

1R - 277

APPROVALS

YEAR(S):

2005-1995



NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON

Governor

Joanna Prukop
Cabinet Secretary

Mark E. Fesmire, P.E.

Director

Oil Conservation Division

May 20, 2005

Mr. Achebe Hope
Unocal Corporation
P.O. Box 1069
276 Tank Farm Road
San Luis Obispo, CA 93406

**RE: 2004 ANNUAL GROUND WATER REPORT
FORMER UNOCAL SOUTH VACUUM UNIT
LEA COUNTY, NEW MEXICO
CASE 1R0277**

Dear Mr. Hope:

The New Mexico Oil Conservation Division (OCD) has reviewed Unocal Corporation's (Unocal) *2004 Annual Ground Water Report - Former Unocal South Vacuum Unit* submitted by Trident Environmental on November 11, 2004. Unocal proposes to continue the present annual ground water monitoring program, to update the flow and transport model, and to submit a annual ground water monitoring report (AGWMR) in January 2006. The OCD concurs with Unocal's proposals.

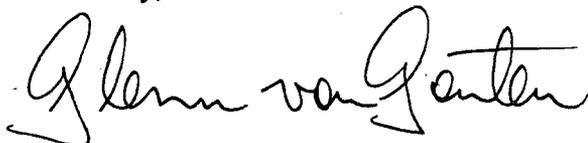
In order to document that Unocal's ground water model is actually performing adequately, the OCD requests that Unocal provide figures depicting the simulated plumes for the both chloride and TDS for the next five years; that is, the 2005 AGWMR should include figures for the simulated plumes for the years 2006 through 2010. This will allow the OCD to compare the simulated plumes with the actual data to ensure that the model is performing adequately.

Please be advised that the OCD's concurrence with Unocal's 2004 AGWMR does not limit Unocal to the approved ground water monitoring program if the program fails to adequately remediate or monitor contamination related to Unocal's activities, or if contamination exists which is outside the scope of the current investigation. In addition, OCD's approval does not relieve Unocal of responsibility for compliance with any other federal, state or local laws and regulations.

Finally, please provide a copy of the 2004 AGWMR to Mr. Paul Sheeley of OCD's Hobbs District Office. Please be sure to copy Mr. Sheeley on all future correspondence on Case 1R0277.

If you have any questions or comments, please contact me at (505) 476-3488.

Sincerely,

A handwritten signature in cursive script that reads "Glenn von Gonten". The signature is written in black ink and is positioned above the typed name.

Glenn von Gonten
Senior Hydrologist
Environmental Bureau

xc: Paul Sheeley, OCD Hobbs District Office
Gilbert Van Deventer, Trident Environmental
Chris Kocka, ENSR



November 11, 2004

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

RECEIVED
NOV 11 2004
OIL CONSERVATION
DIVISION

SUBJECT: TRANSMITTAL LETTER
2004 ANNUAL GROUNDWATER MONITORING REPORT
FORMER UNOCAL SOUTH VACUUM UNIT
SEC 35, T18S, R35E
LEA COUNTY, NEW MEXICO
CASE #1R0277

Dear Mr. Olson:

Enclosed is the 2004 Annual Groundwater Monitoring Report for the Former Unocal South Vacuum Unit site located in Lea County, New Mexico.

Please contact me at (432) 682-0808 or Achebe Hope of Unocal (Real Estate and Remediation Services Group) at (805) 547-5448 with any questions or comments.

Sincerely,

Gilbert J. Van Deventer, REM, PG, NMCS
Trident Environmental – Midland, TX

Attachments

xc: Achebe Hope, Unocal – San Luis Obispo, CA
Chris Kocka, ENSR – Warrenville, IL
Paul Sheeley, OCD - Hobbs, NM



Letter of Transmittal

RECEIVED

ATTENTION:

Mr. Bill Olson
New Mexico OCD
1220 So. St. Francis Drive
Santa Fe, New Mexico 87505

DATE:

2/9/2004

FEB 13 2004

Oil Conservation Division
Environmental Bureau

PROJECT REFERENCE:

Unocal South Vacuum Site

PROJECT NUMBER:

06940-297

WE ARE SENDING YOU THE FOLLOWING:

<u>Number of Originals</u>	<u>Number of Copies</u>	<u>Description</u>
1	0	2003 Annual Groundwater Monitoring Report

REMARKS:

Bill,

Enclosed is one original copy of the 2003 Groundwater Monitoring Report from the former Unocal South Vacuum Unit site. As requested, a copy is being mailed to the Hobbs District office.

Call me at 713-807-6507 if you have any questions.

SIGNATURE:

Timothy J. Herbert, P.G.
Project Manager

1R277

Olson, William

From: Gilbert J Van Deventer [kickbooty@juno.com]
Sent: Wednesday, June 25, 2003 1:32 PM
To: kbehrens@ENSR.com; wolson@state.nm.us; btferry@unocal.com
Subject: Former Unocal S. Vacuum Unit - Annual Sampling Event

The annual sampling event for the site referenced below has been scheduled for July 2, 2003.

Site Name: Former Unocal S. Vacuum Unit
Location: T18S-R35E-Section 36, Unit Letter M
NMOCD Case # 1R0277
Water Development Easement # WD-106

Tasks to be performed:

Each of the six monitoring wells, MW-1 through MW-6, will be gauged for depth to groundwater using an electronic water indicator immediately prior to purging operations. A minimum of 3 well volumes will be purged from each site monitoring well (5 to 10 gallons per well) using a new polyethylene 2-inch diameter bailer. After purging, groundwater samples will be collected and parameters measured using a Hydac Model 910 pH-Conductivity-Temperature meter. Water samples for each monitoring well will be transferred into 500 milliliter (ml) plastic containers for laboratory analysis of total dissolved solids (TDS) (EPA Method 160.1) and chloride (EPA Method 325.3). For each set of samples, chain of custody forms documenting sample identification numbers, collection times, and delivery times to the laboratory will be completed. All water samples will be placed in an ice-filled cooler immediately after collection and transported to SPL, Inc. in Houston, Texas for analysis.

If you have any questions please feel free to email me or call. I will be out of the office Thursday and Friday this week but can be reached by my cell phone.

Gilbert J. Van Deventer, REM gvandeve@umich.edu
Trident Environmental
Office: 432-682-0808
Fax/Home: 432-682-0727
Mobile: 432-638-3106

6/25/2003



March 5, 2003

Mr. William C. Olson
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

RECEIVED

MAR 10 2003

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

SUBJECT: TRANSMITTAL LETTER
2002 ANNUAL GROUNDWATER MONITORING REPORT
FORMER UNOCAL SOUTH VACUUM UNIT
LEA COUNTY, NEW MEXICO
CASE #1R0277

Dear Mr. Olson:

Enclosed is the 2002 Annual Groundwater Monitoring Report for the Former Unocal South Vacuum Unit site located in Lea County, New Mexico.

Please contact me at (915) 682-0808 or Ben Terry of Unocal at (409) 724-3291 with any questions or comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Gilbert J. Van Deventer".

Gilbert J. Van Deventer, REM, NMCS

Attachments

xc: Ben Terry, Unocal - Beaumont, TX
Kevin Behrens, ENSR - Houston, TX
Paul Sheeley, OCD - Hobbs, NM
Myra Meyers, SLO - Hobbs, NM



July 8, 2002

Mr. William C. Olson
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

RECEIVED

JUL 16 2002

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

SUBJECT: TRANSMITTAL LETTER
2001 ANNUAL GROUNDWATER MONITORING REPORT
FORMER UNOCAL SOUTH VACUUM UNIT
LEA COUNTY, NEW MEXICO
CASE #1R0277

Dear Mr. Olson:

Enclosed is the 2001 Annual Groundwater Monitoring Report for the Former Unocal South Vacuum Unit site located in Lea County, New Mexico.

Please contact me at (915) 682-0808 or Ben Terry of Unocal at (409) 724-3291 with any questions or comments.

Sincerely,



Gilbert J. Van Deventer, REM

Attachments

xc: Ben Terry, Unocal – Beaumont, TX
Kevin Behrens, ENSR – Houston, TX
Paul Sheeley, OCD - Hobbs, NM

Olson, William

From: Gilbert J Van Deventer [kickbooty@juno.com]
Sent: Monday, July 08, 2002 8:07 AM
To: kbehrens@ENSR.com; wolson@state.nm.us; PSheeley@state.nm.us; btferry@unocal.com
Subject: S. Vacuum sampling

The annual groundwater sampling at the former Unocal South Vacuum Unit has been scheduled for Thursday July 11th. Samples from the six on site monitoring wells will be analyzed for chlorides and total dissolved solids.

Please call if you have any questions.

Gilbert J. Van Deventer, REM gilvandeventer@yahoo.com
Trident Environmental
Office: 915-682-0808
Fax/Home: 915-682-0727
Mobile: 915-638-3106



NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
Jennifer A. Salisbury
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

November 2, 2001

CERTIFIED MAIL
RETURN RECEIPT NO. 5357-8000

Mr. Ben F. Terry, Jr.
Unocal Corporation
P.O. Box 1283
Nederland, Texas 77627

**RE: GROUND WATER REMEDIATION PLAN
UNOCAL SOUTH VACUUM PIT
CASE #1R277**

Dear Mr. Terry:

The New Mexico Oil Conservation Division (OCD) has reviewed Unocal Corporation's (Unocal) April 6, 2001 "CASE #1R0277, GROUNDWATER REMEDIATION PLAN, FORMER UNOCAL SOUTH VACUUM UNIT" which was submitted on behalf of Unocal by their consultant Trident Environmental. This document contains Unocal's work plan for remediation and monitoring of ground water contamination related to the former Unocal South Vacuum Field pit.

The above referenced work plan is **approved with the following conditions:**

1. All ground water samples shall be obtained and analyzed using EPA approved methods and quality assurance/quality control.
2. Unocal shall submit the annual report OCD Santa Fe Office by April 1 of each year with a copy provided to the OCD Hobbs District Office.
3. Unocal shall notify the OCD at least 48 hours in advance of all scheduled activities such that the OCD has the opportunity to witness the events and split samples.

Please be advised that OCD approval does not limit Unocal to the proposed work plan should the plan fail to adequately remediate or monitor contamination related to Unocal's activities, or if contamination exists which is outside the scope of the work plan. In addition, OCD approval does not relieve Unocal of responsibility for compliance with any other federal, state or local laws and regulations.

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

Sincerely,

A handwritten signature in cursive script, appearing to read "Will Olson".

William C. Olson
Hydrologist
Environmental Bureau

xc: Chris Williams, OCD Hobbs District Office
Gilbert J. Van Deventer, Trident Environmental

Unocal Corporation
P.O. Box 1283 (Highway 366)
Nederland, Texas 77627-1283
Telephone (409) 724-3291
Facsimile (409) 724-3219
E-Mail bferry@unocal.com

SENT VIA AIRBORNE EXPRESS (AIRBILL # 6102806360)

UNOCAL 

Ben F. Terry, C.P.G.
Project Manager
Real Estate and Remediation

September 13, 2001

Commissioner of Public Lands
Attention: Mr. Jerry L. Wagner
Surface Resources Division
310 Old Santa Fe Trail
P.O. Box 1148
Santa Fe, NM 87504-1148

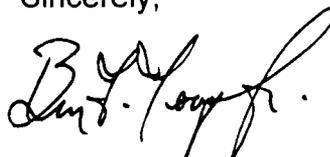
**SUBJECT: GRANT OF WATER DEVELOPMENT
EASEMENT # WD-106
SOUTH VACUUM UNIT SITE
NEAR HOBBS, NEW MEXICO**

Dear Mr. Wagner:

Please find attached two copies of the Unocal-signed Water Development Easement No. WD-106 and check # 4068643 for \$4,200. The check is payment of trespass fees for the subject site 6 groundwater monitoring wells as demanded by your office per your letter dated August 15, 2001 (copy attached).

Unocal appreciates the opportunity to handle this matter nonjudicially. If you have any questions, please contact me at (409) 724-3291.

Sincerely,



Ben F. Terry, Jr., C. P. G.
Project Manager
Unocal Real Estate and Remediation

Grant of Water Development Easement No. WD-106

Page 2

September 13, 2001

x:\bft\word\South Vacuum Unit 1 9 01.doc

Attachments (4)

Water Development Easement No. WD-106 (2 copies)

\$4,200 Check (# 4068643)

NMSLO COPL Letter to Unocal dated August 15, 2001

xc: Myra Meyers, State Land Office, Hobbs, NM

~~Bill Olson, Oil Conservation Division, Santa Fe, NM~~

Paul Sheeley, Oil Conservation Division, Hobbs, NM

Kevin Behrens, IT Group, Houston, TX

Gilbert J. Van Deventer, Trident Environmental, Midland, TX

**NEW MEXICO STATE LAND OFFICE
WATER DEVELOPMENT APPLICATION/EASEMENT**

Water Development Easement No. WD-106

THIS AGREEMENT, dated this ____ day of _____, 20__, made and entered into between the State of New Mexico, acting by and through the undersigned, its Commissioner of Public Lands, hereinafter called the Commissioner, and Unocal Corporation of (address) P.O. Box 1283, Nederland, TX 77627, hereinafter called the Grantee.

The Grantee has filed in the Land Office an application for a Water Development Easement and has tendered the sum of \$1,830.00 which sum includes the \$30.00 application fee and the first year's annual rental.

In consideration of the foregoing sum, the Commissioner grants to the Grantee a Water Development Easement for the sole purpose of: **monitoring wells used for periodic groundwater sampling as directed by the NM Oil Conservation Division** under the following described lands:

Date Well Completed: N/A

State Land Office Well Number: WD-106

State Engineer Office Well Number: N/A

<u>TOWNSHIP/RANGE</u>	<u>SECTION/SUBDIVISION</u>	<u>ACRES</u>
18 South 35 East	36 SW4SW4, NW4SW4 (Wells MW-1 though MW-5)	12.5
19 South 35 East	01 NE4NW4 (Well MW-6)	2.5

Together with the right to make such reasonable use of the land described for each well site as may be necessary to appropriate and develop the water therefrom. The grant under this easement is subject to all the terms all conditions set fourth herein:

1. The grant of this Water Development Easement is for a term of five (5) years, commencing _____ 2001, and ending _____ 2006, unless terminated earlier as provided herein.

2. Additional well sites may be added to this easement by amendment. The term of the easement shall be unaffected by such amendments. Each amendment shall be accompanied by an amendment filing fee of \$30.00 and an annual fee of \$300.00 per well.

3. The parties agree that the intention and purpose of this agreement is for the purpose of monitoring wells.

4. Grantee shall pay to the Commissioner as consideration \$300.00 per well per year.
5. Grantee shall act prudently in drilling, developing, appropriating, transporting and using water and water rights from state trust lands. "Prudent" within the context of this provision means that standard of care, operation and action of reasonable water user acting pursuant to provisions of New Mexico Water Law.
6. Grantee shall not impair existing appropriations of water on state trust lands within the easement or on state trust lands in adjacent areas.
7. Grantee shall not be required to obtain separate right of way grant from the Commissioner for pipelines and other facilities within the limited boundaries of the Water Development Easement. Right of Way outside the boundaries of this easement must be obtained from the Commissioner where other state lands are crossed.
8. With the consent of the Commissioner and payment of a fee of \$50.00, the Grantee may surrender or relinquish this Water Development Easement, in whole or in part, to the Commissioner; provided, however, that this surrender clause shall become absolutely inoperative immediately and concurrently with the filing of any suit in any court of law or equity by the Commissioner or Grantee or any assignee to enforce any of the terms of this Water Development Easement.
9. Grantee, with the consent of the Commissioner, may assign this Water Development Easement, in whole or in part; provided, however, that no assignment of any undivided interest in the Water Development Easement or any part thereof, or any assignment of less than a legal subdivision, shall be recognized or approved by the Commissioner. Upon approval of the assignment, in writing, by the Commissioner, Grantee shall stand relieved from all obligations to the Commissioner with respect to the lands embraced in the assignment, and the Commissioner shall likewise be relieved from all obligations to the assignor as to such tracts, and the assignee shall succeed to all of the rights and privileges of the assignor with respect to such tracts and shall be held to have assumed all of the duties and obligations of the assignor to the Commissioner as to such tracts.
10. The Commissioner may cancel this Water Development Easement for nonpayment of the annual consideration or for violation of any of the terms and covenants, herein; provided, however that before any such cancellation shall be made, the Commissioner must mail to the Grantee, by certified mail, addressed to the post office address of Grantee, shown by the records, a thirty day notice of intention to cancel said water easement, specifying the default for which the Water Development Easement is subject to cancellation. No proof of receipt of notice shall be necessary and thirty days after such mailing the Commissioner may enter cancellation unless Grantee shall have sooner remedied the default.
11. Grantee shall furnish copies of records and such reports and plats of his operation, including but not limited to well logs, drill cores, and other data relating to hydrology and geological formations as the Commissioner may reasonably deem necessary to his administration of the lands.
12. Grantee may make or place such improvements and equipment upon the granted land as may reasonably be necessary to appropriate the water, and upon termination of this Water Development Easement for any reason, Grantee may remove such improvements and equipment as can be removed

without material injury to the premises; provided, however that all sums due the Commissioner have been paid and that such removal is accomplished within (60) days of the termination date or before such earlier date as the Commissioner may set upon thirty (30) days written notice to the Grantee. All improvements and equipment remaining upon the premises after the removal date, as set forth in accordance with this paragraph, shall be forfeited to the Commissioner without compensation. It is expressly understood and agreed that water rights are not improvements of the Grantee. All pipelines constructed hereunder shall be buried below plow depth on tillable soils and no well shall be drilled within one-fourth miles of any existing well without the prior written permission of the Commissioner.

13. Well sites shall be limited to 2 1/2 acre tracts, unless unusual circumstances are present which require a larger area in which case the Grantee and Commissioner will agree on appropriate sizes for such well sites. Each well site shall be in a square shape with each border of the square equidistant from the location of the well. Upon a showing by Grantee of the necessity for an irregularly-shaped well site, the Commissioner may authorize a variation from a square-shaped well site. Grantee shall survey each well site and submit a copy of the survey plat to the Commissioner. **Grantee shall post on each well a sign with the Grantee's name, Water Development Easement number, State Land Office well number, State Engineer Office permit number and locations by legal description.** Grantee may fence only that portion of each 2 1/2 acre well site located which is reasonably required to be fenced.

14. This Water development Easement is made subject to all the provisions and requirements applicable thereto which are to be found in various acts of the legislature of New Mexico and the rules of the Commissioner of Public Lands of the State of New Mexico, the same as though they were fully set forth herein, and said laws and rules, so far as applicable to this Water Development Easement, are to be taken as a part hereof.

15. All the obligations, covenants, agreements, rights and privileges of this Water Development Easement shall extend to and be binding and inure to the benefit of the lawful and recognized assigns or successors in interest of the parties hereto.

16. Nothing contained herein shall be constructed as depriving the lawful holder, present or future of any geothermal resources, oil and gas, grazing, mineral, or business lease, or the holder of any water easement or Water Development Easement, present or future, upon the same lands herein embraced of their right to develop water or to use the land to develop and use the water thereupon or therein in accordance with their leases or easements. That is to say, the doctrine of prior appropriation for beneficial use shall prevail and Grantee shall comply with all laws pertaining to, and with all rules and regulations and procedures of, the State Engineer where the State Engineer has assumed jurisdiction over the water.

17. Payment of all sums due hereunder shall be made at the office of the Commissioner of Public Lands, 310 Santa Fe Trail, P.O. Box 1148, Santa Fe, New Mexico 87504-1148.

18. Grantee, including its heirs, assigns, agents and contractors shall at their own expense fully comply with all laws, regulations, rules, ordinances, and requirements of city, county, regional, state and federal authorities and agencies, in all matter and things affecting the premises and operations thereon which may be enacted or promulgated under the governmental police powers pertaining to public health and welfare, including but not limited to conversation, sanitation, aesthetics, pollution, cultural properties, fire, and environment. Such agencies are not to be deemed third party beneficiaries

hereunder; however, this clause is enforceable by the Commissioner as herein provided or as otherwise permitted by law.

19. Grantee shall save and hold harmless, indemnify and defend the State of New Mexico, the Commissioner of Public Lands, and their agents, employees and officers, in their official and individual capacities, from any and all liability claims, losses, or damages arising out of or alleged to arise out of or indirectly connected with the operations of lessee hereunder, off or on the hereinabove described lands, or the presence on said lands of any agent, contractor or subcontractor of Grantee.

20. Prior to commencement of operations under this Water Development Easement, Grantee shall file a good and sufficient bond with the Commissioner in the amount of \$500.00 to secure the payment of such damage as may occur to livestock, range, water, crops or tangible improvements on the subject lands as may be suffered by the Commissioner, a lessee or other person utilizing such lands under an agreement with the Commissioner, by reason of the developments use and occupation of such lands by Grantee. Such bond may be utilized for reclamation of disturbed lands following the operations of Grantee under this easement.

IN WITNESS WHEREOF, the State of New Mexico has hereunto signed and caused its name to be signed by its Commissioner of Public Lands, thereunto duly authorized with the seal of this office affixed, and Grantee has signed this agreement to be effective the day and year above written.

(SEAL)

STATE OF NEW MEXICO

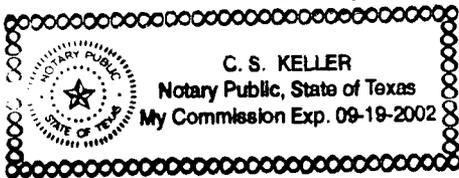
COMMISSIONER OF PUBLIC LANDS
Unocal Corporation

GRANTEE

BY: *[Signature]*

TITLE: *Unocal RR Project Manager*

Subscribed and sworn to before me this 13 day of SEP. 2001.



MY COMMISSION EXPIRES

[Signature]
NOTARY PUBLIC

IT Corporation
2790 MossSide Boulevard
Monroeville, PA 15146-2792
A Member of The IT Group

Fleet Maine N.A. CHECK NUMBER **4068643**

CHECK AMOUNT
04068643
52-153
112

VENDOR NUMBER **767852** CHECK DATE **09/05/01**

*****4,200.00

FOUR THOUSAND TWO HUNDRED AND 00/100 *****

TO THE ORDER OF:
NM STATE LAND OFFICE
PO BOX 1148
SANTA FE NM 87504-1148

Anthony J. De...
AUTHORIZED SIGNATURE

AUTHORIZED SIGNATURE

(WARNING) - Original document has a true watermark. Hold to the light to view.

⑈4068643⑈ ⑆011201539⑆ 00802 06278⑈

COMMISSIONER'S OFFICE
Phone (505) 827-5760
Fax (505) 827-5766

ADMINISTRATION
Phone (505) 827-5700
Fax (505) 827-5853

GENERAL COUNSEL
Phone (505) 827-5713
Fax (505) 827-4262

PUBLIC AFFAIRS
Phone (505) 827-1245
Fax (505) 827-5766



COMMERCIAL RESOURCES
Phone (505) 827-5724
Fax (505) 827-6157

MINERAL RESOURCES
Phone (505) 827-5744
Fax (505) 827-4739

ROYALTY MANAGEMENT
Phone (505) 827-5772
Fax (505) 827-4739

SURFACE RESOURCES
Phone (505) 827-5793
Fax (505) 827-5711

**New Mexico State Land Office
Commissioner of Public Lands
Ray Powell, M.S., D.V.M.**

August 15, 2001

RECEIVED
AUG 20 2001
BEN F. TERRY

Unocal Corporation
P.O. Box 1283
Nederland, TX 77627

Attn: Ben F. Terry

Re: Water Development Easement No. **WD-106**

Dear Mr. Terry:

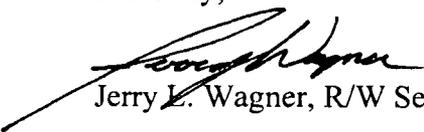
Please sign the enclosed grant of Water Development easement in the presence of a Notary Public and return it back to this office for approval. The grant must be signed by the applicant(s) or a person authorized to sign for the applicant, such as an officer or authorized agent of the company or corporation. **BOTH COPIES MUST BE RETURNED.**

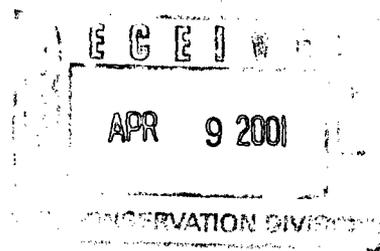
Please **DO NOT DATE THE GRANT, OR MARK THE GRANT IN ANY WAY.** It will be dated when the Commissioner's signature and official seal are affixed to the document.

Also, please remit the additional amount of **\$4,200.00**, to the New Mexico State Land Office this amount is based on \$300.00 per well and the following wells in trespass (MW-1 1995 to 2001 = \$2,100.00, MW-2, 3, 4 1999 to 2001 = \$900.00, MW-5 & 6 2000 to 2001 = \$1,200.00.)

If any corrections are necessary, notify this office and we will retype or amend the grant as required. If we can be of further assistance do not hesitate to contact this office at the above address or call us at either (505) 827-5728 or 5729.

Sincerely,


Jerry L. Wagner, R/W Section
Surface Resources Division



Trident Environmental
P. O. Box 1545
Midland, Texas 79711
(915) 638-3106

April 6, 2001

Mr. Bill Olson
New Mexico Oil Conservation Division
Environmental Bureau
2040 S. Pacheco
Santa Fe, New Mexico 87505

Re: CASE #1R0277
GROUNDWATER REMEDIATION PLAN
FORMER UNOCAL SOUTH VACUUM UNIT

Dear Mr. Olson:

Trident Environmental (formerly the Environmental Services Unit of TRW Inc. – Midland, Texas) was retained by Unocal Corporation (Unocal) to propose the option of preparing an alternate remediation plan for the above-referenced site as requested in your letter dated February 8, 2001. We request that this letter and the “UNOCAL CORPORATION, GROUNDWATER REMEDIATION PLAN, FORMER UNOCAL SOUTH VACUUM UNIT, LEA COUNTY, NEW MEXICO” submitted on November 2, 2000, be accepted as Unocal’s proposal for an alternate remediation plan.

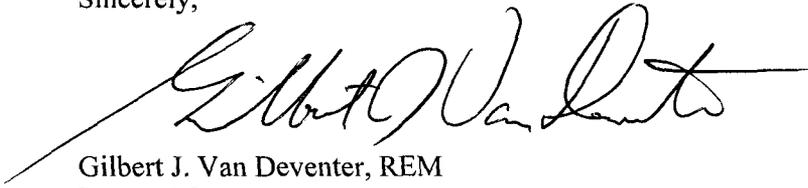
Based on the identified potential receptor and fate and transport modeling results; there is low risk to human health and the environment. Total dissolved solids (TDS) and chloride concentrations in monitoring well MW-1 have been decreasing since the August 13, 1997 sampling event. TDS and chloride concentrations in MW-4 have also declined since the previous sampling event in September 1999. This trend supports the conclusion that the pit closure operations conducted in 1995 were successful in eliminating any continued source of TDS and chlorides into the groundwater and that the plume is attenuating and dissipating naturally. Therefore, Unocal would like to implement the previously submitted remediation plan with the revised and additional actions for groundwater remediation listed below.

- Implement a natural attenuation monitoring program that includes annual groundwater sampling and analysis of chloride and TDS concentrations for each of the six monitoring wells for two years or until New Mexico Water Quality Control Commission (WQCC) standards are met.
- After each year of monitoring, recalibrate the flow and transport model to confirm the plume is naturally attenuating as described in the November 2, 2000 groundwater remediation plan.
- Submit annual monitoring reports to OCD to document natural attenuation conditions.
- After 2 years of monitoring, re-evaluate whether monitoring should be continued, a petition for alternate abatement standards be submitted, or a pump and dispose remediation system be installed.
- During the monitoring program, Unocal will install a point-of-use filtering system for any future water supply wells (public, domestic, livestock, and/or irrigation) that may be constructed and potentially impacted from the subject chloride/TDS plume.

Mr. Bill Olson
New Mexico Oil Conservation Division
April 6, 2001

Unocal is prepared to proceed with the proposed alternate groundwater remediation plan as recommended by Trident Environmental upon approval from the OCD. Please contact Ben Terry of Unocal at (409) 724-3291 with any questions or comments.

Sincerely,



Gilbert J. Van Deventer, REM
Project Manager

xc: Ben F. Terry, Jr., C.P.G., Unocal Corporation – Nederland, TX
Kevin W. Behrens, IT Group – Houston, TX
Chris Williams, NMOCD – Hobbs, NM
Myra Meyers, NM State Land Office – Hobbs, NM

D:\SOUTH VACUUM\ALTGWREMP\PLAN.DOC

Unocal Corporation
P.O. Box 1283 (Highway 366)
Nederland, Texas 77627-1283
Telephone (409) 724-3291
Facsimile (409) 724-3219
E-Mail bferry@Unocal.com

MC: 059-01

SENT VIA AIRBORNE EXPRESS (AIRBILL # 6102805461)

UNOCAL 

01 JUL -9 PM 1:37

Ben F. Terry, C.P.G.
Project Manager
Real Estate and Remediation

June 29, 2001

Commissioner of Public Lands
Attention: Ms. Debra A. Padilla
Manager, R/W
Surface Resources Division
P.O. Box 1148
Santa Fe, NM 87504-1148

**SUBJECT: APPLICATION FOR WATER EASEMENT
SOUTH VACUUM UNIT SITE
NEAR HOBBS, NEW MEXICO**

Dear Ms. Padilla:

Enclosed please find a completed application for a Water Easement with the appropriate fees (\$1,830.00) in accordance with your letter to Unocal dated May 8, 2001 (copy attached). Please note that Unocal requests that the penalty amount of \$300.00 per monitoring well be waived for the following reasons:

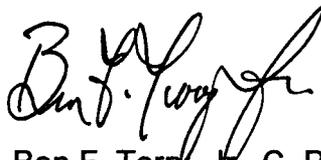
- Unocal was unaware that this matter would be considered a trespass by the State of New Mexico since the Oil Conservation Division (OCD) directed and approved the installation of the six monitoring wells. Furthermore, the OCD did not advise Unocal that it would be necessary to apply for a water easement.
- Unocal was of the understanding that the water development application applies only to groundwater extracted as a commodity for beneficial use (e.g., stock wells, domestic and municipal water supply wells, irrigation wells, etc.) and not for monitoring wells that are used to obtain water quality data (no significant amount of water is extracted).
- Unocal would have come forward on their own behalf had it been known that the water easement applies to monitoring wells.

File: 9924770\CORRESP

Application For Water Easement
Page 2
June 29, 2001

Unocal has taken a very proactive approach and has been in compliance with all OCD directives regarding this site. Unocal appreciates the opportunity to handle this matter nonjudicially per the requirements you have set forth. If you have any questions, please do not hesitate to contact me at (409) 724-3291.

Sincerely,



Ben F. Terry, Jr., C. P. G.
Project Manager
Unocal Real Estate and Remediation

x:\bft\word\South Vacuum Unit 1 6 01.doc

Attachments (3)

Application For Water Easement

\$1,830 Check (# 111900659 2002339448 002)

Copy of NMSLO COPL Letter to Unocal dated 5/8/2001

xc: Myra Meyers, State Land Office, Hobbs, NM
Bill Olson, Oil Conservation Division, Santa Fe, NM
Paul Sheeley, Oil Conservation Division, Hobbs, NM
Kevin Behrens, IT Group, Houston, TX
Gilbert J. Van Deventer, Trident Environmental, Midland, TX



State of New Mexico
COMMISSIONER OF PUBLIC LANDS
310 Old Santa Fe Trail P.O. Box 1148
Santa Fe, New Mexico 87504-1148

APPLICATION FOR WATER EASEMENT

June 29, 2001

To: Commissioner of Public Lands
P.O. Box 1148
Santa Fe, NM 87504-1148

Dear Sir/Madam:

I, Ben F. Terry, Jr., Environmental Project Manager for Unocal (Unocal Corporation) Real Estate and Remediation, and a resident of Nederland, State of Texas, hereby submit an application for a Water Easement under the laws of the State of New Mexico rules and regulations of the State Land Office, for a term of 5 years from the date of expiration of the aforementioned water easement(s). I submit herewith a \$30.00 application fee, together with an estimate of all equipment and facilities placed on the property in conjunction with the water easement activities and the first year's rental offer of not less than \$300.00 for each well authorized by the easements, or for each water easement being renewed, whichever sum is greater.

The land covered by this application for renewal is contiguous and fully described as follows:

SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec 36, Township 18 South, Range 35 East
NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec 36, Township 18 South, Range 35 East
NE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec 01, Township 19 South, Range 35 East

The following information is provided for each well or diversion facility located within the boundaries of the water easement:

LOCATION	CAPACITY OF WELLS	DATE OF APPROPRIATION	EXPECTED VOLUME OF USE
18S 35E 36 330(MW-1)	N/A	1995	< 100 gallons per year
18S 35E 36 330(MW-2)	N/A	1999	< 100 gallons per year
18S 35E 36 330(MW-4)	N/A	1999	< 100 gallons per year
18S 35E 36 330(MW-5)	N/A	1999	< 100 gallons per year
18S 35E 36 310(MW-3)	N/A	2000	< 100 gallons per year
19S 35E 01 110(MW-6)	N/A	2000	< 100 gallons per year

1a. If the New Mexico State Engineer has designated and assigned a file numbers for the water rights upon which the listed appropriations are based, please list the State Engineers water rights file number(s): N/A

1b. If the New Mexico State Engineer has not designated or assigned a file number to these appropriations, please indicate the first date of appropriation for each diversion listed above, and any changes in place or purpose of appropriation and use of the water resources which have material effects on any water right claims can be associated with the above listed appropriations. See above.

2. State fully the purpose of water use for which this renewal application is filed: Monitoring wells used for periodic groundwater sampling as directed by the New Mexico Oil Conservation Division.

3. List all equipment and facilities now located on the above designated lands in associations with the water easement activities, and the current estimated value of said property:

EQUIPMENT/FACILITIES	LAND DESCRIPTION	ESTIMATED VALUE
6 monitoring wells constructed of 2-inch diameter Schedule 40 PVC well casing and 0.010-inch slotted screen	Range land and oil & gas exploration & production leased land	\$2000/monitoring well (\$12,000 total)

4. List all new equipment and facilities which are anticipated to be located within the boundaries of the above designated lands in association with the continued operation of this water easement during the term of renewal applied for herein, and the expected cost of said property: None anticipated

5. Give location of the nearest water well or other water diversion facilities to those listed in this water easement renewal application, and the name of the owner of these facilities: Windmill (L 05339) used for stock watering purposes located on state owned land 3,000 feet south of monitoring well MW-1

6. Do you intend to sublet this water easement? YES ____ NO X

7. Do you intend to sell water produced from the above listed facilities to other users outside the boundaries of the land sought for water easement renewal and listed above? YES ____ NO X

If yes, list all expected buyers of water by type and location of use. (Note: If water easement serves municipal water systems, list only "municipal users" and "within [name of municipality] incorporated boundaries.")

TYPE OF MUNICIPAL USER

LOCATION OF USE

8. List any additional information relative to the land applied for, or use of same, not covered by the above statements _____

9. If water easement is granted, can you provide adequate bond to reclaim all surface damages, which could result from activities undertaken under this easement? Yes

10. If a water easement is granted, do you agree to furnish grantor copies of records and such reports and plats of your operations including, but not limited to well logs, drill cores, and other data

COMMISSIONER'S OFFICE
Phone (505) 827-5760
Fax (505) 827-5766

ADMINISTRATION
Phone (505) 827-5700
Fax (505) 827-5853

GENERAL COUNSEL
Phone (505) 827-5713
Fax (505) 827-4262

PUBLIC AFFAIRS
Phone (505) 827-1245
Fax (505) 827-5766

May 8, 2001



COMMERCIAL RESOURCES
Phone (505) 827-5724
Fax (505) 827-6157

MINERAL RESOURCES
Phone (505) 827-5744
Fax (505) 827-4739

ROYALTY MANAGEMENT
Phone (505) 827-5772
Fax (505) 827-4739

SURFACE RESOURCES
Phone (505) 827-5793
Fax (505) 827-5711

**New Mexico State Land Office
Commissioner of Public Lands
Ray Powell, M.S., D.V.M.**

Unocal Corporation
P.O. Box 1283
Highway 266
Nederland, Texas 77627

RECEIVED
MAY 14 2001
BEN F. TERRY

Attn: Ben Terry

Re: Trespass Monitoring Wells

Dear Mr. Terry:

We have been informed that you have installed six monitoring wells within the following state trust lands:

**Section 36, Township 18 South, Range 35 East
SW4SW4: MW-1, 2, 4, & 5
NW4SW4: MW-3
Section 1, Township 19 South, Range 35 East
NE4NW: MW-6**

Be advised that this constitutes a trespass and in accordance, the Commissioner at this time has elected to remedy the trespass nonjudicially by offering you the opportunity to ratify the unauthorized use. Please submit a water development application. The rental amount to be remitted is based on \$300.00 per well along with the penalty amount of \$300.00 per well for the unauthorized use of the state trust lands. This fee must be received in this office by no later than **June 30, 2001**.

If this matter cannot be remedied as has been stated, then other sanctions may be sought and enforced.

If you have any questions, please do not hesitate to contact this office at the above address or you may call us at (505) 827-5728 or 5729, or you may come by and see us personally.

Sincerely,

A handwritten signature in cursive script that reads "Debra A. Padilla".

Debra A. Padilla, Manager, R/W
Surface Resources Division

Olson, William

From: Gilbert J Van Deventer [SMTP:kickbooty@juno.com]
Sent: Monday, June 11, 2001 11:23 AM
To: wolson@state.nm.us; PSheeley@state.nm.us
Cc: mmeyers@slo.state.nm.us; jmfergerson@clearsource.net;
kbehrens@theitgroup.com; bferry@unocal.com
Subject: Groundwater sampling-S. Vacuum Unit

The next groundwater sampling event for the former Unocal South Vacuum Unit has been scheduled for Tuesday, June 19th.

Six monitoring wells (MW-1 through MW-6) will be gauged for depth to groundwater and purged of a minimum of 3 well volumes of water prior to collecting groundwater samples. The water samples will be analyzed for chlorides and total dissolved solids by SPL Laboratories in Houston, TX. A groundwater sampling event report will be forwarded to the OCD within 30 days of receipt of analytical results.

Please feel free to contact me if you have any questions.

Sincerely,

Gilbert J. Van Deventer, REM
Trident Environmental
Office: 915-682-0808
Fax: 915-682-0727
Mobile: 915-638-3106



NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON

Governor

Jennifer A. Salisbury

Cabinet Secretary

Lori Wrotenbery

Director

Oil Conservation Division

February 8, 2001

CERTIFIED MAIL

RETURN RECEIPT NO. 5051-4102

Mr. Ben F. Terry, Jr.
Unocal Corporation
P.O. Box 1283
Nederland, Texas 77627

**RE: CASE #1R0277
GROUND WATER REMEDIATION PLAN
UNOCAL SOUTH VACUUM PIT**

Dear Mr. Terry:

The New Mexico Oil Conservation Division (OCD) has reviewed Unocal Corporation's (Unocal) November 2, 2000 "UNOCAL CORPORATION, GROUNDWATER REMEDIATION PLAN, FORMER UNOCAL SOUTH VACUUM UNIT, LEA COUNTY, NEW MEXICO" which was submitted on behalf of Unocal by their consultant TRW Systems & Information Technology Group. This document contains Unocal's plan for remediation of ground water contamination related to Unocal's former South Vacuum Field pit.

The remediation plan as set forth in the above referenced document proposes to remediate ground water to an alternate standard other than those set forth in OCD Rule 19.B.(2). Alternate abatement standards can be considered at any time during or after the submission of a Stage 2 Abatement Plan pursuant to OCD Rule 19.B.(6). However, this site is currently exempt from the formal abatement plan process according to OCD Rule 19.D.(1)(f). If Unocal wants the OCD to consider alternate abatement standards for the site, Unocal must notify the OCD that they wish to complete remedial actions according to OCD Rule 19 and file a Stage 2 Abatement Plan which includes a petition, pursuant to OCD Rule 19.B.(6), seeking alternate abatement standards. Please be aware that alternate abatement standards can only be approved after a public hearing in front of the New Mexico Oil Conservation Commission.

The OCD requires that, by April 8, 2001, Unocal shall either file a Stage 2 Abatement Plan Proposal, pursuant to OCD Rule 19.E.(4) which includes a petition for alternate abatement standards, pursuant to OCD Rule 19.B.(6); or, submit an alternate remediation plan for the site.

If you have any questions or comments, please contact Bill Olson at (505) 476-3491.

Sincerely,

A handwritten signature in cursive script, appearing to read "Roger C. Anderson".

Roger C. Anderson
Environmental Bureau Chief

RCA/wco

xc: Chris Williams, OCD Hobbs District Office
Gilbert J. Van Deventer, TRW



NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
Jennifer A. Salisbury
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

September 5, 2000

CERTIFIED MAIL
RETURN RECEIPT NO. 5051-3563

Mr. Ben F. Terry, Jr.
Unocal Corporation
P.O. Box 1283
Nederland, Texas 77627

**RE: GROUND WATER INVESTIGATIONS
UNOCAL SOUTH VACUUM PIT**

Dear Mr. Terry:

The New Mexico Oil Conservation Division (OCD) has reviewed Unocal Corporation's (Unocal) July 18, 2000 "REPORT OF ADDITIONAL GROUNDWATER INVESTIGATION, FORMER UNOCAL SOUTH VACUUM UNIT, LEA COUNTY, NEW MEXICO" which was submitted on behalf of Unocal by their consultant TRW Energy and Environmental Systems. This document contains the results of Unocal's recent investigation of the extent of ground water contamination related to the former South Vacuum Field pit. The document also contains a proposal for long term ground water monitoring.

The investigation actions taken to date are satisfactory and the above referenced ground water monitoring plan is approved with the condition that Unocal submit a ground water remediation plan which will result in the attainment of the abatement standards and requirements set forth in OCD Rule 19.B. The plan shall be submitted to the OCD Santa Fe Office by November 5, 2000 with a copy provided to the OCD Hobbs District Office.

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

Sincerely,

William C. Olson
Hydrologist
Environmental Bureau

xc: Chris Williams, OCD Hobbs District Office
Gilbert J. Van Deventer, TRW

Olson, William

From: Olson, William
Sent: Tuesday, July 18, 2000 8:08 AM
To: 'Gilbert J. Van Deventer'
Subject: RE: Purge water at South Vacuum

The OCD approves of disposing of any purge water onsite that contains contaminants at a concentration that is less than the WQCC ground water standards. Any purge water that contains contaminants at a concentration above WQCC standards must be disposed of at an OCD approved facility.

From: Gilbert J. Van Deventer [SMTP:Gilbert.Vandeventer@trw.com]

Sent: Monday, July 17, 2000 3:10 PM

To: Olson, William

Subject: Purge water at South Vacuum

Would like to request your permission to surface discharge approximately 170 gallons of groundwater that was generated during monitoring well purging operations at the Unocal South Vacuum site in Lea County, NM. BTEX was not detected (< 0.001 mg/l) in any of the six monitoring wells (MW-1 through MW-6). Chlorides ranged from 13.7 mg/l in MW-5 to 1500 mg/l in MW-4. TDS ranged from 274 mg/l in MW-5 to 2910 mg/l in MW-4. First draft of report is complete, will have final copy of report to you by the July 31st deadline.

Olson, William

From: Gilbert J. Van Deventer [SMTP:Gilbert.Vandeventer@trw.com]
Sent: Wednesday, June 07, 2000 1:41 PM
To: Olson, William
Subject: South Vacuum

We have scheduled to install 2 additional monitoring wells at the Unocal South Vacuum site in accordance with the work plan (dated February 3, 2000) and your approval letter (dated May 24, 2000) next week beginning Monday June 12th.

By the way, I would like to request your approval to surface discharge the 220 gallons (approx.) of monitoring well purge water from the last sampling event. Chloride concentrations ranged from 73.6 mg/l in MW3 to 1,576 mg/l in MW4. TDS values ranged from 427 mg/l in MW3 to 2,981 mg/l in MW4. Please advise.



**FACSIMILE
TRANSMISSION**

415 W. Wall St., Ste. 1818
Midland, Texas 79701

DATE: June 7, 2000

TO: Bill Olson
COMPANY: NMOCD

FAX: (505) 827-8177
Phone: (505) 827-7154

FROM: Gil Van Deventer
COMPANY: TRW Inc. (Energy & Environmental Systems)

FAX: (915) 682-0028
Phone: (915) 682-0008

Number of Pages (including cover page): 1

We have scheduled to install 2 additional monitoring wells at the Unocal South Vacuum site in accordance with the work plan (dated February 3, 2000) and your approval letter (dated May 24, 2000) next week beginning Monday June 12th.

cc: Donna Williams, NMOCD - Hobbs District Office

CONFIDENTIALITY NOTICE

The documents accompanying this facsimile transmission contain confidential information belonging to the sender which is legally privileged. The information is intended only for the use of the individual or entity named above. If you are not the intended recipient, you are hereby notified that any disclosure, copying, distribution or the taking of any action in



NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
Jennifer A. Salisbury
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

May 24, 2000

CERTIFIED MAIL
RETURN RECEIPT NO. 5051-3174

Mr. Ben F. Terry, Jr.
Unocal Corporation
P.O. Box 1283
Nederland, Texas 77627

**RE: GROUND WATER INVESTIGATION WORK PLAN
UNOCAL SOUTH VACUUM PIT**

Dear Mr. Terry:

The New Mexico Oil Conservation Division (OCD) has reviewed Unocal Corporation's (Unocal) February 9, 2000 "TRANSMITTAL LETTER, GROUNDWATER INVESTIGATION WORKPLAN, FORMER UNOCAL SOUTH VACUUM UNIT, SOUTH VACUUM OIL FIELD, LEA COUNTY, NEW MEXICO". This document contains Unocal's work plan for additional investigations of the extent of ground water contamination related to the former Unocal South Vacuum Field pit.

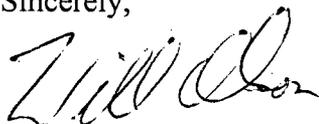
The above referenced work plan is approved with the following conditions:

1. In addition to the sampling parameters proposed, Unocal shall sample and analyze ground water from all site monitoring well for concentrations of benzene, toluene, ethylbenzene and xylene (BTEX) using EPA approved methods and quality assurance/quality control.
2. Unocal shall submit the results of the investigation to the OCD Santa Fe Office by July 31, 2000 with a copy provided to the OCD Hobbs District Office.
3. Unocal shall notify the OCD at least 1 week in advance of all scheduled activities such that the OCD has the opportunity to witness the events and split samples.

Please be advised that OCD approval does not limit Unocal to the proposed work plan should the investigation actions fail to adequately define the extent of contamination related to Unocal's activities, or if contamination exists which is outside the scope of the work plan. In addition, OCD approval does not relieve Unocal of responsibility for compliance with any other federal, state or local laws and regulations.

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

Sincerely,

A handwritten signature in black ink, appearing to read "William C. Olson". The signature is fluid and cursive, with the first name being the most prominent.

William C. Olson
Hydrologist
Environmental Bureau

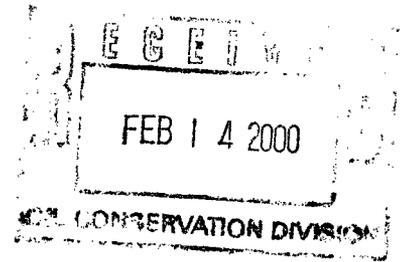
xc: Chris Williams, OCD Hobbs District Office
Gilbert J. Van Deventer, TRW

Unocal Corporation
Highway 366, P.O. Box 128
Nederland, Texas 77627
Telephone (409) 721-4642
Facsimile (409) 724-3219

MC: 011-00

SENT BY U.S. CERTIFIED MAIL, RETURN RECEIPT # Z 329 350 026

UNOCAL 



East Region (Mid-Continent Area)
Asset Management Group

February 9, 2000

Mr. William C. Olson
Hydrologist
Environmental Bureau
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

Dear Mr. Olson:

**SUBJECT: TRANSMITTAL LETTER
GROUNDWATER INVESTIGATION
WORKPLAN
FORMER UNOCAL SOUTH VACUUM UNIT
SOUTH VACUUM OIL FIELD
LEA COUNTY, NEW MEXICO**

Please find enclosed a Groundwater Investigation Workplan for the former Unocal South Vacuum Unit Site in the South Vacuum Oil Field located in Lea County, New Mexico. TRW Systems and Information Technology Group (TRW) prepared the workplan on behalf of Unocal. This delineation investigation workplan was prepared per your letter request of December 23, 1999 (copy of letter attached).

Unocal AMG is prepared to proceed with the proposed delineation investigation upon workplan approval from New Mexico Oil Conservation Division.

Please contact me with any questions or comments. My office phone number is (409) 724-3291 and the office fax is (409) 724-3219.

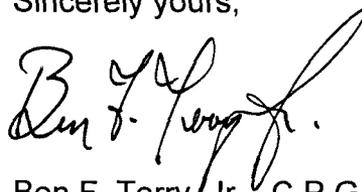
File: 9924770\CORRESP

Transmittal Letter – South Vacuum Unit Workplan

Page 2

February 9, 2000

Sincerely yours,

A handwritten signature in black ink, appearing to read "Ben F. Terry, Jr.", with a large, stylized flourish extending from the end of the signature.

Ben F. Terry, Jr., C.P.G.
AMG Senior Staff Geologist

BFT;bft

Enclosure, 4 pages

Attachment, 1 page

x:\bft\winword\vacuum01.200

xc: C. Williams, OCD Hobbs District Office
G. J. Van Deventer, TRW, Midland, TX
K. W. Behrens, Emcon, Houston, TX
G. R. Morris, Unocal AMG, Parachute, CO



February 3, 2000

Mr. Kevin Behrens
The IT Group
13111 Northwest Freeway, Suite 600
Houston, Texas 77040

Re: Work Plan for Additional Groundwater Investigation
South Vacuum Unit, Lea County, New Mexico

Dear Mr. Behrens:

TRW Inc. appreciates the opportunity to present this work plan to perform additional groundwater investigation activities at the Unocal South Vacuum Unit in Lea County, New Mexico. The costs outlined in this work plan cover the following tasks:

- Completion of two 2-inch diameter monitoring wells to delineate the downgradient (southeast) and cross-gradient (east) extent of chloride- and total dissolved solids- (TDS) impacted groundwater. A diagram of the proposed monitoring well construction details is attached. Also, a site map with the proposed well locations is included.
- Monitoring wells will be completed with at least 5 feet of the well screen above the surface of the water table.
- Provide Unocal a lithologic description and well completion diagram of the subsurface soils encountered, conditions observed, and construction details of each monitoring well.
- Gauge the depth to groundwater in each monitoring well with an electronic water meter
- TRW will wait a minimum of 24 hours after proper development of the newly installed wells (MW-5 and MW-6) to purge and sample groundwater. Groundwater samples will also be collected from existing monitoring wells (MW-1 through MW-4). A minimum of the three saturated well volumes of water will be purged prior to collecting groundwater samples.
- Submit groundwater samples to Southern Petroleum Laboratories (SPL), under contract with Unocal, for analysis of chloride and TDS concentrations from each of six monitoring wells using EPA Methods 325.3 and 160.1, respectively.
- Provide a computer aided drafting map of the site that depicts the groundwater flow direction, hydraulic gradient, and analytical results.
- Provide a brief letter report describing the monitoring well construction, groundwater sampling activities, analytical results, and conclusions of the investigation.

- Pending analytical review and approval of the OCD, all purge water generated after well sampling activities will be discharged to the ground surface.

It is assumed that the requirement for landowner notification is satisfied if Bill Olson of the New Mexico Oil Conservation Division (OCD) approves of this work plan since the state owns the land rights. The scope of work outlined above assumes that the site and off-site areas will be accessible to TRW and drilling contractor personnel. Also, a minimum of one-week notice from Unocal will be necessary so that the OCD and *New Mexico One Call System* (subsurface line locations) can be notified of the work being conducted.

Compensation

TRW estimates the following costs for performing the tasks outlined above at the South Vacuum Unit:

Task Number and Description	
Task 1: Prepare Groundwater Investigation Work Plan for South Vacuum Unit Site	N/C
Task 2: Install Two 2-inch diameter Monitoring Wells at South Vacuum Unit Site	\$9,256
Task 3: Prepare Groundwater Investigation Report for South Vacuum Unit Site	\$2,425
Total	\$11,681

TRW is prepared to proceed on a time and materials basis for an estimated total of \$ 11,681 as summarized above. This estimate does not include applicable state taxes (New Mexico Gross Receipts Tax). Rates are based on the attached 1999 Fee Schedule. If you find the services described in this proposal acceptable, you may authorize TRW to proceed by signing the attached notice to proceed forms and returning one original to TRW. Thanks again for the opportunity to work with you on this project. Please feel free to call me if you have any other questions.

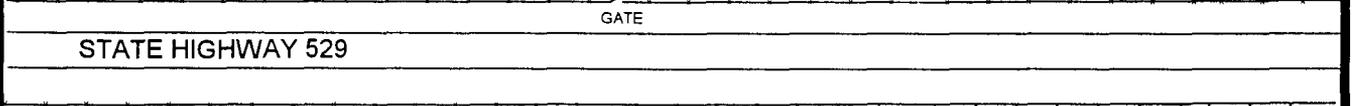
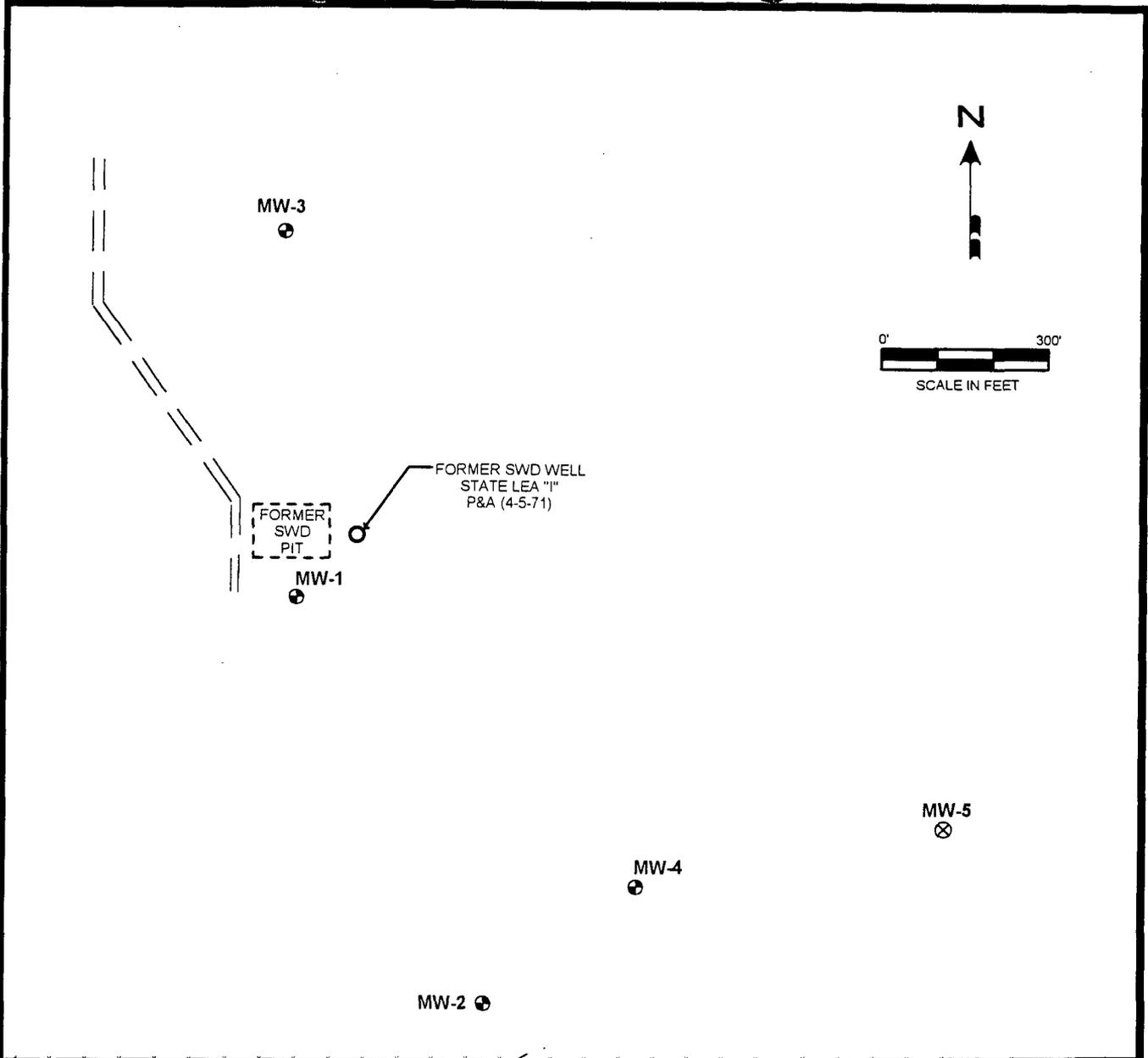
Sincerely,



Gilbert J. Van Deventer, REM
Project Manager

Attachment

xc: Ben Terry, Jr., Unocal AMG, Nederland, TX
Connie Feery - TRW, Albuquerque, NM



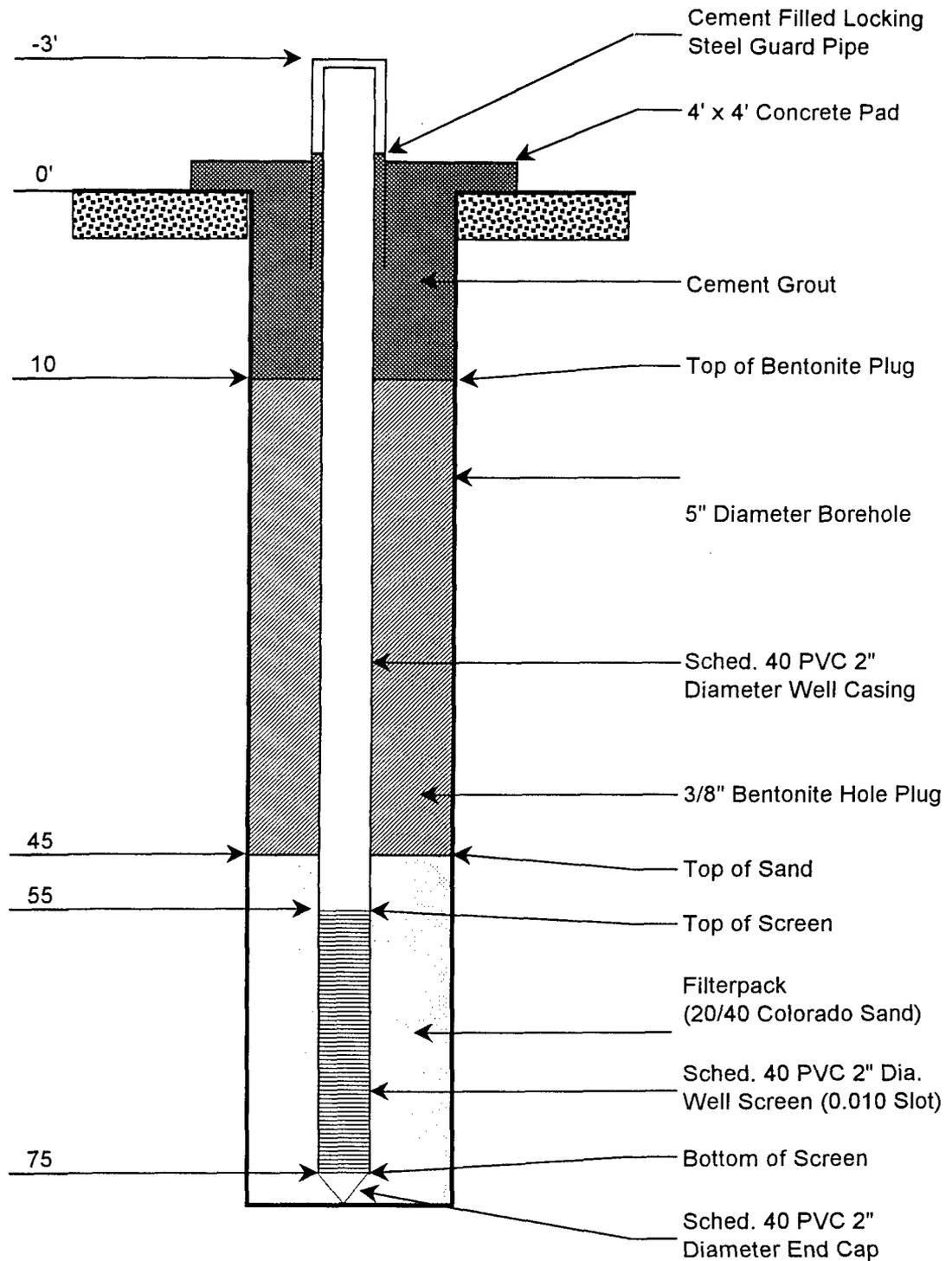
LEGEND	
MW-2 ●	Existing Monitoring Well Location
MW-5 ⊗	Proposed Monitoring Well Location



SITE: UNOCAL SOUTH VACUUM UNIT	
DATE: 02/03/00	REV. NO.: 013100
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	FILE: VACUUM.TCW

FIGURE 1
PROPOSED
MONITORING WELL
LOCATIONS

MONITORING WELL CONSTRUCTION DIAGRAM



	SITE: Unocal - South Vacuum Unit		Monitoring Well Construction Diagram
	DATE: 02/03/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	



STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

December 23, 1999

RECEIVED
DEC 28 1999
BEN F. TERRY

CERTIFIED MAIL
RETURN RECEIPT NO. Z-274-520-746

Mr. Ben F. Terry, Jr.
Unocal Corporation
P.O. Box 1283
Nederland, Texas 77627

**RE: GROUND WATER INVESTIGATION WORK PLAN
UNOCAL SOUTH VACUUM PIT**

Dear Mr. Terry:

The New Mexico Oil Conservation Division (OCD) has reviewed Unocal Corporation's (Unocal) October 20, 1999 "GROUNDWATER INVESTIGATION REPORT, SOUTH VACUUM UNIT, LEA COUNTY, NEW MEXICO" which was submitted on behalf of Unocal by their consultant TRW Energy and Environmental Systems. This document contains the results of Unocal's recent investigation of the extent of ground water contamination related to the former South Vacuum Field pit.

The investigation actions taken to date are satisfactory. However, the investigations did not define the extent of contamination which is excess of New Mexico Water Quality Control Commission (WQCC) standards. Therefore, the OCD requires that Unocal submit an investigation work plan to define the extent of ground water contamination related to Unocal's activities. The work plan will be submitted to the OCD Santa Fe Office by February 25, 2000 with a copy provided to the OCD Hobbs District Office.

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

Sincerely,

A handwritten signature in black ink that reads "Will Olson".

William C. Olson
Hydrologist
Environmental Bureau

xc: Chris Williams, OCD Hobbs District Office
Gilbert J. Van Deventer, TRW



STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

December 23, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. Z-274-520-746

Mr. Ben F. Terry, Jr.
Unocal Corporation
P.O. Box 1283
Nederland, Texas 77627

**RE: GROUND WATER INVESTIGATION WORK PLAN
UNOCAL SOUTH VACUUM PIT**

Dear Mr. Terry:

The New Mexico Oil Conservation Division (OCD) has reviewed Unocal Corporation's (Unocal) October 20, 1999 "GROUNDWATER INVESTIGATION REPORT, SOUTH VACUUM UNIT, LEA COUNTY, NEW MEXICO" which was submitted on behalf of Unocal by their consultant TRW Energy and Environmental Systems. This document contains the results of Unocal's recent investigation of the extent of ground water contamination related to the former South Vacuum Field pit.

The investigation actions taken to date are satisfactory. However, the investigations did not define the extent of contamination which is excess of New Mexico Water Quality Control Commission (WQCC) standards. Therefore, the OCD requires that Unocal submit an investigation work plan to define the extent of ground water contamination related to Unocal's activities. The work plan will be submitted to the OCD Santa Fe Office by February 25, 2000 with a copy provided to the OCD Hobbs District Office.

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

Sincerely,

A handwritten signature in black ink that reads "William C. Olson".

William C. Olson
Hydrologist
Environmental Bureau

xc: Chris Williams, OCD Hobbs District Office
Gilbert J. Van Deventer, TRW



STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

August 19, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. Z-274-520-702

Mr. Ben F. Terry, Jr.
Unocal Corporation
P.O. Box 1283
Nederland, Texas 77627

**RE: GROUND WATER INVESTIGATION WORK PLAN
UNOCAL SOUTH VACUUM PIT**

Dear Mr. Terry:

The New Mexico Oil Conservation Division (OCD) has reviewed Unocal Corporation's (Unocal) July 9, 1999 "TRANSMITTAL LETTER, GROUNDWATER INVESTIGATION WORKPLAN, FORMER UNOCAL SOUTH VACUUM UNIT, SOUTH VACUUM OIL FIELD, LEA COUNTY, NEW MEXICO". This document contains Unocal's work plan for investigation of the extent of ground water contamination related to the former Unocal South Vacuum Field pit.

The above referenced work plan is approved with the following conditions:

1. Unocal shall install an additional ground water monitoring well to delineate the extent of contamination. The additional well shall be installed at the location shown on the attached figure.
2. Unocal shall complete all monitor wells with at least 5 feet of the well screen above the surface of the water table.
3. All monitor wells shall be properly developed upon completion.
4. Unocal shall wait a minimum of 24 hours after development of the monitor wells to purge and sample ground water.
5. Unocal shall submit the results of the investigation to the OCD Santa Fe Office by October 22, 1999 with a copy provided to the OCD Hobbs District Office.
6. Unocal shall notify the OCD at least 72 hours in advance of all scheduled activities such that the OCD has the opportunity to witness the events and split samples.

Please be advised that OCD approval does not limit Unocal to the proposed work plan should the investigation actions fail to adequately define the extent of contamination related to Unocal's activities, or if contamination exists which is outside the scope of the work plan. In addition, OCD approval does not relieve Unocal of responsibility for compliance with any other federal, state or local laws and regulations.

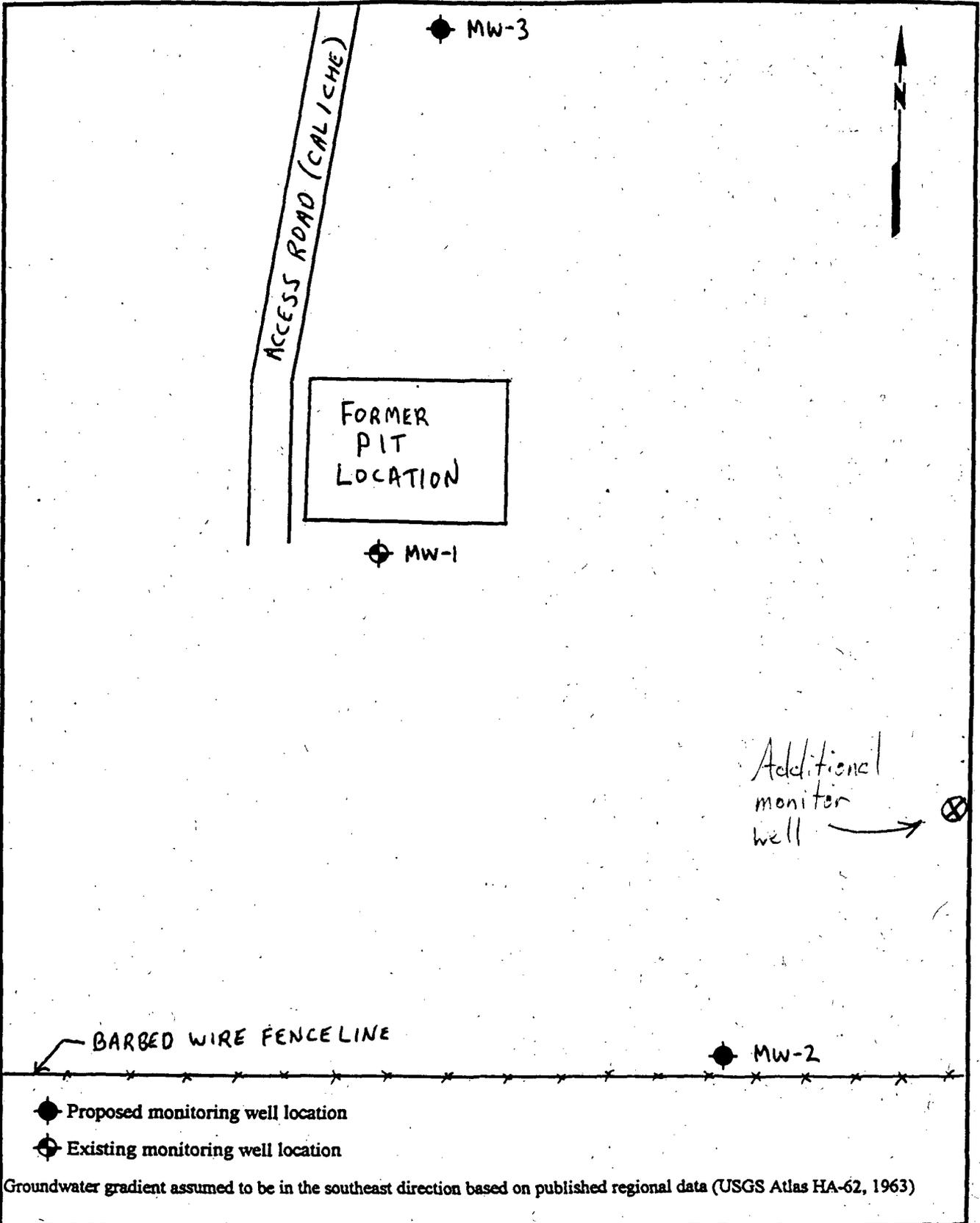
If you have any questions or comments, please contact me at (505) 827-7154.

Sincerely,

A handwritten signature in black ink, appearing to read 'William C. Olson', written in a cursive style.

William C. Olson
Hydrologist
Environmental Bureau

xc: Chris Williams, OCD Hobbs District Office
Gilbert J. Van Deventer, TRW



- Proposed monitoring well location
- ⊗ Existing monitoring well location

Groundwater gradient assumed to be in the southeast direction based on published regional data (USGS Atlas HA-62, 1963)

TRW	SITE: Spirit Energy - South Vacuum Unit		PROPOSED MONITORING WELL LOCATIONS
	DATE: 6/10/99	REV. NO.: 1	
	AUTHOR: GJV	DRN BY: GJV	
	CK'D BY: DTL	SCALE: 1 in = 50 ft	

Unocal Corporation
Highway 366, P.O. Box 128
Nederland, Texas 77627
Telephone (409) 721-4642
Facsimile (409) 724-3219

MC: 065-99

SENT BY U.S. CERTIFIED MAIL, RETURN RECEIPT # Z 409 455 057

UNOCAL 

JUL 12 1999

East Region (Mid-Continent Area)
Asset Management Group

July 9, 1999

Mr. William C. Olson
Hydrologist
Environmental Bureau
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

Dear Mr. Olson:

**SUBJECT: TRANSMITTAL LETTER
GROUNDWATER INVESTIGATION
WORKPLAN
FORMER UNOCAL SOUTH VACUUM UNIT
SOUTH VACUUM OIL FIELD
LEA COUNTY, NEW MEXICO**

Please find enclosed a Groundwater Investigation Workplan for the former Unocal South Vacuum Unit Site in the South Vacuum Oil Field located in Lea County, New Mexico. TRW Systems and Information Technology Group (TRW) prepared the workplan on behalf of Unocal. The workplan was prepared per your letter request of May 14, 1999 (copy of letter attached).

Please be advised that in mid-June Unocal Spirit Energy 76 transferred to Unocal Asset Management Group (AMG) the site environmental project management responsibilities. I am the site AMG Project Manager and will manage the project from the Mid-Continent Region office located in Nederland, Texas. My office phone number is (409) 724-3291 and the office fax is (409) 724-3219. Please contact me with any questions or comments.

Unocal AMG is prepared to proceed with the proposed delineation investigation upon workplan approval from New Mexico Oil Conservation Division.

File: SouthVacuumUnit\CORRESP

Transmittal Letter – South Vacuum Unit Workplan

Page 2

July 9, 1999

Sincerely yours,

A handwritten signature in black ink, appearing to read "Ben F. Terry, Jr." with a stylized flourish at the end.

Ben F. Terry, Jr., C.P.G.
AMG Senior Staff Geologist

BFT;bft
Enclosure
Attachment

x:\bft\winword\vacuum01.799

xc: C. Williams, OCD Hobbs District Office
G. J. Van Deventer, TRW, Midland, TX
K. W. Behrens, Emcon, Houston, TX
G. R. Morris, Unocal AMG, Parachute, CO



TRW Systems & Information 415 West Wall Street, Suite 1818
Technology Group Midland, TX 79701

TRW/MID-GJV-PRO17-99

June 10, 1999

Mr. Rick Sisk
Spirit Energy 76
14141 Southwest Freeway
Sugar Land, Texas 77478

Re: Work Plan and Proposal for Groundwater Investigation at South Vacuum Unit
Lea County, New Mexico

Dear Mr. Sisk:

TRW Inc. appreciates the opportunity to present this work plan and proposal to perform a groundwater investigation at the South Vacuum Unit in Lea County, New Mexico. The costs outlined in this work plan and proposal cover the following tasks:

- Completion of two 2-inch diameter monitoring wells to delineate the upgradient and downgradient extent of chloride- and total dissolved solids- (TDS) impacted groundwater. A diagram of the proposed monitoring well construction details is attached. Also, a hand-drawn map of the site with the proposed well locations is included.
- Provide Spirit Energy a lithologic description and well completion diagram of the subsurface soils encountered, conditions observed, and construction details of each monitoring well.
- Gauge the depth to groundwater in each monitoring well with an electronic water meter
- Purge a minimum of the three saturated well volumes of water and obtain groundwater samples after well construction has been completed.
- Contract with a laboratory to analyze the chloride and TDS concentrations from each of three monitoring wells using EPA Methods 325.3 and 160.1, respectively.
- Provide a computer aided drafting map of the site that depicts the groundwater gradient and analytical results.
- Provide a brief (two page) letter report describing the monitoring well construction, groundwater sampling activities, analytical results, and conclusions of the investigation.

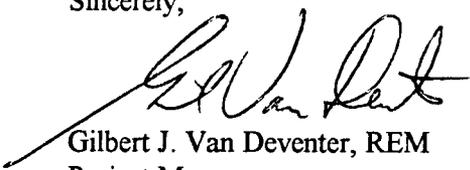
Compensation

TRW estimates the following costs for performing the tasks outlined above at the South Vacuum Unit:

TRW Labor:	Project management, drilling oversight, gauging, sampling report preparation, and administrative tasks	\$ 2,725.00
Other Direct Costs:	Sampling supplies, monitoring and gauging equipment, support vehicle, photographic documentation, per diem, and misc.	\$ 341.86
Laboratory:	Chloride and TDS Analyses (3)	\$ 89.70
Drilling Contractor:	Two 2-inch diameter monitoring wells (75-ft depth)	\$ 2,860.63
Surveyor:	Survey elevations of three monitoring wells within 1/100th ft.	\$ 465.75
Total:		\$ 6,482.94

TRW is prepared to proceed on a time and materials basis for an estimated total of \$ 6,500 as summarized above. This estimate does not include applicable state taxes (New Mexico Gross Receipts Tax). Rates are based on the attached 1998 Fee Schedule. If you find the services described in this proposal acceptable, you may authorize TRW to proceed by signing the attached notice to proceed forms and returning one original to TRW. Thanks again for the opportunity to work with you on this project. Please feel free to call me if you have any other questions.

Sincerely,

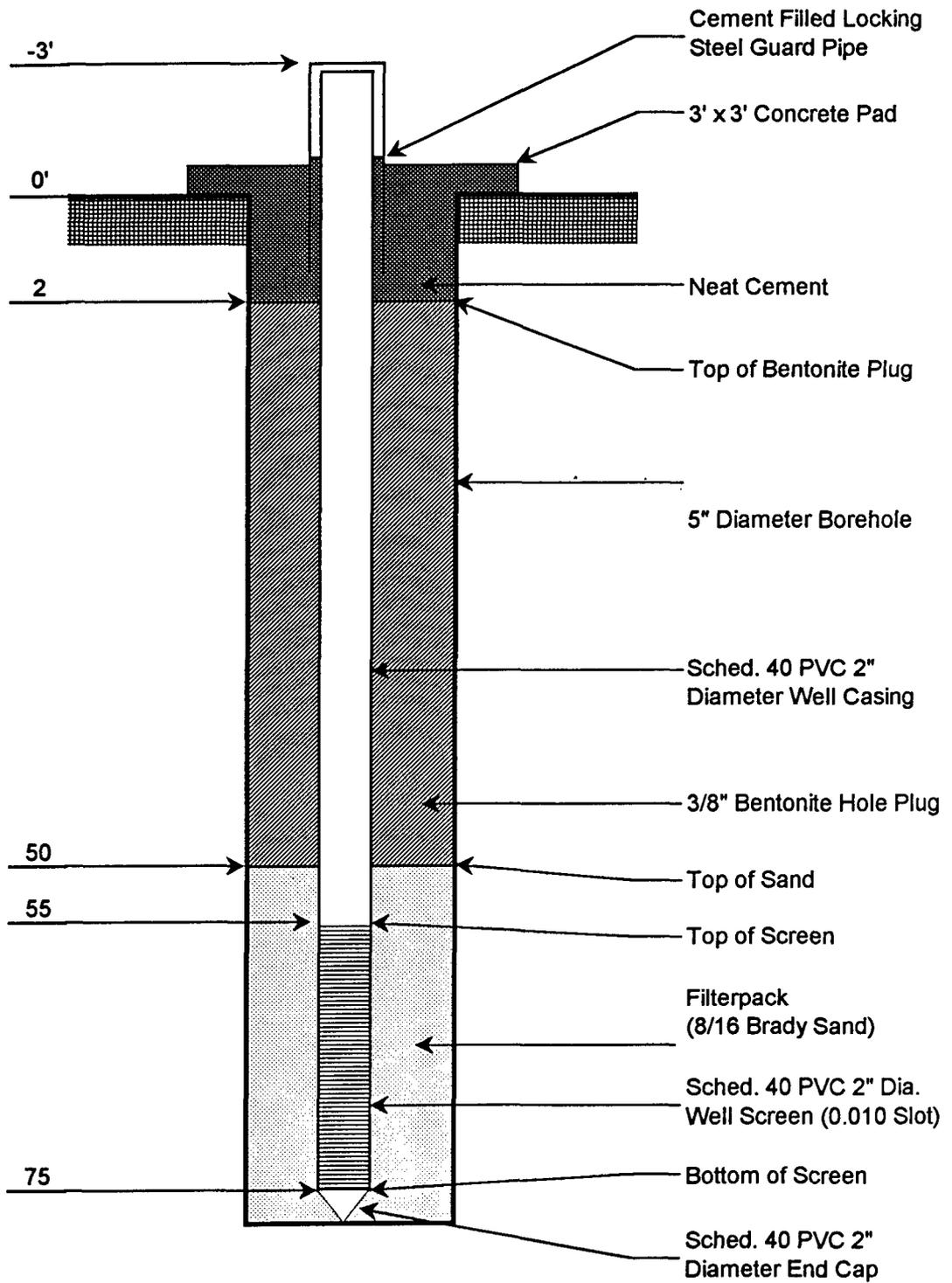


Gilbert J. Van Deventer, REM
Project Manager

Attachment

cc: Connie Feery - TRW, Albuquerque, NM

MONITORING WELL CONSTRUCTION DIAGRAM



TRW

Energy & Environmental Systems

SITE: Spirit Energy - South Vacuum Unit

DATE: 6/10/99

REV. NO.:

1

AUTHOR: GJV

DRAWN BY:

GJV

CK'D BY: DTL

FILE: Well Bore Diagram

**Monitoring Well
Construction Diagram**



TRW Systems & Information Technology Group 415 West Wall Street, Suite 1818
Midland, TX 79701

NOTICE TO PROCEED

With your concurrence in the space provided below, Spirit Energy 76 directs TRW to proceed with the scope of work referenced in our proposal (TRW/MID-GJV-PRO17-99) dated June 10, 1999. TRW is hereby authorized to make expenditures and incur obligations in its performance of the above referenced scope of work.

Two original copies of this document are provided; if your company is in agreement with and accepts this Notice to Proceed, then please have an authorized company representative sign in the space provided below and return one copy of this letter to my attention.

Thank you for your attention to this matter. If you have any questions or need any additional information, please do not hesitate to contact me at (915) 682-0008.

Sincerely,

Gilbert J. Van Deventer, REM
Project Manager

ACCEPTED:

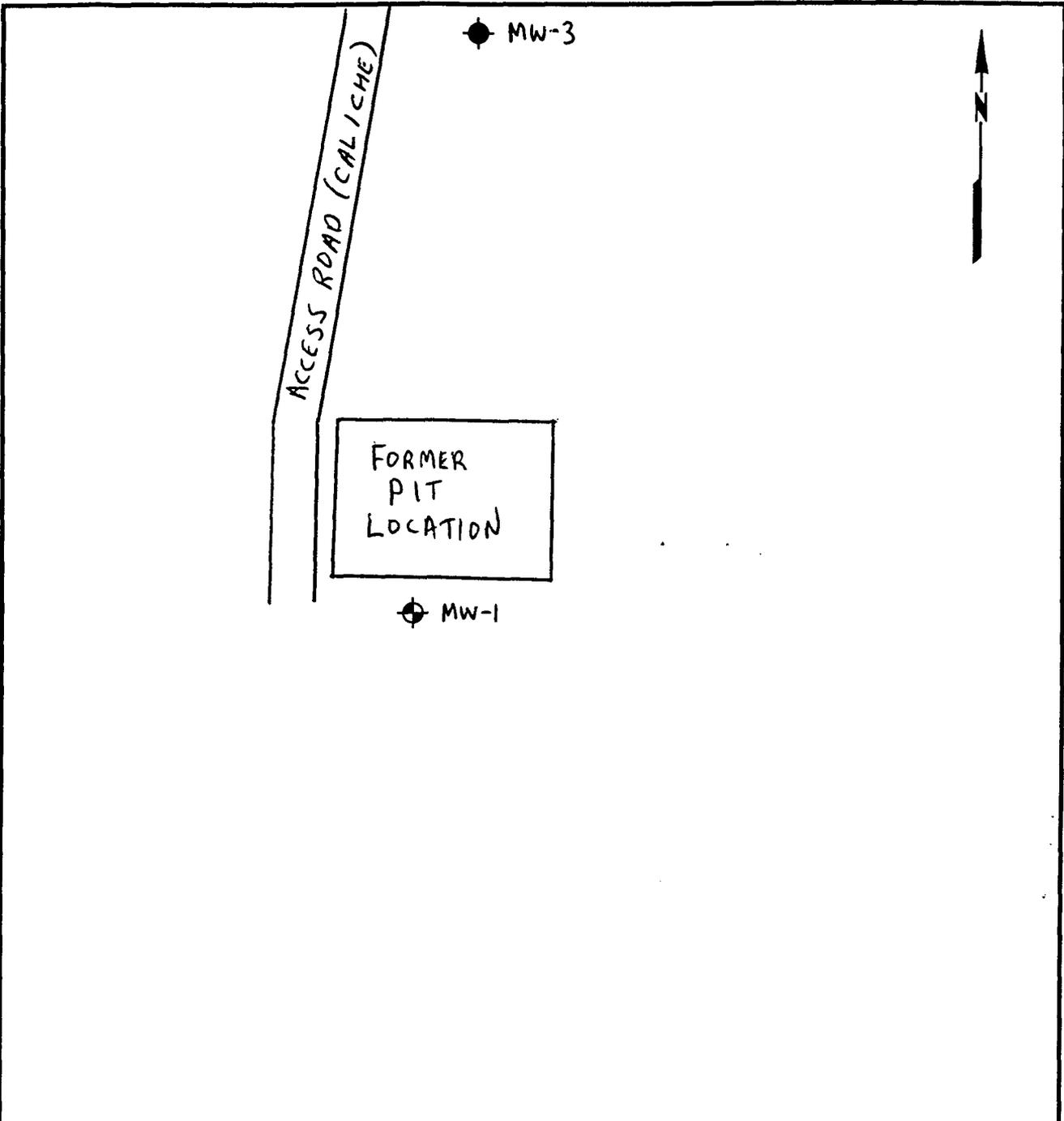
Company Name: Spirit Energy 76

Signature: _____

Printed Name: _____

Title: _____

Date: _____



BARBED WIRE FENCE LINE

- Proposed monitoring well location
- ⊕ Existing monitoring well location

Groundwater gradient assumed to be in the southeast direction based on published regional data (USGS Atlas HA-62, 1963)

TRW	SITE: Spirit Energy - South Vacuum Unit		PROPOSED MONITORING WELL LOCATIONS
	DATE: 6/10/99	REV. NO.: 1	
	AUTHOR: GJV	DRN BY: GJV	
	CK'D BY: DTL	SCALE: 1 in = 50 ft	



STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

May 14, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. Z-274-520-658

Mr. Byron Nanini
Spirit Energy 76
P.O. Box 3100
Midland, Texas 79702

**RE: GROUND WATER INVESTIGATION REQUIREMENT
UNOCAL SOUTH VACUUM PIT**

Dear Mr. Nanini:

The New Mexico Oil Conservation Division (OCD) has reviewed Spirit Energy 76's (Unocal) March 31, 1999 "UNOCAL PIT CLOSURE SOUTH VACUUM, UNIT I - SECTION 35-18S-R35E". This document requests that Unocal continue to monitor the one existing ground water monitoring well at the site of the South Vacuum Pit in lieu of conducting additional ground water investigations as required in the OCD's February 17, 1999 correspondence.

OCD Rule 19 requires that ground water pollution in excess of New Mexico Water Quality Control Commission (WQCC) standards be investigated to determine the extent of contamination and that contamination in excess of WQCC standards be remediated. As stated in the OCD's February 17, 1999 correspondence the concentrations of chloride and total dissolved solids (TDS) in ground water downgradient of the former pit are in excess of WQCC standards and the extent of contamination has not been defined. Therefore, the above referenced request is **denied**. The OCD requires that Unocal submit an investigation work plan to define the extent of ground water contamination related to Unocal's activities. The work plan will be submitted to the OCD Santa Fe Office by July 16, 1999 with a copy provided to the OCD Hobbs District Office.

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

Sincerely,

A handwritten signature in cursive script, appearing to read "William C. Olson".

William C. Olson
Hydrologist
Environmental Bureau

xc: Chris Williams, OCD Hobbs District Office

Z 274 520 658

US Postal Service
Receipt for Certified Mail

No Insurance Coverage Provided.
Do not use for International Mail (See reverse)

Sent to	
Street & Number	
Post Office, State, & ZIP Code	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date	



New Name. Same Spirit.
A Business Unit of Unocal

APR - 5 1999

March 31, 1999

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
Attention: Mr. William C. Olson

RE: Unocal Pit Closure South Vacuum
Unit I - Section 35-18s-R35e

Dear Mr. Olson:

In reference to our conversation and your February 17, request for submitting a work plan to define extent of contamination of site, we would like to address and find a mutual satisfactory agreement in this matter.

At this time Unocal respectfully requests continuing to monitor the well on an annual basis. The attached graph shows both concentration of chlorides and TDS are leveling or decreasing over monitored period. In 1995 tests were submitted on nearest ground water, a windmill approximately three quarter miles south of the pit area. As they met quality standards at that time, and research shows the Ogallala Aquifer apparently ends in an area approximately one mile south of the pit area, we do not agree that further expenditures are prudent or necessary at this time.

Please contact me with your comments, or requirements, (915) 685-6890 or by mail if additional information is needed.

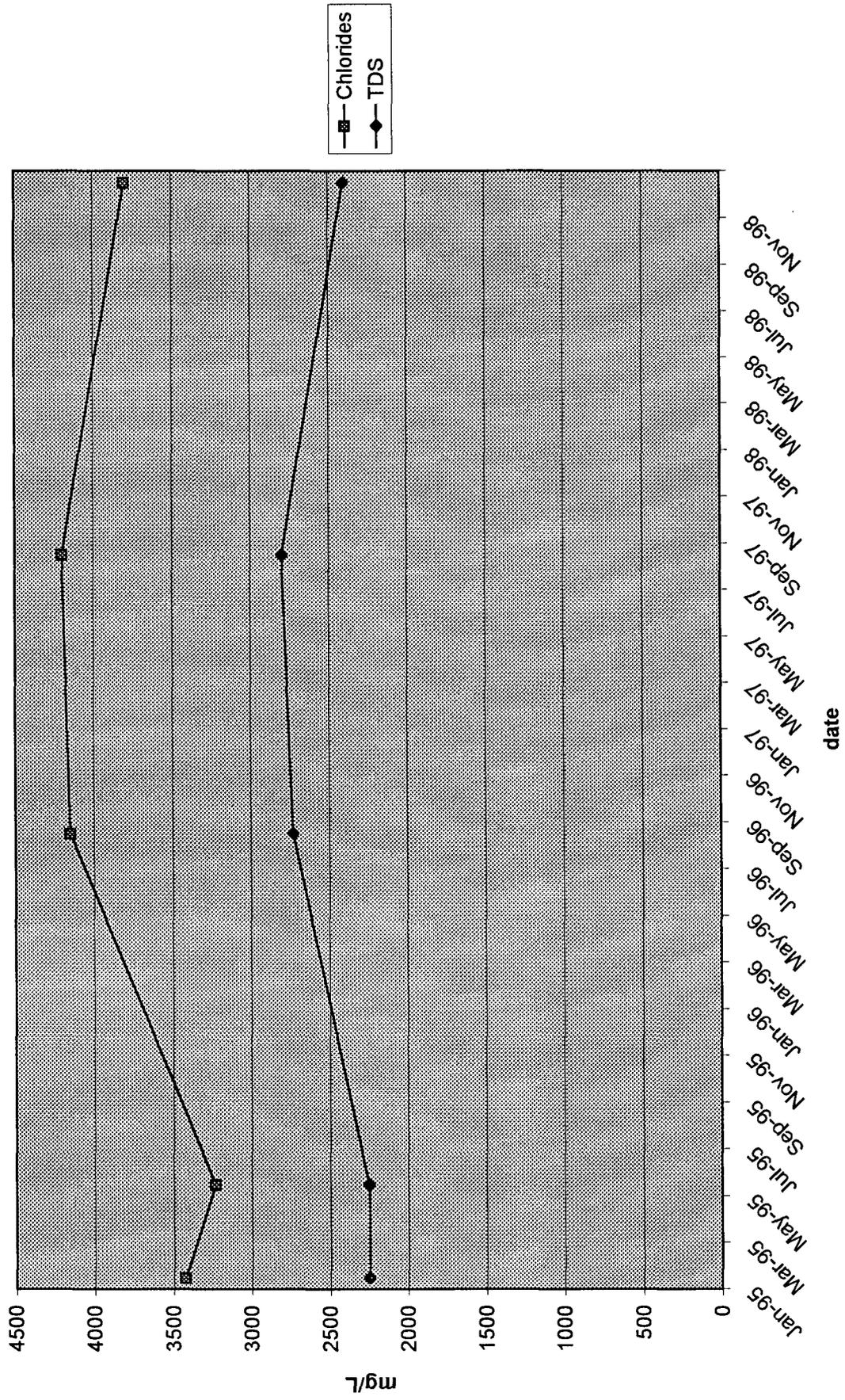
Sincerely,

A handwritten signature in cursive script that reads "Byron Nanini".

Byron Nanini
HES Loss Control Coordinator

cc: Jerry Sexton
Wayne Price
OCD - Hobbs District

TDS and Chloride Concentrations South Vacuum Unit





STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

February 17, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. Z-274-520-624

Mr. Byron Nanini
Spirit Energy 76
P.O. Box 3100
Midland, Texas 79702

**RE: ANNUAL REPORT
UNOCAL SOUTH VACUUM PIT**

Dear Mr. Nanini:

The New Mexico Oil Conservation Division has reviewed Spirit Energy 76's (Unocal) January 19, 1999 "UNOCAL PIT CLOSURE SOUTH VACUUM, UNIT I - SECTION 35-18S-R35E". This document contains the results of Unocal's ground water monitoring related to a former unlined pit at the South Vacuum Unit Lease. The document also requests close of the site remedial actions since ground water quality at the site has stabilized.

A review of the above referenced document shows that the concentrations of chloride and total dissolved solids (TDS) in ground water downgradient of the former pit have increased since the monitor well was installed, the concentrations are still in excess of New Mexico Water Quality Control Commission (WQCC) standards and the extent of contamination has not been defined. Therefore, the above referenced closure request is denied and the OCD requires that Unocal submit an investigation work plan to completely define the extent of ground water contamination related to Unocal's activities. The work plan will be submitted to the OCD Santa Fe Office by April 16, 1999 with a copy provided to the OCD Hobbs District Office.

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

Sincerely,

A handwritten signature in black ink, appearing to read "William C. Olson".

William C. Olson
Hydrologist
Environmental Bureau

xc: Chris Williams, OCD Hobbs District Office

Z 274 520 624

US Postal Service

Receipt for Certified Mail

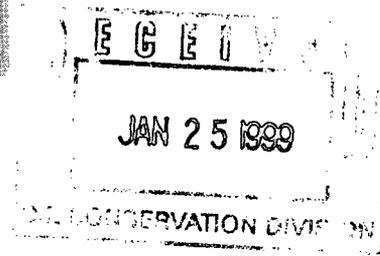
No Insurance Coverage Provided.

Do not use for International Mail (See reverse)

Sent to	
Street & Number	
Post Office, State, & ZIP Code	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date	



New Name. Same Spirit.
A Business Unit of Unocal



January 19, 1999

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
Attention: Mr. William C. Olson

RE: Unocal Pit Closure South Vacuum
Unit I - Section 35-18s-R35e

Dear Mr. Olson:

In accordance with UNOCAL's Ground Water Monitoring Plan for the above mentioned Lease, Unocal retained the services of TRW Environmental Services to draw water samples from the existing groundwater monitor well (MW-1) at the South Vacuum Unit Lease.

The sampling took place on December 14, 1998 using approved methods stipulated in monitoring requirements. The samples were delivered to Trace Analysis in Lubbock, Texas for analysis. A copy of this analysis is attached for your review. A history of the last five analyses are as follows.

	<u>1/27/95</u>	<u>5/18/95</u>	<u>8/28/96</u>	<u>8/13/97</u>	<u>12/14/98</u>
Chlorides(mg/L)	1174	983	1420	1400	1400
TDS (mg/L)	2250	2251	2730	2800	2400

As information indicates the contamination in the well has peaked and stabilized, Unocal requests permission to (1) discontinue monitoring (2) plug and abandon MW-1 (3) consider closure on pit completed.

Please contact me at (915) 685-6890 if additional information is needed.

Sincerely,

Byron Nanini
HES Loss Control Coordinator

cc: Jerry Sexton
Wayne Price
OCD - Hobbs District



6701 Aberdeen Avenue, Suite 9
4725 Ripley Avenue, Suite A

Lubbock, Texas 79424 800•378•1296
El Paso, Texas 79922 888•588•3443
E-Mail: lab@traceanalysis.com

806•794•1296 FAX 806•794•1298
915•585•3443 FAX 915•585•4944

ANALYTICAL RESULTS FOR
TRM INTERNATIONAL, INC
Attention: Gil Van Deventer
415 West Wall Suite 1818
Midland, TX 79701

January 6, 1999
Receiving Date: 12/16/98
Sample Type: Water
Project No:
Project Location:

Sampling Date: 12/14/98
Sample Condition: Intact & Cool
Sample Received by: VW
Project Name: Unocal South Vacuum Unit

TA#	FIELD CODE	CHLORIDE (mg/L)
T115003	MW-1	1,400
ICV		11.39
CCV		11.46
REPORTING LIMIT		0.5
RPD		0
% Extraction Accuracy		91
% Instrument Accuracy		91

PREP DATE 12/17/98
ANALYSIS DATE 12/17/98

METHODS: EPA 300.0, 160.1
CHEMIST: CI: SA TDS: MD
CHLORIDE SPIKE: 62.5 mg/L CHLORIDE

CHLORIDE CV: 12.5 mg/L CHLORIDE

Director, Dr. Blair Leftwich

Date



TRACE ANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
 4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
 E-Mail: lab@traceanalysis.com

**ANALYTICAL RESULTS FOR
 TRW**

Attention: Gil Van Deventer
 415 W. Wall, Suite 1818
 Midland, TX 79701

January 06, 1999
 Receiving Date: 12/16/98
 Sample Type: Water
 Project No: NA
 Project Location: NA
 COC# 13274

Prep Date: 01/04/99
 Analysis Date: 01/04/99
 Sampling Date: 12/14/98
 Sample Condition: Intact & Cool
 Sample Received by: VW
 Project: Unocal South Vacuum

TA#	FIELD CODE	TDS (mg/L)
T115003	9812141350 MW-1	2,400

RPD	99
% Instrument Accuracy	102

METHODS: EPA 160.1.
 CHEMIST: MD/JS



 Director, Dr. Blair Leftwich

1-6-99

 DATE

115003

342

13274

TRW
BDM International, Inc.
415 West Wall
Suite 1818
Midland, TX 79701
(915) 682-0008
FAX: (915) 682-0028



Chain of Custody

Date Dec. 14, 1998 Page 1 of 1

Lab Name		Trace Analysis, Inc	
Address		6701 Aberdeen Lubbock, TX 79424	
Telephone		(806) 794-1296	
Samplers (SIGNATURES)		<i>[Signature]</i>	
Sample Number	Time	Matrix	Sample ID Location
9812141350		Water	MW-1

Analysis Request	
Halogenated	
Aromatic Volatiles	
Volatiles 601/8010	
602/8020	
Phenols, Sub Phenols	
604/8040	
Pesticides/CB	
609/8090	
Polyaromatic Hydrocarbons 610/8310	
Volatile Compounds	
GC/MS 624/8240	
GC/MS 625/8270	
Base/Neu/Acid Compounds	
Total Organic Carbon	
(TOC) 415/9060	
Total Organic Halides	
(TOX) 9020	
Petroleum Hydrocarbons 418.1	
TPH/BTEX	
Modified 8015	
TCLP: Vol., Semi-Vol. Herbicides, Pesticides	
TCLP: Metals	
RCRA Metals (8)	
Priority Pollutant	
Metals (13)	
CAM Metals (18)	
TLC/STLC	
Flash Point	
Corrosivity	
Reactivity	
Oil & Grease	
Cyanide Total/Amenable	
Chemical Oxygen Demand (COD)	
Number of Containers	1

Project Information	Unit	Sample Receipt
Project: <u>Unocal South Vacuum</u>	<u>Unit</u>	Total No. of Containers
Project Director: <u>Byron Nannini</u>		Chain of Custody Seals
Charge Code No.		Rec'd Good Condition/Cold
Shipping ID. No.		Conforms to Record
		Lab No.

Relinquished By	1.	2.	3.
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
<u>TRW Inc.</u>	<u>HELEN SHELTON</u>	<u>TRACE ANALYSIS</u>	<u>Trace Analysis</u>
	<u>12/15/98</u>	<u>12/15/98</u>	<u>12/16/98</u>
	<u>12:00PM</u>	<u>12:00PM</u>	<u>12:00PM</u>

Received By	1.	2.	3.
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
<u>TRW Inc.</u>	<u>HELEN SHELTON</u>	<u>TRACE ANALYSIS</u>	<u>Trace Analysis</u>
	<u>12/15/98</u>	<u>12/15/98</u>	<u>12/16/98</u>
	<u>12:00PM</u>	<u>12:00PM</u>	<u>12:00PM</u>

Special Instructions/Comments: Send results & invoice to:
Byron Nannini
Spirit Energy P.O. Box 3100, Midland, TX 79702

Shipped by hand / 1 sample - HS 4 Bus 159384285
Distribution: White, Canary-Laboratory • Pink, BDM
14
Vicki Windler
Vicki Windler
Trace Analysis
12/16/98

RECEIVED

SEP 10 1997

CONSERVATION DIVISION



New Name. Same Spirit.
A Business Unit of Unocal

September 8, 1997

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
Attention: Mr. William C. Olson

**RE: Unocal Pit Closure South Vacuum
Unit I - Section 35-18s-R35e**

Dear Mr. Olson:

In accordance with UNOCAL's Ground Water Monitoring Plan for the above mentioned lease, Unocal retained the services of BDM Environmental Services (BDM) to draw water samples from the existing groundwater monitor well at the South Vacuum Unit Lease.

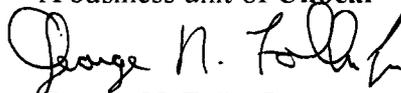
The sampling took place on August 13, 1997 and was accomplished by purging the well with three casing volumes of development water, and then obtaining the analytical samples with a new, disposal bailer, then placed into EPA approved sample jars. These samples were then delivered to Trace Analysis in Lubbock, Texas for analysis. A copy of the analysis is attached for your review.

A comparison to previous analysis completed on August 30, 1996 are as follows:

<u>August 30, 1996</u>	<u>August 13, 1997</u>
Chloride 1,420 (mg/L)	Chloride 1,400 (mg/l)
TDS 2,730 (mg/L)	TDS 2,800 (mg/l)

Please call me at (915) 685-6890 if any additional information is needed.

Sincerely,
Spirit Energy 76
A business unit of Unocal


George N. Folks Jr.
Sr. Staff HES Coordinator

cc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs District Environmental Engineer

6701 Aberdeen Avenue
 Lubbock, Texas 79424
 806•794•1296
 FAX 806•794•1298

ANALYTICAL RESULTS FOR
 BDM International
 Attention Gil VanDeVenter
 415 W. Wall, Suite 1818
 Midland TX 79701

Date: Aug 29, 1997
 Date Rec: 8/16/97
 Project: N/A
 Proj Name: South Vacuum Unit
 Proj Loc: N/A

Lab Receiving # : 9708000314
 Sampling Date: 8/13/97
 Sample Condition: Intact and Cool
 Sample Received By: SA

TA#	Field Code	MATRIX	Cl (mg/L)	TDS (mg/L)
T 79790	MW-1	Water	1400	2800
	Method Blank		<0.5	<5
	Reporting Limit		1	10
	QC		502	---

RPD 3 1
 % Extraction Accuracy 117 ---
 % Instrument Accuracy 100 ---

TEST	PREP METHOD	PREP DATE	ANALYSIS METHOD	ANALYSIS COMPLETED	CHEMIST	QC: (mg/L)	SPIKE: (mg/L)
Cl	N/A	8/28/97	EPA 300.0	8/28/97	JS	500	1000
TDS	N/A	8/19/97	EPA 160.1	8/19/97	JS	---	---

[Signature]
 Director Dr. Blair Leftwich
 Date 8-29-97



TRACE ANALYSIS, INC.
 A Laboratory for Advanced Environmental Research and Analysis

Unocal Corporation
Oil & Gas Operations
1004 North Big Spring, Suite 300
P.O. Box 3100
Midland, Texas 79702
Telephone (915) 685-7600

RECEIVED
OIL CONSERVATION DIVISION

NOV 8 1996

UNOCAL 

November 1, 1996

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
Oil CONSERVATION DIVISION

Central U. S. Business

Attention: Mr. William C. Olson

**RE: Unocal Pit Closure South Vacuum Unit
Unit I - Section 35-18s-R35e**

Dear Mr. Olson:

At the request of the New Mexico Oil Conservation Division, and in accordance with UNOCAL's Ground Water Monitoring Plan for the above mentioned lease, Unocal retained the services of Geoscience, Consultants, Ltd. (GCL) to draw water samples from the existing groundwater monitor well at the South Vacuum Unit Lease.

The sampling took place on August 28, 1996 and was accomplished by purging the well with three casing volumes of development water, and then obtaining the analytical samples with a new, disposal bailer, then placed into EPA approved sample jars. These samples were then delivered to Trace Analysis in Lubbock, Texas for analysis. A copy of the analysis is attached for your review.

A comparison to previous analysis completed on May 20, 1995 are as follows:

<u>May 20, 1995</u>	<u>August 30, 1996</u>
Chloride 983 (mg/L)	Chloride 1,420 (mg/L)
TDS 2,251 (mg/L)	TDS 2,730 (mg/L)

Please call me at (915) 685-6890 if any additional information is needed.

Sincerely,



Jimmy D. Mason
HES Coordinator
South Permian Asset

cc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs District Environmental Engineer

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
GCL ENVIRONMENTAL
Attention: Dwayne Salisbury
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

September 19, 1996
Receiving Date: 08/30/96
Sample Type: Water
Charge Code No: 3096-002
Project Location: NA
COC# 10178

Prep Date: 08/30/96
Analysis Date: 08/30/96
Sampling Date: 08/28/96
Sample Condition: I & C
Sample Received by: SH
Project Name: Unocal

TA#	FIELD CODE	TDS (mg/L)	CHLORIDE (mg/L)
T58312	9608280955 Unocal	2,730	1,420
QC	Quality Control	---	23.7
RPD		1	1
% Extraction Accuracy		---	97
% Instrument Accuracy		---	95
REPORTING LIMIT		---	1.0

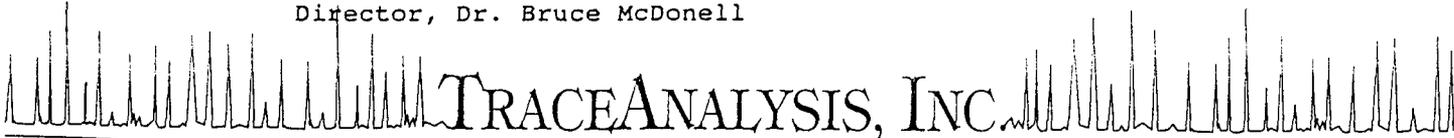
METHODS: EPA 300.0, 160.1.
CHEMIST: MS
CHLORIDE SPIKE: 50 mg/L CHLORIDE.
CHLORIDE QC: 23.7 mg/L CHLORIDE.



Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

9-19-96

DATE


TRACE ANALYSIS, INC.

A Laboratory for Advanced Environmental Research and Analysis

OIL CONSERVATION DIVISION

2040 S. Pacheco
Santa Fe, New Mexico 87505

September 27, 1995

CERTIFIED MAIL
RETURN RECEIPT NO. Z-765-962-419

Mr. Jimmy D. Mason
HES Coordinator
Unocal Corporation
P.O. Box 3100
Midland, Texas 79702

RE: UNOCAL SOUTH VACUUM UNIT PIT CLOSURE

Dear Mr. Mason:

The New Mexico Oil Conservation Division (OCD) has reviewed Unocal Corporation's September 5, 1995 "UNOCAL PIT CLOSURE SOUTH VACUUM UNIT, UNIT I - SECTION 35-18S-R35E". This document contains Unocal's proposal to continue monitoring the existing site monitor well on an annual basis.

The above referenced monitoring proposal is approved with the following conditions:

1. Ground water from the monitor well will be sampled and analyzed for concentrations of major cations and anions using EPA approved methods.
2. Unocal will submit a monitoring report to the OCD each year by October 1, with the first report due on October 1, 1996. The report will contain:
 - a. A description of all activities which occurred.
 - b. A summary of the laboratory analytic results of water quality sampling of the monitor wells. The data will be presented in tabular form and will show all past and present sampling results.
3. Unocal will notify the OCD at least one week in advance of all scheduled activities such that the OCD has the opportunity to witness the events and/or split samples.
4. All monitoring reports will be submitted to the OCD Santa Fe Office with copies provided to the OCD Hobbs District Office.

Mr. Jimmy D. Mason
September 27, 1995
Page 2

Please be advised that OCD approval does not relieve Unocal of liability if contamination exists which is beyond the scope of the work plan. In addition, OCD approval does not relieve Unocal of responsibility for compliance with any other federal, state or local laws and/or regulations.

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

Sincerely,



William C. Olson
Hydrogeologist
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs Office

Z 765 962 419

Receipt for Certified Mail



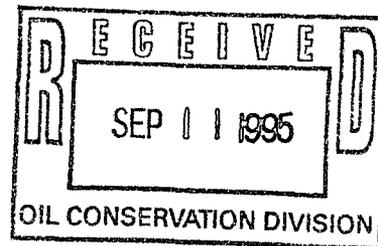
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PS Form 3800, March 1993

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Unocal Corporation
Oil and Gas Operations
1004 North Big Springs, Suite 300
P.O. Box 3100
Midland, Texas 79702
Telephone (915) 685-7600



UNOCAL 

September 5, 1995

Central U.S. Business Unit

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
Attention Mr. William C. Olson

**RE: Unocal Pit Closure South Vacuum Unit
Unit I - Section 35-18s-R35e**

Dear Mr. Olson:

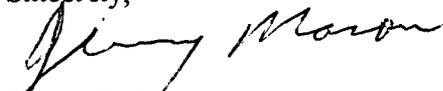
Unocal has received the August 8, 1995 "New Mexico Oil Conservation Divisions request for a plan to address the remaining ground water contamination at the South Vacuum Unit."

Unocal respectfully requests to address the remaining ground water contamination by continued water sampling from the existing ground water monitoring well on an annual basis and forwarding the analytical results to the Oil Conservation Division for review. This analysis will be done for major cations and anions, and done in accordance with EPA protocol (EPA 600/2-82-029) using EPA-approved methods (SW-846).

Unocal considers this to be a viable plan due to the relatively low chloride and TDS content of the water and the fact that the chloride levels were shown to be declining on previous documented samplings taken.

Please call me at (915) 685-6890 if any additional information is needed.

Sincerely,



Jimmy D. Mason
HES Coordinator
South Permian Asset

cc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs District Environmental Engineer

NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 S. Pacheco
Santa Fe, New Mexico 87505

August 8, 1995

CERTIFIED MAIL
RETURN RECEIPT NO. Z-765-962-384

Mr. Jimmy Mason
HES Coordinator
Unocal Corporation
P.O. Box 3100
Midland, Texas 79702

RE: UNOCAL SOUTH VACUUM UNIT PIT CLOSURE

Dear Mr. Mason:

The New Mexico Oil Conservation Division (OCD) has reviewed Unocal Corporation's June 21, 1995 "UNOCAL PIT CLOSURE SOUTH VACUUM UNIT, FOLLOW-UP GROUND WATER SAMPLING, UNIT I - SECTION 35-18S-R35E". This document contains the results of Unocal's second round of ground water sampling related to closure of an unlined emergency overflow pit at Unocal's South Vacuum Unit. The document also requests final closure approval, approval to plug and abandon the site monitor well and approval to dispose of monitor well purge water onsite.

The OCD approves of Unocal's request to dispose of the monitor well purge water onsite. However, the investigation results show that the elevated chloride and total dissolved solids concentrations in the downgradient ground water are apparently a result of activities associated with the unlined pit. Since these contaminants are in excess of the New Mexico Water Quality Control Commission ground water standards, the OCD cannot issue approval of final closure or plugging and abandonment of the monitor well at this time. Therefore, the OCD requests that Unocal submit a plan to address the remaining ground water contamination at the site to the OCD by September 15, 1995.

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

Sincerely,



William C. Olson
Hydrogeologist
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs District Office

Z 765 962 3A4


Receipt for Certified Mail
No Insurance Coverage Provided
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PS Form 3800, March 1993

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Unocal Corporation
Oil and Gas Operations
1004 North Big Springs, Suite 300
P.O. Box 3100
Midland, Texas 79702
Telephone (915) 685-7600

OIL CONSERVATION DIVISION
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1995 JUN 24 PM 8 52



June 21, 1995

Central U.S. Business Unit

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
Attention Mr. William C. Olson

**RE: Unocal Pit Closure South Vacuum Unit
Follow-Up Groundwater Sampling
Unit I - Section 35-18s-R35e**

Dear Mr. Olson:

Unocal has completed a second round of groundwater sampling activities for the monitoring well at the above-referenced location as requested in previous correspondence.

The well was gauged for depth to groundwater on May 18, 1995 using an electric water level indicator. Depth to groundwater measured approximately 59 feet below ground surface. Prior to collecting the sample, the well was surge bailed and purged of approximately 6 gallons of development water using a decontaminated disposable bailer. Groundwater samples were then obtained using a new disposable bailer after purging. The water samples were transferred from the bailer into air-tight septum-sealed 40-ml glass VOA sample vials with zero head space for analysis of total BTEX, and 1 liter glass jars for analysis for PAH, and major cations and anions analyses in accordance with EPA protocol (EPA 600/2-82-029) using EPA-approved methods (SW-846). The samples were then packed in an ice-filled cooler and shipped to Trace Analysis, Inc. in Lubbock, Texas.

The groundwater sample analytical results are summarized in Tables 1, 2, and 3 (attached). The Laboratory reports are also included.

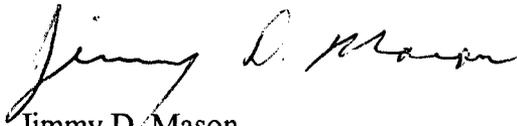
The groundwater samples recorded dissolved BTEX and total naphthalene concentrations below the method detection limit of 0.001 mg/l (Table 1). These results are consistent with the first round of groundwater samplings conducted on January 25, 1995.

The analytical results for major cations and anions are listed in Table 2. Chloride and total dissolved solids concentrations of 983 mg/l and 2,251 mg/l, respectively, were the only constituents that exceed the New Mexico Water Quality Control Commission standards of 250 mg/l and 1,000 mg/l, respectively, for domestic water supplies. These concentrations are similar to the first round sampling results, although chloride levels decreased approximately 200 mg/l during this sampling.

With these confirmatory samplings considered Unocal respectfully requests OCD approval to plug and abandon the existing groundwater monitor well and consider closure on the pit to be completed; Also permission is requested to discharge the approximately 30 gallons of monitoring well development water currently contained in a 55 gallon drum on site. Based on the analytical results for the monitoring well the development water contains no petroleum hydrocarbons and only minimal chloride and TDS levels.

Please call me at (915) 685-6890 if any additional information is needed.

Sincerely,

A handwritten signature in cursive script that reads "Jimmy D. Mason".

Jimmy D. Mason
HES Coordinator
South Permian Asset

cc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs District Environmental Engineer

TABLE 1

GROUNDWATER SAMPLE ANALYTICAL RESULTS
FOR BTEX AND NAPHTHALENES
South Vacuum Unit - Lea County, New Mexico

Constituent	Date Sampled	Results (mg/l)	NMWQCC Standards (mg/l)
Benzene	01-27-95	< 0.001	0.01
	05-18-95	< 0.001	
Toluene	01-27-95	< 0.001	0.75
	05-18-95	< 0.001	
Ethylbenzene	01-27-95	< 0.001	0.75
	05-18-95	< 0.001	
Xylenes	01-27-95	< 0.001	0.62
	05-18-95	< 0.001	
Naphthalenes plus total monomethylnaphthalenes	01-27-95	< 0.001	0.03
	05-18-95	< 0.0004	

* Unregulated constituent (NMWQCC Standards not specified for these constituents).
 ** Other Standards for Domestic Water Supply as specified in the New Mexico Water Quality Control Commission (NMWQCC) Regulations (§3-103 subsection B).
 Numbers in bold indicate concentrations exceed NMWQCC Standards for Domestic Water Supplies.

TABLE 2

**GROUNDWATER SAMPLE ANALYTICAL RESULTS
FOR MAJOR IONS AND FIELD PARAMETERS
South Vacuum Unit - Lea County, New Mexico**

Constituent	Date Sampled	Results (mg/l)	NMWQCC Standards (mg/l)
Calcium (Ca)	01-27-95	297	•
	05-18-95	234	
Magnesium (Mg)	01-27-95	35.3	•
	05-18-95	25.1	
Sodium (Na)	01-27-95	674	•
	05-18-95	625	
Potassium (K)	01-27-95	13.5	•
	05-18-95	NA	
Silica (Si)	01-27-95	NA	•
	05-18-95	12.9	
Chloride (Cl)	01-27-95	1,174	250
	05-18-95	983	
Bicarbonate (HCO ₃)	01-27-95	231	•
	05-18-95	237	
Nitrate (NO ₃ -N)	01-27-95	NA	10
	05-18-95	3.71	
Sulfate (SO ₄)	01-27-95	120	600**
	05-18-95	115	
Total Dissolved Solids	01-27-95	2,250	1,000**
	05-18-95	2,251	
pH	01-27-95	7.5 S.U.	6-9 S.U.**
	05-18-95	7.72	
Conductivity	01-27-95	4,300	•
	05-18-95	4,470	

• Unregulated constituent (NMWQCC Standards not specified for these constituents).
 ** Other Standards for Domestic Water Supply as specified in the New Mexico Water Quality Control Commission (NMWQCC) Regulations (§3-103 subsection B).
 Numbers in bold indicate concentrations exceed NMWQCC Standards for Domestic Water Supplies.
 NA Indicates constituent not analyzed.

TABLE 3

GROUNDWATER SAMPLE ANALYTICAL RESULTS FOR TOTAL METALS
South Vacuum Unit - Lea County, New Mexico

Constituent	Date	Results (mg/l)	NMWQCC Standards (mg/l)
Arsenic (As)	01-27-95	< 0.1	0.1
Barium (Ba)	01-27-95	< 0.05	1.0
Cadmium (Cd)	01-27-95	< 0.01	0.01
Chromium (Cr)	01-27-95	< 0.01	0.05
Lead (Pb)	01-27-95	< 0.05	0.05
Mercury (Hg)	01-27-95	< 0.001	0.002
Selenium (Se)	01-27-95	< 0.2	0.05
Silver (Ag)	01-27-95	< 0.01	0.05

• Unregulated constituent (NMWQCC Standards not specified for these constituents).
 ** Other Standards for Domestic Water Supply as specified in the New Mexico Water Quality Control Commission (NMWQCC) Regulations (§3-103 subsection B).
 Numbers in bold indicate concentrations exceed NMWQCC Standards for Domestic Water Supplies.
 Total metals were not resampled since initial results indicate all analyzed metals were below the method detection limits.

.6701 Aberdeen Avenue
 Lubbock, Texas 79424
 806•794•1296
 FAX 806•794•1298

ANALYTICAL RESULTS FOR
 UNOCAL CORP.
 Attention: Jim Mason
 P. O. Box 3100
 Midland, TX 79702

May 31, 1995
 Receiving Date: 05/20/95
 Sample Type: Water
 Charge Code No: 3096-002
 Project Location: Unocal

Prep Date: 05/20/95
 Analysis Date: 05/20/95
 Sampling Date: 05/18/95
 Sample Condition: I & C
 Sample Received by: BL
 Project Name: South Vacuum Unit
 COC# 9768

TA#	FIELD CODE	FLUORIDE (mg/L)	CHLORIDE (mg/L)	TDS (mg/L)	S04 (mg/L)	NO3-N (mg/L)	C03 as CaC03 (mg/L)	HC03 as CaC03 (mg/L)
T36315	9505181040 Unocal	0.4	983	2,251	115	3.71	0	237
QC	Quality Control	1.0	499	---	9	1.0	---	---
RPD		1	0	0	6	0	4	4
% Extraction Accuracy		100	98	---	98	106	---	---
% Instrument Accuracy		102	100	---	90	100	---	---
REPORTING LIMIT		0.1	1.0	1	1.0	0.1	1	1

METHODS: EPA 340.2, 375.4, 353.3, 4500 Cl-B, 310.1, 160.1.
 CHLORIDE SPIKE AND QC: Sample spiked with 500 mg/L CHLORIDE and
 Blank spiked with 500 mg/L CHLORIDE.
 S04 SPIKE AND QC: Sample spiked with 10 mg/L S04 and Blank spiked with 10 mg/L S04.
 FLUORIDE SPIKE AND QC: Sample spiked with 0.5 mg/L FLUORIDE and
 Blank spiked with 1.0 mg/L FLUORIDE.
 NO3-N SPIKE AND QC: Sample spiked with 1.33 mg/L NO3-N and Blank spiked with 1.0 mg/L NO3-N.



 Director, Dr. Blair Leftwich
 Director, Dr. Bruce McDonell

6-1-95

 DATE

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
UNOCAL CORP.
Attention: Jim Mason
P. O. Box 3100
Midland, TX 79702

May 31, 1995
Receiving Date: 05/20/95
Sample Type: Water
Charge Code No: 3096-002
Project Location: Unocal

Prep Date: 05/22/95
Analysis Date: 05/25/95
Sampling Date: 05/18/95
Sample Condition: I & C
Sample Received by: BL
Project Name: South Vacuum Unit
COC# 9768

-----TOTAL METALS-----

TA#	FIELD CODE	Na (mg/L)	Mg (mg/L)	Ca (mg/L)	Si (mg/L)
T36315	9505181040 Unocal	624.9	25.1	234	12.9
QC	Quality Control	9.09	4.8	10.1	2.34
RPD		0	1	1	1
% Extraction Accuracy		97	87	89	94
% Instrument Accuracy		91	96	101	94
REPORTING LIMIT		0.1	0.1	0.05	0.1

METHODS: EPA SW 846-3015, 6010.

TOTAL Na SPIKE AND QC: Sample spiked with 200.0 mg/L Na and Blank spiked with 10.0 mg/L Na.
TOTAL Mg SPIKE AND QC: Sample spiked with 200 mg/L Mg and Blank spiked with 5.0 mg/L Mg.
TOTAL Ca SPIKE AND QC: Sample spiked with 200 mg/L Ca and Blank spiked with 10.0 mg/L Ca.
TOTAL Si SPIKE AND QC: Sample spiked with 1.0 mg/L Si and Blank spiked with 2.50 mg/L Si.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

6-1-95

DATE



A Laboratory for Advanced Environmental Research and Analysis

6701 Aberdeen Avenue
 Lubbock, Texas 79424
 806•794•1296
 FAX 806•794•1298

ANALYTICAL RESULTS FOR
UNOCAL CORP.
Attention: Jim Mason
P. O. Box 3100
Midland, TX 79702

May 31, 1995
 Receiving Date: 05/20/95
 Sampling Date: 05/18/95
 Sample Type: Water
 Sample Condition: Intact & Cool
 Sample Received by: BL
 Project Name: South Vacuum Unit
 Project Location: Unocal
 COC# 9768
 Extraction Date: 05/22/95
 Analysis Date: 05/22/95

PAH's		Reporting	T36315 9505181040			
EPA 8270 (mg/L)	Limit	Unocal	QC	RPD	%EA	%IA
Naphthalene	0.0004	ND	49.7			99
Acenaphthylene	0.0004	ND	47.9			96
Acenaphthene	0.0004	ND	47.5	0	90	95
Fluorene	0.0004	ND	46.8			94
Phenanthrene	0.0004	ND	47.1			94
Anthracene	0.0004	ND	46.8			94
Fluoranthene	0.0004	ND	45.7			91
Pyrene	0.0004	ND	52.4	1	109	105
Benzo[a]anthracene	0.0004	ND	48.8			98
Chrysene	0.0004	ND	49.4			99
Benzo[b]fluoranthene	0.0004	ND	49.6			99
Benzo[k]fluoranthene	0.0004	ND	46.5			93
Benzo[a]pyrene	0.0004	ND	49.2			98
Indeno[1,2,3-cd]pyrene	0.0004	ND	49.2			96
Dibenz[a,h]anthracene	0.0004	ND	49.0			98
Benzo[g,h,i]perylene	0.0004	ND	53.7			107

*ND = Not Detected

% RECOVERY

2-Fluorophenol SURR	75
Phenol-d6 SURR	46
Nitrobenzene-d5 SURR	80
2-Fluorobiphenyl SURR	80
2,4,6-Tribromophenol SURR	56
Terphenyl-d14 SURR	132

METHODS: EPA SW 846-3510; EPA 8270.


 Director, Dr. Blair Leftwich

Director, Dr. Bruce McDonell

6-1-95
 DATE

TRACE ANALYSIS, INC.

A Laboratory for Advanced Environmental Research and Analysis

6701 Aberdeen Avenue
Lubbock, Texas 79424
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FAX 806•794•1298

ANALYTICAL RESULTS FOR
UNOCAL CORP.
Attention: Jim Mason
P. O. Box 3100
Midland, TX 79702

Extraction Date: 05/23/95
Analysis Date: 05/23/95
Sampling Date: 05/18/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: South Vacuum Unit
COC# 9768

2-methylnaphthalene/
1-methylnaphthalene
(mg/L)

TA#	FIELD CODE	
T36315	9505181040 Unocal	ND
QC	Quality Control	49.2

Reporting Limit 0.001

RPD 0
% Extraction Accuracy 90
% Instrument Accuracy 98

ND = Not Detected

METHODS: EPA SW 846-8270, 3510.



Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

6-8-95

DATE


TRACE ANALYSIS, INC.

A Laboratory for Advanced Environmental Research and Analysis

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
UNOCAL CORP.
Attention: Jim Mason
P. O. Box 3100
Midland, TX 79702

PAGE 1 of 2

May 31, 1995
Receiving Date: 05/20/95
Sample Type: Water
Charge Code No: 3096-002
Project Location: Unocal
COC# 9768

Prep Date: 05/27/95
Analysis Date: 05/27/95
Sampling Date: 05/18/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: South Vacuum Unit

EPA 8240 Compounds (ug/L)	T36315 9505181040 Unocal	Reporting Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	ND	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50



TRACE ANALYSIS, INC.

A Laboratory for Advanced Environmental Research and Analysis

Project Location: Unocal South Vacuum Unit

EPA 8240 Compounds (ug/L)	T36315 9505181040 Unocal	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	ND	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2

SURROGATES**% RECOVERY**

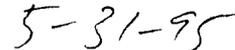
Dibromofluoromethane	91
Toluene-d8	92
4-Bromofluorobenzene	90

*ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8240.



 Director, Dr. Blair Leftwich
 Director, Dr. Bruce McDonell



 Date



STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

May 2, 1995

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-252

Mr. Jimmy Mason
Unocal Corporation
P.O. Box 3100
Midland, Texas 79702

RE: UNOCAL SOUTH VACUUM UNIT PIT CLOSURE

Dear Mr. Mason:

The New Mexico Oil Conservation Division (OCD) has completed a review of UNOCAL's undated "UNOCAL PIT CLOSURE SOUTH VACUUM UNIT, UNIT I - SECTION 35-18S-R35E" which was received by the OCD on March 7, 1995. This document contains the results of Unocal's closure of an unlined emergency overflow pit at Unocal's South Vacuum Unit. The document also recommends conducting additional ground water sampling prior to plugging the site monitor well.

The OCD approves of the pit closure actions taken to date and the recommendation to conduct additional ground water sampling of the monitor well. However, the OCD defers comment on the recommendation to plug the monitor well until the OCD reviews the results of the proposed additional ground water sampling. The OCD would also like to make you aware that the investigation results appear to show that the high chloride concentrations in the downgradient ground water are a result of activities associated with the unlined pit.

Please be advised that OCD approval does not relieve Unocal of liability should remaining contaminants pose a future threat to ground waters, surface waters or the environment. In addition, OCD approval does not relieve Unocal of responsibility for compliance with any other federal, state or local laws and/or regulations.

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

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs District Office

P 667 242 252

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PS Form **3800**, June 1990

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To: STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
Attention Mr. Rodger Anderson

Permian Basin Business Unit

From: Jimmy Mason - HES Coordinator South Permian Asset

**RE: Unocal Pit Closure South Vacuum Unit
Unit I - Section 35-18s-R35e**

Dear Mr. Anderson:

Unocal began remediation efforts on the South Vacuum Unit SWD Emergency overflow pit on January 11, 1995. The initial scope of the remediation effort was to delineate the contamination caused by the pit, then to excavate the area of contamination and solidify the soils in accordance with New Mexico Oil Conservation Division Guidelines.

Assessments of the soil contamination levels were began using the trenching method and on site field screenings for TPH concentrations taken. Sample digging indicated that the TPH contamination had penetrated to a depth greater than six feet into the soil below the bottom of the pit. TPH levels at these sites ranged from 17,960ppm to 21,480ppm. (see attachment plat 1) At this point extremely hard rock was encountered and made further digging with available equipment difficult. In order to properly delineate the area it was determined soil borings would be necessary. On January 12 Eades Water Well Service moved in and drilled seven (7) soil borings (see attachment plat 2) which were field screened for TPH levels by Allstate Services using a Mega TPH analyzer. Samples were taken at various levels of each boring to determine contamination levels. (see attachment 3) Confirmatory samples were also preserved in air tight glass laboratory jars and placed on ice. These samples were delivered to Environmental Labs of Texas on January 13 with instructions to run TPH, Chloride content, and BTEX levels. (see attachment 4). Soil boring holes were then cemented from bottom to top by Eades Water Well Service with cement containing five percent (5%) bentonite on January 13. Confirmatory results were received from Environmental Labs of Texas and the determination was made to excavate approximately two feet into the outside the existing perimeter of the pit and three to six feet into the bottom of the pit or to the bottom of any observed hydrocarbon staining. Excavation of the pit began on January 13 and continued until January 16 resulting in an accumulated total of 2460 cubic yards of contaminated soil and ranging from a depth of three to six feet into the bottom of the pit.

At this point the in situ solidification method of remediation was began for the site per NMOCD Guidelines, Section VI, Part A. 1b. , iii.

The solidification process was begun on January 17 and completed January 22nd. The matrix material was delivered via tank trucks and was placed in the excavated hole. The stockpiled contaminated soil was added to the matrix and mixed thoroughly and water was added to obtain the correct consistency. A total of 375 tons of cement media was added to the 2460 cubic yards of contaminated soil and mixed with a total of 228 barrels of fresh water. With blending completed the remaining uncontaminated berm material was used to smooth and cap the solidified material.

In order to assure delineation of the pit Unocal made the decision to drill a ground water monitor well at the pit site. On January 25, 1995, a temporary monitor well was installed to a depth of approximately 70 feet utilizing an air rotary rig. The monitor well was placed approximately 30 feet south of the former pit in a downgradient direction of groundwater flow. Supervision of the drilling and sampling operations of the well was contracted to GCL from Albuquerque, N.M. and a Staff Project Hydrogeologist was on site during all phases of the operations. Mr. Wayne Price, Environmental Engineer for the New Mexico Oil Conservation Division Hobbs New Mexico District Office, was present to observe all drilling and sampling operations on the well.

During the drilling of the well soil samples were collected at ten foot intervals using a split spoon sampling tool from surface to sixty feet below the surface, at which depth groundwater was encountered. The soil samples were field screened by the GCL representative using a Century Model 128 organic vapor analyzer (OVA). The soil sample that registered the highest OVA reading and the sample immediately above the groundwater table were submitted to Environmental Labs of Texas to be analyzed for TPH using the EPA method 418.1 and BTEX using EPA method 8020.

OVA readings for the well varied from 5ppm at the 60 to 61 foot sample intervals to 750 ppm at the 37 to 38 foot interval, which corresponded to soil sample analytical results for total BTEX concentrations of 4.12 mg/kg and 5.98 mg/kg, respectively. TPH concentrations for the same two sampling intervals recorded levels of 1,785 mg/kg and 4926 mg/kg, respectively.

Upon completion of the soil sampling operations, a monitor well constructed of 2-inch diameter schedule 40 PVC well casing (60 foot length) and screen (15 foot length) was installed in the borehole to a total depth of 70 feet. The screened portion of the well was sand packed with 8/16 brady sand and that was capped with a five-foot thick bentonite seal. The annular space above the seal was left open until the groundwater analytical results were obtained.

On January 27, 1995 groundwater sampling was begun. Prior to collecting a groundwater sample, the well was surge bailed and purged of approximately 28 gallons of development water using a decontaminated PVC bailer. Groundwater samples were then obtained using a new, decontaminated, disposable bailer after purging. The water samples were transferred from the disposable bailer into air-tight, septum-sealed 40 ml glass VOA samples vials with zero head space for analysis of total BTEX, and 1 liter glass jars for

analysis of PAH, total metals, and major cations and anions in accordance with EPA protocol (EPA 600/2-82-029) using EPA-approved methods (SW-846). The water samples were placed in an ice-filled cooler immediately after collection and transported to Environmental Labs of Texas in Odessa, Texas.

Analysis of the groundwater recorded dissolved BTEX and total naphthalene concentrations below the method detection limit of 0.001 mg/l. Similarly, all metal concentrations (Ag, As, Ba, Cd, Cr, Hg, Pb, and Se) were below the method detection limits. The analytical results for major cations and anions (Ca, K, Mg, Cl, HCO₃, and SO₄) are listed in attachment 5. Chloride and total dissolved solids concentrations of 1,174 mg/l and 2,250 mg/l, respectively, were the only constituents that exceed the New Mexico Water Quality Control Commissions standards of 250 mg/l and 1000 mg/l, respectively, for domestic water supplies.

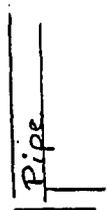
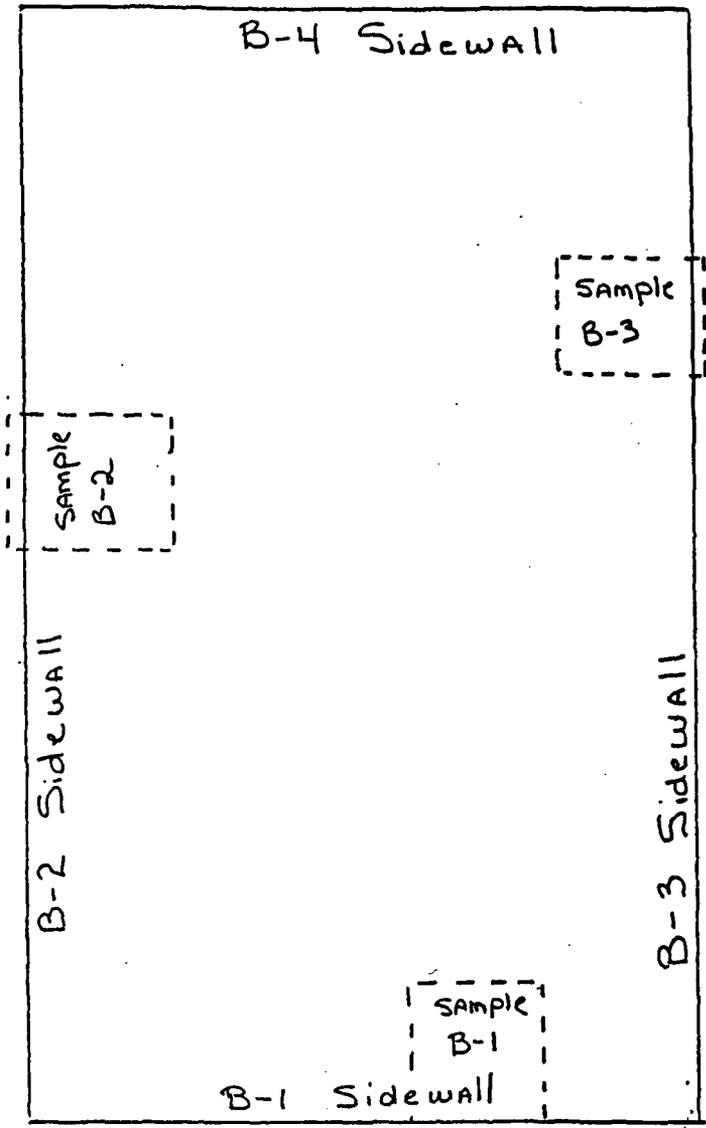
On February 9, 1995 the monitor well was completed by filling the annulus above the bentonite seal with cement containing 5% bentonite. A monument was constructed around the well head and a locking lid installed to secure the well bore.

Water samples were collected from an existing windmill approximately three quarters of a mile south of the pit on January 16, 1995. Analysis were ran by Martin Water Labs in Midland, Texas and this water was found to meet the established New Mexico water quality standards (see attachment 6). Research also revealed that the Ogallala Aquifer apparently ends in an area approximately one mile south of the pit area. Considering these conditions Unocal respectfully requests to collect confirmatory groundwater samples from the monitor well after a thirty day period. If these analysis concur with previously collected samples Unocal requests to plug and abandon the existing monitor well and consider the pit closed.

After review, if additional information is needed please contact me at 915-685-6890.

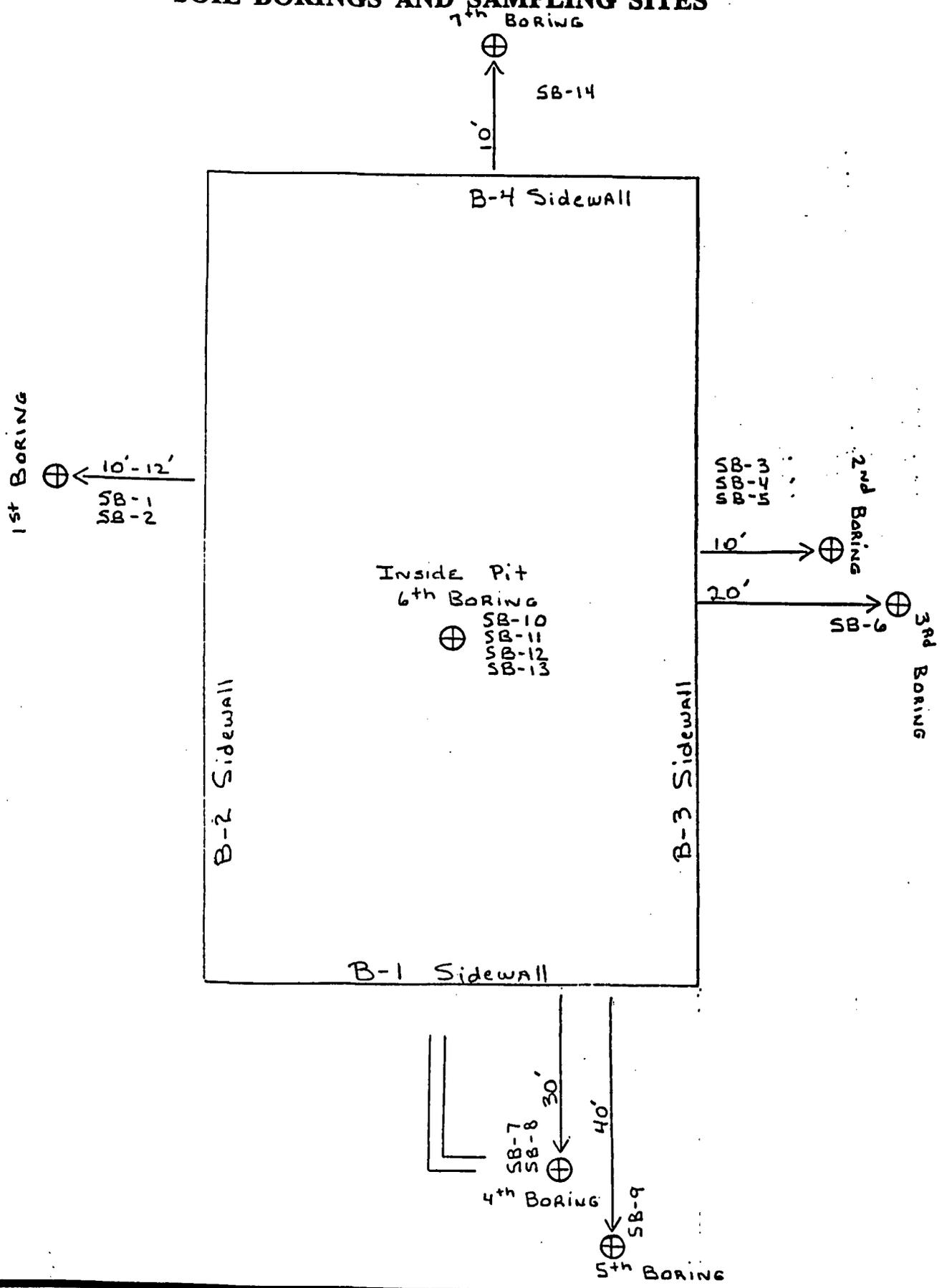
cc: Jerry Sexton - OCD District 1 Supervisor

DELINEATION TRENCHING



----- = TRENCHING AREA

SOIL BORINGS AND SAMPLING SITES



SOIL BORINGS - FIELD SCREENING FOR TPH

<u>SAMPLE ID</u>	<u>LOCATION SAMPLED</u>	<u>RESULTS (ppm)</u>
SB-1	B-2 Sidewall, 10'-12' from perimeter, 15'-16' FGL	116
SB-2	B-2 Sidewall, 10'-12' from perimeter, 20' FGL	17
SB-3	B-3 Sidewall, 10' from perimeter, 15' FGL	17,760
SB-4	B-3 Sidewall, 10' from perimeter, 20' FGL	787
SB-5	B-3 Sidewall, 10' from perimeter, 25' FGL	ND
SB-6	B-3 Sidewall, 20' from perimeter, 10' FGL	ND
SB-7	B-1 Sidewall, 30' from perimeter, 10' FGL	831
SB-8	B-1 Sidewall, 30' from perimeter, 15'-16' FGL	536
SB-9	B-1 Sidewall, 40' from perimeter, 15' FGL	49
SB-10	Inside Pit, boring to 10' = 15' FGL	13,240
SB-11	Inside Pit, boring to 15' = 20' FGL	1,300
SB-12	Inside Pit, boring to 20' = 25' FGL	1,007
SB-13	Inside Pit, boring to 25' = 30' FGL	133
SB-14	B-4 Sidewall, 10' from perimeter, 20' FGL	7

FGL = from ground level

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"Don't Treat Your Soil Like Dirt!"

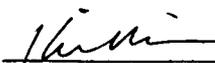
January 16, 1995

Client: Unocal
 Mr. Jimmy Mason
 P.O. Box 3100
 Midland, Texas 79702

Sample Matrix: Soil

Job ID: Vacuum Lease
Date Received: 1/13/95
Date Reported: 1/16/95

Parameter	Value	Units	EPA Test Method
Sample ID: SB-2			
Total Chlorides	638	ppm	325.3
Sample ID: SB-5			
Total Chlorides	213	ppm	
Sample ID: SB-6			
Total Chlorides	383	ppm	
Sample ID: SB-8			
Total Chlorides	128	ppm	
Sample ID: SB-9			
Total Chlorides	298	ppm	
Sample ID: SB-10			
Total Chlorides	681	ppm	
Sample ID: SB-11			
Total Chlorides	425	ppm	
Sample ID: SB-12			
Total Chlorides	723	ppm	
Sample ID: SB-13			
Total Chlorides	427	ppm	


 Kirk Robinson

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

January 16, 1995

Client: Unocal
Mr. Jimmy Mason
P.O. Box 3100
Midland, Texas 79702

Sample Matrix: Soil

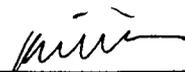
Job ID: Vacuum Lease
Date Received: 1/13/95
Date Reported: 1/16/95

<u>Parameter</u>	<u>Value</u>	<u>Units</u>	<u>EPA Test Method</u>
Sample ID: SB-2 Total Petroleum Hydrocarbons	41	ppm	418.1/3550
Sample ID: SB-5 Total Petroleum Hydrocarbons	344	ppm	
Sample ID: SB-6 Total Petroleum Hydrocarbons	<10.0	ppm	
Sample ID: SB-8 Total Petroleum Hydrocarbons	375	ppm	
Sample ID: SB-9 Total Petroleum Hydrocarbons	<10.0	ppm	
Sample ID: SB-10 Total Petroleum Hydrocarbons	18,444	ppm	
Sample ID: SB-11 Total Petroleum Hydrocarbons	1,976	ppm	
Sample ID: SB-12 Total Petroleum Hydrocarbons	1,118	ppm	
Sample ID: SB-13 Total Petroleum Hydrocarbons	152	ppm	

QC (Quality Control)

Total Petroleum Hydrocarbons 418.1 QC: 150 ppm
Detection Limit 10.0 ppm

	<u>Result</u>	<u>%LA</u>
TPH 418.1	150 ppm	100


Kirk Robinson

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

January 16, 1995

Client: Unocal
Mr. Jimmy Mason
P.O. Box 3100
Midland, Texas 79702

Job ID: Vacuum Lease
Date Received: 1/13/95
Date Reported: 1/16/95

Sample Matrix: Soil

<u>Compounds</u>	<u>Actual (ppm)</u>	<u>Detection Limit (ppm)</u>	<u>QC</u>	<u>%IA</u>
Sample ID: SB-2				
Benzene	ND	0.1	0.100	100
Toluene	ND	0.1	0.099	99
Ethylbenzene	ND	0.1	0.099	99
Xylene (m,p)	ND	0.2	0.195	98
Xylene (o)	ND	0.1	0.098	98
<u>Surrogate Spike</u>	<u>%Recovery</u>			
<u>a,a,a Trifluorotoluene</u>	<u>90</u>			
Sample ID: SB-5				
Benzene	ND	0.1	0.100	100
Toluene	ND	0.1	0.099	99
Ethylbenzene	ND	0.1	0.099	99
Xylene (m,p)	ND	0.2	0.195	98
Xylene (o)	ND	0.1	0.098	98
<u>Surrogate Spike</u>	<u>%Recovery</u>			
<u>a,a,a Trifluorotoluene</u>	<u>88</u>			
Sample ID: SB-6				
Benzene	ND	0.1	0.100	100
Toluene	ND	0.1	0.099	99
Ethylbenzene	ND	0.1	0.099	99
Xylene (m,p)	ND	0.2	0.195	98
Xylene (o)	ND	0.1	0.098	98
<u>Surrogate Spike</u>	<u>%Recovery</u>			
<u>a,a,a Trifluorotoluene</u>	<u>97</u>			

page 2 BTEX Continued

<u>Compounds</u>	<u>Actual (ppm)</u>	<u>Detection Limit (ppm)</u>	<u>QC</u>	<u>%IA</u>
Sample ID: SB-8				
Benzene	ND	0.1	0.100	100
Toluene	ND	0.1	0.099	99
Ethylbenzene	ND	0.1	0.099	99
Xylene (m,p)	ND	0.2	0.195	98
Xylene (o)	ND	0.1	0.098	98
<u>Surrogate Spike</u>	<u>%Recovery</u>			
<u>a,a,a Trifluorotoluene</u>	<u>96</u>			
Sample ID: SB-9				
Benzene	ND	0.1	0.100	100
Toluene	ND	0.1	0.099	99
Ethylbenzene	ND	0.1	0.099	99
Xylene (m,p)	ND	0.2	0.195	98
Xylene (o)	ND	0.1	0.098	98
<u>Surrogate Spike</u>	<u>%Recovery</u>			
<u>a,a,a Trifluorotoluene</u>	<u>94</u>			
Sample ID: SB-10				
Benzene	ND	0.1	0.100	100
Toluene	ND	0.1	0.099	99
Ethylbenzene	ND	0.1	0.099	99
Xylene (m,p)	ND	0.2	0.195	98
Xylene (o)	ND	0.1	0.098	98
<u>Surrogate Spike</u>	<u>%Recovery</u>			
<u>a,a,a Trifluorotoluene</u>	<u>97</u>			
Sample ID: SB-11				
Benzene	ND	0.1	0.100	100
Toluene	ND	0.1	0.099	99
Ethylbenzene	ND	0.1	0.099	99
Xylene (m,p)	ND	0.2	0.195	98
Xylene (o)	ND	0.1	0.098	98
<u>Surrogate Spike</u>	<u>%Recovery</u>			
<u>a,a,a Trifluorotoluene</u>	<u>96</u>			

page 3 BTEX Continued

<u>Compounds</u>	<u>Actual (ppm)</u>	<u>Detection Limit (ppm)</u>	<u>QC</u>	<u>%IA</u>
Sample ID: SB-12				
Benzene	ND	0.1	0.100	100
Toluene	ND	0.1	0.099	99
Ethylbenzene	ND	0.1	0.099	99
Xylene (m,p)	ND	0.2	0.195	98
Xylene (o)	ND	0.1	0.098	98
<u>Surrogate Spike</u>	<u>%Recovery</u>			
<u>a,a,a Trifluorotoluene</u>	<u>94</u>			

Sample ID: SB-13				
Benzene	ND	0.1	0.100	100
Toluene	ND	0.1	0.099	99
Ethylbenzene	ND	0.1	0.099	99
Xylene (m,p)	ND	0.2	0.195	98
Xylene (o)	ND	0.1	0.098	98
<u>Surrogate Spike</u>	<u>%Recovery</u>			
<u>a,a,a Trifluorotoluene</u>	<u>97</u>			

QC= 100 ppb BTE (o)X & 200 ppb (m,p) X. Surrogate Spike=120 ppb a,a,a Trifluorotoluene
Methods: EPA SW 846-8020/5030

ND = Not Detected


Kirk Robinson

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

January 30, 1995

Unocal
Mr. Jimmy Mason
P.O. Box 3100
Midland, Texas 79702

Sample Matrix: Water

Project: Unocal, South Vacuum Unit
Project Manager: Jimmy Mason/Gilbert VanDeventer (GCL)
Date Received: 1/27/95
Analysis Date: 1/30/95

Compounds	Actual (ug/l)	Detection Limit (ug/l)	QC	%IA
Sample ID: 9501271045 MW-1				
Benzene	ND	1.0	80	80
Toluene	ND	1.0	82	82
Ethylbenzene	ND	1.0	83	83
Xylene (m,p)	ND	1.0	163	82
Xylene (o)	ND	1.0	83	83
<u>Surrogate Spike</u>	<u>%Recovery</u>			
a,a,a Trifluorotoluene	90			

QC= 100 ug/l BTE (o)X & 200 ug/l (m,p) X. Surrogate Spike=80 ug/l a,a,a Trifluorotoluene
Methods: EPA SW 846-8020/5030

ND = Not Detected


Kirk Robinson

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

February 6, 1995

Unocal
Mr. Jimmy Mason
P.O. Box 3100
Midland, Texas 79702

Sample Matrix: Water

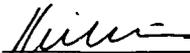
Project: Unocal, South Vacuum Unit
Project Manager: Jimmy Mason/Gilbert VanDeventer (GCL)

Date Received: 1/27/95
Analysis Date: 2/3/95

	Ca ⁺⁺ (mg/L)	Mg ⁺⁺ (mg/L)	Na ⁺ (mg/L)	K ⁺ (mg/L)
9501271035 MW-1	297	35.3	674	13.5
Quality Control -----	19.1	21.6	19.8	53.4
% IA	97	108	99	107

QC: Ca⁺⁺ 20 mg/L, Mg⁺⁺ 20 mg/L, Na⁺ 20 mg/L, K⁺ 50 mg/L

Methods: EPA-600/4-79-020 215.1, 242.1, 273.1, 258.1.


Kirk Robinson

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

February 6, 1995

Unocal
Mr. Jimmy Mason
P.O. Box 3100
Midland, Texas 79702

Sample Matrix: Water

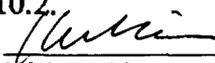
Project: Unocal, South Vacuum Unit
Project Manager: Jimmy Mason/Gilbert VanDeventer (GCL)

Date Received: 1/27/95
Analysis Date: 2/3/95

Sample ID: 9501271035 MW-1

	Conductivity (uS/cm)	pH (s.u.)	Chlorides (mg/L)	Sulfates (mg/L)	TDS (mg/L)	HCO ₃ (mg/l)
	4,300	7.5	1,174	120	2,250	231
Quality Control	---	7.0	500	10	---	---
% Accuracy		100	100	100		

Methods: EPA-600/4-79-020 120.1, 150.1, 325.3, 375.4, 160.1, 310.2.


Kirk Robinson

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

February 6, 1995

Unocal
Mr. Jimmy Mason
P.O. Box 3100
Midland, Texas 79702

Sample Matrix: Water

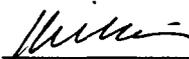
Project: Unocal, South Vacuum Unit
Project Manager: Jimmy Mason/Gilbert VanDeventer (GCL)

Date Received: 1/27/95
Analysis Date: 2/3/95

Parameter	Value (mg/l)	QC	% Accuracy	Detection Limit
Sample ID: 9501271040 MW-1				
Arsenic (As)	<0.1	10.7	107	0.1
Selenium (Se)	<0.2	2.1	105	0.2
Chromium (Cr)	<0.01	10.6	106	0.01
Cadmium (Cd)	<0.01	2.09	101	0.01
Lead (Pb)	<0.05	10.5	105	0.05
Barium (Ba)	<0.05	197	98	0.05
Silver (Ag)	<0.01	10.4	104	0.01
Mercury (Hg)	<0.001	0.022	95	0.001

Methods: EPA SW 846-3005, 6010, 7741.

Metals QC: 2.0 mg/L Cd, Se, ; 200 mg/L Ba; 10 mg/L As, Pb, Cr and Ag; and 0.005 mg/L Hg.


Kirk Robinson

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

February 8, 1995

Unocal
Mr. Jimmy Mason
P.O. Box 3100
Midland, Texas 79702

Sample Matrix: Water

Project: Unocal, South Vacuum Unit
Project Manager: Jimmy Mason/Gilbert VanDeventer (GCL)

Date Received: 1/27/95
Analysis Date: 2/3/95

<u>EPA 8270 Compounds (ppm)</u>	<u>Value (ppm)</u>	<u>Detection Limit</u>	<u>QC</u>	<u>%IA</u>
Sample ID: 9501271100 MW-1				
Napthalene	ND	0.001	0.454	91

<u>Surrogates</u>	<u>%Recovery</u>
2-Fluorophenol SURR	106
Phenol-d5 SURR	104
Nitrobenzene-d5 SURR	88
2-Fluorobiphenyl	96
2,4,6-Tribromophenol SURR	105
Terphenyl-d14 SURR	128

Methods: EPA SW846-8270.


Kirk Robinson

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

January 30, 1995

Unocal
Mr. Jimmy Mason
P.O. Box 3100
Midland, Texas 79702

Sample Matrix: Soil

Project: Unocal, South Vacuum Unit
Project Manager: Jimmy Mason/Gilbert VanDeventer (GCL)
Date Received: 1/27/95
Analysis Date: 1/30/95

Compounds	Actual (mg/kg)	Detection Limit (mg/kg) QC		%IA
Sample ID: 9501251155 MW-1 (37-38')				
Benzene	ND	0.1	0.080	80
Toluene	0.66	0.1	0.082	82
Ethylbenzene	0.26	0.1	0.083	83
Xylene (m,p)	2.50	0.1	0.163	82
Xylene (o)	2.56	0.1	0.083	83
<u>Surrogate Spike</u>	<u>%Recovery</u>			
a,a,a Trifluorotoluene	108			
Sample ID: 9501251545 MW-1 (50-51')				
Benzene	ND	0.1	0.080	80
Toluene	0.49	0.1	0.082	82
Ethylbenzene	0.20	0.1	0.083	83
Xylene (m,p)	1.03	0.1	0.163	82
Xylene (o)	2.40	0.1	0.083	83
<u>Surrogate Spike</u>	<u>%Recovery</u>			
a,a,a Trifluorotoluene	100			

QC= 100 ppb BTE (o)X & 200 ppb (m,p) X. Surrogate Spike=5 ppm a,a,a Trifluorotoluene
Methods: EPA SW 846-8020/5030

ND = Not Detected


Kirk Robinson

ENVIRONMENTAL LAB OF , INC.

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January 30, 1995

Unocal
Mr. Jimmy Mason
P.O. Box 3100
Midland, Texas 79702

Sample Matrix: Soil

Project: Unocal, South Vacuum Unit
Project Manager: Jimmy Mason/Gilbert VanDeventer (GCL)
Date Received: 1/27/95
Analysis Date: 1/30/95

Parameter	Value	Units	EPA SW-846 Test Method
Sample ID: 9501251155 MW-1 (37-38')			418.1/3550

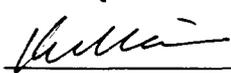
Total Petroleum Hydrocarbons	4,926	mg/kg
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Sample ID: 9501251545 MW-1 (50-51')

Total Petroleum Hydrocarbons	1,785	mg/kg
------------------------------	-------	-------

QC (Quality Control)
Total Petroleum Hydrocarbons QC: 145 ppm
Detection Limit 10 mg/kg

	Result	% IA
TPH	147 ppm	101


Kirk Robinson

