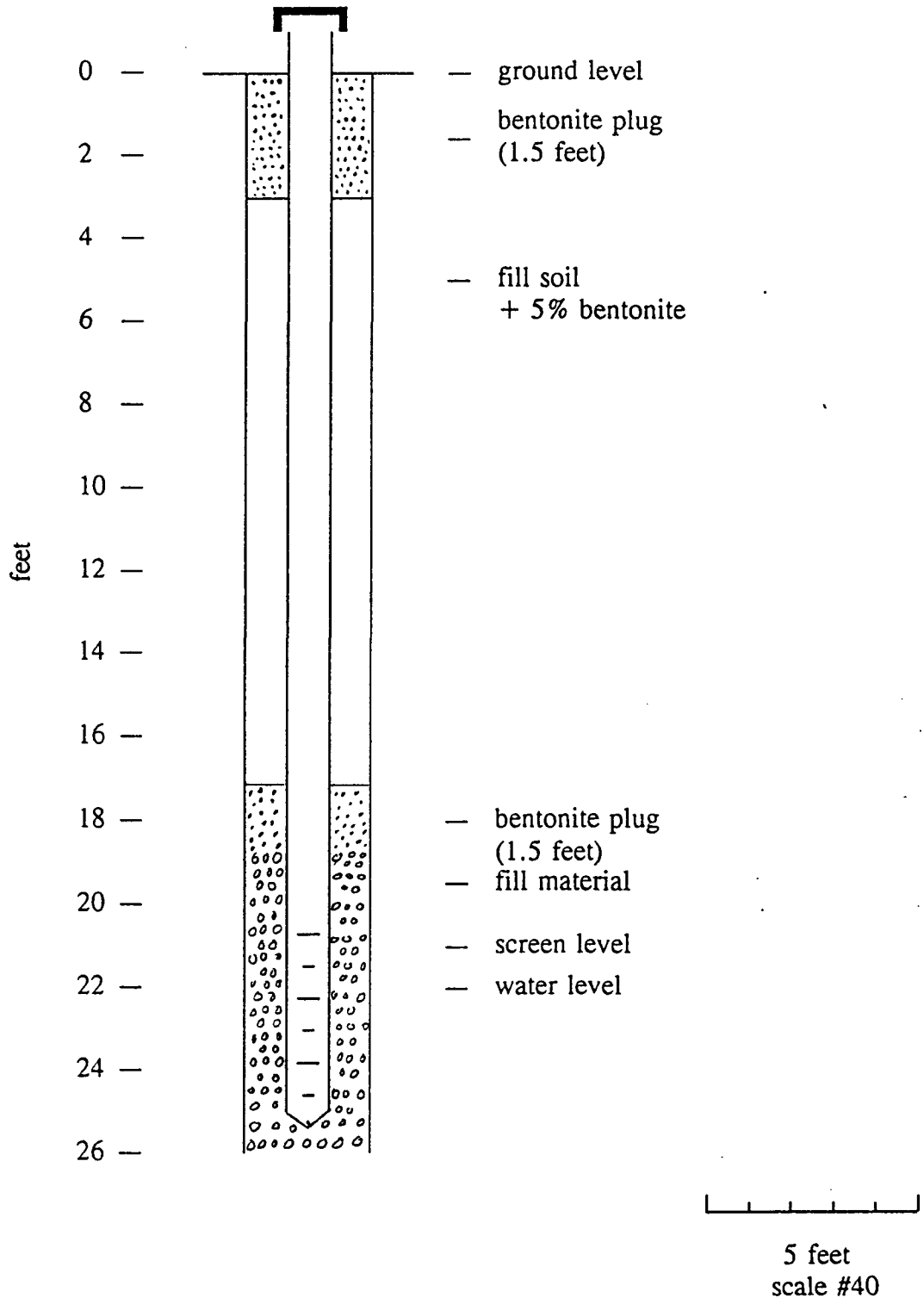
Figure [redacted] Monitor Well Placement for Re[redacted]diation



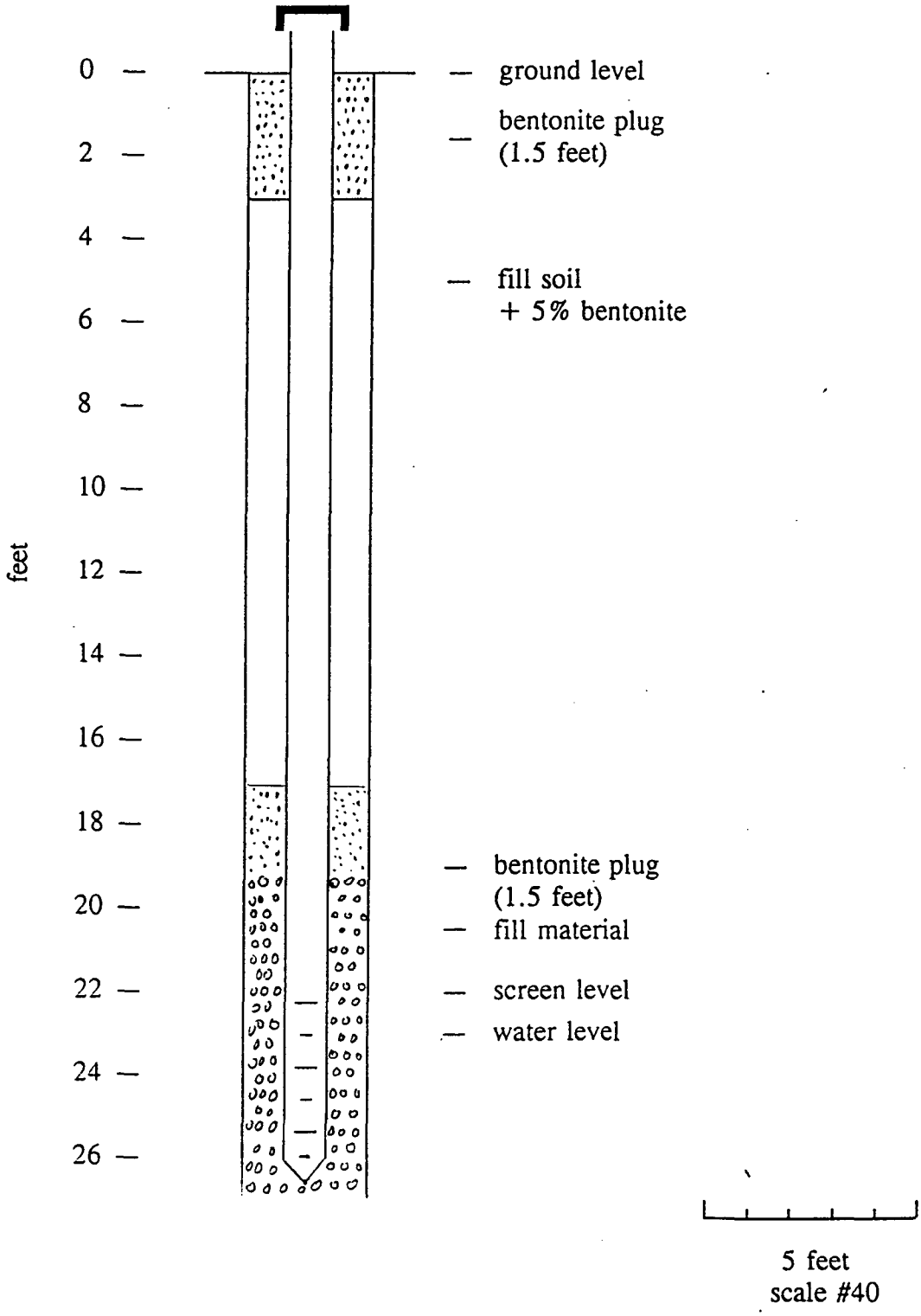
Monitor Well Design - MW#1 Nell Hall



Monitor Well Design - MW#2 Nell Hall



Monitor Well Design - MW#3 Nell Hall



Well Placement and Design

A total of 8 air sparging wells (ASW) capable of achieving a 20+-foot air distribution radius have been position to cover the Nell Hall contaminant site (see attached site map). The wells are numbered #1 to #8 starting at the south end. The contaminated area is elliptically shaped with the majority of the BTEX in the south portion of the ellipse.

Each air sparging well is constructed from 2-inch diameter schedule 40 or 80 pvc with a 2-foot-long well screen. The screen slot size of 0.01 inches (number 10) is recommended for the ASW completion. In order to assist well construction, the screen section should be completed with a molded point. (See attached well diagram for details of ASW construction.)

The ASW screen is placed 1 foot below the water table. Some well placements may be adjusted in areas where clay sands are present. (See individual well depth table.) Complete the wellbore area with a coarse sand pack in the screen area. The placement of the sand pack is particularly important in clay sand areas. The sand pack is placed along the length of the well screen and completed 0.5 feet above the screened area. The well screen area and sand pack are isolated from the remainder of the borehole by a hydrated 1.5-foot bentonite plug. The bentonite plug can be placed by using 1/4 bentonite pellets. Depending on when the wells are installed, the bentonite plug may be partially below groundwater level.

The wells can be installed using a 4.25-inch or 8-inch hollow-stem auger. A 1.5-foot hydrated bentonite seal must be placed over the sand pack. Over the first bentonite seal, the wellbore is backfilled with surface soil and a 5% bentonite mixture. The surface is capped using a second bentonite seal. (See well design diagram.)

The 8 air sparging wells with 40-foot air distribution diameter are capable of providing sufficient oxygen to biodegrade the contamination reported in the site assessment. From a theoretical carbon, oxygen, bio-rate calculation, the remediation should be completed in 4 weeks. The time required for remediation should be used as a guideline and not an absolute completion time. Depending on the biodegradation rate in the first 2 weeks, nutrient addition may be necessary. From the site analysis, nitrogen levels found in TW3 were less than detectable levels (see Table 1). However, phosphate levels were found to be more than sufficient. If we find it necessary to add nutrient, only a nitrogen source will be required. It is possible that the nitrogen source in this aquifer is not in a nitrate chemical species (NO_3) and therefore not detected by the analysis.

It is recommended that the 2-inch SCH 40 and SCH 80 be purchased from local suppliers. The 2-foot screen material may not be available in the Farmington area. Screen material can be purchased from:

Atlantic Screen and Manufacturing, Inc.
118 Broadball Road
Milton, DE 19968
Telephone: (302) 684-3197
Facsimile: (302) 684-0643

Environmental Well Products
1639 Stanley Avenue
P.O. Box 71
Dayton, OH 45404-0071
Telephone: (800) 777-0977
Facsimile: (513) 461-3257

2" SCH 80 4-foot screen $8.30 per unit
available in threads or flush joints
Note: o-rings are required and available upon request.

The screening material is also available by the foot at $1.71 per foot for 2-inch SCH 80. Coupling units will be required ($0.85 per unit). Each of the seven wells will require a riser cap or reducer to 1 inch and a molded point ($1.87 per unit).

The air transfer lines from the manifold to the individual sparging wells should be equipped with easy on/off connections. The air transfer lines will be rotated 3 to 5 times during the remediation process. The connections used must have a positive and tight seal to avoid air losses.

Please contact BioRem personnel for discussion of sparge well construction and installation.

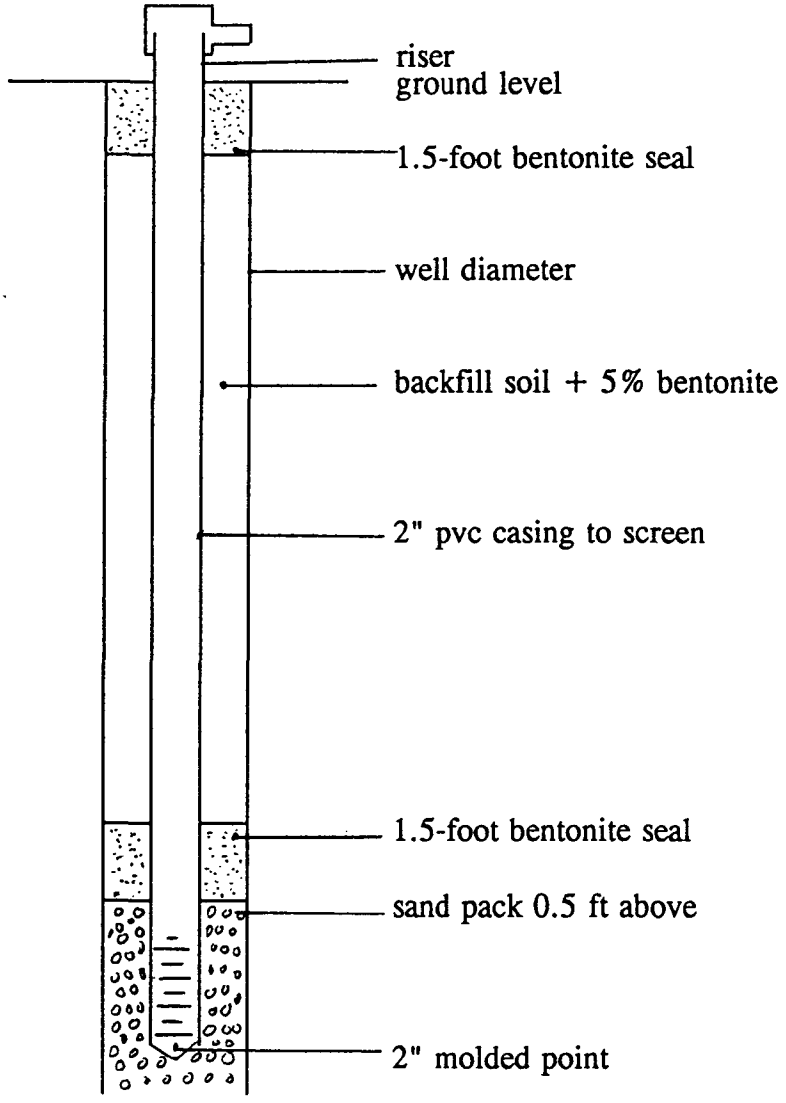
It should be noted that telephone consulting is provided by BioRem during the construction phase without time charges to Conoco.

Air Sparging Well Lengths - Nell Hall #1

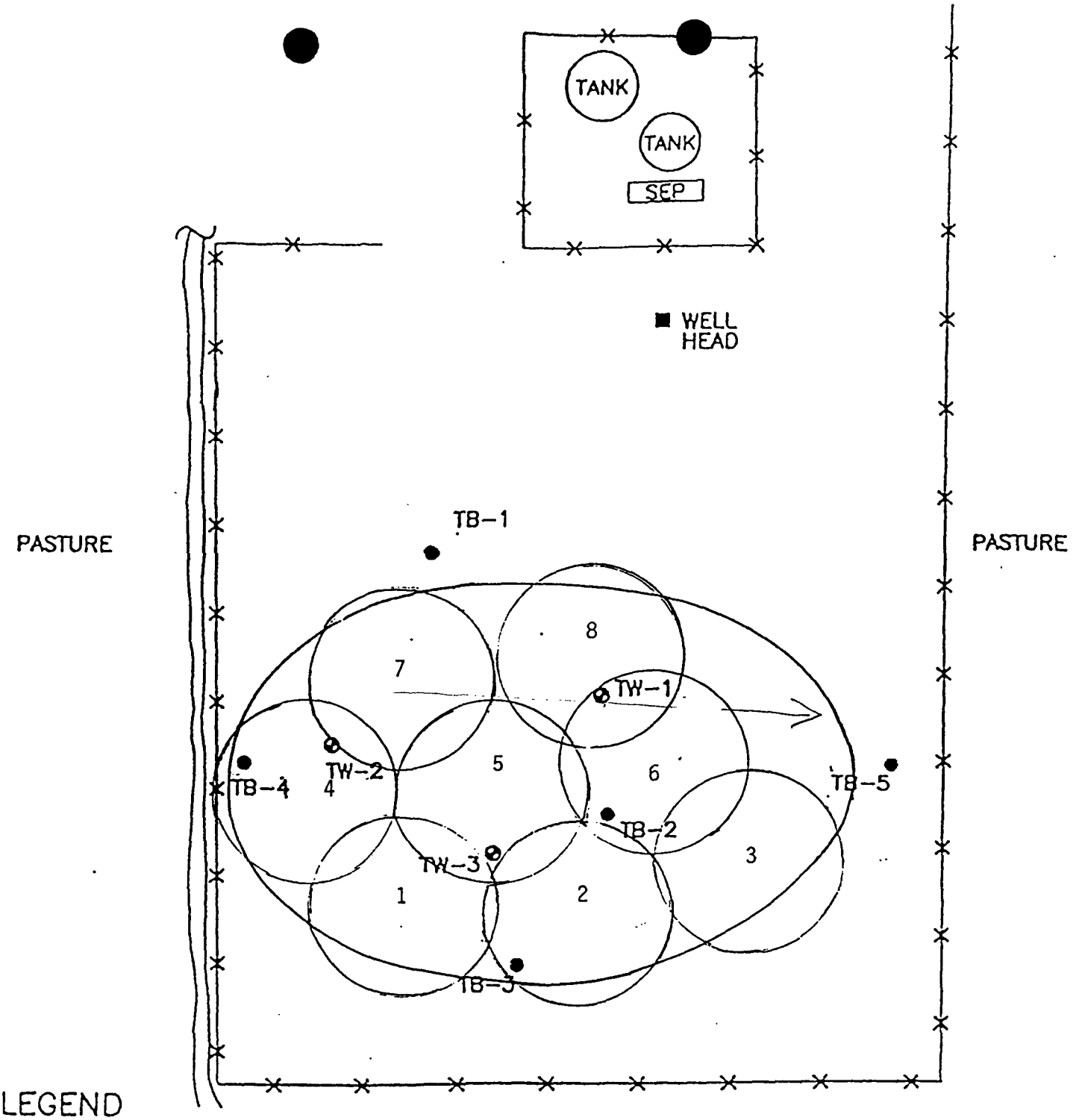
Well #	Casing Length (ft.)[2]	Total Well Length (ft.)[3,4]
SW 1	23.5	26.0
SW 2	23.5	26.0
SW 3	24.0	26.5
SW 4	23.5	26.0
SW 5	23.5	26.0
SW 6	22.5	25.0
SW 7	23.5	26.0
SW 8	22.5	25.0

1. All screen lengths are 2 feet.
2. Length of casing from ground level to screen.
3. Riser length is 6 inches.
4. Total length of well including riser casing and screen.

Air Sparging Well Design for Nell Hall #1



4 feet
Scale #40



LEGEND

FENCE

TB APPROXIMATE BORING LOCATION AND NUMBER

TW APPROXIMATE TEMPORARY WELL LOCATION AND NUMBER

0 40

FEET

Sparging Manifold

Sparge air from the atmosphere will be transferred through an air filter, through the blower, and into a manifold for distribution to the individual sparging wells. The air blower is connected to the manifold through a 2" galvanized pipe. Galvanized pipe is recommended to reduce possibility of corrosion. Corrosion particulates may cause blockage on valves and gauges in the manifold area. The galvanized pipe coupling the air blower and manifold is required to withstand the possibility of high temperatures generated by the blower. The 2" galvanized pipe should be 1 to 12 feet in length to dispense heat generated by the blower.

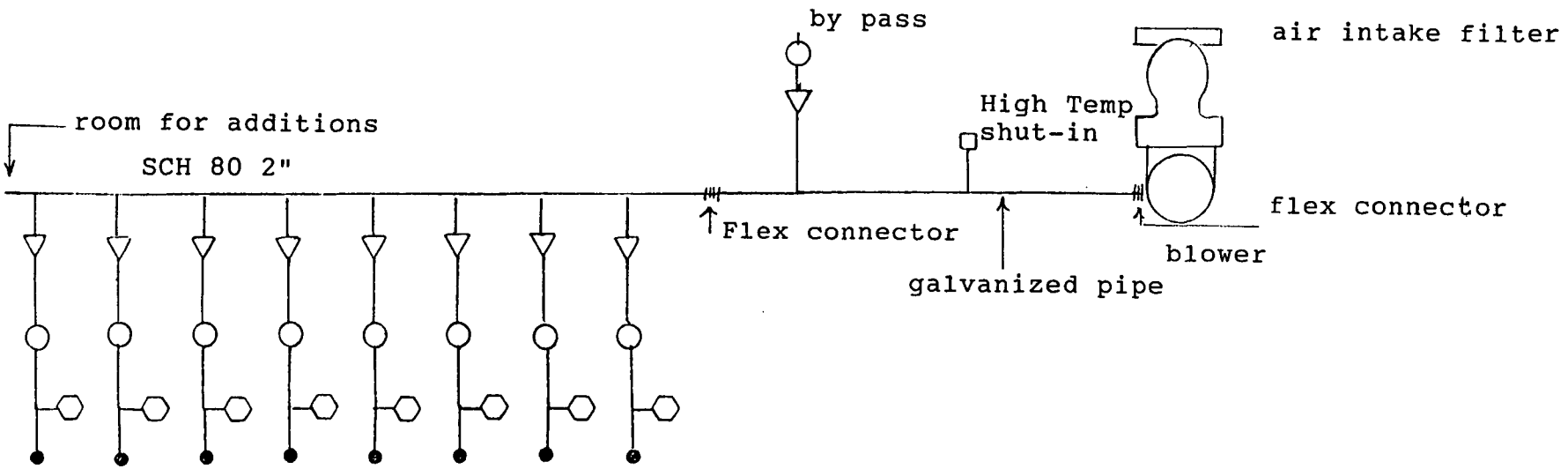
The 10- to 12-foot length of pipe may be in the form of a U or loop reducing equipment space. It is recommended that some type of safety protection around the air blower and particularly the galvanized piping be provided.

A high-temperature shut-down switch mounted on the 2" galvanized pipe on the exit side of the air blower is recommended. The high-temperature shut-down switch is required to protect the blower from potentially overheating.

In addition to the high-temperature shut-down switch, a bypass air flow meter and ball valve should be installed. The meter and valve are placed immediately prior to the manifold. The purpose of the bypass valve is to regulate excess air to the atmosphere during sparging operations. The valve unit is required and the air flow meter is optional. A Dwyer RM-123 with 3 to 30 scfm or equivalent is recommended for this service.

The sparging manifold is constructed of SCH 80 material. We recommend the use of a flex connector between the galvanized pipe and the manifold. On the manifold, each ASW flow line consists of a ball valve, a 1-20 scfm flow meter and a 0-15 psi pressure gauge. In order to reduce cost of purchasing numerous flow meters and pressure gauges, the manifold can be constructed with tees and plugs. It is recommended at least 2 flow meters and 2 pressure gauges be purchased. A pressure gauge and flow meter can be used on each individual well to set and check the well parameters. Once the individual wells are set, only periodical checks and adjustments are necessary. The sparged air travels from the manifold to each individual well in a 1" diameter pipe. PVC or black polyethylene pipe can be used for the transfer line. (See attached air sparging manifold diagram for details.)

Sparging Manifold .gram



▽ ball valve

○ flow meter

⬡ pressure gauge

□ vacuum gauge

● connection to individual ASW

Blowers

The air sparge blower has been designed for this application to deliver at least 40 standard cubic feet per minute (scfm) while maintaining up to 12 psi of wellhead pressure. Motors will range from 3 to 5 HP to turn the blower shaft (most are direct drive). A single-phase or three-phase motor is available depending on available power supply. The blower has been oversized to allow for variable use at future sites. Additional options include air filter, silencer, high-temperature shut-in and relief valve.

We recommend the Roots URAI 32-2-2 blower with a 5 HP motor for this remediation (see attached specification sheet).

Initial remediation will start with approximately 2 cfm. This relatively low sparging rate will minimize hydrocarbon stripping while maximizing biodegradation of the BTEX. Although not necessary, field monitoring of oxygen content in the monitoring well can assist in determining remediation progress and zone of influence.

Blower maintenance may include a change of oil and greasing the rotating shaft and air intake filter, depending on the type of unit and maintenance manual specifications.

It may be difficult to obtain the blower size recommended in areas where a power supply is not available and will require a portable power supply. Please discuss blow options with BioRem before making a final selection.

Blower unit cost is in the $3,500 to $4,500 range, depending on the additional equipment placed on the unit (motor controls, gauges, etc.).

Detroit Air Compressor & Pump Co.
(Roots/Dresser)
3205 Bermuda
Ferndale, MI 48220
(810) 544-2982
(810) 544-2027 (Fax)
Contact: Dennis Wise

Invincible Airflow Systems
700 North Ray
P.O. Box 380
Baltic, OH 43804
(216) 897-3200
(216) 897-3400 (Fax)

GAST Manufacturing
P.O. Box 97
Benton Harbor, MI 49023
(616) 926-6171
(616) 927-0808 (Fax)

EG&G Rotron
Saugerties, NY 12477
(914) 246-3401
(914) 246-3802

ROOTS (UNLIMITED)
DRESSER INDUSTRIES, INC
ROOTS DIVISION
900 WEST MOUNT STREET
CONNERSVILLE, INDIANA 47331

COMPANY : Conoco PHN. 1-505-324-5821
ATTN. : John Coy 5W 324-5813 FAX :
REFERENCE : PO 7481-619154

PERFORMANCE

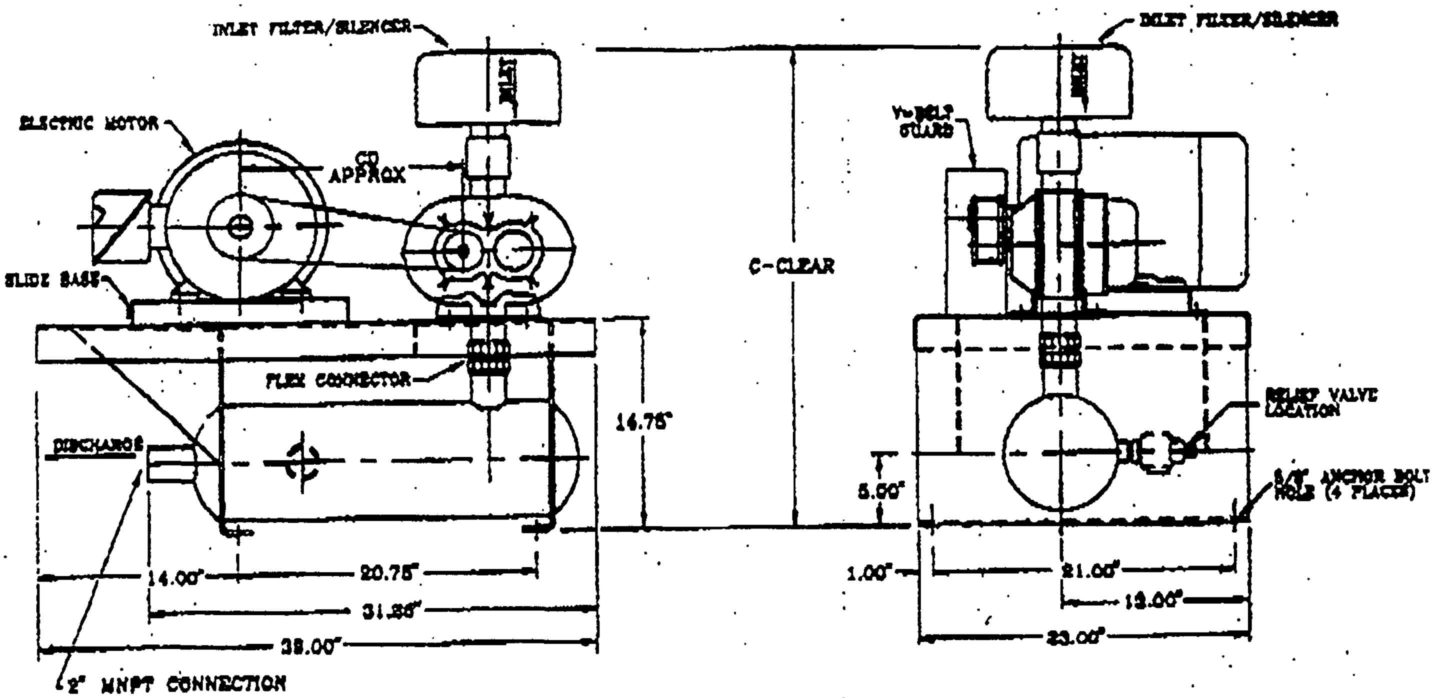
BAROMETER (PSIA)		DISCHARGE PRESSURE (PSIA)	6-10 PSIG
INLET PRESSURE (PSIA)	14.5	DISCHARGE TEMP. (F)	265 °F
INLET TEMPERATURE (F)	100 °F	BLOWER SPEED (RPM)	2000
INLET FLOW (ACFM)	50	BLOWER BRAKE HP	4.1

BILL OF MATERIALS – 2F PACKAGE

■ ITEMS SUPPLIED IN PACKAGE

- ■ BLOWER 32 RAI-U
- ■ MOTOR: FRAME 184 HP 5 RPM 1800 MFG. VOLT 1-60-230
- ~~☐ INLET FILTER~~ ■ INLET FILTER/SILENCER 2"
- ~~☐ INLET SILENCER~~ ■ DISCHARGE SILENCER 2"
- ~~☐ CHECK VALVE: Techno Check 3002 class A~~
- ~~☐ BUTTERFLY VALVE: POC~~
- ~~☐ TEMP. GAUGE: Ashcroft, 50-550° RANGE~~
- ~~☐ TEMP. SWITCH: 0-425°F RANGE NEMA 4 ( ) NEMA 7 ( )~~
- ~~☐ PRESS. GAUGE: WIKA, 0-15 PSI RANGE~~
- ~~☐ PRES. SWITCH: 3-20 PSI RANGE NEMA 4 ( ) NEMA 7 ( )~~
- ■ RELIEF VALVE: 2"-337 @ 10 PSIG

ROOTSPAK STANDARD ARRANGEMENT



MODEL	BLOWER	C	CD	APPROX NET WT. (LBS.)
22-1.5-2	22 URAI	34.38	15.50	240
24-2-2	24 URAI	32.38	15.50	250
32-1.5-2	32 URAI	35.38	15.50	270
→ 32-2-2	32 URAI	36.38	15.50	275
33-2-2	33 URAI	35.88	15.50	280
42-2-2	42 URAI	32.63	15.50	295

NOTES:
1. ALL DIMENSIONS ARE IN INCHES
2. PACKAGES MAY NOT BE EXACTLY AS SHOWN.
3. APPROX. WEIGHTS DO NOT INCLUDE MOTOR.
4. ALL INSTRUMENTS MOUNTED IN DISCH. SILENCER.

PROPOSAL

PACKAGE PRICE AS SHOWN: 4375 EA. QTY: 1
F.O.B. Ferndale MI FREIGHT COLLECT
DELIVERY: 4-6 WEEKS A R O
TERMS OF PAYMENT : NET 30 DAYS
OPTIONAL PRICING : Includes mounted starter, crating for shipment, HE temp switch, inlet filter gage,

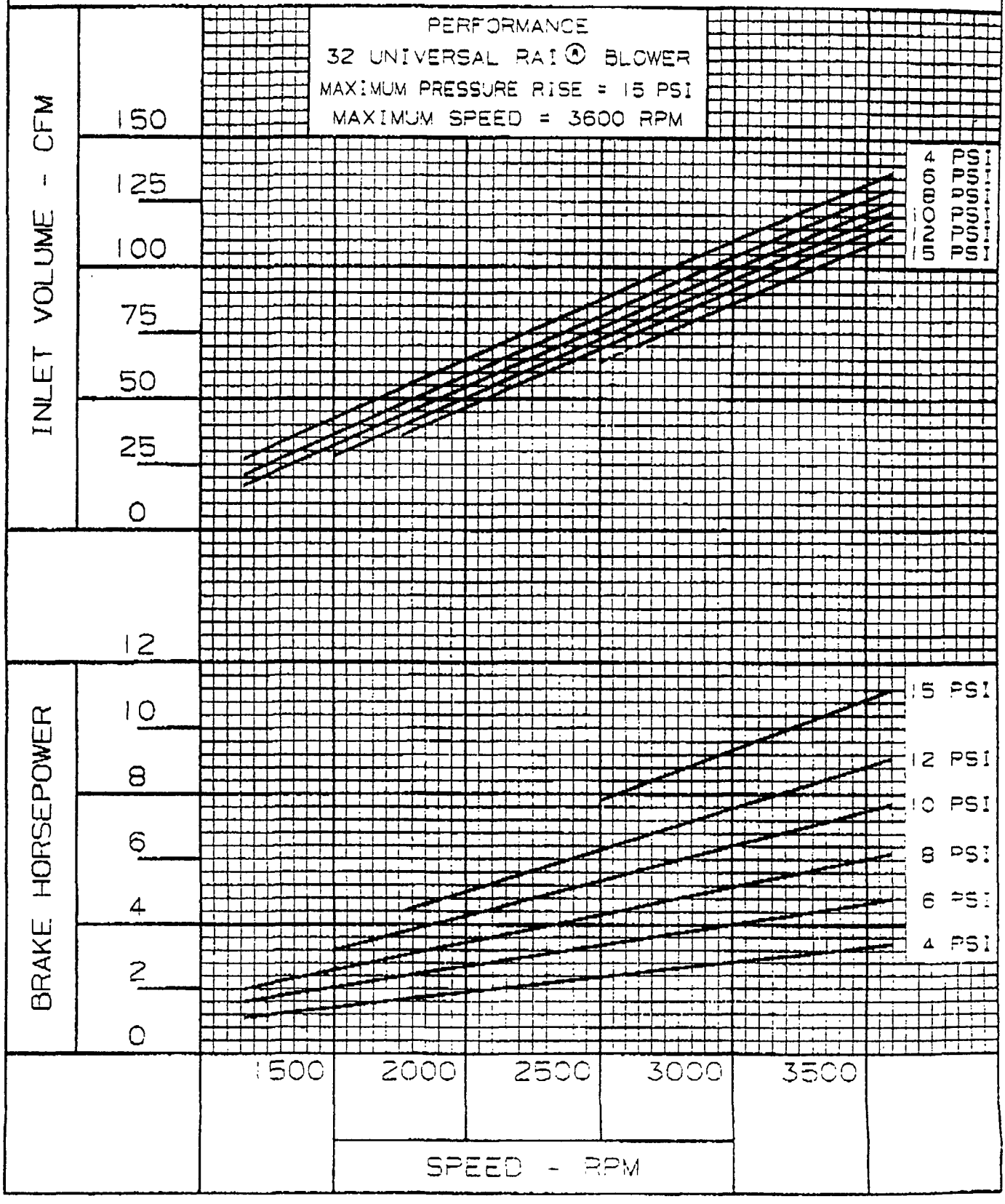
PRICES ARE FIRM THRU DELIVERY & ARE SUBJECT TO ROOTS STANDARD TERMS AND CONDITIONS

FPAK-8

ROOTS DIVISION
DRESSER INDUSTRIES, INC.
CONNERSVILLE, IN. 47331
PRINTED IN U.S.A.

PERFORMANCE BASED ON INLET AIR AT 14.7 PSIA & 68°F

AUGUST 1990



PC-12-32

Remediation Parameters

The BioAir Sparging remediation will be conducted over a four-week time period. During the four weeks of remediation and analysis, adjustments in the air volumes may be necessary. The four-week remediation period if only a preliminary calculation and may require extension if closure standards are not achieved.

Week One

SW #	scfm
1	2
2	2
3	3
4	2
5	2
6	2
7	2
8	2

Week Two

SW #	scfm
1	3
2	3
3	4
4	2
5	3
6	3
7	3
8	4

Week Three

SW #	scfm
1	4
2	4
3	4
4	3
5	4
6	4
7	4
8	4

Week Four

SW #	scfm
1	3
2	3
3	4
4	3
5	3
6	4
7	3
8	4

It may be necessary to add a nitrogen source to stimulate biodegradation. Preliminary analyses indicate nitrogen levels, as tested as NO_3, may be too low to obtain maximum benefit from the oxygen added to the contaminated zone.

RECORD OF SUBSURFACE EXPLORATION

Philip Environmental Services Corp.
4000 Monroe Road
Farmington, New Mexico 87401
(606) 326-2262 FAX (606) 326-2388

Borehole # ____
Well # TW-1
Page 1 of 1

Project Name Nell Hall No. 1
Project Number 14449 Phase 2000.22
Project Location Aztec NM

Elevation ____
Borehole Location East of Excavated Area
GWL Depth 23.5
Logged By S. Pope
Drilled By M. Donahue
Date/Time Started 1030 6/1/95
Date/Time Completed 1345 6/1/95

Well Logged By S. Pope
Personnel On-Site M. Donahue
Contractors On-Site N/A
Client Personnel On-Site Russ, John Coy.

Drilling Method HSA 4¼ ID
Air Monitoring Method PID, CGI

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: ~~NDU~~ PPM BZ	BH	S	Drilling Conditions & Blow Counts
0										
5	1	2.5 4.5	15	Brown Sand Med-Co. grained Trace Clay, Moist sub round sub angular, loose, Moist			0	0	0	
	2	5 7	11	SAA (Scant H)			0	0	0	- Very hard Cobble Something not all sample collection..
10	3	7.5 9.5	18	SAA w/abundant cobbles			0	0	0	- Obstruction @ 6'
	4	10 12	19	SAA No Notable cobbles	SP		0	0	0	- Difficult drilling due to abundance of Cobbles.
15	5	12.5 14.5	15	SAA			0	0	0	- Cobbles disc. @ 10
	6	15 17	6	SAA w/ Gravel and cobbles Med-Co gravel			0	0	0	- Cobbles again @ 15
	7	17.5 19.5	21	SAA			0	0	0	- Very difficult drilling due to cobbles
20	8	20 22	21	Trace gravel no cobbles			0	0	0	
	9	22.5 24.5	12	SAA Saturated			0	0	0	- Water @ ≈ 23.5' - Will Drill to 28.5 and set Temp Well
25						26.5				
				Noted ± 2' of Gray Clay on Augers after Removal w/Mod Coarse Sand	CL					
30				TOB 28.5, 26.5						
35										
40										

Head Space

	Depth	Reading PPM
1.	2.5 - 4.5	0
2	5 - 7	.2
3.	7.5 - 9.5	0
4.	10 - 12	.2
5.	12.5 - 15.5	0 Not enough S.
6.	15 - 17	
7.	17.5 - 19.5	0
*8.	20 - 22	0
9	22.5 - 24.5	0

Comments: Collected for lab analysis

Geologist Signature Scott T. Pope

RECORD OF SUBSURFACE EXPLORATION

Philip Environmental Services Corp.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole #
Well # TW-2
Page 1 of 1

Project Name: Conoco Nell Hall No. 1
Project Number: 14449 Phase: 2000.7
Project Location: Aztec NM

Elevation:
Borehole Location: West Side of Pit
GWL Depth: 22'
Logged By: S. Pope
Drilled By: M. Donahue
Date/Time Started: 1515 6/1/95
Date/Time Completed: 1650 6/1/95

Well Logged By: S. Pope
Personnel On-Site: S. Pope / M. Donahue
Contractors On-Site: N/A
Client Personnel On-Site: Russ, John Coy
Drilling Method: HSA 4 1/4 ID
Air Monitoring Method: PID, CGI

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: ~~NDU~~ PPM BZ	BH	S	Drilling Conditions & Blow Counts
0										
5	1	2.5 4.5	15	Brown Med-Co Sand, trace med-co gravel, subround-subangular Trace Clay on top of sample, loose Moist			0	0	0	
	2	5 7	17	SAA No Clay			0	0	0	
10	3	7.5 9.5	17	SAA			0	0	0	- Cobbles @ 8' to [illegible]
	4	11 13	18	SAA Gray discoloration @ 13'	SP		0	0	2	- In gray open in ?
15	5	13 15	22	Gray SAA			0	0	4	Slight HC odor
	6	15 17	23	SAA			0	0	2	Appears degraded
20	7	17.5 19.5	23	SAA			0	0	4	
	8	20 22	3	SAA Dk Gray Wet @ 22			0	0	4	
25	9	22.5 24.5	15	Saturated			0	0	20	- Water @ 22' w/w - Will set well @ 27'
				Noted 2' Clay Gray w/ Fine-Med Sand Wet Soft @ [illegible]	CL	25.0				Headspace
				TOB - 27						
30										
35				TD MWI. 25 ft.						
40										

Headspace

Depth	PPM
2.5-4.5	0
5-7	0
7.5-9.5	.2
11-13	3
13-15	.8
15-17	1.2
17.5-19.5	11.0
No enough	—
*9 22.5-24.5	70.0

Comments: * Collected for Lab analysis

Geologist Signature: Steve T. Pope

RECORD OF SUBSURFACE EXPLORATION

Philip Environmental Services Corp.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # 1
Well # TW-3
Page 1 of 1

Project Name Conoco Nell Hall No
Project Number 14449 Phase 2000.77
Project Location Aztec, NM

Elevation
Borehole Location Sanding Pit Down Gradient
GWL Depth 22.0
Logged By S. Pope
Drilled By M. Donahue
Date/Time Started 1800 6/1/95
Date/Time Completed 1930

Well Logged By S. Pope
Personnel On-Site S. Pope, M. Donahue
Contractors On-Site N/A
Client Personnel On-Site N/A

Drilling Method HSA 4¼ ID
Air Monitoring Method PID, CGI

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: ~~NDU~~ PPM BZ	BH	S	Drilling Conditions & Blow Counts
0										
5	1	2.5 4.5	12	Brown Silty Sand fine-Med grained trace clay, Med dense, Moist	SM	5	0	0	0	
	2	5 7	10	Brown Med-Co Sand, Trace Silt Loose, Moist	SP		0	0	0	
10	3	7.5 9.5	11	SAA			0	0	0	
	4	10 12	15	SAA + trace Gravel and Cobbles Slight gray discoloration @ 12			0	0	0	- Drilling in Cobbles @ 11.5
15	5	12.5 14.5	20	SAA			0	0	0	
	6	15 17	20	SAA No Cobbles, No gravel			0	0	0	
	7	17.5 19.5	22	SAA Slight gray discoloration			0	0	4	- Slight HC odor
20	8	20 22	19	Gray wet @ 21			0	0	8	
	9	2.5 24.5	19	SAA Saturated			0	0	8	Measured water level 22. Well Driller set well
25										
30				TOB - 27 25 22 3.						
35										
40										

Headspace

Depth	PPM
2.5-4.5	0
5-7	0
7.5-9.5	0
10-12	0
12.5-14.5	0
15-17	0
17.5-17.5	1
20-22	6
* 22.5-24.5	8

Comments: * Collected for lab analysis.

Geologist Signature Scott T Pope

RECORD OF SUBSURFACE EXPLORATION

Borehole # TB-01
Well #
Page of

Philip Environmental Services Corp.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Project Name Conoco Well Hall No. 1
Project Number 14449 Phase 2000.77
Project Location Aztec, NM

Elevation
Borehole Location North of Excavated Area
GWL Depth 23.0
Logged By S. Pope
Drilled By M. Donahue
Date/Time Started 0930 6/2/95
Date/Time Completed 1130 6/2/95

Well Logged By S. Pope
Personnel On-Site M. Donahue
Contractors On-Site N/A
Client Personnel On-Site N/A

Drilling Method HSA 4¼ ID
Air Monitoring Method PID, CGI

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0				Brown Sand Med-Co grained trace Silt and gravel, Med dense Moist						- Cobble begin @ 6.5 - Difficult drilling
5										
10										
15			Cuttings		SP		0	0		
20							0	0		
	1	22 24	18	Brown Sand Med-Co grained trace Gravel wet @ 23, Med dense, grading to a fine Med Sand trace Clay			0	0	0	headspace = 0 ppm water @ ≈ 23 Will push well point to 26 and collect GW sample
25				TOB - 27.5						WL measured from Drive Point 23.5 BTM WELL Point = Well Point 5.5 Length
30										
35										
40										

Comments:

Geologist Signature Scott T Pope

RECORD OF SUBSURFACE EXPLORATION

Philip Environmental Services Corp.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # TR-2
Well #
Page 1 of 1

Project Name Conoco Nell Hall No 1
Project Number 14449 Phase 200277
Project Location Aztec NM

Elevation
Borehole Location South East of Pit
GWL Depth 23.0
Logged By S. Pope
Drilled By M Donahue
Date/Time Started 1430 6/2/95
Date/Time Completed 1645 6/2/95

Well Logged By S. Pope
Personnel On-Site S. Pope M. Donahue, T. Oki
Contractors On-Site N/A
Client Personnel On-Site Russ, John Cox

Drilling Method HSA 4¼ 1' Well Point
Air Monitoring Method PID CGI

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0				Brown Sandy Clay Med-Coarse Sand, med stiff, Moist	SC		0	0	0	
5			Cuttings	Brown Sand Med Coarse Grained Med dense, Moist	SP					
10							0	0	0	- Cobbles @ 11'
15							0	0	0	
20										- No visable impact on sample. Headspace
25	1	22 24	10 8	Brown Sand med-Coarse Grained Subrounded-subangular, Saturated @ 23.0' Med dense			0	0	8	- Push drive point to 26', will push - water @ 2325 BGS inside well point.
				TOB 26'						
30										- Well point @ 2
35										
40										

Comments: Noted Slight odor on soil sample, odor was not typical of hydrocarbons
1 Bag Hole Plug No 8 granular in bottom of hole.

Geologist Signature Scott T. Pope

RECORD OF SUBSURFACE EXPLORATION

Borehole # TB-3
Well #
Page 1 of 1

Philip Environmental Services Corp.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Project Name Conoco Well Hall No. 1
Project Number 14449 Phase 2000.77
Project Location Aztec NM

Elevation
Borehole Location South of TW-3
GWL Depth 22.5
Logged By S. Pope
Drilled By M. Donahue
Date/Time Started 1700 6/2/95
Date/Time Completed 1830 6/2/95

Well Logged By S. Pope
Personnel On-Site M. Donahue, J. O'Kief
Contractors On-Site N/A
Client Personnel On-Site N/A

Drilling Method HSA 4¼" ID
Air Monitoring Method PID, CGI

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0				Brown Sandy Clay, fine-med grained sand, Med stiff, Moist	SC					
5				Brown-Sand Med-Coarse Grained, Trace Gravel and Cobbles, Med dense, Moist.	SP		0	0		-Cobbles @ 6' Very Slow Drilling -Through cobbles @ 8'5
10			Cuttings				0	0		-Back in Cobbles @ 12
15							0	0		-Through cobbles @ 15
20							0	0		
25	1	22 24	16	Brown Sand Med-Coarse Grained med dense, Saturated @ 23'			0	0	0	-Water @ 23. 17' will drive well pt to 26' and collect GW Sample. -WL 22.5 after well point -Headspace = 0.0 on soil 22-24
30				TDB-26						
35										
40										

Comments:

Geologist Signature

4/21/95\DRILLOG.XLS

RECORD OF SUBSURFACE EXPLORATION

Philip Environmental Services Corp.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # TB-
Well #
Page 1 of 1

Project Name: Conoco Neil Hall No
Project Number: 14449 Phase: 2000
Project Location: Aztec NM

Elevation:
Borehole Location: West of TW-2
GWL Depth: 21.6
Logged By: S. Pope
Drilled By: M. Donahue
Date/Time Started: 2/2/95 1900
Date/Time Completed: 2/2/95 2000

Well Logged By: S. Pope
Personnel On-Site: S. Pope, M Donahue
Contractors On-Site: N/A
Client Personnel On-Site: N/A

Drilling Method: HSA 4¼ ID - bore hole 8"
Air Monitoring Method: PID, CGI

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0				Brown Sandy Clay, Fine-Med Grained, Med stiff, Moist.						
5				Brown Sand, Med-Co grained Med dense, Moist.			0	0		
							0	0		
10			Cuttings	Cobbles						- Cobbles
							0	0		
15				Out of Cobbles						- Through cobbles
							0	0		- Black Cutti[ngs] 18' w/ HC o[dor] 240 or
20										
	1	22.5-23.5	6	Dk-Gray-Black Sand w/ Coarse Gravel, Med-Coarse Sand, Very hard, Saturated @ 22. TOB-22.5 HC odor			0	4	129	- Refusal @ 6 Spoon wet 6 Very large co[bbles] Cant drive w Headspace 24 Super - Drilled to 22 - Water came up - Collect GW augers.
25										
30										
35										
40										

Comments: Unable to push well point through cobbles. Sampled Grou[nd water] through augers.

Geologist Signature: [signature]

RECORD OF SUBSURFACE EXPLORATION

Borehole # 1E-5
Well #
Page 1 of 1

PHILIP ENVIRONMENTAL
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Project Name Conoco Nell Hall No1
Project Number 14449 Phase 200077
Project Location Aztec NM

Elevation
Borehole Location TB-5 East of TW-1, TB-2 13' from fence
GWL Depth 22.3
Logged By S. Pope
Drilled By M DONOHUE
Date/Time Started 0630 6/15/95
Date/Time Completed 0730 6/15/95

Well Logged By ST Pope
Personnel On-Site Jim Okie, M. Donahue
Contractors On-Site N/A
Client Personnel On-Site N/A

Drilling Method 4 1/4" ID HSA
Air Monitoring Method PID, CGI

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: PPM BZ	BH	HS	Drilling Conditions & Blow Counts
0										
5			Cuttings	Brown Sand Med-Co grained loose, moist.			0	0		
10							0	0		
15							0	0		
20							0	0		
25	1	22-24	18	Brown Sand Med-Coarse grained Loose, Saturated	SP		0	0	0	Well point Pushed to 26'
30				TOB-26						
35										
40										

Comments: WL-22.3 after installing well point

Geologist Signature Scott T. Pope

6/12/95\DRILLOG1.XLS

INVOICE

FLINT F-125
REV. 3-92

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
P.O. Box 3155
Tulsa, OK. 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

P.A

Customer Conoco 6 7064-711894-1-308 INVOICE NO.

Address ~~6 Box 911 85 54~~ Date 10-20-94

Lease NEIL HALL Well No. 1 Customer P. O. No. GREG VICK Contractor Job No. CH 2618

FROM:	TO:	HOURS	WORK PERFORMED
6:30	12:30	6	SAN JAUN NM DROVE to LOCTION FINI, OFF FILLing HOLE. Pick up FENCE AND old PIPE.

EMPLOYEES TIME	HOURS	RATE	AMOUNT
LIEF K WILLARD (RF	6	15.00	90 00
TERANCE BROCK (L	6	13.50	81 00
BRAIN SHEAFFER (L	6	13.50	81 00
TOTAL			252 00
MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE			
TOTAL			

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT
3 TON	3616	6	20.00	180 00
TRAILER	5020	2	8.70	17 40
BACK HOE RE	11496	4	21.00	84 00
TOTAL				282 40
TOTAL INVOICE AMOUNT				474 40

APPROVED Greg Vick FOR CUSTOMER

APPROVED Randy Schaefer FOR CONTRACTOR

TICKET NUMBER 024460

INVOICE

FLINT F-125
REV. 3-92

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
P.O. Box 3155
Tulsa, OK. 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

P.A

Customer: Conoco 67064-7111899-1-308 INVOICE NO.

Address: ~~67011 711899~~ Date: 10-19-94

Lease: Nell Hall Well No.: 1 Customer P. O. No.: Greg Vic Contractor Job No.: LH26119

FROM:	TO:	HOURS	WORK PERFORMED
			San Jaun NM
8:00	8:30	12	Pickup Back Hoe Tailer When to Loction
			Took Down Fenece state to Back Fill Hole
			Dig Dirt, ~~Repaid~~ Fix two Inch Line That
			Brock When Back Filling In Hole.
½ Lunch			

EMPLOYEES TIME	HOURS	RATE	AMOUNT
Lief Willard	12	15.00	180.00
Terrance Brock	12	13.50	162.00
Brain Sheaffer	12	13.50	162.00
TOTAL			504.00

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT
3 Ton	3616	12	20.14	241 [illegible]
Trailer	5070	2	8.70	17 4[illegible]
Back Hoe RE	11496	10	21.10	211 0[illegible]
TOTAL				469 [illegible]

TOTAL INVOICE AMOUNT 973 [illegible]

APPROVED: Greg Vick FOR CUSTOMER

APPROVED: [signature] FOR CONTRACTOR

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE

TOTAL

TICKET NUMBER 024458

INVOICE

FLINT F-125
REV. 1-90

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
POST OFFICE BOX 3155
TULSA, OKLAHOMA 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

Customer CONOCO INVOICE NO.

Address 67011 7111894 Date 10-7-94

Lease NELL HALL Well No. 1 Customer P. O. No. GREG UIC Contractor Job No. CH26119

FROM:	TO:	HOURS	SAN JUAN NM WORK PERFORMED
6:00	7:00	1	DISC DIRT

EMPLOYEES TIME	HOURS	RATE	AMOUNT
LIEF K WICLARD CRF	1	150	15 00
SERGIO H. CERBERES CL	1	13.5	13 50
TOTAL			28 50
MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE			
TOTAL			

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT
1 TON	3488	1	15.4	15 40
TRAILER	5020	1/2	13.4	6 70
TRACTOR	6420	1/2	15 00	7 50
DISC	RENT	1/2	8 00	4 00
TOTAL				33 60
TOTAL INVOICE AMOUNT				62 10

APPROVED _____ FOR CUSTOMER

APPROVED Randy Lloyd FOR CONTRACTOR

TICKET NUMBER 149215

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
POST OFFICE BOX 3155
TULSA, OKLAHOMA 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

~~C-7064-711894-1-308~~

Customer CONOCO INVOICE NO.

Address ~~6911~~ ~~9111894~~ D+A Date 10/3/94

Lease HALLNELL Well No. 1 Customer P. O. No. Gary Lack Contractor Job No. LH26119

FROM:	TO:	HOURS	WORK PERFORMED
0830	11:30	1	DISC DIRT

EMPLOYEES TIME	HOURS	RATE	AMOUNT
J. F KWILLAR RT	1	15.0	15 00
STEVE ROMERO L	1	13.5	13 50
TOTAL			28 50

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE

TOTAL

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT
1 TON	3484	1	15.4	15 40
TRATOR	6274	1	15.0	15 00
TRIALER	5072	1	13.4	13 40
DISC RENTAL		1	8.0	8 00
TOTAL				51 80

TOTAL INVOICE AMOUNT 80 30

APPROVED Gary Vick FOR CUSTOMER

APPROVED Randy Schmidt FOR CONTRACTOR

TICKET NUMBER 145882

INVOICE

FLINT F-125
REV. 1-90

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
POST OFFICE BOX 3155
TULSA, OKLAHOMA 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

Customer Conoco INVOICE NO.

Address 67011 7113219 Date 9-26-94

Lease NELL HALL Well No. 1 Customer P. O. No. GREG U.C Contractor Job No. CH26 119

San Juan Co

FROM:	TO:	HOURS	WORK PERFORMED
10:30	12:30	2	TURNED DIRT with Disc

EMPLOYEES TIME	HOURS	RATE	AMOUNT	
LIEFK WILLARD RP	2	15.0	30	00
BRAIN SCHAEFFLER L	2	13.5	27	00
TOTAL			57	00

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT	
1 TON	3484	2	15.4	30	8C
TRACTOR	CH20	2			
TRAILER	5070	2	87	19	4C
Disc	RENT	2	8	16	00
TOTAL				106	4C

TOTAL INVOICE AMOUNT	163	4C

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE

TOTAL

APPROVED Gary Vick
FOR CUSTOMER

APPROVED
FOR CONTRACTOR

TICKET NUMBER 149184

FLINT F-125
REV. 1-90

INVOICE

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
POST OFFICE BOX 3155
TULSA, OKLAHOMA 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

Customer: CONOCO

INVOICE NO.:

Address: 67011 711894

Date: 9-23-94

Lease: HALL NELL Well No.: 1 Customer P. O. No.: GERS VIC Sun Sand Co Contractor Job No.: LH26119

FROM:	TO:	HOURS	WORK PERFORMED
6:30	7:30	1	Disc Dirt

EMPLOYEES TIME	HOURS	RATE	AMOUNT	
LIEFKWILLARD	1	150	15	00
BRAIN SCHEFFIER	1	135	13	50
TOTAL			28	50

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT	
1 TON	3484	1	1546	15	46
TRAILER	5070	1	[illegible]	[illegible]	00
TRACTOR	6422	1	[illegible]	[illegible]	00
Disc	RENT	1	800	8	00
TOTAL				52	4[illegible]

TOTAL INVOICE AMOUNT: [illegible] 96

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE

TOTAL

APPROVED: Cary Vick FOR CUSTOMER

APPROVED: [signature] FOR CONTRACTOR

TICKET NUMBER 149181

INVOICE

FLINT F-125
REV. 1-90

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
POST OFFICE BOX 3155
TULSA, OKLAHOMA 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

Customer CONOCO INVOICE NO.

Address 67011 7111894 Date

Lease ~~HALLNELL~~ Neil Hall Well No. 1 Customer P. O. No. Gary Work Contractor Job No. LH26119

FROM:	TO:	HOURS	WORK PERFORMED
1030	1130	1	DISC DIRT

EMPLOYEES TIME	HOURS	RATE	AMOUNT
LIEF KWILLAR RF	1	150	15 00
STEVE ROMERO L	1	135	13 50
TOTAL			28 50

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE			
TOTAL			

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT
1 TON	3484	1	15.4	15 40
TRATOR	6274	1	15.0	15 00
TRIALER	5072	1	13.4	13 40
DISC RENTAL		1	8.0	8 00
TOTAL				51 80

TOTAL INVOICE AMOUNT 80 30

APPROVED Gary Vick FOR CUSTOMER

APPROVED Randy Shepard FOR CONTRACTOR

TICKET NUMBER 145882

INVOICE

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

POST OFFICE BOX 3155
TULSA, OKLAHOMA 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO.

Customer Conoco INVOICE NO.

Address 67011 7111 894 Date

Lease HALL NELL Well No. 1 Customer P. O. No. GRES. Inc Contractor Job No. LH26119

FROM:	TO:	HOURS	WORK PERFORMED
			SAN JUAN, NM
6:30	7:30	1	disc drill

EMPLOYEES TIME	HOURS	RATE	AMOUNT
Lic F K WILLARD RP	1	15.0	15 00
~~Robert Jackson~~			
TOTAL			15 00

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT
1 TON	3784	1	15.4	15 40
TRAILER	5070	1	8.78	8 70
TRACTOR	4120	1	15.0	15 00
DISC	RENT	1	8 00	8 00
TOTAL				47 10

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE			
TOTAL			

TOTAL INVOICE AMOUNT 62 10

APPROVED [signature] FOR CUSTOMER

APPROVED [signature] FOR CONTRACTOR

TICKET NUMBER 145889

INVOICE

FORM F-125 REV 1/90

FLINT Engineering & Construction Co.
2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
POST OFFICE BOX 3155
TULSA, OKLAHOMA 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

Customer Conoco INVOICE NO.

Address 67011 711894 Date 9-22-94

Lease Hall Nell Well No. 1 Customer P. O. No. Greg Vic Contractor Job No. CH 26119

FROM:	TO:	HOURS	WORK PERFORMED
			San Juan, NM
6:30	8:30	2	Disc Dirt

EMPLOYEES TIME	HOURS	RATE	AMOUNT
Lief K Willard RR	2	15.0	30 00
Brian Schiffer L	2	13.5	27 00
TOTAL			57 00

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT
1 Ton 3484	2		15.4	30 80
Trailer 5070	1		8.7	8 70
Tractor 6224	2		15.00	30 00
Disc Rear	2		8.00	16 00
TOTAL				85 50

TOTAL INVOICE AMOUNT 142 50

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE

TOTAL

APPROVED Corey Vick FOR CUSTOMER

APPROVED Randy Schuyler FOR CONTRACTOR

TICKET NUMBER 145900

INVOICE

FLINT F-125
REV. 1-90

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
POST OFFICE BOX 3155
TULSA, OKLAHOMA 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

Customer: Conoco
INVOICE NO.

Address: 67011 7111894
Date: 9-21-94

Lease: NELL HALL Well No. 1 Customer P. O. No. Greg Vic Contractor Job No. 1H26119

FROM:	TO:	HOURS	WORK PERFORMED
			San Juan, NM
10:30	11:30	1	Disc dirt

EMPLOYEES TIME	HOURS	RATE	AMOUNT
LIEFK WILLARD RF	1	15.0	15 00
BRIAN SCHIFFER	1	135	13 50
TOTAL			28 50

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT
1 TON 3484	3484	1	15.4	15 40
TRAILER 5020	5020	1	870	8 70
TRACTOR 6224	6224	1	15.0	15 00
DISC RENT	RENT	1	8.00	8 00
TOTAL				47 10

TOTAL INVOICE AMOUNT 75 60

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE

TOTAL

APPROVED [signature] FOR CUSTOMER

APPROVED [signature] FOR CONTRACTOR

TICKET NUMBER 145895

INVOICE

FLINT F-125
REV. 1-80

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
POST OFFICE BOX 3155
TULSA, OKLAHOMA 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

Customer CONOCO INVOICE NO.

Address FARMINGTON, NM (67011 - 7111894) Date 9-20-94

Lease NELL HALL 1 Well No. NELL HALL 1 Customer P. O. No. GREG VICK Contractor Job No. LH26119

FROM:	TO:	HOURS	SAN JUAN CO, NM WORK PERFORMED
4:30pm	5:30pm	1	DROVE TO LOCATION, IDENTIFIED CONDUIT, FITTING NEEDS, ORDERED [redacted] MATERIAL.

EMPLOYEES TIME	HOURS	RATE	AMOUNT
JAMES E. EDMANSON, PF	1	15.0	15 00
JEREMY DIVINE, L	1	13.5	13 50
OTAL			28 50

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE		
OTAL		

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT
INT'L 3TON	3751	1	20.1	20 10
TOTAL				20 10

TOTAL INVOICE AMOUNT 48 60

APPROVED Greg Vick FOR CUSTOMER

APPROVED Randy Schnyder FOR CONTRACTOR

TICKET NUMBER 145787

INVOICE

FLINT F-125
REV. 1-90

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
POST OFFICE BOX 3155
TULSA, OKLAHOMA 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

Customer CONOCO INVOICE NO.

Address Date 9-13-94

Lease NELL HALL Well No. 1 Customer P. O. No. Greg Vick Contractor Job No. LH26119

FROM:	TO:	HOURS	WORK PERFORMED
8:00	10:00	2	

EMPLOYEES TIME	HOURS	RATE	AMOUNT
LIEF KILLARD	2	15.	30
TOTAL			30

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE

TOTAL

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT
1 TON	3494	2	15.40	30 80
TRACTOR	6229	2	21.10	42 20
TRAILER RENTAL		1	13.40	13 40
DISC		2	8.00	16 00
				102 40
TOTAL				~~80 40~~
TOTAL INVOICE AMOUNT				~~110 40~~ 132 40

APPROVED Greg Vick FOR CUSTOMER

APPROVED Randy Schmidt FOR CONTRACTOR

TICKET NUMBER 149078

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

TOTAL PETROLEUM HYDROCARBONS
EPA METHOD 418.1

Conoco Inc.

Project: Soil TPH
Matrix: Soil
Condition: Intact/Cool

Date Reported: 09/09/94
Date Sampled: 09/01/94
Date Received: 09/01/94
Date Extracted: 09/07/94
Date Analyzed: 09/07/94

Sample ID	Lab ID	Result (mg/kg)	Detection Limit
Nell Hall #1 Dehy Pit	G01436	380	17

ND - Analyte not detected at stated detection level.

References:

Method 418.1: Petroleum Hydrocarbons, Total Recoverable, USEPA Chemical Analysis of Water and Waste, 1978.

Method 3550: Ultrasonic Extraction of Non-Volatile and Semi-Volatile Organic Compounds from Solids, USEPA SW-846, Rev. 1, July 1992.

Analyst: Anna Schaerer

Reviewed:

Mountain Laboratories, Inc.

2508 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Conoco Inc.

Project ID:	Soil TPH, H2O BTEX	Report Date:	09/09/94
Sample ID:	Nell Hall #1 Dehy Pit	Date Sampled:	09/01/94
Lab ID:	G01437	Date Received:	09/01/94
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	09/07/94

Target Analyte	Concentration (ppb)	Detection Limit (ppm)
Benzene	6,400	0.2
Toluene	260	0.2
Ethylbenzene	68	0.2
m,p-Xylenes	9,800	0.2
o-Xylene	38	0.2

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Bromofluorobenzene	99.4	86 -115%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Anna Schaeves
Analyst

Review

INVOICE

FLINT Engineering & Construction Co.
2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
P.O. Box 3155
Tulsa, OK. 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO.

Customer Conoco INVOICE NO.

Address 67011 711894 Date 8 9 94

Lease Nell Hall Well No. 1 Customer P. O. No. Gary Vick Contractor Job No. LH26119

FROM:	TO:	HOURS	WORK PERFORMED
630	630	11/2	Dug out Dirt Pickup Fence.
			Pickup Dirt.
Lunch		1/2	

EMPLOYEES TIME	HOURS	RATE	AMOUNT	
Lief Kw Cardre F	11½	15.00	172	50
Tom Gerry OP	11½	19.25	221	38
Randy [illegible] Driller	Back	17.50	52	50
TOTAL			446	38

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT	
1 Ton	3190	11½	15.40	177	10
Backhoe					
Box Blade	6222	10'	21.10	211	00
Trackhoe RE	4141	10	63.20	632	00
4x4	3807	3	15.40	46	20
TOTAL				1066	30

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE

TOTAL

TOTAL INVOICE AMOUNT 1512 68

APPROVED Gary Vick FOR CUSTOMER

APPROVED Randy [illegible] FOR CONTRACTOR

TICKET NUMBER 012320

FLINT Engineering & Construction

2440 South Yukon Avenue · Tulsa, Oklahoma 74107-2729

CUSTOMER Conoco

ADDRESS 67011 7111 894

INVOICE NO.

DATE 9-6-94

WORK LOCATION (NAME) Nell Hall 1

FLINT JOB NO. LH26719

CITY (IF APPLICABLE)

COUNTY San Saba

TAX CODE

4:00	5:00	1	Disc drit

Lief K Willard	RF	1	15.00	15.00
Julio B Moreno	L	1	13.50	13.50
			TOTAL	28.50

		15.40	15.40
		8.70	8.70
		21.10	21.10
Disc		8.00	8.00
		TOTAL	45.20
		NON TAXABLE	
		TAXABLE	
		SALES TAX	
			73.70

TOTAL		

CUSTOMER SIGNATURE

CONTRACTOR SIGNATURE

TICKET NUMBER 224547

F-255 (5-92)

PLEASE PAY FROM THIS INVOICE. TERMS NET. STATEMENTS MAILED ONLY UPON REQUEST.

INVOICE

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

P.O. Box 3155
Tulsa, OK 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

Customer CONOCO INVOICE NO.

Address Date 3-31-94

Lease N'E HALL Well No. 1 Customer P. O. No. Ray York Contractor Job No. LH26119

FROM:	TO:	HOURS	WORK PERFORMED
6:30	7:00	12½	MOVED BACK HOE & BOX BLADE to LOCATION
			STARTED to REMOVE DIRT & THEN HAD to
			GET TRACK HOE FOR DEPTH to REMOVE
			MORE DIRT & TOO TOO SHALLOW. PULLED
			UNDER GROUND LOOP & RAN OUT DIRT.
			MARKED OFF HOLE AND SHUT FENCES.
Lunch	½		

EMPLOYEES TIME	HOURS	RATE	AMOUNT	
LIEF K. WILLARD L	12½	13.50	168	75
TOM GERRY OP	12½	19.25	240	63
RANDY SCHREFFLER	4½	17.50	78	75
TOTAL			488	13

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE

TOTAL				

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT	
1 TON	5730	12½	15.40	192	50
TRAILER	5092	3	18.20	54	60
BOX BLADE	6227	6	21.10	126	60
BACK HOE	12708 6430	6	21.10	126	60
TRACK HOE	RE2194	6	63.20	379	20
414	3507	4½	15.40	69	30
TOTAL				948	80

TOTAL INVOICE AMOUNT	1436	93

APPROVED Ray York FOR CUSTOMER

APPROVED Randy Schreffler FOR CONTRACTOR

TICKET NUMBER 012319

Soil Treated Onsite [X] Date Remediation Started: 8/31/94

[ ] In Situ Bio [ ] w/vapor venting [X] Landfarmed [ ] Composted

	Date: 8/31/94 Description	Amount/Rate	Date: Description	Amount/Rate
Tilled	LANDFARM w/ BACKHOE			
Nutrients	32-0-0	76 #		
Moisture	(TILLED 9-8, 9-13, 9-21, 9-22, 9-23,			
Bulking Agent	9-26, 10-3 & 10-7-94.			
Organic Material				

	Date: Description	Amount/Rate	Date: Description	Amount/Rate
Tilled				
Nutrients				
Moisture				
Bulking Agent				
Organic Material				

ALL SAMPLE RESULTS ARE SHOWN ON "SAMPLING RESULTS NOTES" FORM

SOIL TREATED/HANDLED OFFSITE

TO SITE(ATTACH MANIFEST)

Where Treated:

Type of Land (Fed/Nav/Jic/State/Fee):

Quantity Moved:

Quantity Disposed At Envirotech:

FROM SITE (ATTACH MANIFEST)

To This Location From:

Type of Land (Fed/Nav/Jic/State/Fee):

Quantity Moved:

FINAL CLOSURE

BTEX: _____ ppm (From Headspace Analysis) TPH: _____ ppm (From Lab Results)

Revegetated: yes [ ] no [ ]

Active Well or Facility Pad: yes [ ] no [ ]

NOTES: START REMEDIATION 8/31/94, EXCAVATED TO DEPTH of 12' CONT STILL GOING DOWN, SDON 9/1/94 CONT EXCAVATION TO GROUND H2O @ 16' below GROUND level - COMP SAMPLE TAKEN OVM = 120 TPH = 2600 EXCAVATED AREA 22' x 24' x 16', HIT GW @ 16', INITIAL ANALYSIS ON SOIL TPH & GW BTEX INDICATE ABOVE REQUIREMENT, LANDFARMED SOIL FROM PIT & TURNED SOIL 9-8, 9-13, 9-21, 9-22, 9-23, 9-26, 10-3 & 10-7-94. 10-19-94 BACKFILLED PIT w/ CLEAN REMEDIATED SOIL. PREPARE TO PERFORM FURTHER DELINIATION & ASSESS GW ISSUE.

INVOICE

FLINT F-125
REV. 3-92

FLINT Engineering & Construction Co.

2440 South Yukon Avenue Tulsa, Oklahoma 74107-2729

REMIT TO:
P.O. Box 3155
Tulsa, OK. 74101-3155

WHEN REMITTING PLEASE REFER TO THIS INVOICE NO

Customer CONOCO INVOICE NO.

Address Date 8 29 94

Lease Nye Hall Well No. 1 Customer P. O. No. Grey Vick Contractor Job No. LH26119

FROM:	TO:	HOURS	WORK PERFORMED
9:30	10:30	1	stir Pit with Back Hoe

EMPLOYEES TIME	HOURS	RATE	AMOUNT
Lieftwillard (L)	1	[illegible]	13 50
Tom Gerry (OP)	1	[illegible]	19 25
TOTAL			32 75

MATERIALS BOUGHT OUT OR SUBSISTENCE ALLOWANCE

TOTAL

EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT
1 TON	3484	1	15 40	15 40
TRAILER	5207	1	8 70	8 70
BACKHOE	12180	1	21 10	21 10
TOTAL				45 20

TOTAL INVOICE AMOUNT 77 95

APPROVED Grey Vick FOR CUSTOMER

APPROVED Randy Schmidt FOR CONTRACTOR

TICKET NUMBER 012315

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

TOTAL PETROLEUM HYDROCARBONS
EPA METHOD 418.1

Conoco

Project: None Given
Matrix: Soil
Condition: Intact/Cool

Date Reported: 05/12/94
Date Sampled: 5/3-4/1994
Date Received: 05/04/94
Date Extracted: 05/11/94
Date Analyzed: 05/11/94

Sample ID	Lab ID	Result (mg/kg)	Detection Limit
Nell Hall #1	G00377	2;600	200
State Com H 4 A	G00378	3,200	200

ND - Analyte not detected at stated detection level.

References:

Method 418.1: Petroleum Hydrocarbons, Total Recoverable, USEPA Chemical Analysis of Water and Waste, 1978.

Method 3550: Ultrasonic Extraction of Non-Volatile and Semi-Volatile Organic Compounds from Solids, USEPA SW-846, Sept. 1986.

Analyst: Austin Wolf

Reviewed: mh

SAN JUAN BASIN

PIT CLOSURE DOCUMENTATION

LOCATION: Nell Hall #

RCRA EXEMPT WASTES: Yes ☒ No ☐

PIT TYPE: Dehy pit

E FLOW TO PIT STOPPED: 5/3/94 - (Removed Dehy - No Replacement)

ACREAGE TYPE: ☐ FEDERAL ☐ JICARILLA ☐ NAVAHO ☐ STATE ☒ FEE

SITE ASSESSMENT

	Ranking Score
1) Groundwater Depth: < 50'	
Basis: Location Elevation	20
2) Wellhead Protection Area:	
Dista.. e To Water Sources: < 1000' Private Domest Water Sources: < 200	
Basis: Location distance to homes & irrigation H2o	20
3) Distance To Surface Body of Water: > 1000'	
Basis: Distance to River	0
Total Score:	40

Soil Characteristic

☐ Highly Contaminated/Saturated ☒ Unsaturated Contaminated

RANKING CRITERIA

Depth to Groundwater		Wellhead Protection Area		Distance to Surface Water Body	
	Score	<1000' from water source or < 200' from private domestic water source	Score		Rank
<50 ft	20	yes	20	<200' boriz	20
<50 - 99	10	no	0	200 - 1000 ' boriz	10
>100 ft	0			>1000' boriz.	0

GUIDELINE REMEDIATION LEVELS

	Total Ranking Score		
	>19	10-19	0-9
Benzene (ppm)	10	10	10
BTEX (ppm)	50	50	50
Field Headspace Method for BTEX	100	100	100
TPH (ppm) **	100	1.000	5.000

** Concentration above background

DEFINITION OF CONTAMINATION

Date: 5/3/94

Depth Excavated:

Full Excavation : ☐ Maximum Extent Practicable

ALL SAMPLE RESULTS ARE SHOWN ON "SAMPLE RESULTS NOTES" FORM

Groundwater Encountered: Yes ☒ No ☐

If yes, approximate depth:

Groundwater Sampling? ☐ Yes ☐ No

Where was gw sample taken?

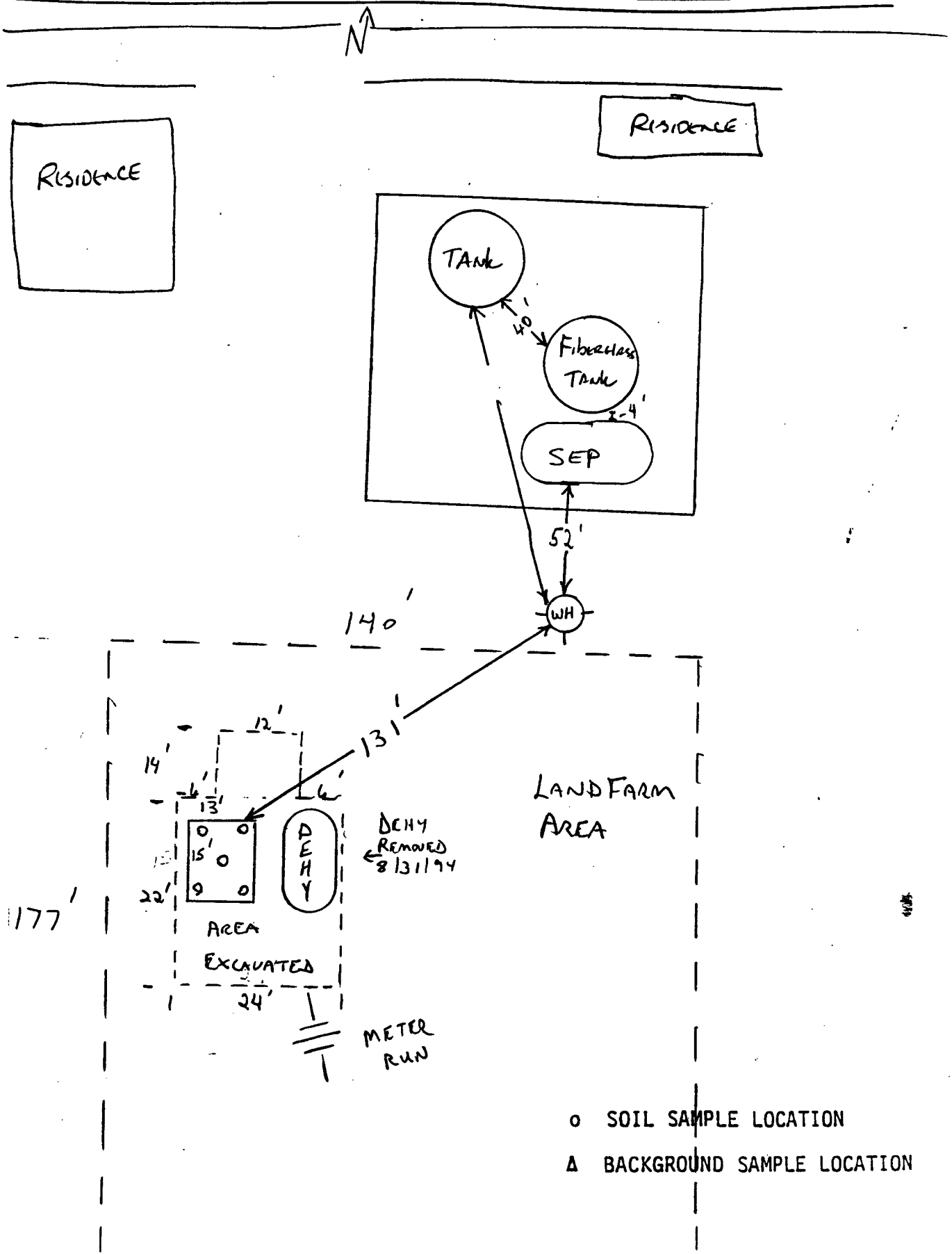
Attach GW Sample Results

NOTES:

PIT LOCATION AND COMPOSITE SAMPLE PROFILE MAP

WELL LOCATION: Nell Hall #1 S___ T___ R 11W UNIT M

DATE STARTED: 5/3/94 DATE COMPLETED: _____



PIT CLOSURE DOCUMENTATION – SAMPLING RESULTS NOTES

LOCATION OF PIT: Nell Hall #1 TYPE OF PIT: Dehy

	SAMPLE EVENT # 1	SAMPLE EVENT # 2	SAMPLE EVENT #	SAMPLE EVENT #	SAMPLE EVENT #	SAMPLE EVENT #	SAMPLE EVENT #	SAMPLE EVENT #
DESCRIPTION OF SAMPLE								
DATE OF SAMPLE	5/3/94	9/1/94						
LOCATION OF SAMPLE	DEHY PIT	DEHY PIT	"					
TYPE OF SAMPLE: (GRAB/COMPOSITE)	Comp	Comp						
DEPTH OF SAMPLE(S)	0-3'	16'						
TEMPERATURE OF SAMPLE	76°F	76°F						
FIELD METHOD RESULTS (PPMS)								
TPH VAPORS (EQUIV UNITS)	256	192 ppm						
BENZENE RESPONSE FACTOR	.47	.47						
ADJUSTED FOR BENZENE EQUIV UNITS	120	90						
LAB RESULTS IN PPM:								
METHOD (418.1 OR MOD 8015)	8015	418.1						
TPH	2600	380						
NOTES	Analyzed 5/11/94	H2O Sample Sent to LAB for Analysis 9/1/94						