

GW - 21

**GENERAL  
CORRESPONDENCE**

**YEAR(S):**

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2006-1995

**Price, Wayne, EMNRD**

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**From:** Price, Wayne, EMNRD  
**Sent:** Tuesday, May 02, 2006 11:52 AM  
**To:** Vijay K Kurki (vkkurki@marathonoil.com)  
**Cc:** Sharon Hall (shall@arcadis-us.com)  
**Subject:** GW-21 Indian Basin Gas Plant Annual Groundwater Monitoring

Dear ViJay:

OCD is in receipt of the Annual Groundwater Monitoring report for the above subject site. The report contained Marathon's proposed plan section 6.5 for sampling, monitoring and continued abatement of the groundwater contamination. OCD hereby approves of the path forward.

Please be advised that OCD approval of this plan does not relieve the owner/operator of Responsibility should their operations fail to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve the owner/operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Wayne Price  
Oil Conservation Div.  
1220 S. Saint Francis  
Santa Fe New Mexico 87505

phone: 505-476-3490  
fax: 505-476-3462

5/2/2006



**Marathon  
Oil Company**

P.O. Box 3487  
Houston, TX 77253-3487  
5555 San Felipe Street  
Houston, TX 77056-2799  
Telephone 713/629-6600

April 26, 2006

Mr. Wayne Price  
Environment Bureau  
Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87504

**RE: Annual Groundwater Monitoring Report, January - December 2005  
Indian Basin Remediation Project/GW-21  
Eddy County, NM**

Dear Mr. Price:

Please find enclosed Annual Groundwater Monitoring Report, January - December 2005, for Indian Basin Remediation Project. The annual report, which was prepared by ARCADIS G&M, Inc., summarizes the groundwater monitoring and remediation activities associated with the Indian Basin Remediation Project during the 2005 calendar year.

If you have any questions or need any additional information, please contact me at (713) 296-2213.

Sincerely,

A handwritten signature in cursive script that reads 'Vijay K. Kurki'.

Vijay K. Kurki, P.E.  
Environmental Supervisor

File: NM-IBRP E700-115  
(3236-300 months after termination of the facility)  
enclosures

cc: Tom L. Breningerr w/enclosures  
Dan Hanchera w/o enclosures  
Joe. W. Sologub w/o enclosures

## Price, Wayne

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**From:** Price, Wayne  
**Sent:** Monday, March 28, 2005 3:47 PM  
**To:** Vijay K Kurki (E-mail)  
**Cc:** Bratcher, Mike  
**Subject:** Marathon Indian Basin Gas Plant GW-021 inspection and tour of Groundwater Remediation

Dear Mr. Kurki:

Please find enclosed a copy of OCD's inspection report and photo documentation conducted recently. Please address items 1-5 by June 15, 2005.



Mar 22\_05 Inspection Photos  
inspection report.doc March 22, 20...

Sincerely:

Wayne Price  
New Mexico Oil Conservation Division  
1220 S. Saint Francis Drive  
Santa Fe, NM 87505  
505-476-3487  
fax: 505-476-3462  
E-mail: WPRICE@state.nm.us



# Environmental Facility Inspection

Inspection Detail Photos/Images

Facility Name: MARATHON INDIAN BASIN GP Time Out: 15:00 Time In: 17:00 Hrs:   
 Inspector: Wayne Price Dt Mod: 3/28/2005 Purpose: Normal Routine Activity   
 Inspection Date: 03/22/2005 Inspect No.: aLVWP0508753704 Type: Field Inspection

## Violations / Documentation

List Violations or Indicate Compliance

Specific Violation	
▶	No Violations Identified - All O.K.
*	

Additional Violation Notes

Documentation Acquired: ☐ Samples ☐ Statements ☐ Sketch ☐ Video ☒ Photos

## Compliance Items

(Checked Items Denote Non-Compliance)

Write Compliance Based on this Inspection

- ☐ Drums ☐ Process ☐ AG Tanks ☐ AG-Saddle Tks ☐ Labeling ☐ Tanks/Sumps ☐ Permits   
☐ UG Lines ☐ WD Practice ☐ Class V ☐ Housekeeping ☐ Spill Rpt ☐ Potential ENV ☐ Wtr Wells

Describe Remedial Action Required

## Zoom

1. One process area needs containment-see photos.
2. Marathon needs to submit closure plan for the old skimmer tank area-see photos.
3. Marathon to verify if new skimmer basin area sump has secondary containment.
4. On-site water well needs to be sampled and tested for BTEX, Gen Chem and Metals
5. Marathon should segregate sulfur disposal area from old landfill/farm and up-date plot plan showing this area.

Documents reviewed: Current Discharge Permit status approved.  
 Toured groundwater remediation with Glen von Gotten-OCD and plant personal

OK

Cancel

Font...

Record: 1 of 1 (Filtered)

Form View



Process area in plant does not have containment.



Same as above.



Area where sulfur is being disposed of.-west side of plant looking northeast.



Old water/condensate skimmer basin area tank. Out of service.



Same as Above



Old skimmer basin area.-looking east



Old Skimmer basin area including out of service pump and sump. Looking east.



collapsed LPG tank

# OCD ENVIRONMENTAL BUREAU

## SITE INSPECTION SHEET

DATE: 3/22 Time: 3:50 PM

Type of Facility: Refinery ☐ Gas Plant ☒ Compressor St. ☐ Brine St. ☐ Oilfield Service Co. ☐  
Surface Waste Mgt. Facility ☐ E&P Site ☐ Crude Oil Pump Station ☐  
Other ☐ \_\_\_\_\_

Discharge Plan No ☐ Yes ☒ GW# 021

FACILITY NAME: MARATHON INDIAN BASIN GAS PLANT (170 MA 05)

PHYSICAL LOCATION: \_\_\_\_\_  
Legal: QTR \_\_\_\_\_ QTR \_\_\_\_\_ Sec \_\_\_\_\_ TS \_\_\_\_\_ R \_\_\_\_\_ County EMY CO.

OWNER/OPERATOR (NAME) \_\_\_\_\_

Contact Person: VJ KURKI Tele:# 505-457-2621

MAILING ADDRESS: \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

Owner/Operator Rep's: \_\_\_\_\_

OCD INSPECTORS: PRICE, VOLSOUTER, PRITCHER

1. **Drum Storage:** All drums containing materials other than fresh water must be stored on an impermeable pad with curbing. All empty drums will be stored on their sides with the bungs in and lined up on a horizontal plane. Chemicals in other containers such as sacks or buckets will also be stored on an impermeable pad and curb type containment.

2. **Process Areas:** All process and maintenance areas which show evidence that leaks and spills are reaching the ground surface must be either paved and curbed or have some type of spill collection device incorporated into the design.

WASTE SULFUR DISPOSAL AREA - NOT ~~IN THE DESIGN PLAN~~

3. Above Ground Tanks: All above ground tanks which contain fluids other than fresh water must be bermed to contain a volume of one-third more than the total volume of the largest tank or of all interconnected tanks. All new tanks or existing tanks that undergo a major modification, as determined by the Division, must be placed within an impermeable bermed enclosure.

OLD WATER/CONDENSATE SKIMMER BASIN AREA  
NEED CLOSURE PLAN

4. Above Ground Saddle Tanks: Above ground saddle tanks must have impermeable pad and curb type containment unless they contain fresh water or fluids that are gases at atmospheric temperature and pressure.

5. Labeling: All tanks, drums and containers will be clearly labeled to identify their contents and other emergency notification information.

6. Below Grade Tanks/Sumps: All below grade tanks, sumps, and pits must be approved by the OCD prior to installation or upon modification and must incorporate secondary containment and leak-detection into the design. All pre-existing sumps and below-grade tanks must demonstrate integrity on an annual basis. Integrity tests include pressure testing to 3 pounds per square inch above normal operating pressure and/or visual inspection of cleaned out tanks and/or sumps, or other OCD approved methods. The OCD will be notified at least 72 hours prior to all testing.

NEW SKIMMER BASIN SUMP - CHECK FOR SECONDARY CONTAINMENT  
INSTALLED 1996

7. Underground Process/Wastewater Lines: All underground process/wastewater pipelines must be tested to demonstrate their mechanical integrity at present and then every 5 years thereafter, or prior to discharge plan renewal. The permittee may propose various methods for testing such as pressure testing to 3 pounds per square inch above normal operating pressure or other means acceptable to the OCD. The OCD will be notified at least 72 hours prior to all testing.



8. Onsite/Offsite Waste Disposal and Storage Practices: Are all wastes properly characterized and disposed of correctly?

Does the facility have an EPA hazardous waste number? \_\_\_\_\_ Yes \_\_\_\_\_ No

ARE ALL WASTE CHARACTERIZED AND DISPOSED OF PROPERLY? YES NO IF NO DETAIL  
BELOW.

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9. Class V Wells: Leach fields and other wastewater disposal systems at OCD regulated facilities which inject non-hazardous fluid into or above an underground source of drinking water are considered Class V injection wells under the EPA UIC program. All Class V wells that inject non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes will be closed unless it can be demonstrated that groundwater will not be impacted in the reasonably foreseeable future. Closure of Class V wells must be in accordance with a plan approved by the Division's Santa Fe Office. The OCD allows industry to submit closure plans which are protective of human health, the environment and groundwater as defined by the WQCC, and are cost effective. Class V wells that inject domestic waste only must be permitted by the New Mexico Environment Department.

ANY CLASS V WELLS NO ☐ YES ☐ IF YES DESCRIBE BELOW ! Undetermined ☐

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10. Housekeeping: All systems designed for spill collection/prevention will be inspected weekly and after each storm event to ensure proper operation and to prevent overtopping or system failure. A record of inspections will be retained on site for a period of five years.

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11. Spill Reporting: All spills/releases will be reported pursuant to OCD Rule 116 and WQCC 1203 to the proper OCD District Office.

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12. Does the facility have any other potential environmental concerns/issues?

TOURED GROUND WATER REMEDIATION WELLS - NOW USING  
VAPOR EXTRACTION

13. Does the facility have any other environmental permits - i.e. SPCC, Stormwater Plan, etc.?

14. ANY WATER WELLS ON SITE? NO ☐ YES ☒ IF YES, HOW IS IT BEING USED?

ONE WATER WELL ON SITE (SW#1) NEED ANALYSIS

BTEX  
CHLORIDES  
METALS

15. Documents reviewed:

DISCHARGE PLAN REVIEW

Miscellaneous Comments:

Photos taken:

ATTACHED

Documents Reviewed/Collected:

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comply with that time.

The Owner reserves the right to reject any and all Bids, to waive technicalities, and to accept the Bid it deems to be in the best interest of the City of Santa Fe.

The work designated as SANTA FE YOUTH AND FAMILY CONSORTIUM - PHASE I, and consists of, but is not limited to; Construction of new administration facility, landscape, parking, patio's.

Contractor shall be responsible for verifications of all measurements and dimensions for bidding.

Contractor shall be responsible for all permits, fees, and State and City inspections associated with the construction.

The City of Santa Fe is an Equal Opportunity Employer and all qualified applicants will receive consideration without regard to race, color, religion, sex, sexual orientation or national origin. The successful Bidder will be required to conform to the Equal Opportunity Employment Regulations.

Bids will be received by the City of Santa Fe and will be delivered to City of Santa Fe, Purchasing Office, 2651 Siringo Road, Bldg. H Santa Fe, New Mexico 87505 until 2:00 P.M. local prevailing time, December 17, 2004. Any bid received after this deadline will not be considered. This bid is for the purpose of procuring: SANTA FE YOUTH AND FAMILY CONSORTIUM - PHASE I.

**ATTEST:**

Kathryn Raveling,  
Director Finance and Budget Department  
City of Santa Fe,  
New Mexico  
Legal #76325  
Pub. December 7, 2004

**FIRST JUDICIAL DISTRICT COURT STATE OF NEW MEXICO COUNTY OF SANTA FE**

**PAUL MANNICK and KATHY MANNICK,**  
Plaintiffs,

**ARTON FRERICHs and MARY FRERICHs,**  
Defendants.

**NOTICE OF PENDENCY OF ACTION FOR SPECIFIC PERFORMANCE**

An action for specific performance has been filed by the named plaintiffs against the named defendants to require the transfer of legal title to the real property described in the complaint in this cause, located within Section 26 and Section 27 of T.15N., R.8E., N.M.P.M. If the defendants fail to file a responsive pleading or motion within twenty days of the last date of this publication, a judgment or other appropriate relief will be rendered in the cause against the defendants by default.

**FIRST JUDICIAL DISTRICT COURT STATE OF NEW MEXICO COUNTY OF SANTA FE**

Case No: D-0101-CV-200402287

**IN THE MATTER OF A PETITION FOR CHANGE OF NAME OF JEANNINE D. OWENS**

**NOTICE OF CHANGE OF NAME**

TAKE NOTICE that in accordance with the provisions of Sec. 40-8-1 through Sec. 40-8-3 NMSA 1978, the Petitioner Jeannine D. Owens will apply to the Honorable James A. Hall, District Judge of the First Judicial District at the Santa Fe Judicial Complex at Santa Fe, New Mexico at 1:15 p.m. on the 17th day of December, 2004, for an order to change her name from Jeannine D. Owens to Jeannine D. LaFontaine.

STEPHEN T. PACHECO,  
District Court Clerk  
By: Cori Dennison  
Deputy Court Clerk

Respectfully submitted,

By: David Mittle, Esq.  
Law Office of David E. Mittle  
208 Maynard  
Santa Fe, NM 87501  
Tel.: (505) 982-4021  
Legal #76311  
Pub. November 30; December 7, 2004

**LEGAL NOTICE REQUEST FOR PROPOSALS**

The New Mexico Retiree Health Care Authority (NMRHCA) is seeking competitive proposals from qualified companies to offer and administer a statewide Medicare Preferred Provider Organization (PPO) benefit plan option(s) effective July 1, 2005.

The New Mexico Retiree Health Care Authority (NMRHCA) provides benefits for all retirees and their dependents from public entities that participate in the NMRHCA. On November 1, 2004, the NMRHCA covered approximately 8,659 retirees and 5,177 dependents under age 65 and 15,120 retirees and 4,446 dependents over age 65 in one or more of its benefit plans.

Offerors interested in obtaining the bid documents should contact the NMRHCA's Procurement Manager: Ms. Kristin Thompson, Executive Assistant NMRHCA, 2500 Louisiana, NE, Suite 101, Albuquerque, NM 87110, Phone: (505) 883.0232, Fax: (505) 884.8611, E-mail: kris@nmrhc.state.nm.us beginning at 9:00 a.m., Monday, December 6, 2004.

Proposals are due by 4:00 p.m. (MDT) on January 14, 2005. Award of a contract is tentatively scheduled for February 1, 2005. Enrollment activities for the selected Medicare PPO plan option(s) will be conducted in March-May 2005.

Any contract resulting from this procurement shall be subject

the New Mexico criminal statutes impose felony penalties for illegal bribes, gratuities, and kickbacks. Legal #76324  
Pub. December 6, 7, 8, 9, 10, 2004

**Meeting Notice**

Statewide Independent Living Council

The Statewide Independent Living Council will meet on Friday December 10, 2004 from 9:00 AM-4:00 PM at the Holiday Inn Express 1100 N. California, Socorro NM. The Council will discuss the State Plan for Independent Living, State and National issues affecting Independent Living, and receive reports from state agencies and Centers for Independent Living and other business. Final agenda will be available 24 hours prior to the meeting by calling Chris Isengard at 459-7672. Interpreters for persons with Hearing impairments will be provided. If you are a person with a disability who requires reasonable accommodations to participate in the meeting please contact Chris Isengard at 459-7672 at least 24 hours before the meeting to arrange for accommodations. Legal #76330  
Pub. December 7, 8, 9, 2004

**NOTICE OF A REGULAR MEETING OF THE NEW MEXICO MINING COMMISSION AND A MEETING OF THE COAL SURFACE MINING COMMISSION**

The New Mexico Mining Commission will hold a regular meeting at 1:00 p.m. Wednesday, December 15, 2004 in Porter Hall on the 1st floor of the Wendell Chino Building located at 1220 South Saint Francis Drive in Santa Fe, NM. During the meeting the Mining Commission will consider the items on its agenda which may include the adoption of an Open Meetings Act Resolution, a legislative update, and the Mining Act Reclamation Program's annual report. Additionally, the Mining Commission may consider other issues that come before it.

The New Mexico Coal Surface Mining Commission (CSMC) will reschedule its November 29, 2004 meeting, which was canceled due to inclement weather, at 3:00 p.m. Wednesday, December 15, 2004 in Porter Hall on the 1st floor of the Wendell Chino Building located at 1220 South Saint Francis Drive in Santa Fe, NM. During the meeting the CSMC will consider adoption of an Open Meetings Act Resolution and a legislative update. Additionally, the CSMC may consider other issues that come before it.

A copy of the draft agenda will be available at least one week prior to the meeting and can be viewed at <http://www.emnrd.state.nm.us/Mining/nmcm/hearings.htm> for the Mining Commission; and [will apply for holidays.

The Santa Fe New Mexican accepts no liability for legal ads that fail to published to meet the requirements of local ordinances.

\*\*Notice of Meeting\*\*

LEGAL NOTICE IS HEREBY GIVEN that the Governing Board of Santa Fe Community College \(SFCC\) will hold a Regular Meeting on Thursday, December 16 at 6 p.m. in the SFCC Board Room. In preparation for this Regular Meeting, the Governing Board will meet as a committee of the whole in a study session on Wednesday, December 15 at 6 p.m. in the President's Conference Room. No action will be taken during the study session on December 15, 2004.

Board meetings are open to the public. Individuals who need special accommodations should make arrangements by calling 428-1201 at least 24 hours before the meeting. An agenda will be available from the President's Office at least 24 hours prior to the meeting. Legal #76328  
Pub. December 7, 2004

\*\*REQUEST FOR PROPOSALS\*\*

New Mexico School for the Deaf is requesting competitive sealed qualifications based proposals to provide conference space for a 300-550 person conference in the spring of 2006.

Copies of the Request for Proposal \(RFP\) may be obtained by email request to Michele Bove at \[miche.bove@nmsd.k12.nm.us\]\(mailto:miche.bove@nmsd.k12.nm.us\) or by mail to \[cindy.huff@nmsd.k12.nm.us\]\(mailto:cindy.huff@nmsd.k12.nm.us\) or the request may be faxed to \(505\) 476-6421.

\*\*Proposals will be received until 5:00 p.m. MDT, December 10, 2004 and must be sealed and delivered to:\*\*

Cindy Huff,  
Coordinator  
Center for Information, Training and Professional Development  
New Mexico School for the Deaf  
1060 Cerrillos Rd.  
Santa Fe, NM 87505  
Attn: CASA 2006 RFP

New Mexico School for the Deaf reserves the right to reject any and all proposals. Legal #75289  
Pub. November 25, 26, 29, 30; December 1, 2, 3, 6, 7, 8, 2004

\*\*STATE OF NEW MEXICO COUNTY OF SANTA FE FIRST JUDICIAL DISTRICT COURT\*\*

No. D-0101-CV-2002-00045

\*\*GOLDMAN SACHS MORTGAGE COMPANY,\*\*  
Plaintiff,

vs.

\*\*CARLOS QUEZADA and ALBERTO V. AGUILERA a/k/a Juan Gabriel,\*\*  
Defendants.](http://www.emnrd.st</a></p></div><div data-bbox=)

the legal description shall control, and is more particularly described as follows:

Parcel One (1) as shown on plat entitled "Plat of Survey Requested by Pablo O. and Toni P. Romero, Robert and Anita Marie R. Armijo and Joseph M. Romero showing Parcels 1, 2, 3 and 4, within portion of Exception 203, P.C. 256", Pojoaque Pueblo Grant, in Sections 5 and 8, T19N, R9E, filed in the Office of the County Clerk, Santa Fe County, New Mexico on August 11, 1993, in Plat Book 252, page 030, as Document No. 826,279,

including any improvements, fixtures, and attachments, such as, but not limited to, mobile homes, subject to all taxes, utility liens and other restrictions and easements of record, and subject to a one (1) month right of redemption by the Defendants, the foregoing sale will be made to satisfy a foreclosure judgment rendered by this Court in the above-entitled and numbered cause, being an action to foreclose a mortgage on the above-described property. The Plaintiff's judgment is \$299,222.69, and the same bears interest at 10.9700% per annum, which accrues at the rate of \$89.93 per diem, commencing on August 1, 2002, with the Court reserving entry of final judgment against said Defendant Carlos Quezada for the amount due after foreclosure sale, for costs and attorney's fees, plus interest as may be assessed by the Court. The Plaintiff has the right to bid at such sale all of its judgment amount and submit its bid verbally or in writing. The Plaintiff may apply all or any part of its judgment to the purchase price in lieu of cash. The sale may be postponed and rescheduled at the discretion of the Special Master.

The Court's decree, having duly appointed Edward Little, as its Special Master to advertise and immediately offer for sale the subject real estate and to apply the proceeds of sale, first to the costs of sale and the Special Master's fees, then to pay the above-described judgment, interest, and costs of sale, and to pay unto the registry of the Court any balance remaining to satisfy future adjudication of priority mortgage holders;

NOW, THEREFORE, notice is hereby given that in the event that said property is not sooner redeemed, the undersigned will as set forth above, offer for sale and sell to the highest bidder for cash or equivalent, the lands and improvements described above for the purpose of satisfying, in the adjudged order of priorities, the judgment described herein and decree of foreclosure together

30; December 7, 2004

**NOTICE OF PUBLICATION**

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

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge permit application(s) has been submitted to the Director of the Oil Conservation Division, 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3440:

(GW-21) Marathon Oil Company, Mr. Vijay K. Kurki, P.E., Senior HES Professional, P.O. Box 3487, Houston, Texas, 77253-3487, has submitted a renewal application for the previously approved discharge plan for the Indian Basin Gas Plant located in the NE/4 Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. Plant waste water will be disposed of into the off-site OCD permitted class II well AGI SWD#1 located 2138 feet from the North line and 1060 feet from the West line (Unit E) of Section 23, T21S, R23E. The renewal application consists of methods and procedures for handling products, waste, waste water management, and site groundwater remediation summary.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge permit application and draft discharge permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. The draft discharge permit may also be viewed at OCD's web site <http://www.emnrd.state.nm.us/ocd/>. Prior to ruling on any proposed discharge permit or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed permit based on information available. If a public hearing is held, the director will approve or disapprove the proposed permit based on information in the permit and information submitted at the hearing.

GIVEN under the Seal of New Mexico





**Marathon  
Oil Company**

P.O. Box 3487  
Houston, TX 77253-3487  
Telephone 713/629-6600

February 23, 2005

Mr. Wayne Price  
Environmental Bureau  
New Mexico Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

**RE: Signed copy of Discharge Plan GW-21 Renewal  
Renewal Fee enclosed  
Indian Basin Gas Plant**

Dear Mr. Price,

Please find attached signed copy of the Discharge Plan renewal dated January 21, 2005.  
Renewal flat fee of \$4,000 for a gas plant is enclosed (Check No: 1164203).

Contact me at (713) 296-2213 if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads 'Vijay Kurki'.

Vijay K. Kurki, P.E.  
Senior HES Professional

xc: Mr. Tom Breninger, Plant Superintendent, IBGP

File: NM-IBGP-E405-038

ACKNOWLEDGEMENT OF RECEIPT  
OF CHECK/CASH

I hereby acknowledge receipt of check No. [REDACTED] dated 2/2/05  
or cash received on \_\_\_\_\_ in the amount of \$ 4000<sup>00</sup>  
from MARATHON OIL CO.  
for INDIAN BASIN GAS PLANT GW-21-  
Submitted by: <sup>(Facility Name)</sup> WAYNE PRICE Date: 3/11/05  
Submitted to ASD by: [Signature] Date: 11  
Received in ASD by: \_\_\_\_\_ Date: \_\_\_\_\_  
Filing Fee \_\_\_\_\_ New Facility \_\_\_\_\_ Renewal ☒  
Modification \_\_\_\_\_ Other \_\_\_\_\_  
Organization Code 521.07 Applicable FY 2004

To be deposited in the Water Quality Management Fund.

Full Payment ☒ or Annual Increment \_\_\_\_\_

DO NOT CASH UNLESS WARNING BAND AND THE CHECK BACKGROUND ARE IN VIOLET. THE LINE BELOW CONTAINS MICROPRINTING.

ACCOUNTS PAYABLE CHECK	Marathon Oil Company P.O. Box 3129 Houston, TX 77253	CHECK DATE 02/21/2005	CHECK NUMBER [REDACTED]
PAID TO ORDER <b>WATER QUALITY MANAGEMENT</b> 1220 S SAINT FRANCIS SANTA FE, NM 87505		GOOD AFTER 150 DAYS <b>\$4,000.00</b> FOUR THOUSAND DOLLARS WATCH AND SIGN IN TWO PLACES WITH NUMBERS	
NATIONAL CITY BANK Ashland, Ohio		By: <u>[Signature]</u> Authorized Representative	
Four thousand and 00/100 Dollars			

DO NOT CASH UNLESS THIS CHECK IS ON WATERMARKED PAPER. HOLD TO LIGHT TO VIEW. THE LINE ABOVE CONTAINS MICROPRINTING.

[REDACTED]



**Marathon  
Oil Company**

P.O. Box 3487  
Houston, TX 77253-3487  
Telephone 713/629-6600

January 24, 2005

Mr. Wayne Price  
Environmental Bureau  
New Mexico Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

**RE: Groundwater Discharge Plan GW-21  
Additional Attachments  
Indian Basin Gas Plant**

Dear Mr. Price,

Please find attached following attachments for the renewal application submitted to you in November 2004.

1. September 16, 2004 annual sampling approval letter from OCD
2. Public Notice Documentation at the facility
3. Certified mail return receipt card copies and letter copies sent to land owner – BLM
4. Table showing list of wells on the monitoring plan

If you have any questions regarding this application, please contact me at (713) 296-2213.

Sincerely,

Vijay K. Kurki, P.E.  
Senior HES Professional

xc: Mr. Tom Breninger, Plant Superintendent, IBGP

File: NM-IBGP-E405-038

**Kurki, Vijay K.**

---

**From:** Kurki, Vijay K.  
**Sent:** Monday, January 24, 2005 10:55 AM  
**To:** wprice@state.nm.us  
**Subject:** IBGP GW Discharge Plan Renewal

Wayne,

I was out of the office Friday, I could not return your call soon. Your message said that you were not able to locate the details about the remediation sampling plan. I have enclosed Appendix D with the plan amended on December 2, 2004. I can resend that information to you through e-mail if you can't find it. I have enclosed following documents for your reference. I will also send you hard copies of this information through mail today.

- 1) OCD September 16, 2004 letter approval of annual sampling at IBGP.
- 2) Pictures showing public notice at the facility
- 3) Certified mail return receipt card copies and letter copies sent to land owner around the facility (BLM).
- 4) Table showing list of wells on the monitoring plan



PublicNoticePictures .PDF (1 MB...    Table\_Sampling\_Plan.PDF (6 KB)...    LandOwnerNoticeLetter.pdf (212...    OCD approval of sampling plan ...

I will give you call after you had a chance to review these documents.

Thanks

**Vijay K. Kurki**  
Southern Business Unit  
Phone: (713) 296-2213  
Cell: (713) 408-6775  
Fax: (713) 499-6746  
vkkurki@marathonoil.com



# NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

**BILL RICHARDSON**

Governor

**Joanna Prukop**

Cabinet Secretary

**Mark E. Fesmire, P.E.**

Director

**Oil Conservation Division**

September 16, 2004

Mr. Vijay K. Kurki  
Marathon Oil Company  
P.O. Box 3487  
Houston, Texas 77253-3487

**RE: GROUND WATER REMEDIATION PROJECT  
MARATHON INDIAN BASIN GAS PLANT (GW-21)**

Dear Mr. Kurki:

The New Mexico Oil Conservation Division (OCD) has reviewed Marathon Oil Company's (MOC) September 2, 2004 email titled "INDIAN BASIN REMEDIATION PROJECT" and March 31, 2004 "ANNUAL GROUNDWATER MONITORING REPORT, JANUARY - DECEMBER 2003, INDIAN BASIN REMEDIATION PROJECT, EDDY COUNTY, NM".

These documents contain the results of MOC's remediation and monitoring of hydrocarbon contaminated ground water at MOC's Indian Basin Gas Plant. The documents also request approval to modify the ground water monitoring program. The proposed modification consists of changing ground water quality sampling events from semiannual to annual events. Ground water elevation monitoring in all site wells would remain a semiannual event.

The above-referenced proposed modification to the ground water monitoring program is approved. Please be advised that OCD approval does not relieve MOC of responsibility if the system fails to adequately remediate or monitor contamination related to MOC's activities, or if contamination exists which is outside the scope of the plan. In addition, OCD approval does not relieve MOC of responsibility for compliance with any other federal, state or local laws and regulations.

If you have any questions, please contact me at (505) 476-3491.

Sincerely,

William C. Olson

Hydrologist

Environmental Bureau

xc: Tim Gum, OCD Artesia District Supervisor

**Olson, William**

---

**From:** Kurki, Vijay K. [vkkurki@marathonoil.com]  
**Sent:** Thursday, September 02, 2004 2:34 PM  
**To:** wolson@state.nm.us  
**Cc:** Sologub Jr, Joe  
**Subject:** Indian Basin Remediation Project

Bill,

As we discussed on phone, Marathon would like to reduce groundwater monitoring to single annual event. Based on historical sampling data collected through 2003, it is apparent that BTEX concentrations are significantly reduced in most wells included in our sampling program. This request was included in the 2003 Annual Groundwater report submitted to you in March this year. This annual sampling would be conducted in April of each year as per the original OCD approved monitoring plan. We will continue to sample for PAH and metals once in two years as approved by OCD.

I appreciate your written confirmation on reducing sampling frequency from semi-annual to annual.

Thanks

**Vijay K. Kurki**

Southern Business Unit

**Phone: (713) 296-2213**

**Cell: (713) 408-6775**

**Fax: (713) 499-6746**

**vkkurki@marathonoil.com**

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9/16/2004



# NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

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Director

Oil Conservation Division

September 16, 2004

Mr. Vijay K. Kurki  
Marathon Oil Company  
P.O. Box 3487  
Houston, Texas 77253-3487

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MARATHON INDIAN BASIN GAS PLANT (GW-21)**

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If you have any questions, please contact me at (505) 476-3491.

Sincerely,

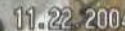
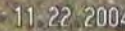
William C. Olson

Hydrologist

Environmental Bureau

xc: Tim Gum, OCD Artesia District Supervisor

Pictures taken on November 22, 2004 showing Public Notice Posting at the facility







**Marathon  
Oil Company**

P.O. Box 3487  
Houston, TX 77253-3487  
Telephone 713/629-6600

November 30, 2004

**CERTIFIED MAIL**

Ms. Linda Rundell  
Director  
Bureau of Land Management  
P.O. Box 27115  
Santa Fe, New Mexico 87502-0115

**RE: New Mexico Oil Conservation Division (OCD)  
Groundwater Discharge Permit Renewal  
Indian Basin Gas Plant, Eddy County, NM  
Marathon Oil Company**

Dear Ms. Rundell,

Marathon Oil Company, operator of the Indian Basin Gas Plant located in NE/4 Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico, has submitted a renewal application to OCD for the previously approved discharge plan. This renewal application consists of methods and procedures for handling products, waste and waste water management and site groundwater remediation summary.

Please find enclosed a copy of notice that was posted at the plant entrance on November 22, 2004. This notice is provided to you to satisfy the requirements of NMAC 20.6.2.3108 as BLM is adjacent land owner of record.

If you need more information please direct them to me at the address on the letter head. You may also contact me at (713) 296-2213 or by e-mail at [VKKurki@MarathonOil.Com](mailto:VKKurki@MarathonOil.Com).

Sincerely,

A handwritten signature in cursive script that reads 'Vijay Kurki'.

Vijay K. Kurki, P.E.  
Senior HES Professional

Encl.

cc: Mr. Tony Herrell, BLM- Carlsbad Field Office Manager (by certified mail)  
Mr. Wayne Price, NMOCD, Santa Fe, NM

File: NM-IBGP-E405-038

## NOTICE OF PUBLICATION

Posted: 11/22/2004

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

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge permit application(s) has been submitted to the Director of the Oil Conservation Division, 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3440:

**(GW-21) Marathon Oil Company, Mr. Vijay K. Kurki, P.E., Senior HES Professional, P.O. Box 3487, Houston, Texas, 77253-3487 (Phone: 713-296-2213), has submitted a renewal application for the previously approved discharge plan for the Indian Basin Gas Plant located in the NE/4 Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. Plant waste water will be disposed of into the off-site OCD permitted injection well - AGI SWD#1 located 2138 feet from the North line and 1060 feet from the West line (Unit E) of Section 23, T21S, R23E. The renewal application consists of methods and procedures for handling products, waste, waste water management, and site groundwater remediation summary.**

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge permit application and draft discharge permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. The draft discharge permit may also be viewed at OCD's web site <http://www.emnrd.state.nm.us/oed/>. Prior to ruling on any proposed discharge permit or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed permit based on information available. If a public hearing is held, the director will approve or disapprove the proposed permit based on information in the permit and information submitted at the hearing.

The Plan can also be viewed at the plant. The local Marathon Oil Company representative at the Indian Basin Gas Plant is **Mr. Tom Breninger**, Plant Superintendent. The street address of the plant is **329 Marathon Road (Eddy County Road 401), Lakewood**, New Mexico. The mailing address is P.O. Box 1324, Artesia, New Mexico 88211. The plant telephone number is **(505) 457-2621**.

## SENDER COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Linda Rundell  
Director  
Bureau of Land Management  
P. O. Box 27115  
Santa Fe, NM 87502-0115

2. Article Number (Copy from service label)

7001 1140 0001 0446 0559

PS Form 3811, July 1999

Domestic Return Receipt

102595-00-M-0952

## COMPLETE THIS SECTION ON DELIVERY

A. Received by (Please Print Clearly) B. Date of Delivery

Vada McCoy 12-6-09

C. Signature

X Vada McCoy

☐ Agent☐ AddresseeD. Is delivery address different from item 1? ☐ Yes

If YES, enter delivery address below:

DEC 6 2004

3. Service Type

☒ Certified Mail ☐ Express Mail☐ Registered☐ Insured Mail☒ Return Receipt for Merchandise☐ C.O.D.

4. Restricted Delivery? (Extra Fee)

☐ Yes

U.S. Postal Service

## CERTIFIED MAIL RECEIPT

(Domestic Mail Only; No Insurance Coverage Provided)

Public Notice - NMOC

Postage

\* Certified Fee

Return Receipt Fee  
(Endorsement Required)Restricted Delivery Fee  
(Endorsement Required)

Total Postage

Mr. Tony Herrell

Sent To

BLM Field Office Manager

Street, Apt. No.  
or PO Box No.

620 East Greene Street

City, State, ZIP

Carlsbad, NM 88220

PS Form 3800, January 2001

See Reverse for Instructions

U.S. Postal Service

## CERTIFIED MAIL RECEIPT

(Domestic Mail Only; No Insurance Coverage Provided)

Public Notice - NMOC

Postage

\* Certified Fee

Return Receipt Fee  
(Endorsement Required)Restricted Delivery Fee  
(Endorsement Required)

Total Postage

Ms. Linda Rundell

Sent To

Director

Bureau of Land Management

Street, Apt. No.  
or PO Box No.

P. O. Box 27115

City, State, ZIP

Santa Fe, NM 87502-0115

PS Form 3800, January 2001

See Reverse for Instructions

## SENDER: COMPLETE THIS SECTION

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Tony Herrell  
BLM Field Office Manager  
620 East Greene Street  
Carlsbad, NM 88220

2. Article Number (Copy from service label)

7001 1140 0001 0446 0566

PS Form 3811, July 1999

Domestic Return Receipt

102595-00-M-0952

## COMPLETE THIS SECTION ON DELIVERY

A. Received by (Please Print Clearly) B. Date of Delivery

KNA ABLE 12-7

C. Signature

X KNA ABLE

☐ Agent☐ AddresseeD. Is delivery address different from item 1? ☐ Yes

If YES, enter delivery address below:

☐ No

3. Service Type

☒ Certified Mail☐ Express Mail☐ Registered☐ Insured Mail☒ Return Receipt for Merchandise☐ C.O.D.

4. Restricted Delivery? (Extra Fee)

☐ Yes

Table 1. Groundwater Monitoring Plan (revised October 2004)  
Marathon Oil Company, Indian Basin Remediation Project, Eddy County, New Mexico.

**Shallow Zone**

Well ID	Sampling Schedule				
	Month April	annual	Analytical Parameters annual e/o year		Month October
MW-14	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-43	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-46	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-49	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-50	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-54	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-55	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-61	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-65	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-69	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-77	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-78	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-79	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-90	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-91	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-105	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-106	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-

**Lower Queen**

Well ID	Sampling Schedule				
	Month April	semi-annual	Analytical Parameters annual e/o year		Month October
MW-57	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-59	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-60	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-61A	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-62	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-63	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-64	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-66	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-67	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-70	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-71	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-73	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-74	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-87	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-87A	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-88	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-89	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-94	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-95	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-96	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-97	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-98	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-104	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-108	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-
MW-111	X	BTEX	Chloride, TDS	SVOCs, WQCC metals	-

**Notes:**

**OCD approved annual sampling plan with a semi-annual groundwater gauging in 2004.**

**Sampling will be performed in the month of April annually.**

SVOC and WQCC metals analysis will fall on even years (i.e., 2002, 2004, etc.)

SVOCs Semi-Volatile Organic Compounds via Method 8310

WQCC metals New Mexico Water Quality Control Commission metals (dissolved only for arsenic, lead, selenium, aluminum, barium, boron, cadmium, chromium, cobalt, copper, iron, manganese, molybdenum, nickel, silver, and zinc)

TDS Total Dissolved Solids

e/o year Every other year

**NOTICE OF  
PUBLICATION**

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

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge permit application(s) has been submitted to the Director of the Oil Conservation Division, 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3440:

**(GW-21) Marathon Oil Company, Mr. Vijay K. Kurki, P.E., Senior HES Professional, P.O. Box 3487, Houston, Texas, 77253-3487, has submitted a renewal application for the previously approved discharge plan for the Indian Basin Gas Plant located in the NE/4 Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. Plant waste water will be disposed of into the off-site OCD permitted class II well AGI SWD#1 located 2138 feet from the North line and 1060 feet from the West line (Unit E) of Section 23, T21S, R23E. The renewal application consists of methods and procedures for handling products, waste, waste water management, and site groundwater remediation summary.**

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge

permit application and draft discharge permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. The draft discharge permit may also be viewed at OCD's web site

<http://www.emnrd.state.nm.us/ocd/>. Prior to ruling on any proposed discharge permit or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed permit based on information available. If a public hearing is held, the director will approve or disapprove the proposed permit based on information in the permit and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 1th day of December 2004.

**STATE OF  
NEW MEXICO  
OIL CONSERVATION  
DIVISION**

**S E A L**

**Mark Fesmire,  
Director**

**Legal #76327  
Pub: December 7, 2004**

## Price, Wayne

---

**From:** Kurki, Vijay K. [vkurkigowdra@marathonoil.com]  
**Sent:** Wednesday, November 17, 2004 12:44 PM  
**To:** Price, Wayne  
**Cc:** Breninger, Tom  
**Subject:** RE: Permit review GW-021

**Importance:** High



GW21\_PUBNOT\_VK  
K Comments.doc

Wayne,

Please find attached Public Notice page with my comments. Marathon uses AGI SWD #1 well (API# 30-015-31294) to dispose plant waste. This well was drilled in August 2000. I will send you an updated plan as we discussed this morning.

I forwarded your previous e-mail to Tom Breninger. Tom's e-mail address: tlbreninger@marathonoil.com

Thanks

Vijay K. Kurki  
Southern Business Unit  
Phone: (713) 296-2213  
Cell: (713) 408-6775  
Fax: (713) 499-6746  
vkkurki@marathonoil.com

-----Original Message-----

**From:** Price, Wayne [mailto:WPrice@state.nm.us]  
**Sent:** Tuesday, November 16, 2004 3:40 PM  
**To:** Kurki, Vijay K.  
**Cc:** Gum, Tim  
**Subject:** FW: Permit review GW-021

> -----Original Message-----

> **From:** Price, Wayne  
> **Sent:** Tuesday, November 16, 2004 2:13 PM  
> **To:** 'vjkurki@marathonoil.com'  
> **Subject:** Permit review GW-021

>  
> **Attention:** Mr. Kurki (HES)  
> Mr. Breninger- Plant Supt.

>  
> OCD is in receipt of the Discharge Permit application and Discharge Plan  
> document dated September 17, 2004. In order for OCD to continue its  
> review, the following issues need to be resolved:

>  
> 1. OCD records indicate that the two disposal wells shown in the  
> discharge plan has either been plugged or converted to a gas well.

Our

> records show that the Marathon Federal SWD#1 API #  
30-015-10373

> has been plugged. The Marathon Indian Basin Gas Com well #1 API #  
> 30-015-00037 has been converted to a gas well. Please verify  
which

> wells are being used for disposal and amend the discharge plan.

Please

> provide the OCD SWD orders that allowed disposal.

>

> 2. The plot plans supplied in the plan did not show the old landfill or land farm areas. Please amend these drawings to reflect these areas.

>

> 3. Section 8.5.2.1 Treatment of soils: Please see OCD condition #17 in the previously approved permit. Please amend you permit to reflect these conditions:

>

> 4. OCD understands that the land farm has a liner. Please indicate how vadose zone monitoring will be accomplished without compromising the liner? Please address this issue and send in an amendment to plan.

>

> 5. Please amend section 8.5.2.1 to include full TCLP for all non-exempt material to be land farmed.

>

> 6. The four new tanks that were installed. Please provide documentation these tanks were installed pursuant to Condition #5 of the existing permit. They must have impermeable secondary containment.

> Due to past activities, OCD will require that all gas liquid condensate tanks shall have impermeable secondary containment. Please amend you plan to reflex this change. Marathon may propose a schedule to accomplish this.

>

> 7. The pipelines going to the disposal wells must be included in the underground line testing. Please amend you plan to include this.

>

> 8. Please find enclosed a copy of the public notice. Please let OCD know ASAP if this notice is technically correct. Also I have enclosed the public notice regs and flowchart to assist you in your part of the notice. You will be required to provide OCD with Proof of Notice.

>

> <<GW21\_PUBNOT11\_15\_04.DOC>> <<Public Notice Reg's..doc>> <<PN Flow Chart.doc>>

>

> 9. Please provide a comprehensive section in the plan to address the groundwater remediation. This section should have a chronologic section of significant events, maps, remediation activities, detail monitoring plan, treatment plan, reports due, discovery of new contamination and a commitment to continue remediation operations.

>

>

>

>

>

> Sincerely:

> Wayne Price

> New Mexico Oil Conservation Division

> 1220 S. Saint Francis Drive

> Santa Fe, NM 87505

> 505-476-3487

> fax: 505-476-3462  
> E-mail: WPRICE@state.nm.us  
>

Confidentiality Notice: This e-mail, including all attachments is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure or distribution is prohibited unless specifically provided under the New Mexico Inspection of Public Records Act. If you are not the intended recipient, please contact the sender and destroy all copies of this message. -- This email has been scanned by the MessageLabs Email Security System.

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## NOTICE OF PUBLICATION

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

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Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge permit application and draft discharge permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. The draft discharge permit may also be viewed at OCD's web site <http://www.emnrd.state.nm.us/ocd/>. Prior to ruling on any proposed discharge permit or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed permit based on information available. If a public hearing is held, the director will approve or disapprove the proposed permit based on information in the permit and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 15<sup>th</sup> day of November 2004.

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

S E A L

Mark Fesmire, Director

**Price, Wayne**

---

**From:** Kurki, Vijay K. [vkkurki@marathonoil.com]  
**Sent:** Monday, January 24, 2005 9:55 AM  
**To:** wprice@state.nm.us  
**Subject:** IBGP GW Discharge Plan Renewal

Wayne,

I was out of the office Friday, I could not return your call soon. Your message said that you were not able to locate the details about the remediation sampling plan. I have enclosed Appendix D with the plan amended on December 2, 2004. I can resend that information to you through e-mail if you can't find it. I have enclosed following documents for your reference. I will also send you hard copies of this information through mail today.

- 1) OCD September 16, 2004 letter approval of annual sampling at IBGP.
- 2) Pictures showing public notice at the facility
- 3) Certified mail return receipt card copies and letter copies sent to land owner around the facility (BLM).
- 4) Table showing list of wells on the monitoring plan

<<PublicNoticePictures.PDF>> <<Table\_Sampling Plan.PDF>> <<LandOwnerNoticeLetter.pdf>> <<OCD approval of sampling plan mod.pdf>>

I will give you call after you had a chance to review these documents.

Thanks

**Vijay K. Kurki**

Southern Business Unit

**Phone: (713) 296-2213**

**Cell: (713) 408-6775**

**Fax: (713) 499-6746**

**vkkurki@marathonoil.com**

---

This email has been scanned by the MessageLabs Email Security System.  
For more information please visit <http://www.messagelabs.com/email>

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**Marathon  
Oil Company**

P.O. Box 3487  
Houston, TX 77253-3487  
Telephone 713/629-6600

November 30, 2004

**CERTIFIED MAIL**

Ms. Linda Rundell  
Director  
Bureau of Land Management  
P.O. Box 27115  
Santa Fe, New Mexico 87502-0115

**RE: New Mexico Oil Conservation Division (OCD)  
Groundwater Discharge Permit Renewal  
Indian Basin Gas Plant, Eddy County, NM  
Marathon Oil Company**

Dear Ms. Rundell,

Marathon Oil Company, operator of the Indian Basin Gas Plant located in NE/4 Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico, has submitted a renewal application to OCD for the previously approved discharge plan. This renewal application consists of methods and procedures for handling products, waste and waste water management and site groundwater remediation summary.

Please find enclosed a copy of notice that was posted at the plant entrance on November 22, 2004. This notice is provided to you to satisfy the requirements of NMAC 20.6.2.3108 as BLM is adjacent land owner of record.

If you need more information please direct them to me at the address on the letter head. You may also contact me at (713) 296-2213 or by e-mail at [VKKurki@MarathonOil.Com](mailto:VKKurki@MarathonOil.Com).

Sincerely,

A handwritten signature in cursive script that reads 'Vijay Kurki'.

Vijay K. Kurki, P.E.  
Senior HES Professional

Encl.

cc: Mr. Tony Herrell, BLM- Carlsbad Field Office Manager (by certified mail)  
Mr. Wayne Price, NMOCD, Santa Fe, NM

File: NM-IBGP-E405-038

## NOTICE OF PUBLICATION

Posted: 11/22/2004

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

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge permit application(s) has been submitted to the Director of the Oil Conservation Division, 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3440:

**(GW-21) Marathon Oil Company, Mr. Vijay K. Kurki, P.E., Senior HES Professional, P.O. Box 3487, Houston, Texas, 77253-3487 (Phone: 713-296-2213), has submitted a renewal application for the previously approved discharge plan for the Indian Basin Gas Plant located in the NE/4 Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. Plant waste water will be disposed of into the off-site OCD permitted injection well - AGI SWD#1 located 2138 feet from the North line and 1060 feet from the West line (Unit E) of Section 23, T21S, R23E. The renewal application consists of methods and procedures for handling products, waste, waste water management, and site groundwater remediation summary.**

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge permit application and draft discharge permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. The draft discharge permit may also be viewed at OCD's web site <http://www.emnrd.state.nm.us/ocd/>. Prior to ruling on any proposed discharge permit or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed permit based on information available. If a public hearing is held, the director will approve or disapprove the proposed permit based on information in the permit and information submitted at the hearing.

The Plan can also be viewed at the plant. The local Marathon Oil Company representative at the Indian Basin Gas Plant is **Mr. Tom Breninger**, Plant Superintendent. The street address of the plant is **329 Marathon Road (Eddy County Road 401), Lakewood**, New Mexico. The mailing address is P.O. Box 1324, Artesia, New Mexico 88211. The plant telephone number is **(505) 457-2621**.

## SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Linda Rundell  
Director  
Bureau of Land Management  
P. O. Box 27115  
Santa Fe, NM 87502-0115

2. Article Number (Copy from service label)

7001 1140 0001 0446 0559

PS Form 3811, July 1999

Domestic Return Receipt

102595-00-M-0952

## COMPLETE THIS SECTION ON DELIVERY

A. Received by (Please Print Clearly) B. Date of Delivery

Vada McCoy 12-6-04

C. Signature

X Vada McCoy

☐ Agent  
☐ Addressee
D. Is delivery address different from item 1? ☐ Yes

If YES, enter delivery address below:

DEC 6 2004

3. Service Type

☒ Certified Mail ☐ Express Mail  
☐ Registered ☐ Return Receipt for Merchandise  
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee)

☐ Yes

U.S. Postal Service

## CERTIFIED MAIL RECEIPT

(Domestic Mail Only; No Insurance Coverage Provided)

Public Notice - NM OGD

Postage

Certified Fee

Return Receipt Fee  
(Endorsement Required)Restricted Delivery Fee  
(Endorsement Required)

Total Postage

Mr. Tony Herrell

Sent To

BLM Field Office Manager

Street, Apt. No.  
or PO Box No.

620 East Greene Street

City, State, ZIP

Carlsbad, NM 88220

PS Form 3800, January 2001

See Reverse for Instructions

U.S. Postal Service

## CERTIFIED MAIL RECEIPT

(Domestic Mail Only; No Insurance Coverage Provided)

Public Notice - NM OGD

Postage

Certified Fee

Return Receipt Fee  
(Endorsement Required)Restricted Delivery Fee  
(Endorsement Required)

Total Postage

Ms. Linda Rundell

Sent To

Director

Bureau of Land Management

Street, Apt. No.;  
or PO Box No.

P. O. Box 27115

City, State, ZIP

Santa Fe, NM 87502-0115

PS Form 3800, January 2001

See Reverse for Instructions

## SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Tony Herrell  
BLM Field Office Manager  
620 East Greene Street  
Carlsbad, NM 88220

2. Article Number (Copy from service label)

7001 1140 0001 0446 0566

PS Form 3811, July 1999

Domestic Return Receipt

102595-00-M-0952

## COMPLETE THIS SECTION ON DELIVERY

A. Received by (Please Print Clearly) B. Date of Delivery

KNA ABLE 12-7

C. Signature

X KNA ABLE

☐ Agent  
☐ Addressee
D. Is delivery address different from item 1? ☐ Yes

If YES, enter delivery address below:

☐ No

3. Service Type

☒ Certified Mail ☐ Express Mail  
☐ Registered ☒ Return Receipt for Merchandise  
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee)

☐ Yes



# NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

**BILL RICHARDSON**

Governor

**Joanna Prukop**

Cabinet Secretary

**Mark E. Fesmire, P.E.**

Director

Oil Conservation Division

September 16, 2004

Mr. Vijay K. Kurki  
Marathon Oil Company  
P.O. Box 3487  
Houston, Texas 77253-3487

**RE: GROUND WATER REMEDIATION PROJECT  
MARATHON INDIAN BASIN GAS PLANT (GW-21)**

Dear Mr. Kurki:

The New Mexico Oil Conservation Division (OCD) has reviewed Marathon Oil Company's (MOC) September 2, 2004 email titled "INDIAN BASIN REMEDIATION PROJECT" and March 31, 2004 "ANNUAL GROUNDWATER MONITORING REPORT, JANUARY - DECEMBER 2003, INDIAN BASIN REMEDIATION PROJECT, EDDY COUNTY, NM".

These documents contain the results of MOC's remediation and monitoring of hydrocarbon contaminated ground water at MOC's Indian Basin Gas Plant. The documents also request approval to modify the ground water monitoring program. The proposed modification consists of changing ground water quality sampling events from semiannual to annual events. Ground water elevation monitoring in all site wells would remain a semiannual event.

The above-referenced proposed modification to the ground water monitoring program is approved. Please be advised that OCD approval does not relieve MOC of responsibility if the system fails to adequately remediate or monitor contamination related to MOC's activities, or if contamination exists which is outside the scope of the plan. In addition, OCD approval does not relieve MOC of responsibility for compliance with any other federal, state or local laws and regulations.

If you have any questions, please contact me at (505) 476-3491.

Sincerely,

William C. Olson

Hydrologist

Environmental Bureau

xc: Tim Gum, OCD Artesia District Supervisor

# Indian Basin Gas Plant Groundwater Discharge Plan Renewal

Pictures taken on November 22, 2004 showing Public Notice Posting at the facility





**Marathon  
Oil Company**

P.O. Box 3487  
Houston, TX 77253-3487  
Telephone 713/629-6600

December 3, 2004

Mr. Wayne Price  
Environmental Bureau  
New Mexico Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

**RE: Amended Groundwater Discharge Plan GW-21  
Attachments  
Indian Basin Gas Plant**

Dear Mr. Price,

Please find attached amended discharge plan documentation as per your e-mail request dated November 16, 2004.

If you have any questions regarding this application, please contact me at (713) 296-2213.

Sincerely,

A handwritten signature in cursive script that reads 'Vijay Kurki'.

Vijay K. Kurki, P.E.  
Senior HES Professional

xc: Mr. Tom Breninger, Plant Superintendent, IBGP

File: NM-IBGP-E405-038





# NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

**GARY E. JOHNSON**

Governor

**Jennifer A. Salisbury**

Cabinet Secretary

**Lori Wrotenberg**

Director

**Oil Conservation Division****CORRECTED****ADMINISTRATIVE ORDER SWD-784**

## **APPLICATION OF MARATHON OIL COMPANY FOR PRODUCED WATER AND GAS PLANT WASTE DISPOSAL, EDDY COUNTY, NEW MEXICO.**

### **ADMINISTRATIVE ORDER OF THE OIL CONSERVATION DIVISION**

Under the provisions of Rule 701(B), Marathon Oil Company made application to the New Mexico Oil Conservation Division on July 28, 2000, for permission to complete for produced water and gas plant waste disposal its AGI Well No. 1 (API No. N/A) located 2138 feet from the North line and 1060 feet from the West line (Unit E) of Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. The AGI Well No. 1 is to be drilled and completed to replace Marathon's Indian Basin Com Well No. 1 disposal well.

#### **THE DIVISION DIRECTOR FINDS THAT:**

- (1) The application has been duly filed under the provisions of Rule 701(B) of the Division Rules and Regulations;
- (2) Satisfactory information has been provided that all offset operators and surface owners have been duly notified;
- (3) The applicant has presented satisfactory evidence that all requirements prescribed in Rule 701 will be met; and
- (4) No objections have been received within the waiting period prescribed by said rule.

#### **IT IS THEREFORE ORDERED THAT:**

The applicant herein, is hereby authorized to complete its AGI Well No. 1 (API No. N/A) located 2138 feet from the North line and 1060 feet from the West line (Unit E) of Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico, in such a manner as to permit the injection of produced water and gas plant waste for disposal purposes into the Devonian formation from approximately 10,350 feet to 11,000 feet (Openhole) through 5 1/2 inch plastic-lined tubing set in a packer located at approximately 10,300 feet.

*Administrative Order SWD-784  
Marathon Oil Company  
August 17, 2000  
Page 2*

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**IT IS FURTHER ORDERED THAT:**

Within 30 days of commencing injection operations into the AGI Well No. 1, injection operations in Marathon's Indian Basin Com Well No. 1 disposal well shall cease and it shall be plugged back pursuant to Division standards.

The operator shall take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.

Prior to commencing injection operations into the well, the casing shall be pressure tested from the surface to the packer setting depth to assure the integrity of said casing.

The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface or left open to the atmosphere to facilitate detection of leakage in the casing, tubing, or packer.

The injection well or system shall be equipped with a pressure limiting device which will limit the wellhead pressure on the injection well to no more than 2070 psi.

The Director of the Division may authorize an increase in injection pressure upon a proper showing by the operator of said well that such higher pressure will not result in migration of the injected fluid from the Devonian formation. Such proper showing shall consist of a valid step-rate test run in accordance with and acceptable to this office.

The operator shall notify the supervisor of the Artesia district office of the Division of the date and time of the installation of disposal equipment and of any mechanical integrity test so that the same may be inspected and witnessed.

The operator shall immediately notify the supervisor of the Artesia district office of the Division of the failure of the tubing, casing, or packer in said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

**PROVIDED FURTHER THAT,** jurisdiction is retained by the Division for the entry of such further orders as may be necessary for the prevention of waste and/or protection of correlative rights or upon failure of the operator to conduct operations (1) to protect fresh water or (2) consistent with the requirements in this order, whereupon the Division may, after notice and hearing, terminate the injection authority granted herein.

The operator shall submit monthly reports of the disposal operations on Division Form C-115, in accordance with Rule Nos. 706 and 1120 of the Division Rules and Regulations.

The injection authority granted herein shall terminate one year after the effective date of

*Administrative Order SWD-784*

*Marathon Oil Company*

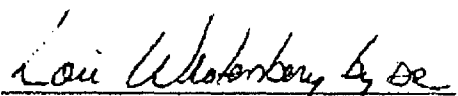
*August 17, 2000*

*Page 3*

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this order if the operator has not commenced injection operations into the subject well, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

Approved at Santa Fe, New Mexico, on this 17<sup>th</sup> day of August, 2000.



LORI WROTENBERY, Director

LW/MWA/kv

cc: Oil Conservation Division - Artesia  
U.S. Bureau of Land Management - Carlsbad

RECEIVED



**Marathon  
Oil Company**

DEC 06 2004

**CONSERVATION  
DIVISION**

P.O. Box 3487  
Houston, TX 77253-3487  
Telephone 713/629-6600

November 30, 2004

**CERTIFIED MAIL**

Ms. Linda Rundell  
Director  
Bureau of Land Management  
P.O. Box 27115  
Santa Fe, New Mexico 87502-0115

**RE: New Mexico Oil Conservation Division (OCD)  
Groundwater Discharge Permit Renewal  
Indian Basin Gas Plant, Eddy County, NM  
Marathon Oil Company**

Dear Ms. Rundell,

Marathon Oil Company, operator of the Indian Basin Gas Plant located in NE/4 Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico, has submitted a renewal application to OCD for the previously approved discharge plan. This renewal application consists of methods and procedures for handling products, waste and waste water management and site groundwater remediation summary.

Please find enclosed a copy of notice that was posted at the plant entrance on November 22, 2004. This notice is provided to you to satisfy the requirements of NMAC 20.6.2.3108 as BLM is adjacent land owner of record.

If you need more information please direct them to me at the address on the letter head. You may also contact me at (713) 296-2213 or by e-mail at [VKKurki@MarathonOil.Com](mailto:VKKurki@MarathonOil.Com).

Sincerely,

A handwritten signature in cursive script that reads 'Vijay Kurki'.

Vijay K. Kurki, P.E.  
Senior HES Professional

Encl.

cc: Mr. Tony Herrell, BLM- Carlsbad Field Office Manager (by certified mail)  
Mr. Wayne Price, NMOCD, Santa Fe, NM

File: NM-IBGP-E405-038

## NOTICE OF PUBLICATION

Posted: 11/22/2004

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

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge permit application(s) has been submitted to the Director of the Oil Conservation Division, 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3440:

**(GW-21) Marathon Oil Company, Mr. Vijay K. Kurki, P.E., Senior HES Professional, P.O. Box 3487, Houston, Texas, 77253-3487 (Phone: 713-296-2213), has submitted a renewal application for the previously approved discharge plan for the Indian Basin Gas Plant located in the NE/4 Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. Plant waste water will be disposed of into the off-site OCD permitted injection well - AGI SWD#1 located 2138 feet from the North line and 1060 feet from the West line (Unit E) of Section 23, T21S, R23E. The renewal application consists of methods and procedures for handling products, waste, waste water management, and site groundwater remediation summary.**

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge permit application and draft discharge permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. The draft discharge permit may also be viewed at OCD's web site <http://www.emnrd.state.nm.us/oed/>. Prior to ruling on any proposed discharge permit or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed permit based on information available. If a public hearing is held, the director will approve or disapprove the proposed permit based on information in the permit and information submitted at the hearing.

The Plan can also be viewed at the plant. The local Marathon Oil Company representative at the Indian Basin Gas Plant is **Mr. Tom Breninger**, Plant Superintendent. The street address of the plant is **329 Marathon Road (Eddy County Road 401), Lakewood**, New Mexico. The mailing address is P.O. Box 1324, Artesia, New Mexico 88211. The plant telephone number is **(505) 457-2621**.



**Marathon  
Oil Company**

P.O. Box 3487  
Houston, TX 77253-3487  
Telephone 713/629-6600

October 29, 2004

Mr. Wayne Price  
Environmental Bureau  
New Mexico Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

**RE: Groundwater Discharge Plan GW-21  
Attachments  
Indian Basin Gas Plant**

Dear Mr. Price,

Please find attached updated attachments for the renewal application submitted to you last month.

If you have any questions regarding this application, please contact me at (713) 296-2213.

Sincerely,

A handwritten signature in cursive script that reads "Vijay K. Kurki".

Vijay K. Kurki, P.E.  
Senior HES Professional

xc: NMOCD District II, Artesia, NM  
Mr. Tom Breninger, Plant Superintendent, IBGP

File: NM-IBGP-E405-038

## NOTICE OF PUBLICATION

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

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge permit application(s) has been submitted to the Director of the Oil Conservation Division, 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3440:

**(GW-21) Marathon Oil Company, Mr. Vijay K. Kurki, P.E., Senior HES Professional, P.O. Box 3487, Houston, Texas, 77253-3487, has submitted a renewal application for the previously approved discharge plan for the Indian Basin Gas Plant located in the NE/4 Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. Plant waste water will be disposed of into the off-site OCD permitted class II well AGI SWD#1 located 2138 feet from the North line and 1060 feet from the West line (Unit E) of Section 23, T21S, R23E. The renewal application consists of methods and procedures for handling products, waste, waste water management, and site groundwater remediation summary.**

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge permit application and draft discharge permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. The draft discharge permit may also be viewed at OCD's web site <http://www.emnrd.state.nm.us/oed/>. Prior to ruling on any proposed discharge permit or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed permit based on information available. If a public hearing is held, the director will approve or disapprove the proposed permit based on information in the permit and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 1<sup>th</sup> day of December 2004.

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

S E A L

Mark Fesmire, Director

## Price, Wayne

---

**From:** Kurki, Vijay K. [vkurkigowdra@marathonoil.com]  
**Sent:** Wednesday, November 17, 2004 12:44 PM  
**To:** Price, Wayne  
**Cc:** Breninger, Tom  
**Subject:** RE: Permit review GW-021

**Importance:** High



GW21\_PUBNOT\_VK  
K Comments.doc

Wayne,

Please find attached Public Notice page with my comments. Marathon uses AGI SWD #1 well (API# 30-015-31294) to dispose plant waste. This well was drilled in August 2000. I will send you an updated plan as we discussed this morning.

I forwarded your previous e-mail to Tom Breninger. Tom's e-mail address: tlbreninger@marathonoil.com

Thanks

Vijay K. Kurki  
Southern Business Unit  
Phone: (713) 296-2213  
Cell: (713) 408-6775  
Fax: (713) 499-6746  
vkkurki@marathonoil.com

-----Original Message-----

**From:** Price, Wayne [mailto:WPrice@state.nm.us]  
**Sent:** Tuesday, November 16, 2004 3:40 PM  
**To:** Kurki, Vijay K.  
**Cc:** Gum, Tim  
**Subject:** FW: Permit review GW-021

> -----Original Message-----

> **From:** Price, Wayne  
> **Sent:** Tuesday, November 16, 2004 2:13 PM  
> **To:** 'vjkurki@marathonoil.com'  
> **Subject:** Permit review GW-021

>  
> **Attention:** Mr. Kurki (HES)  
> Mr. Breninger- Plant Supt.

>  
> OCD is in receipt of the Discharge Permit application and Discharge Plan  
> document dated September 17, 2004. In order for OCD to continue its  
> review, the following issues need to be resolved:

>  
> 1. OCD records indicate that the two disposal wells shown in the  
> discharge plan has either been plugged or converted to a gas well.  
Our  
> records show that the Marathon Federal SWD#1 API #  
30-015-10373  
> has been plugged. The Marathon Indian Basin Gas Com well #1 API #  
> 30-015-00037 has been converted to a gas well. Please verify  
which  
> wells are being used for disposal and amend the discharge plan.  
Please



> provide the OCD SWD order that allowed disposal.

>

> 2. The plot plans supplied in the plan did not show the old landfill or land farm areas. Please amend these drawings to reflect these areas.

>

> 3. Section 8.5.2.1 Treatment of soils: Please see OCD condition #17 in the previously approved permit. Please amend your permit to reflect these conditions:

>

> 4. OCD understands that the land farm has a liner. Please indicate how vadose zone monitoring will be accomplished without compromising the liner? Please address this issue and send in an amendment to plan.

>

> 5. Please amend section 8.5.2.1 to include full TCLP for all non-exempt material to be land farmed.

>

> 6. The four new tanks that were installed. Please provide documentation these tanks were installed pursuant to Condition #5 of the existing permit. They must have impermeable secondary containment. Due to past activities, OCD will require that all gas liquid condensate tanks shall have impermeable secondary containment. Please amend your plan to reflect this change. Marathon may propose a schedule to accomplish this.

>

> 7. The pipelines going to the disposal wells must be included in the underground line testing. Please amend your plan to include this.

>

> 8. Please find enclosed a copy of the public notice. Please let OCD know ASAP if this notice is technically correct. Also I have enclosed the public notice regs and flowchart to assist you in your part of the notice. You will be required to provide OCD with Proof of Notice.

>

> <<GW21\_PUBNOT11\_15\_04.DOC>> <<Public Notice Reg's..doc>> <<PN Flow Chart.doc>>

>

> 9. Please provide a comprehensive section in the plan to address the groundwater remediation. This section should have a chronologic section of significant events, maps, remediation activities, detail monitoring plan, treatment plan, reports due, discovery of new contamination and a commitment to continue remediation operations.

>

>

>

>

>

> Sincerely:

> Wayne Price

> New Mexico Oil Conservation Division

> 1220 S. Saint Francis Drive

> Santa Fe, NM 87505

> 505-476-3487

> fax: 505-476-3462  
> E-mail: WPRICE@state.nm.us  
>

Confidentiality Notice: This e-mail, including all attachments is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure or distribution is prohibited unless specifically provided under the New Mexico Inspection of Public Records Act. If you are not the intended recipient, please contact the sender and destroy all copies of this message. -- This email has been scanned by the MessageLabs Email Security System.

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This email has been scanned by the MessageLabs Email Security System.  
For more information please visit <http://www.messagelabs.com/email>

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**Price, Wayne**

---

**From:** Price, Wayne  
**Sent:** Tuesday, November 16, 2004 2:13 PM  
**To:** 'vjkurki@marathonoil.com'  
**Subject:** Permit review GW-021

**Contacts:** Vijay K Kurki

Attention: Mr. Kurki (HES)  
Mr. Breninger- Plant Supt.

OCD is in receipt of the Discharge Permit application and Discharge Plan document dated September 17, 2004. In order for OCD to continue its review, the following issues need to be resolved:

1. OCD records indicate that the two disposal wells shown in the discharge plan has either been plugged or converted to a gas well. Our records show that the Marathon Federal SWD#1 API # 30-015-10373 has been plugged. The Marathon Indian Basin Gas Com well #1 API # 30-015-00037 has been converted to a gas well. Please verify which wells are being used for disposal and amend the discharge plan. Please provide the OCD SWD orders that allowed disposal.
2. The plot plans supplied in the plan did not show the old landfill or land farm areas. Please amend these drawings to reflect these areas.
3. Section 8.5.2.1 Treatment of soils: Please see OCD condition #17 in the previously approved permit. Please amend you permit to reflect these conditions:
4. OCD understands that the land farm has a liner. Please indicate how vadose zone monitoring will be accomplished without compromising the liner? Please address this issue and send in an amendment to plan.
5. Please amend section 8.5.2.1 to include full TCLP for all non-exempt material to be land farmed.
6. The four new tanks that were installed. Please provide documentation these tanks were installed pursuant to Condition #5 of the existing permit. They must have impermeable secondary containment. Due to past activities, OCD will require that all gas liquid condensate tanks shall have impermeable secondary containment. Please amend you plan to reflex this change. Marathon may propose a schedule to accomplish this.
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8. Please find enclosed a copy of the public notice. Please let OCD know ASAP if this notice is technically correct. Also I have enclosed the public notice regs and flowchart to assist you in your part of the notice. You will be required to provide OCD with Proof of Notice.



GW21\_PUBNOT11\_  
15\_04.DOC



Public Notice  
Reg's..doc



PN Flow Chart.doc

9. Please provide a comprehensive section in the plan to address the groundwater remediation. This section should have a chronologic section of significant events, maps, remediation activities, detail monitoring plan, treatment plan, reports due, discovery of new contamination and a commitment to continue remediation operations.

Sincerely:  
Wayne Price  
New Mexico Oil Conservation Division

220 S. Saint Francis Drive  
Santa Fe, NM 87505  
505-476-3487  
fax: 505-476-3462  
E-mail: WPRICE@state.nm.us

**NOTICE OF PUBLICATION**

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

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge permit application(s) has been submitted to the Director of the Oil Conservation Division, 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3440:

**(GW-21) Marathon Oil Company, Mr. Vijay K. Kurki, P.E., Senior HES Professional, P.O. Box 3487, Houston, Texas, 77253-3487, has submitted a renewal application for the previously approved discharge plan for the Indian Basin Gas Plant located in the NE/4 Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. Plant waste water will be disposed of into two off-site OCD permitted class II wells. Hydrocarbon-contaminated ground water from Marathon's ground water remediation project will be collected and treated to New Mexico Water Quality Control Commission standards by an air stripper/activated carbon system. The treated water will then be injected into the Lower Queen and/or the Shallow zone aquifer located in SE/4 of Section 23, Township 21 South, Range 23 East and NE/4 of Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. The renewal application consist of methods and procedures for handling products, waste, waste water management, and site groundwater investigation/remediation plans.**

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge permit application and draft discharge permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. The draft discharge permit may also be viewed at OCD's web site <http://www.emnrd.state.nm.us/ocd/>. Prior to ruling on any proposed discharge permit or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed permit based on information available. If a public hearing is held, the director will approve or disapprove the proposed permit based on information in the permit and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 15<sup>th</sup> day of November 2004.

**STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION**

S E A L

Mark Fesmire, Director

DRAFT

November 15, 2004

**CERTIFIED MAIL**  
**RETURN RECEIPT NO.**

Mr. Vijay K. Kurki, P.E.  
Marathon Oil Company  
P.O. Box 3487  
Houston, Texas 77253-3487

Re: Discharge Plan GW-021 Renewal  
Indian Basin Gas Plant

Dear Mr. Kurki:

The groundwater discharge plan renewal for the Marathon Oil Company Indian Basin Gas Plant GW-021 operated by Marathon Oil Company located in the NE/4 of Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico, **is hereby approved** under the conditions contained in the enclosed attachment. Enclosed are two copies of the conditions of approval. . **Please sign and return one copy to the New Mexico Oil Conservation Division (OCD) Santa Fe Office within 30 working days of receipt of this letter.**

The original discharge plan application was submitted on November 10, 1981 and approved on November 26, 1984 with an expiration date of November 26, 1989. The discharge plan renewal application dated September 17, 2004 and supplemental information submitted pursuant to Section 3106 of the New Mexico Water Quality Control Commission (WQCC) Regulations also includes all earlier applications and all conditions later placed on those approvals.

The discharge plan is renewed pursuant to Section 3109.C. Please note Section 3109.G., which provides for possible future amendment of the plan. Please be advised that approval of this plan does not relieve Marathon Oil Company of liability should operations result in pollution of surface or ground waters, or the environment. Please be advised that all exposed pits, including lined pits and open top tanks (exceeding 16 feet in diameter) shall be screened, netted, or otherwise rendered nonhazardous to wildlife including migratory birds.

Please note that Section 3104. of the regulations requires that "when a plan has been approved, discharges must be consistent with the terms and conditions of the plan." Pursuant to Section 3107.C., Marathon Oil Company is required to notify the Director of any facility expansion, production increase, or process modification that would result in any change in the discharge of water quality or volume.

DRAFT

Pursuant to Section 3109.H.4., this approval is for a period of five years. **This approval will expire November 26, 2009** and an application for renewal should be submitted in ample time before that date. Pursuant to Section 3106.F. of the regulations, if a discharger submits a discharge plan renewal application at least 120 days before the discharge plan expires and is in compliance with the approved plan, then the existing discharge plan will not expire until the application for renewal has been approved or disapproved.

The discharge plan application for the Marathon Oil Company, Indian Basin Gas Plant is subject to the WQCC Regulation 3114. Every billable facility submitting a discharge plan will be assessed a fee equal to the filing fee of \$100 plus a renewal flat fee of \$4000.00 for a Gas Plant.

Please make all checks payable to: **Water Quality Management Fund**  
**C/o: Oil Conservation Division**  
**1220 South Saint Francis Drive**  
**Santa Fe, New Mexico 87505.**

If you have any questions, please contact Wayne Price of my staff at (505-476-3487) or E-mail [WPRICE@state.nm.us](mailto:WPRICE@state.nm.us). On behalf of the staff of the OCD, I wish to thank you and your staff for your cooperation during this discharge permit review.

Sincerely,

Roger C. Anderson  
Environmental Bureau Chief  
RCA/lwp  
Attachment-1  
Xc: OCD Hobbs Office

**ATTACHMENT TO THE DISCHARGE PLAN GW-021 APPROVAL**  
**Marathon Oil Company, Indian Basin Gas Plant**  
**DISCHARGE PLAN APPROVAL CONDITIONS**  
**November 15, 2004**

1. Payment of Discharge Plan Fees: The \$100.00 filing fee has been received by the OCD. There is a required flat fee of \$4000.00 for Gas Processing Plants.
2. Commitments: Marathon Oil Company will abide by all commitments submitted in the discharge plan renewal application dated September 17, 2004 and supplemental information including attachments, and these conditions for approval.
3. Drum Storage: All drums containing materials other than fresh water must be stored on an impermeable pad with curbing. All empty drums should be stored on their sides with the bungs in place and lined up on a horizontal plane. Chemicals in other containers such as sacks or buckets must also be stored on an impermeable pad with curbing.
4. Process Areas: All process and maintenance areas which show evidence that leaks and spills are reaching the ground surface must be either paved and curbed or have some type of spill collection device incorporated into the design.
5. Above Ground Tanks: All above ground tanks which contain fluids other than fresh water must be bermed to contain a volume of one-third more than the total volume of the largest tank or of all interconnected tanks. All new facilities or modifications to existing facilities must place the tank on an impermeable type pad within the berm.

**Section 9. of the Discharge Plan application: (Proposed Modifications)** The four new storage tanks located in the southeast portion of the plant shall have an impermeable secondary containment.

6. Above Ground Saddle Tanks: Above ground saddle tanks must have impermeable pad and curb type containment unless they contain fresh water or fluids that are gases at atmospheric temperature and pressure.
7. Labeling: All tanks, drums, and other containers should be clearly labeled to identify their contents and other emergency information necessary if the tank were to rupture, spill, or ignite.
8. Below Grade Tanks/Sumps: All below grade tanks, sumps, and pits must be approved by the OCD prior to installation or upon modification and must incorporate secondary containment and leak-detection into the design. All below grade tanks, sumps and pits must be tested annually, except systems that have



secondary containment with leak detection. These systems with leak detection shall have a monthly inspection of the leak detection to determine if the primary containment is leaking. Results of tests and inspections shall be maintained at the

facility covered by this discharge plan and available for NMOCD inspection. Any system found to be leaking shall be reported pursuant to Item # 12. Permit holders may propose various methods for testing such as pressure testing to 3 pounds per square inch above normal operating pressure and/or visual inspection of cleaned out tanks and/or sumps, or other OCD approved methods. The OCD will be notified at least 72 hours prior to all testing.

9. Underground Process/Wastewater Lines: All underground process/wastewater pipelines must be approved by the OCD prior to installation and must be tested to demonstrate their mechanical integrity every five (5) years. Results of such tests shall be maintained at the facility covered by this discharge plan and available for NMOCD inspection. Permit holders may propose various methods for testing such as pressure testing to 3 pounds per square inch above normal operating pressure or other means acceptable to the OCD. The OCD will be notified at least 72 hours prior to all testing. The wastewater disposal lines from the plant to the disposal wells shall be included in the Underground Process/Wastewater Lines testing program.
10. Class V Wells: No Class V wells that inject non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes will be approved for construction and/or operation unless it can be demonstrated that groundwater will not be impacted in the reasonably foreseeable future. Leach fields and other wastewater disposal systems at OCD regulated facilities which inject non-hazardous fluid into or above an underground source of drinking water are considered Class V injection wells under the EPA UIC program. Class V wells that inject domestic waste only must be permitted by the New Mexico Environment Department.
11. Housekeeping: All systems designed for spill collection/prevention, and leak detection will be inspected daily to ensure proper operation and to prevent over topping or system failure. All spill collection and/or secondary containment devices will be emptied of fluids within 48 hours of discovery. A record of inspections will be retained on site for a period of five years.
12. Spill Reporting: All spills/releases shall be reported pursuant to OCD Rule 116. and WQCC 1203. to the OCD Artesia District Office.
13. Waste Disposal: All wastes will be disposed of at an OCD approved facility. Only oilfield exempt wastes shall be disposed of down Class II injection wells. Non-exempt oilfield wastes that are non-hazardous may be disposed of at an OCD approved facility upon proper waste determination per 40 CFR Part 261. Any waste stream that is not listed in the discharge permit will be approved by OCD on a case-by-case basis.

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Rule 712 Waste: Pursuant to Rule 712 disposal of certain non-domestic waste is allowed at solid waste facilities permitted by the New Mexico Environment Department as long as the waste stream is identified in the discharge permit, and

existing process knowledge of the waste stream does not change without notification to the Oil Conservation Division.

14. Gas Plant Class II Disposal Wells: Shall be operated and maintained pursuant to OCD division orders SWD-55 and SWD-416 as amended April 12, 2000.
15. OCD Inspections: Additional requirements may be placed on the facility based upon results from OCD inspections.
16. Storm Water Permit: Stormwater runoff controls shall be maintained. As a result of operations, if any water contaminant that exceeds the WQCC standards listed in 20 NMAC 6.2.3101 is discharged in any stormwater run-off, then immediate actions shall be taken to mitigate the effects of the run-off, notify the OCD within 24 hours, and modify the discharge permit to include a formal stormwater run-off containment permit and submit for OCD approval within 15 days.
17. Landfarm/Landfill Operations: The on-site landfarm shall be maintained and operated as proposed in the discharge plan application and only receive hydrocarbon contaminated soils generated from plant operations that are non-hazardous as defined by EPA CFR 40 part 261. Remediated soils from the landfarm may be used for soil replacement of plant clean-up areas, storm water control dikes, secondary containment berms in the gas plant if: the Total Petroleum Hydrocarbon (TPH) levels are 1000 ppm or less, total BTEX levels are 50 ppm or less and benzene levels are 1 ppm or less. Records shall be maintained for all soils placed into and removed from the landfarm. The off-site use of any remediated soils from the landfarm area shall be approved by the OCD on a case-by-case basis.

Marathon shall address the closure of the old covered non-active landfill at time of discharge plan closure.
18. Vadose Zone and Water Pollution: The previously submitted investigation and remediation plans were submitted pursuant to the discharge plan and all future discoveries of contamination will be addressed through the discharge plan process.
  - A. Treatment System Monitoring: Marathon will sample and analyze the treatment system effluent on a monthly basis for benzene, toluene, ethylbenzene and xylenes (BTEX) and on a quarterly basis for major cations/anions and polynuclear aromatic hydrocarbons using EPA approved methods. The results of these sampling events will be included in the annual ground water remediation monitoring reports for the facility.
  - B. Reverse Osmosis (RO) Reject and Commingled Water: Marathon will sample and analyze the RO reject and commingled water on a quarterly basis for major cations/anions including Ph and TDS using EPA approved methods. The

DRAFT

concentrations present in the water to be infiltrated will not exceed the WQCC limits as listed in WQCC Regulation 3101. The results of these sampling events will be included in the annual ground water remediation monitoring reports for the facility.

Vadose Zone and Water Pollution: The previously submitted investigation(s) and remediation plans were submitted pursuant to the discharge permit and all future discoveries of contamination will be addressed through the discharge permit. Marathon shall abide by all previous and future requirements issued by OCD.

A. Groundwater Report: A Quarterly report will be submitted to the OCD by the first day of January, April, July, and October of each year. All monitoring wells, water wells and recovery wells shall be sampled and analyzed for General Chemistry using EPA approved methods. After four quarters, a request may be made to reduce the sampling to contaminants of concern that exceed the New Mexico groundwater standards. The groundwater reports shall contain the following information:

- i. A description of the monitoring and remediation activities, which occurred during the quarter including conclusions and recommendations for addressing existing and newly discovered contamination.
- ii. A chronologic summary table listing all laboratory analytic results of all monitoring and recovery points for contaminants of concern. Copies of the most recent laboratory analytical data sheets shall also be submitted.
- iii. A water table potentiometric elevation map using the water table elevation of the ground water in all wells. This map shall show well locations, pertinent site features, and the direction and magnitude of the hydraulic gradient using elevation contour lines.
- iv. Plots of water table elevation vs. time for each ground water monitoring point.
- v. A map showing all pertinent features such as brine well area, brine pond area, buildings, playa lakes, location of numbered fresh water wells, all monitor and recovery wells and isopleth lines for contaminants of concern.
- vi. The volume of liquid recovered in the recovery wells during each quarter and the total recovered to date.
- vii. Electronic filing: OCD would like to encourage reporting in an acceptable electronic format.

B. Additional Requirements:

- i. Marathon shall notify the OCD Santa Fe and local district office at least 2 weeks in advance of all scheduled activities such that the OCD has the opportunity to witness the events and split samples.
- ii. Marathon shall submit an investigation and remediation plan for OCD approval within 15 days of the discovery of the exceedance of a WQCC standard in any

DRAFT

down gradient monitor well or fresh water well where contaminant concentrations did not exceed WQCC standards during the preceding monitoring event.

27. Quarterly Report: A Quarterly report will be submitted to the OCD by the first day of January, April, July, and October of each year. The report shall contain the following information:
- A. All information as required in condition # 25 above and sub-items.
  - B. Summary of all leaks, spills and releases and corrective actions taken.
  - C. A Summary of all well activity, work-over, pressure test.
  - D. Each permit condition shall be addressed in the quarterly report.
19. Transfer of Discharge Plan: The OCD will be notified prior to any transfer of ownership, control, or possession of a facility with an approved discharge plan. A written commitment to comply with the terms and conditions of the previously approved discharge plan must be submitted by the purchaser and approved by the OCD prior to transfer.
20. Closure: The OCD will be notified when operations of the facility are discontinued for a period in excess of six months. Prior to closure of the facility a closure plan will be submitted for approval by the Director. Closure and waste disposal will be in accordance with the statutes, rules and regulations in effect at the time of closure.
21. Certification: **Marathon Oil Company** by the officer whose signature appears below, accepts this permit and agrees to comply with all terms and conditions contained herein. **Marathon Oil Company** further acknowledges that these conditions and requirements of this permit may be changed administratively by the Division for good cause shown as necessary to protect fresh water, human health and the environment.

Conditions accepted by: **Marathon Oil Company**

\_\_\_\_\_  
Company Representative- print name

\_\_\_\_\_  
Date \_\_\_\_\_  
Company Representative- Sign

Title \_\_\_\_\_

Mr. Kurki  
Nov 15, 2004  
Page 8

DRAFT



**Marathon  
Oil Company**

P.O. Box 3487  
Houston, TX 77253-3487  
Telephone 713/629-6600

October 29, 2004

Mr. Wayne Price  
Environmental Bureau  
New Mexico Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

**RE: Groundwater Discharge Plan GW-21  
Attachments  
Indian Basin Gas Plant**

Dear Mr. Price,

Please find attached updated attachments for the renewal application submitted to you last month.

If you have any questions regarding this application, please contact me at (713) 296-2213.

Sincerely,

Vijay K. Kurki, P.E.  
Senior HES Professional

xc: NMOCD District II, Artesia, NM  
Mr. Tom Breninger, Plant Superintendent, IBGP

File: NM-IBGP-E405-038



**Marathon  
Oil Company**

P.O. Box 3487  
Houston, TX 77253-3487  
Telephone 713/629-6600

March 31, 2004

**RECEIVED**

VIA OVERNIGHT MAIL

APR 01 2004

**Oil Conservation Division  
Environmental Bureau**

Mr. William C. Olson  
Hydrogeologist  
Environment Bureau  
Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87504

**RE: Annual Groundwater Monitoring Report, January - December 2003  
Indian Basin Remediation Project  
Eddy County, NM**

Dear Mr. Olson:

Please find enclosed Annual Groundwater Monitoring Report, January - December 2003, for Indian Basin Remediation Project. The annual report, which was prepared by ARCADIS G&M, Inc., summarizes the groundwater monitoring and remediation activities associated with the Indian Basin Remediation Project during the 2003 calendar year.

No changes to current Groundwater Monitoring plan are proposed for calendar year 2004. However, as we discussed during our phone conversation early this year, Marathon is proposing to implement changes to groundwater monitoring plan beginning in 2005. I look forward to discussing these issues with you during our April 21, 2004 Meeting.

If you have any questions or need any additional information, please call me at (713) 296-2213.

Sincerely,

Vijay K. Kurki, P.E.  
Advanced HES Professional

File: NM-IBRP E700-115  
(3236-300 months after termination of the facility)  
enclosures

cc: Tom L. Breningerr w/enclosures  
Satya Sinha, Kerr-McGee Corporation w/enclosures  
Ken W. Tatarzyn w/o enclosures  
Tom C. Lowry w/o enclosures  
Joe. W. Sologub w/o enclosures

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

NMOCD

FORM APPROVED  
OMB No. 1004-0135  
Expires January 31, 2004

**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.*

**SUBMIT IN TRIPLICATE - Other instructions on reverse side**

1. Type of Well  
☐ Oil Well ☐ Gas Well ☒ Other **Disposal**

RECEIVED

2. Name of Operator  
**Marathon Oil Company**

MAR 15 2004

3a. Address  
**P.O. Box 1324, Artesia, NM**

3b. Phone No. (include area code)  
**505-457-2621**

OCD-ARTESIA

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
**1650 FSL & 1650 FWL  
Section 24, T-21-S, R-23-E**

5. Lease Serial No.

**NM 05612A**

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

8. Well Name and No.

**Marathon Federal SWD #1**

9. API Well No.

**30-015-10373**

10. Field and Pool, or Exploratory Area

**Indian Basin**

11. County or Parish, State

**Eddy, NM**

**12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA**

TYPE OF SUBMISSION	TYPE OF ACTION			
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input checked="" type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input checked="" type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

**02/05/04** Notified BLM, Jim Amos, & OCD, Van Barton. MIRU Triple N rig #24. NU BOP. POOH w/ injection tubing and packer. RIH w/ w/ tbg, stacked out @ 2,643'. Contacted Van Barton w/ OCD, ok'd setting cement retainer. RIH w/ packer to 2,452'. Unable to set packer. Contacted Van Barton w/ OCD, ok'd continuing w/ cement retainer. Set 4 1/2" cement retainer @ 2,452'. Circulated hole w/ mud and squeezed 35 sx C cmt below retainer. Pumped 35 sx C cmt on retainer 2,452 - 1,933'. SDFN.

**02/06/04** ND BOP and RIH w/ tbg to 186'. Pumped 15 sx C cmt to surface. POOH w/ tbg, topped off wellbore w/ cmt. RDMO.

Cut off wellhead, capped well, installed dry hole marker. Cut off rig anchors, backfilled cellar.

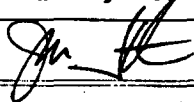
Approved as to plugging of the well bore.  
Liability under bond is retained until  
surface restoration is completed.

14. I hereby certify that the foregoing is true and correct

Name (Printed/Typed)

**James F. Newman, P.E.**

Signature



**Triple N Services, Inc.**  
Title (432)-687-1994

Date **02/23/04**

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

**(ORIG. SGD.) ALEXIS C. SWOBODA**

**PETROLEUM ENGINEER**

**MAR 09 2004**

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on reverse)



District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, Artesia, NM 88210  
District III  
1000 Rio Brazos Rd., Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy, Minerals & Natural Resources

Form C-101  
March 4, 2004

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

RECEIVED

AUG 19 2004

Submit to appropriate District Office  
State Lease - 6 Copies  
Fee Lease - 5 Copies  
OCD-ARTESIA ☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

<sup>1</sup> Operator Name and Address <b>Marathon Oil Company</b> <b>P.O. Box 3487, Houston Texas 77253-3487</b>		<sup>2</sup> OGRID Number <b>14021</b> ✓
<sup>4</sup> Property Code <b>006403</b> ✓		<sup>3</sup> API Number <b>30- 015-00037</b>
<sup>5</sup> Property Name <b>Indian Basin Gas Com.</b>		<sup>6</sup> Well No. <b>1</b>

<sup>7</sup> Surface Location

UL or lot no.	Section	Township	Range	Lot. Idn	Feet from the	North/South Line	Feet from the	East/West line	County
<b>E</b>	<b>23</b>	<b>21-S</b>	<b>23-E</b>		<b>1980'</b>	<b>North</b>	<b>660'</b>	<b>East</b> <b>West</b>	<b>Hddy</b>

<sup>8</sup> Proposed Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot. Idn	Feet from the	North/South Line	Feet from the	East/West line	County
<sup>9</sup> Proposed Pool 1 <b>Indian Basin Morrow (78960)</b> ✓					<sup>10</sup> Proposed Pool 2				

Drilling Pit Location and Other Information

UL or lot no.	Section	Township	Range	Lot. Idn	Feet from the	North/South Line	Feet from the	East/West line	County
Depth to ground water			Distance from nearest fresh water well			Distance from nearest surface water			
<sup>11</sup> Work Type Code <b>P</b>		<sup>12</sup> Well Type Code <b>S</b>		<sup>13</sup> Cable/Rotary <b>N/A</b>		<sup>14</sup> Lease Type Code <b>Federal</b>		<sup>15</sup> Ground Level Elevation <b>3832'</b>	
<sup>16</sup> Multiple <b>N</b>		<sup>17</sup> Proposed Depth <b>9800</b>		<sup>18</sup> Formation <b>Morrow</b>		<sup>19</sup> Contractor		<sup>20</sup> Spud Date <b>05/29/1963</b>	

<sup>21</sup> Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
<b>12 1/4"</b>	<b>9 5/8"</b>	<b>32#</b>	<b>2250'</b>	<b>1000</b>	<b>0</b>
<b>7 13/16"</b>	<b>7"</b>	<b>26#</b>	<b>10100'</b>	<b>1350</b>	<b>6070'</b>

<sup>22</sup> Describe the proposed program. If this application is to DEEPEN or PLUG BACK, give the data on the present productive zone and proposed new productive zone. Describe the blowout prevention program, if any. Use additional sheets if necessary.

Marathon Oil is proposing to permanently plug back the Devonian zone in the Indian Basin Gas Com No.1. The well is currently producing Morrow gas up the casing annulus through perfs that were previously squeezed. Marathon proposes to plug the Devonian with a CIBP at 10000' topped with 200' cement. Marathon will recomple the well to the Morrow. The Morrow zone will be produced through the tubing under a packer with the squeezed Upper Penn and Wolfcamp perfs isolated behind the packer. Please see attachments for a work-over procedure & wellbore diagrams for before & after the plug back.

<sup>23</sup> I hereby certify that the information given above is true and complete to the best of my knowledge and belief. I further certify that the drilling pit will be constructed according to NMOCD guidelines ☐ a general permit ☐, or an (attached) alternative OCD-approved plan ☐.

Signature: *Charles E. Kendrick*

Printed name: **Charles E. Kendrick**

Title: **Engineering Technician**

E-mail Address: **cekendrix@MarathonOil.com**

Date: **08/09/2004**

Phone: **713-296-2096**

OIL CONSERVATION DIVISION

Approved by:

**TIM W. GUM**

**DISTRICT II SUPERVISOR**

Approval Date: **SEP 02 2004**

Expiration Date: **SEP 02 2005**

Conditions of Approval: **9130**

Attached ☐

**Oper. To squeeze ON Devonian**

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, Artesia, NM 88210  
District III  
1000 Rio Brazos Rd., Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy, Minerals & Natural Resources

Form C-102  
Revised June 10, 2003

OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Submit to Appropriate District Office  
State Lease - 4 Copies  
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

<sup>1</sup> API Number <b>30-015-00037</b>	<sup>2</sup> Pool Code <b>78960</b>	<sup>3</sup> Pool Name <b>Indian Basin Morrow</b>
<sup>4</sup> Property Code <b>006403</b>	<sup>5</sup> Property Name <b>Indian Basin Gas Com</b>	<sup>6</sup> Well Number <b>1</b>
<sup>7</sup> OGRID No. <b>14021</b>	<sup>8</sup> Operator Name <b>Marathon Oil Company</b>	<sup>9</sup> Elevation <b>3832</b>

<sup>10</sup> Surface Location

UL or lot no. <b>E</b>	Section <b>23</b>	Township <b>21-S</b>	Range <b>R-23</b>	Lot. Idn	Feet from the <b>1980'</b>	North/South line <b>North</b>	Feet from the <b>660'</b>	East/West line <b>West</b>	County <b>Edgy</b>
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<sup>11</sup> Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot. Idn	Feet from the	North/South line	Feet from the	East/West line	County
<sup>12</sup> Dedicated Acres <b>640</b>	<sup>13</sup> Joint or Infill <b>N</b>	<sup>14</sup> Consolidation Code	<sup>15</sup> Order No.						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<sup>16</sup> ↑ 1980' ← 660' →				<b>RECEIVED</b> <b>AUG 19 2004</b> <b>JOJO-ARTERIA</b>	<sup>17</sup> OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief. <i>Charles E. Kendrick</i> Signature <b>Charles E. Kendrick</b> Printed Name <b>Engineering Technician</b> Title and E-mail Address <b>cekendrix@MarathonOil</b> Date
					<sup>18</sup> SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. <b>08/09/2004</b> Date of Survey Signature and Seal of Professional Surveyor:
					Certificate Number

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*

FORM APPROVED  
OMB NO. 1004-0135  
Expires: November 30, 2000

5. Lease Serial No.  
NM0384628

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

**SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

1. Type of Well  
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.  
INDIAN BASIN GAS COM 1

2. Name of Operator  
MARATHON OIL COMPANY

Contact: CHARLES KENDRIX  
E-Mail: cekendrix@marathonoil.com

9. API Well No.  
30-015-00037

3a. Address  
P.O. BOX 3487  
HOUSTON, TX 77253-3487

3b. Phone No. (include area code)  
Ph: 713.296.2096

10. Field and Pool, or Exploratory  
DEVONIAN

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 23 T22S R23E SWNW 1980FNL 660FWL

AUG 19 2004  
OCD-ARTERIA

11. County or Parish, and State  
EDDY COUNTY, NM

**12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA**

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input checked="" type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

Marathon is proposing to plug back the Devonian SWD zone in the Indian Basin Gas Com No. 1. The well is currently being produced through the casing annulus from perforations in the Morrow reservoir due to a failed cement squeeze on this reservoir. Marathon intends to put the Morrow back into full production pending approval from the BLM and the NMOC on plugging back the Devonian zone. If Marathon cannot get the well to meet NMOC's casing integrity requirements, we will proceed with plugging and abandoning the well. Please see the attachments for a diagram of the wellbore before work-over and proposed wellbore after work-over.

14. I hereby certify that the foregoing is true and correct.

**Electronic Submission #34393 verified by the BLM Well Information System  
For MARATHON OIL COMPANY, sent to the Carlsbad**

Name (Printed/Typed) CHARLES KENDRIX

Title AUTHORIZED REPRESENTATIVE

Signature (Electronic Submission)

Date 08/11/2004

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved By

Title

Date

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

**\*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\***



Southern Business Unit  
Business Development

P.O. Box 3487  
Houston, TX 77056-3487  
Telephone: (713) 296-2096  
FAX: (713) 499-6750

August 12, 2004

New Mexico Oil Conservation Division  
Attn: Mr. Tim Gum  
1301 Grand Avenue  
Artesia, New Mexico 88210

RECEIVED

AUG 19 2004

OCB-ARTESIA

Re: Plug-Back of Indian Basin Gas Com No. 1. (Old Indian Basin Acid Gas Disposal Well)

Dear Mr. Gum,

Marathon Oil Company is planning to perform a plug-back and recompletion of the Indian Basin Gas Com. No. 1 well, located in Eddy County, New Mexico in Section 23, Township 21 South, Range 23 East. This well was previously used as an acid gas injection well into the Devonian formation (~10,100') through 3-1/2" IPC tubing. However, no acid gas has been injected since January 24, 2001 because Marathon completed a new injection well. The tubing side is shut-in and the well has been producing from the Morrow formation (~9,100) up the well's annulus, through previously squeezed Morrow perforations, since November 1, 2001 (see Attachment #1). This letter serves to provide you with a summary of our operational intentions of this plug-back and recompletion, and to request guidance on procedural requirements relating to the abandonment of the Devonian section and the subsequent casing integrity test prior to the recompletion to the Morrow.

This well is extremely close to the existing Indian Basin Gas Plant (IBGP) acid gas compressor and therefore makes workover operations very challenging due to the health, environmental, and safety issues that are inherent when working closely with high pressure, sour gas. In early October, the IBGP is planning a 5 day turnaround, offering us a timeframe in which the acid gas compressor will not be running; therefore, the proposed work on this well can be safely pursued. However, should we determine that the Devonian abandonment and Morrow recompletion cannot be completed in the 5 day window, Marathon will most likely be forced to explore the viability of permanently abandoning the well in that timeframe.

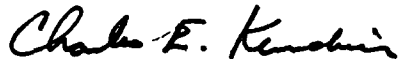
To abandon the open-hole Devonian section, Marathon intends to first pull the existing wellbore hardware, and run in the hole to set a CIBP onto which a ~200' cement plug will be set. In the interest of the short timeframe with which to work on this well, the Morrow will likely be completed with tubing conveyed perforating guns (and a foamer string to help decrease the hydraulic head on the formation). Also, a production packer will be set above the reperforated Morrow perforations and below the previously squeezed Upper Penn perforations (see Attachment #2). At this stage of the operations, Marathon intends to load the backside and pressure test the casing above the Morrow to verify its integrity, or to identify any potential perforation leaks – because we know the Morrow formation's squeezed perforations are leaking, it is prudent to test the casing only after we have isolated the Morrow under a packer to help to identify any additional leaks.

In the event that casing leaks above the Morrow are discovered, it is *this* guidance from the NMOC office that Marathon wishes to receive. Operationally, we have 3 options that can be pursued to adequately handle any casing integrity issue. The first option, and the one preferred by Marathon, would

be to simply connect the backside to a meter, and flow it to alleviate any chance of pressure build-up. The second option would be to run in the hole with a second production packer (above the first one set in the Morrow recompletion and, most likely, above the squeezed Wolfcamp formation) to isolate the leak from the surface. The third option would be to run in the hole with a bridge plug and a packer to try to identify the true location of the leak and squeeze it. Clearly, this third option is time-prohibitive since we will not be able to plan to do this and to complete the plug-back/recompletion in the previously discussed 5 day timeframe.

In summary, Marathon would very much appreciate the opportunity to discuss with you this operation, and to get specific clarification on the rules associated with abandoning an acid gas injection formation as well as the rules associated with annular casing leaks and acceptable remediations. When you have a moment and have reviewed our letter and associated attachments, please feel free to call Marathon's Indian Basin operations engineer, Mark Mick, at 713-296-1921, if you have any questions and to schedule a conference call with our team to further discuss this issue. Mark can also be reached via e-mail at [msmick@marathonoil.com](mailto:msmick@marathonoil.com).

Sincerely,

A handwritten signature in cursive script that reads "Charles E. Kendrix".

Charles E. Kendrix  
Engineering Technician

## **Summary: IBGC#1 Morrow Recompletion Procedure**

### **CIBP with Cement Plug**

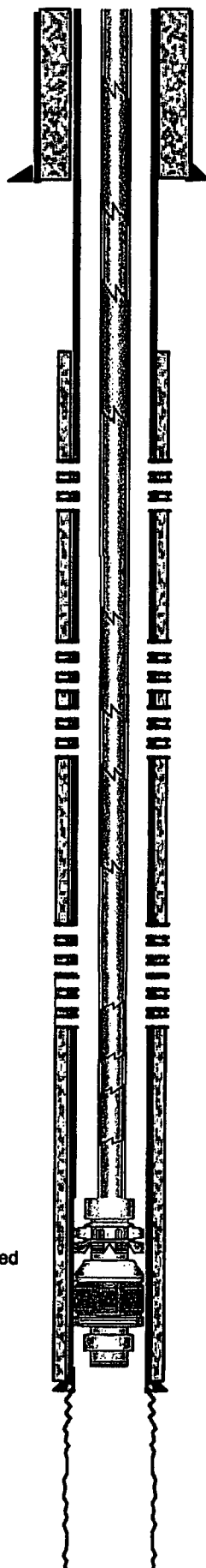
1. POOH with 3-1/2" internally coated tubing and packer
2. RU wireline. RIH with CIBP on wireline.
3. Set CIBP at ~10,000, which is 100' above 7" casing shoe.
4. Wireline dump bail ~8 bbls of cement on top of CIBP, providing a ~200' cement plug.
5. Load the well with 7% KCl water to pressure test the plug.
6. RIH with 2-3/8" tubing, foamer string, and TCP guns with propellant sleeve. On bottom of tubing have an RTTS packer, tbg. sub, 'X' profile, tbg. joint, 'XN' profile, mechanical gun release, and then TCP guns.
7. Set RTTS packer at ~8,800' (between the Upper Penn and Morrow).
8. Load the backside and pressure test the casing down the annulus to verify integrity of casing and previously squeezed perforations in the Upper Penn and Wolfcamp.
9. Perforate Morrow from ~9,039' – 9,263'.
10. Produce Morrow.



Marathon Oil Company  
 Indian Basin Gas Com No. 1  
 1980' FNL 660' FWL  
 UL "E", Sec 23, T-21-S, R-23-E  
 6-Jul-04

GL: 3832' DF:3842' KB: 3843'

# **IB GC#1: Current Wellbore Configuration**



Surface Casing  
 9 5/8" Set @ 2250' w/ 1000 sks cmt

Production Casing  
 7" 23-26& 29# Set @ 10100' Cmt'd w/ 1350 sks

Tubing 3 1/2" IPC

Top of Cement on production casing @ 6070'

Squeezed Wolfcamp perms 6574'-6768'

Squeezed Upper Penn Perfs 7376'-7538'

Squeezed Upper Penn Perfs 7670'-7764'

7670'-7674'

7681'-7688'

7710'-7718'

7725'-7727'

7736'-7740'

7748'-7754'

7760'-7764'

Squeezed Morrow Perfs 9039'-9263' (Leaking)

9039'-9049'

9199'-9207'

9227'-9235' Perf w/ 4JSPF

9238'-9246'

9251'-9263'

9227'-9263' Reshot w/ 4JSPF

Baker Model R Nickel coated  
 Packer set @ 9965'

Open hole Devonian SWD

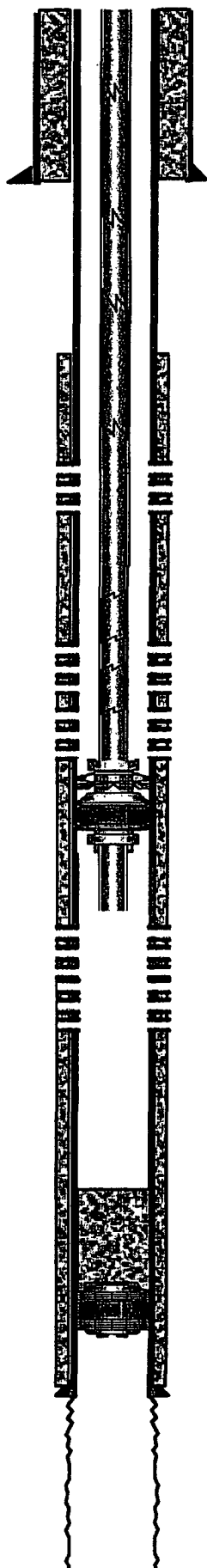
TD 10438'



# **IB GC#1: Proposed Wellbore Configuration**

Marathon Oil Company  
 Indian Basin Gas Com No. 1  
 1980' FNL 660' FWL  
 UL "E", Sec 23, T-21-S, R-23-E  
 6-Jul-04

GL: 3,832' DF:3,842' KB: 3,843'



Surface Casing  
 9 5/8" Set @ 2250' w/ 1,000 sks cmt

Production Casing  
 7" 23-26& 29# Set @ 10,100' Cmtd w/ 1350 sks

Tubing 2 3/8" IPC

Top of Cement on production casing @ 6,070'

Squeezed Wolfcamp perms 6574'-6768'

Squeezed Upper Penn Perfs 7376'-7538'

Squeezed Upper Penn Perfs 7670'-7764'

7670'-7674'	7681'-7688'
7710'-7718'	7725'-7727'
7736'-7740'	7748'-7754'
7760'-7764'	

2 3/8" x 7" PLS Packer  
 Set at ~8,800'

Reperforated Morrow Perfs 9039'-9263'

~200' Cement plug on  
 top of CIBP

Cast-Iron Bridge Plug  
 Set at ~10,000'

Open hole Devonian SWD



**Olson, William**

---

**From:** Olson, William  
**Sent:** Tuesday, April 22, 2003 10:37 AM  
**To:** 'Peacock, Paul'  
**Cc:** Reed, Alan J.  
**Subject:** RE: IBRP Sampling

Paul,

The below-referenced sampling plan correction is acceptable.

If you have any questions please contact me.

Sincerely,

William C. Olson  
Hydrologist  
New Mexico Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505  
(505) 476-3491

-----Original Message-----

**From:** Peacock, Paul [mailto:MPPeacock@MarathonOil.com]  
**Sent:** Monday, April 21, 2003 1:47 PM  
**To:** William C Olson (E-mail)  
**Cc:** Reed, Alan J.  
**Subject:** FW: IBRP Sampling

Bill,

The groundwater samples from the Indian Basin Remediation Project monitoring wells that were sampled during the April Semi-Annual Sampling Event were not analyzed for TDS or Chloride as described in the following e-mail. I concur with Alan Reed's recommendation to collect the additional samples during the October Sampling Event. If you concur with this recommendation, then please advise.

Thanks.

M. Paul Peacock  
Marathon Oil Company  
Southern Business Unit  
Senior HES Professional  
Phone: 915-687-8140

-----Original Message-----

**From:** Reed, Alan J. [mailto:AREed2@arcadis-us.com]  
**Sent:** Tuesday, April 15, 2003 10:48 AM  
**To:** Peacock, Paul  
**Subject:** IBRP Sampling

Hello Paul -

It has come to my attention that we did not sample for chloride and TDS during the April sampling event as outlined in the sampling plan for IBRP. These constituents are typically sampled for on an annual basis during the April event. My recommendation is to collect these samples during the October event unless you have a problem with that solution. I think we sample a few less wells during the October event, but we should be able to

go back to those wells that were included in the April event, but not the October event and get the samples. I apologize for letting this slip through the cracks. I think we just mis-interpreted the table that lists what is to be analyzed for during the events, and it was originally thought that chloride and TDS were sampled semi-annually along with the metals, etc.

We also have additional gauging data from the April event from when James went back to the site to recheck a number of wells that contained PSH. I can forward the information if you do not already have it from Jim. I also understand that Jim was going to check a couple of other wells this week (MW-72 and MW-75).

Alan J. Reed, Jr., P.E.  
ARCADIS  
areed2@arcadis-us.com



P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

February 28, 2003

Mr. William C. Olson  
Hydrologist  
Environment Bureau  
Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

RECEIVED

MAR 03 2003

ENVIRONMENTAL BUREAU  
OIL CONSERVATION DIVISION

RE: Annual Groundwater Monitoring Report, January - December 2002  
Indian Basin Remediation Project

Dear Mr. Olson:

Marathon Oil Company (Marathon) hereby submits the Annual Groundwater Monitoring Report, January - December 2002, to the New Mexico Oil Conservation Division. The annual report, which was prepared by ARCADIS G&M, Inc., summarizes the groundwater monitoring and remediation activities associated with the Indian Basin Remediation Project during the 2002 calendar year.

If you have any questions or need any additional information, then please call me at (915) 687-8140.

Sincerely,

A handwritten signature in black ink, appearing to read 'M. Paul Peacock'.

M. Paul Peacock  
Senior HES Professional

MPP\OCD 2002 Annual Report.doc  
File: NM-IBRP E700-115  
(3236-300 months after termination of the facility)  
enclosures

cc: T. C. Lowry w/o enclosures  
C. M. Schweser w/enclosures  
J. L. Guthrie w/o enclosures  
K. W. Tatarzyn w/o enclosures  
Chris Biagi of Kerr-McGee Corporation w/enclosures



Mr. M. Paul Peacock  
Marathon Oil Company  
Mid-Continent Region  
Production United States  
PO Box 552  
Midland Texas 79702-0552

## RECEIVED

FEB 05 2003

ENVIRONMENTAL BUREAU  
OIL CONSERVATION DIVISION

ARCADIS G&M, Inc.  
3000 Cabot Boulevard West  
Suite 3004  
Langhorne  
Pennsylvania 19047  
Tel 215 752 6840  
Fax 215 752 6879

ENVIRONMENTAL

**Subject:**

Petition to Discontinue Groundwater Extraction Operations  
Indian Basin Remediation Project (IBRP), Eddy County, New Mexico.

ARCADIS Geraghty & Miller Project No. NP000443.0005.00003

Dear Mr. Peacock:

ARCADIS G&M, on behalf of Marathon Oil Company (MOC), has prepared an evaluation of the groundwater extraction system currently operating at the Indian Basin Gas Plant (site), located approximately 20 miles northwest of Carlsbad, in Eddy County, New Mexico. Per our discussions, MOC is petitioning to discontinue groundwater extraction operations. This document provides the justification for this request.

**Date:**

4 February 2003

**Contact:**

David Fulton  
Mike Hansen

**Extension:**

215.752.6840

### Introduction

Cleanup efforts at the site, collectively known as the Indian Basin Remediation Project (IBRP), were initiated in April 1991 to recover free phase petroleum hydrocarbons related to the release of a liquid by-product of natural gas production known as "condensate". Summarized below is the rationale for discontinuing groundwater extraction operations at the site based on asymptotic mass removal and the implementation of an alternative mass removal technology.

The subsurface at the site includes two distinct geologic zones known as the "Shallow Zone" and the "Lower Queen", both with saturated and unsaturated strata. Currently, there are a total of 151 wells present at the site related to the IBRP. These wells are used for a combination of groundwater monitoring, groundwater and condensate recovery, treated groundwater infiltration, and condensate vapor extraction. Remediation efforts implemented at the site include the operation of a groundwater extraction and treatment system in the Lower Queen and a vapor extraction system (VES) in the Shallow Zone and Lower Queen. Figure 1 shows the groundwater extraction wells, VES locations, and the condensate thickness based on October 2002 data. Operation of the groundwater extraction and infiltration wells is

permitted by the New Mexico State Engineer's Office (NMSEO), which requires monthly reports of groundwater withdrawal and infiltration volumes.

The remedial goals for the groundwater extraction and treatment system include the following:

- 1) Initiate recovery of condensate (e.g. liquid and dissolved phase)
- 2) To establish control the condensate plume and limit further plume migration, and
- 3) Remove recoverable condensate and restore groundwater quality to meet the New Mexico Water Quality Control Commission Ground Water Standards

The following sections discuss the effectiveness of the groundwater extraction system in meeting these goals.

#### **Groundwater Extraction for Recovering Condensate**

Groundwater and total fluids (condensate and groundwater) are removed from the Lower Queen via recovery wells MW-58, MW-65A, MW-72, MW-75, MW-81, MW-83, MW-84, MW-85, MW-86, and MW-110. Recovered groundwater is treated and then infiltrated in upgradient wells IW-1 and IW-2 in the Lower Queen.

Evaluation of the historical condensate recovery data since April 1991 indicates that 3,692 barrels were removed through emergency response actions and 4,945 barrels were removed via vacuum truck, open pit volatilization, and frac tank volatilization. The groundwater extraction system removed condensate at the following rates:

1996	362.7 barrels
1997	265.6 barrels
1998	511.3 barrels
1999	617.6 barrels
2000	667.4 barrels
2001	19.3 barrels
2002	0.0 barrels

Condensate recovery using groundwater extraction has demonstrated a declining trend starting in April 2000 through October 2001. Condensate has not been recovered from the groundwater extraction system from November 5, 2001 through January 2003. During 2001, approximately 1,378,166 barrels of total fluids were recovered from the Lower Queen resulting in the removal of 19 barrels of condensate. Based on this data, the ratio of "Barrels of Groundwater Recovered to Barrels of Condensate Removed" for 2001 is 72,535:1. This ratio suggests that the

capability of the groundwater extraction system to remove condensate has reached an asymptotic level since large volumes of groundwater must be extracted to remove a minimum volume of condensate. This concept is further supported by the 2002 data, which indicates no condensate was recovered from the groundwater extraction system. In addition, the performance data also demonstrates that minimal dissolved-phase condensate is removed from groundwater as a result of the extraction system. The influent concentration (e.g. measured as total BTEX) to the treatment system has been non-detectable since September 2000.

As a result of the declining and asymptotic removal of condensate using groundwater extraction, vapor extraction technology was employed to enhance mass removal. Based on the results of testing completed in 1999 and 2000, six (6) additional VES blowers were installed in September 2001. Currently, nine (9) VES Blowers have been operating throughout 2001 and 2002 (e.g. through October). The use of vapor extraction combined with aerobic biodegradation has shown significant improvement in the mass removal of condensate. For the year 2001, approximately 330 barrels of condensate were removed using vapor extraction, and 1,344 barrels of condensate were remediated via biodegradation. The inability of the groundwater extraction system to effectively remove condensate and the enhancement of condensate removal via the VES is graphically shown in Figure 2.

Based on this line of evidence, Marathon Oil Company believes the VES is a more efficient technology for removing condensate from the Lower Queen and that groundwater extraction, as a mass removal technique, has reached an asymptotic limit.

#### **Groundwater Extraction To Control Condensate Migration**

In order to determine and evaluate the distribution and potential migration of condensate, site-wide well gauging events is performed on a semi-annual basis. The liquid-level measurements obtained from each well, and the surveyed well elevations, are used to calculate groundwater elevations, with density corrections where condensate is present. The resulting groundwater elevation data are used to generate groundwater flow contour maps, which are presented in Annual Groundwater Monitoring Reports. Review of the April 2002 and October 2002 maps indicate that the Shallow Zone and Lower Queen groundwater flow pattern is consistent with patterns observed in previous years. This pattern indicates localized groundwater depression surrounding some of the extraction wells. Flow in the Shallow Zone is to the southeast at an approximate gradient of 0.018 and flow in the Lower Queen is generally radial with a northerly component at an approximate gradient of 0.0005.

The occurrence of free product in both the Shallow Zone and Lower Queen during the October 2002 gauging event was similar to patterns observed in both the October 2001 and April 2002 gauging events. These patterns were analyzed using key indicator wells, including MW-68, MW-72, MW-84, MW-130, and VE-19. These wells depict a decreasing and stabilized product thickness trend indicative of an initial high mass removal rate followed by much smaller incremental amounts being removed. This trend reflects the ability of groundwater extraction to initially remove "recoverable" free product followed by the tailing off or asymptotic removal. Subsequently, this line of evidence indicates that the volume of free product has been reduced and stabilized.

Groundwater samples are collected from selected wells during each of the gauging events to evaluate groundwater quality at the site. Groundwater samples are analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX). The analytical results indicate that total BTEX concentrations in both water-bearing units have remained consistent or declined slightly in most wells. The BTEX concentrations in the Lower Queen during October 2002 were all non-detect, except MW-67, which had a benzene level of 6 ug/L. This sampling event is similar to results observed in both the April 2002 and October 2001 sampling events, suggesting the dissolved-phase condensate plume has been reduced and stabilized.

#### **Summary**

A technical review of the data collected since April 1991 was performed to determine if the groundwater extraction system is a viable means for removing condensate and controlling condensate migration from the Lower Queen. The lines of evidence suggest that the groundwater extraction system has successfully reduced the volume and mobility of the condensate plume. Continued operation of the groundwater extraction system during between April 2000 and December 2002 has resulted in an asymptotic mass removal trend, indicative of the technologies inability to sustain long-term mass removal. Subsequently, Marathon Oil Company has implemented vapor extraction as a viable technology to enhance condensate mass removal. With the VES in place, the residual stabilized condensate plume can be effectively remediated without the aid of continued groundwater extraction. Therefore, Marathon Oil Company requests permission to discontinue groundwater extraction operations.

#### **Recommendations**

Marathon Oil Company recommends continued operation of the VES and that operation of the groundwater extraction system be discontinued by implementing the following action plan:

1. Deactivate the groundwater extraction system and monitor groundwater/condensate thickness in the Lower Queen groundwater extraction wells MW-58, MW-65A, MW-72, MW-75, MW-81, MW-82, MW-83, MW-84, MW-85, MW-86, and MW-110 on a monthly basis for three months.
2. If condensate thickness levels remain consistent during this time period, then the groundwater extraction system shall remain off-line.
3. If condensate thickness levels increase in select wells, the VES will be configured to operate on these wells to ensure effective removal of condensate mass. If VES is unable to reduce the condensate thickness by 50% in three (3) months, the groundwater extraction system will be re-activated for these wells.
4. After two semi-annual monitoring events, free product thickness and dissolved-phase condensate concentrations will be evaluated to demonstrate no adverse impact has occurred regarding plume geometry or migration. At this time, Marathon Oil Company will petition to dismantle the groundwater extraction portion of the remediation system.

If you have any questions or require further assistance, please contact us.

Sincerely,

ARCADIS Geraghty & Miller, Inc.

*David E. Fulton*

David E. Fulton, P.G.  
Project Manager

*Michael A. Hansen*

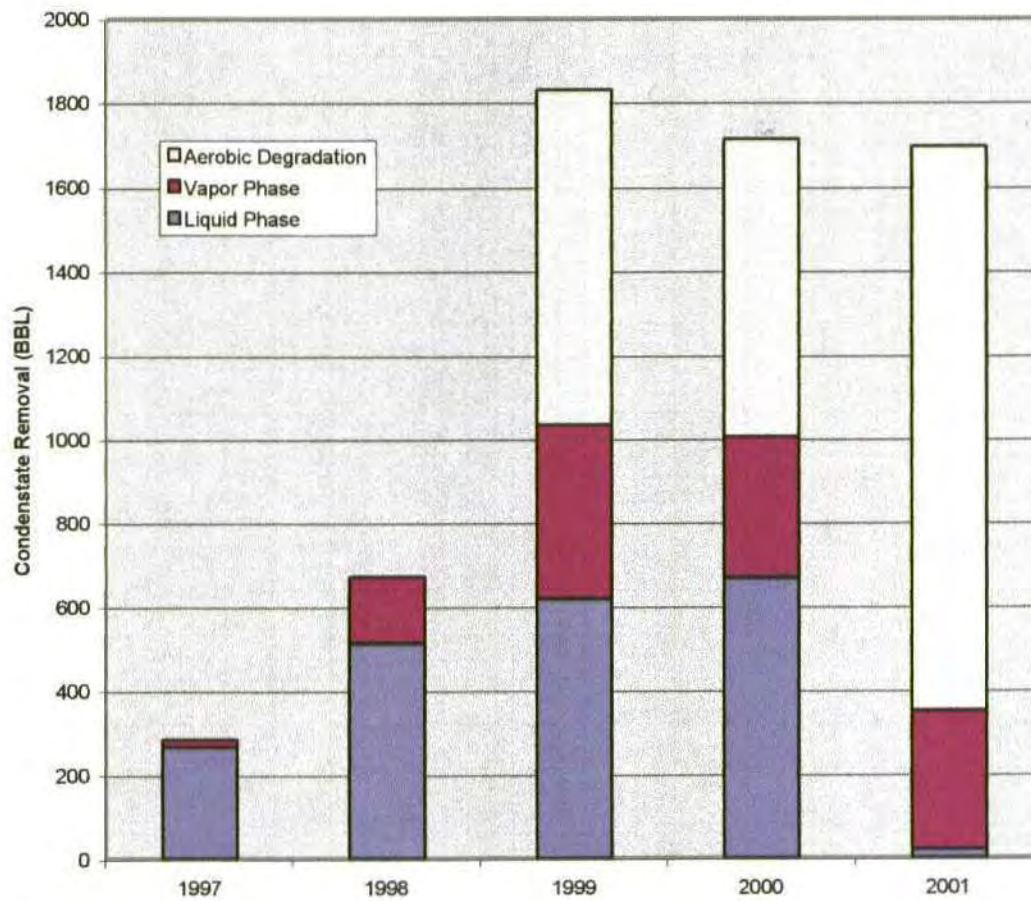
Michael A. Hansen  
Principal Engineer, P.E.

copy: Alan Reed – AG&M Midland  
William Olson – New Mexico OCD





Figure 2 - Estimated Yearly Condensate Removal (1997 - 2001)  
Marathon Oil Company  
Indian Basin Remediation Project  
Eddy County, New Mexico





# NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

**BILL RICHARDSON**

Governor

**Joanna Prukop**

Cabinet Secretary

**Lori Wrotenbery**

Director

**Oil Conservation Division**

February 3, 2003

**CERTIFIED MAIL**

**RETURN RECEIPT NO. 7001-1940-0004-7923-0674**

Mr. Paul Peacock  
Marathon Oil Company  
P.O. Box 552  
Midland, Texas 79702-0552

**RE: GROUND WATER REMEDIATION PROJECT  
MARATHON INDIAN BASIN GAS PLANT (GW-21)**

Dear Mr. Peacock:

The New Mexico Oil Conservation Division (OCD) has reviewed Marathon Oil Company's (MOC) December 4, 2002 "PETITION TO DISCONTINUE GROUNDWATER EXTRACTION OPERATIONS, INDIAN BASIN REMEDIATION PROJECT" and April 29, 2002 "ANNUAL GROUNDWATER MONITORING REPORT, JANUARY - DECEMBER 2001, INDIAN BASIN REMEDIATION PROJECT". These documents contain the results of MOC's remediation and monitoring of hydrocarbon contaminated ground water at MOC's Indian Basin Gas Plant, and requests permission to plug and abandon certain shallow zone monitor wells and use low-flow sampling techniques during future sampling events. The documents also request approval to discontinue the ground water pump and treat system in lieu of remediating ground water with the ongoing vapor extraction system.

The above-referenced requests are approved with the following conditions:

1. MOC shall not plug and abandon shallow zone monitor wells MW-17, MW-32 AND MW-47.
2. The OCD defers comment on dismantling the ground water extraction system until the OCD has the opportunity to evaluate the future performance of ground water remediation activities.

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

Mr. M. Paul Peacock  
February 3, 2003  
Page 2

If you have any questions, please contact me at (505) 476-3491.

Sincerely,

A handwritten signature in dark ink, appearing to read "Will Olson", written in a cursive style.

William C. Olson  
Hydrologist  
Environmental Bureau

xc: Tim Gum, OCD Artesia District Supervisor



P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

December 4, 2002

Mr. William C. Olson  
Hydrogeologist  
Environment Bureau  
Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87504

**RECEIVED**

**DEC 05 2002**

ENVIRONMENTAL BUREAU  
OIL CONSERVATION DIVISION

RE: Petition to Discontinue Groundwater Extraction Operations  
Indian Basin Remediation Project

Dear Mr. Olson:

Marathon Oil Company (Marathon) hereby requests approval to discontinue the operation of the groundwater extraction system for the Indian Basin Remediation Project. This request is based on the technical justification outlined in the attached Petition to Discontinue Groundwater Extraction Operations Proposal dated November 26, 2002, which was prepared by ARCADIS G&M, Inc. Upon your approval of this request, Marathon will discontinue the operation of the groundwater extraction system by implementing the action plan listed in the attached proposal.

If you have any questions or need any additional information to evaluate this request, then please call me at (915) 687-8140.

Sincerely,

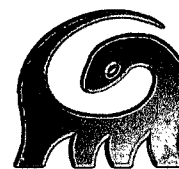
A handwritten signature in black ink that reads 'M. Paul Peacock'.

M. Paul Peacock  
Senior HES Professional

MPPAOC Letter - IBRP Pumping System.doc  
File: NM-IBRP E700- 1057  
(3236-300 months after termination of the facility)  
enclosures

cc: C. M. Schweser w/enclosures  
J. L. Guthrie w/o enclosures  
K. W. Tatarzyn w/o enclosures





Mr. M. Paul Peacock  
Marathon Oil Company  
Mid-Continent Region  
Production United States  
PO Box 552  
Midland Texas 79702-0552

ARCADIS G&M, Inc.  
3000 Cabot Boulevard West  
Suite 3004  
Langhorne  
Pennsylvania 19047  
Tel 215 752 6840  
Fax 215 752 6879

ENVIRONMENTAL

**Subject:**

Petition to Discontinue Groundwater Extraction Operations  
Indian Basin Remediation Project (IBRP), Eddy County, New Mexico.

ARCADIS Geraghty & Miller Project No. NP000443.0005.00003

**Date:**

26 November 2002

Dear Mr. Peacock:

**Contact:**

David Fulton  
Mike Hansen

ARCADIS G&M, on behalf of Marathon Oil Company (MOC), has prepared an evaluation of the groundwater extraction system currently operating at the Indian Basin Gas Plant (site), located approximately 20 miles northwest of Carlsbad, in Eddy County, New Mexico. Per our discussions, MOC is petitioning to discontinue groundwater extraction operations. This document provides the justification for this request.

**Extension:**

215.752.6840

## Introduction

Cleanup efforts at the site, collectively known as the Indian Basin Remediation Project (IBRP), were initiated in April 1991 to recover free phase petroleum hydrocarbons related to the release of a liquid by-product of natural gas production known as "condensate". Summarized below is the rationale for discontinuing groundwater extraction operations at the site based on asymptotic mass removal and the implementation of an alternative mass removal technology.

The subsurface at the site includes two distinct geologic zones known as the "Shallow Zone" and the "Lower Queen", both with saturated and unsaturated strata. Currently, there are a total of 151 wells present at the site related to the IBRP. These wells are used for a combination of groundwater monitoring, groundwater and condensate recovery, treated groundwater infiltration, and condensate vapor extraction. Remediation efforts implemented at the site include the operation of a groundwater extraction and treatment system in the Lower Queen and a vapor extraction system (VES) in the Shallow Zone and Lower Queen. Figure 1 shows the groundwater extraction wells, VES locations, and the condensate thickness based on October 2002 data. Operation of the groundwater extraction and infiltration wells is

is permitted by the New Mexico State Engineer's Office (NMSEO), which requires monthly reports of groundwater withdrawal and infiltration volumes.

The remedial goals for the groundwater extraction and treatment system include the following:

- 1) Initiate recovery of condensate (e.g. liquid and dissolved phase)
- 2) To establish control the condensate plume and limit further plume migration, and
- 3) Remove recoverable condensate and restore groundwater quality to meet the New Mexico Water Quality Control Commission Ground Water Standards

The following sections discuss the effectiveness of the groundwater extraction system in meeting these goals.

#### **Groundwater Extraction for Recovering Condensate**

Groundwater and total fluids (condensate and groundwater) are removed from the Lower Queen via recovery wells MW-58, MW-65A, MW-72, MW-75, MW-81, MW-83, MW-84, MW-85, MW-86, and MW-110. Recovered groundwater is treated and then infiltrated in upgradient wells IW-1 and IW-2 in the Lower Queen.

Evaluation of the historical condensate recovery data since April 1991 indicates that 3,692 barrels were removed through emergency response actions and 4,945 barrels were removed via vacuum truck, open pit volatilization, and frac tank volatilization. The groundwater extraction system removed condensate at the following rates:

1996	362.7 barrels
1997	265.6 barrels
1998	511.3 barrels
1999	617.6 barrels
2000	667.4 barrels
2001	19.3 barrels
2002	10.1 barrels (As of October 2002)

Condensate recovery using groundwater extraction has demonstrated a declining trend starting in April 2000 and an asymptotic trend from November 2000 through October 2002. Condensate has not been recovered from the groundwater extraction system since November 5, 2001. During 2001, approximately 1,378,166 barrels of total fluids were recovered from the Lower Queen resulting in the removal of 19 barrels of condensate. Based on this data, the ratio of "Barrels of Groundwater Recovered to Barrels of Condensate Removed" for 2001 is 72,535:1. This ratio

suggests that the capability of the groundwater extraction system to remove condensate has reached an asymptotic level since large volumes of groundwater must be extracted to remove a minimum volume of condensate. In addition, the performance data also demonstrates that minimal dissolved-phase condensate is removed from groundwater as a result of the extraction system. The influent concentration (e.g. measured as total BTEX) to the treatment system has been non-detectable since September 2000.

As a result of the declining and asymptotic removal of condensate using groundwater extraction, vapor extraction technology was employed to enhance mass removal. Based on the results of testing completed in 1999 and 2000, six (6) additional VES blowers were installed in September 2001. Currently, nine (9) VES Blowers have been operating throughout 2001 and 2002 (e.g. through October). The use of vapor extraction combined with aerobic biodegradation has shown significant improvement in the mass removal of condensate. For the year 2001, approximately 330 barrels of condensate were removed using vapor extraction, and 1,344 barrels of condensate were remediated via biodegradation. The inability of the groundwater extraction system to effectively remove condensate and the enhancement of condensate removal via the VES is graphically shown in Figure 2.

Based on this line of evidence, Marathon Oil Company believes the VES is a more efficient technology for removing condensate from the Lower Queen and that groundwater extraction, as a mass removal technique, has reached an asymptotic limit.

#### **Groundwater Extraction To Control Condensate Migration**

In order to determine and evaluate the distribution and potential migration of condensate, site-wide well gauging events is performed on a semi-annual basis. The liquid-level measurements obtained from each well, and the surveyed well elevations, are used to calculate groundwater elevations, with density corrections where condensate is present. The resulting groundwater elevation data are used to generate groundwater flow contour maps, which are presented in Annual Groundwater Monitoring Reports. Review of the April 2002 and October 2002 maps indicate that the Shallow Zone and Lower Queen groundwater flow pattern is consistent with patterns observed in previous years. This pattern indicates localized groundwater depression surrounding some of the extraction wells. Flow in the Shallow Zone is to the southeast at an approximate gradient of 0.018 and flow in the Lower Queen is generally radial with a northerly component at an approximate gradient of 0.0005.



The occurrence of free product in both the Shallow Zone and Lower Queen during the October 2002 gauging event was similar to patterns observed in both the October 2001 and April 2002 gauging events. These patterns were analyzed using key indicator wells, including MW-68, MW-72, MW-84, MW-130, and VE-19. These wells depict a decreasing and stabilized product thickness trend indicative of an initial high mass removal rate followed by much smaller incremental amounts being removed. This trend reflects the ability of groundwater extraction to initially remove "recoverable" free product followed by the tailing off or asymptotic removal. Subsequently, this line of evidence indicates that the volume of free product has been reduced and stabilized.

Groundwater samples are collected from selected wells during each of the gauging events to evaluate groundwater quality at the site. Groundwater samples are analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX). The analytical results indicate that total BTEX concentrations in both water-bearing units have remained consistent or declined slightly in most wells. The BTEX concentrations in the Lower Queen during October 2002 were all non-detect, except MW-67, which had a benzene level of 6 ug/L. This sampling event is similar to results observed in both the April 2002 and October 2001 sampling events, suggesting the dissolved-phase condensate plume has been reduced and stabilized.

### **Summary**

A technical review of the data collected since April 1991 was performed to determine if the groundwater extraction system is a viable means for removing condensate and controlling condensate migration from the Lower Queen. The lines of evidence suggest that the groundwater extraction system has successfully reduced the volume and mobility of the condensate plume. Continued operation of the groundwater extraction system during between April 2000 and October 2002 has resulted in an asymptotic mass removal trend, indicative of the technologies inability to sustain long-term mass removal. Subsequently, Marathon Oil Company has implemented vapor extraction as a viable technology to enhance condensate mass removal. With the VES in place, the residual stabilized condensate plume can be effectively remediated without the aid of continued groundwater extraction. Therefore, Marathon Oil Company requests permission to discontinue groundwater extraction operations.

### **Recommendations**

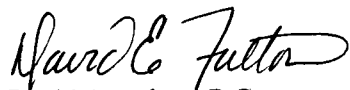
Marathon Oil Company recommends continued operation of the VES and that operation of the groundwater extraction system be discontinued by implementing the following action plan:

1. Deactivate the groundwater extraction system and monitor groundwater/condensate thickness in the Lower Queen groundwater extraction wells MW-58, MW-65A, MW-72, MW-75, MW-81, MW-82, MW-83, MW-84, MW-85, MW-86, and MW-110 on a monthly basis for three months.
2. If condensate thickness levels remain consistent during this time period, then the groundwater extraction system shall remain off-line.
3. If condensate thickness levels increase in select wells, the VES will be configured to operate on these wells to ensure effective removal of condensate mass. If VES is unable to reduce the condensate thickness by 50% in three (3) months, the groundwater extraction system will be re-activated for these wells.
4. After two semi-annual monitoring events, free product thickness and dissolved-phase condensate concentrations will be evaluated to demonstrate no adverse impact has occurred regarding plume geometry or migration. At this time, Marathon Oil Company will petition to dismantle the groundwater extraction portion of the remediation system.

If you have any questions or require further assistance, please contact us.

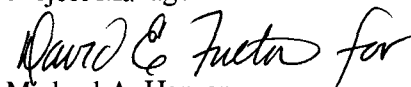
Sincerely,

ARCADIS Geraghty & Miller, Inc.



David E. Fulton, P.G.

Project Manager



Michael A. Hansen

Principal Engineer, P.E.

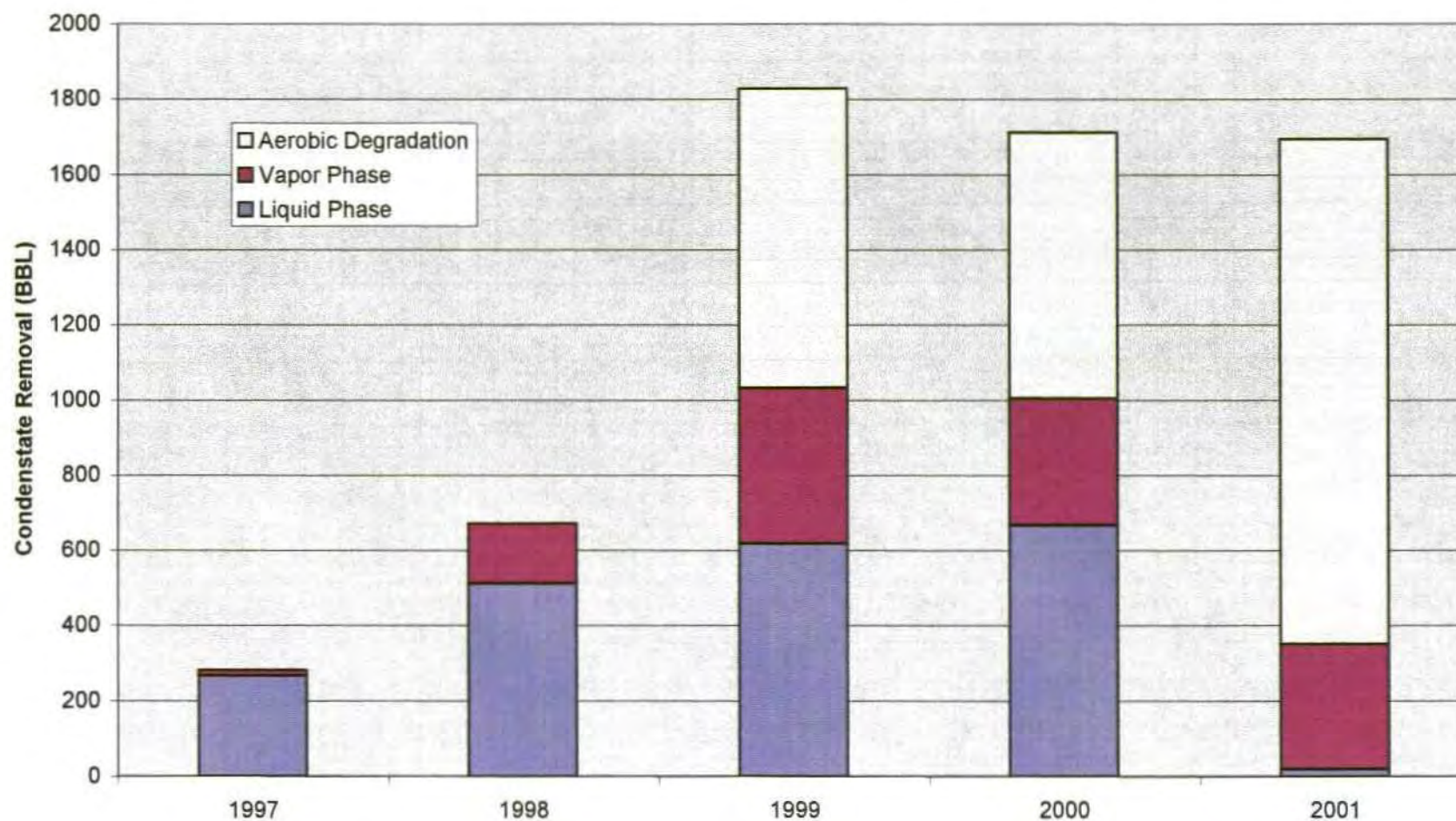
Enclosure

copy: Alan Reed – AG&M Midland





**Figure 2 - Estimated Yearly Condensate Removal (1997 - 2001)**  
**Marathon Oil Company**  
**Indian Basin Remediation Project**  
**Eddy County, New Mexico**





**Marathon  
Oil Company**

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

April 29, 2002

**RECEIVED**

**APR 30 2002**

ENVIRONMENTAL BUREAU  
OIL CONSERVATION DIVISION

Mr. William C. Olson  
Hydrogeologist  
Environment Bureau  
Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87504

RE: Annual Groundwater Monitoring Report, January - December 2001  
Indian Basin Remediation Project

Dear Mr. Olson:

Marathon Oil Company (Marathon) submits the Annual Groundwater Monitoring Report, January - December 2001, to the New Mexico Oil Conservation Division. The annual report, which was prepared by ARCADIS G&M, Inc., summarizes the groundwater monitoring and remediation activities associated with the Indian Basin Remediation Project during the 2001 calendar year.

The report contains a Shallow Abandonment Plan and a modified Groundwater Monitoring Plan for your approval. Marathon is proposing the abandonment of 42 shallow zone wells that are either redundant or have been historically dry. Marathon is also proposing to purge and sample the monitoring wells using a low-flow procedure. The low-flow procedure is outlined in the plan. I look forward to discussing these issues with you during our May 7, 2002 Meeting.

If you have any questions or need any additional information, then please call me at (915) 687-8118.

Sincerely,

A handwritten signature in black ink, appearing to read 'M. Paul Peacock'.

M. Paul Peacock  
Senior Environmental & Safety Engineer

MPPAOC 2001 Annual Report.doc  
File: NM-IBRP E700-115  
(3236-300 months after termination of the facility)  
enclosures

cc: T. C. Lowry w/o enclosures  
C. M. Schweser w/enclosures  
J. L. Guthrie w/o enclosures  
K. W. Tatarzyn w/o enclosures  
Chris Biagi of Kerr-McGee Corporation w/enclosures

**Olson, William**

---

**From:** Olson, William  
**Sent:** Wednesday, April 10, 2002 10:12 AM  
**To:** 'Peacock, M P (Paul) '  
**Subject:** RE: Indian Basin Remediation Project Annual Report

Paul,

The below referenced extension request is approved.

Sincerely,

William C. Olson  
New Mexico Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505  
(505) 476-3491

=====

-----Original Message-----

**From:** Peacock, M P (Paul) [mailto:MPPeacock@MarathonOil.com]  
**Sent:** Monday, March 25, 2002 2:52 PM  
**To:** William C Olson (E-mail)  
**Subject:** RE: Indian Basin Remediation Project Annual Report

Bill,

I need another month to complete the review process and finalize the Indian Basin Remediation Project Annual Report. Therefore, I am requesting an extension of the submittal deadline to May 1, 2002. If you concur with this request, then please advise.

Sincerely,

*M. Paul Peacock*

Advanced Environmental & Safety Engineer  
Southern Business Unit

Marathon Oil Company  
125 W. Missouri Street  
P. O. Box 552  
Midland, TX 79702

Ph: 915-687-8118  
Fax: 915-687-8186  
E-mail: MPPeacock@MarathonOil.com

-----Original Message-----

**From:** Peacock, M P (Paul)

4/10/2002

**Sent:** Friday, February 22, 2002 11:39 AM  
**To:** William C Olson (E-mail)  
**Subject:** Indian Basin Remediation Project Annual Report

Bill,

Pursuant to our telephone conversation, you agreed to extend our deadline for submittal of the Indian Basin Remediation Project Annual Report to April 1, 2002. If you have any questions or need any additional information, then please advise.

Sincerely,

*M. Paul Peacock*

Advanced Environmental & Safety Engineer  
Southern Business Unit

Marathon Oil Company  
125 W. Missouri Street  
P. O. Box 552  
Midland, TX 79702

Ph: 915-687-8118  
Fax: 915-687-8186  
E-mail: [MPPeacock@MarathonOil.com](mailto:MPPeacock@MarathonOil.com)

4/10/2002

DP21

**Olson, William**

**From:** Peacock, M P (Paul) [MPPeacock@MarathonOil.com]

**Sent:** Friday, February 22, 2002 10:39 AM

**To:** William C Olson (E-mail)

**Subject:** Indian Basin Remediation Project Annual Report

Bill,

Pursuant to our telephone conversation, you agreed to extend our deadline for submittal of the Indian Basin Remediation Project Annual Report to April 1, 2002. If you have any questions or need any additional information, then please advise.

Sincerely,

*M. Paul Peacock*

Advanced Environmental & Safety Engineer  
Southern Business Unit

Marathon Oil Company  
125 W. Missouri Street  
P. O. Box 552  
Midland, TX 79702

Ph: 915-687-8118  
Fax: 915-687-8186  
E-mail: MPPeacock@MarathonOil.com

2/22/2002



Price, Wayne

GW-021

**From:** Price, Wayne  
**Sent:** Thursday, January 11, 2001 4:14 PM  
**To:** 'M P (Paul) Peacock'  
**Subject:** RE: Indian Basin Gas Plant - Insulation Disposal Approval

Approved!

-----  
**From:** M P (Paul) Peacock[SMTP:MPPeacock@marathonoil.com]  
**Sent:** Thursday, January 11, 2001 3:52 PM  
**To:** wprice@state.nm.us  
**Subject:** Indian Basin Gas Plant - Insulation Disposal Approval

<<File: MSDSPL~1.HTM>>

Wayne,

As we discussed, Marathon requests approval to ship the non hazardous calcium silicate insulation from the Indian Basin Gas Plant to Controlled Recovery, Inc. for disposal. The electronic HTM file, which contains MSDS for the insulation, is attached. As indicated on the MSDS, the insulation does not contain asbestos. If you have any questions or need any additional information, then please advise.

Sincerely,

M. Paul Peacock  
Advanced Environmental & Safety Engineer

Marathon Oil Company  
P. O. Box 552  
Midland, TX 79702

## Price, Wayne

**From:** Price, Wayne  
**Sent:** Tuesday, October 03, 2000 11:05 AM  
**To:** 'M P Peacock'  
**Cc:** Kieling, Martyne; Gum, Tim; Williams, Donna  
**Subject:** RE: Cooling tower sludge disposal -Reply

Approved using the C-138 process.

-----  
**From:** M P Peacock[SMTP:mppeacock@marathonoil.com]  
**Sent:** Monday, October 02, 2000 5:06 PM  
**To:** Price, Wayne  
**Subject:** RE: Cooling tower sludge disposal -Reply

Wayne,

Marathon requests approval to ship the cooling tower sludge from the Indian Basin Gas Plant to Controlled Recovery, Inc. for disposal in stead of Marathon's on-site landfarm. If you have any questions or need any additional information, then please advise.

M. Paul Peacock  
Advanced Environmental & Safety Engineer

Marathon Oil Company  
P. O. Box 552  
Midland, TX 79702

Ph: 915/687-8312  
Fax: 915/687-8305  
E-mail: mppeacock@marathonoil.com

>>> "Price, Wayne" <WPrice@state.nm.us> 09/27/00 04:43pm >>>  
Dear Mr. Johnson:

Your request to dispose of the cooling tower basin solid waste material into the on-site landfarm is hereby approved with the following conditions:

1. Any chemical constituent found in the cooling tower sludge that exceeds the NM WQCC standards as defined in 20 NMAC 6.2.3103 will be incorporated into the plants Stormwater Testing Program and Landfarm Vadose Zone Monitoring Program.
2. This approval is good for a one-time application to the on-site landfarm for non aqueous, non-hazardous, non-exempt/non-hydrocarbon waste generated from the Plant Cooling Tower. This approval will expire December 15, 2000.
3. Marathon will submit a revised discharge plan for OCD Approval reflecting the above changes by December 15, 2000.

Please be advised that NMOCD approval of this plan does not relieve Marathon of liability should their operations pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve Marathon of responsibility for compliance with any other federal, state, or local laws and/or regulations.

> -----  
> **From:** Price, Wayne  
> **Sent:** Tuesday, September 26, 2000 5:04 PM  
> **To:** 'Troy R Johnson'

> Subject: RE: Cooling tower sludge disposal  
>  
> Dear Mr. Johnson:  
>  
> After reviewing the analytical I notice there were some heavy metals that  
> exceed the groundwater standards. The purpose of the landfarm is to  
> bio-remediate hydrocarbons. Would this action make the landfarm a  
> landfill? Please call me so we can discuss this issue.  
>  
> -----  
> From: Troy R Johnson[SMTP:TRJohnson@MarathonOil.com]  
> Sent: Friday, September 22, 2000 12:41 PM  
> To: Price, Wayne  
> Cc: TRJohnson@MarathonOil.com  
> Subject: Cooling tower sludge disposal  
>  
> <<File: T1.JPG>><<File: T2.JPG>><<File: T3.JPG>><<File:  
> T4.JPG>><<File: T5.JPG>><<File: T6.JPG>><<File: T7.JPG>>  
> Wayne,  
>  
> Attached are the TCLP and Total metals analysis on the cooling tower  
> sludge at the Indian Basin Gas Plant. As you requested, we included a  
> total metals in addition to the TCLP. As we have done in previous years,  
> we would like permission to mix the sludge with soil in the landfarm.  
> Cleaning the cooling tower is a rare event, occurring about every 5 years.  
>  
> Call me at (915)687-8302 if you have any questions or comments.  
>  
> Troy Johnson  
> Marathon Oil Company  
>  
>

## **Price, Wayne**

---

**From:** Price, Wayne  
**Sent:** Wednesday, September 27, 2000 3:43 PM  
**To:** 'Troy R Johnson'; Price, Wayne  
**Cc:** 'mppeacock@marathonoil.com'  
**Subject:** RE: Cooling tower sludge disposal

Dear Mr. Johnson:

Your request to dispose of the cooling tower basin solid waste material into the on-site landfarm is hereby approved with the following conditions:

1. Any chemical constituent found in the cooling tower sludge that exceeds the NM WQCC standards as defined in 20 NMAC 6.2.3103 will be incorporated into the plants Stormwater Testing Program and Landfarm Vadose Zone Monitoring Program.
2. This approval is good for a one-time application to the on-site landfarm for non aqueous, non-hazardous, non-exempt/non-hydrocarbon waste generated from the Plant Cooling Tower. This approval will expire December 15, 2000.
3. Marathon will submit a revised discharge plan for OCD Approval reflecting the above changes by December 15, 2000.

Please be advised that NMOCD approval of this plan does not relieve Marathon of liability should their operations pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve Marathon of responsibility for compliance with any other federal, state, or local laws and/or regulations.

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**From:** Price, Wayne  
**Sent:** Tuesday, September 26, 2000 5:04 PM  
**To:** 'Troy R Johnson'  
**Subject:** RE: Cooling tower sludge disposal

Dear Mr. Johnson:

After reviewing the analytical I notice there were some heavy metals that exceed the groundwater standards. The purpose of the landfarm is to bio-remediate hydrocarbons. Would this action make the landfarm a landfill? Please call me so we can discuss this issue.

-----  
**From:** Troy R Johnson[SMTP:TRJohnson@MarathonOil.com]  
**Sent:** Friday, September 22, 2000 12:41 PM  
**To:** Price, Wayne  
**Cc:** TRJohnson@MarathonOil.com  
**Subject:** Cooling tower sludge disposal

<<File: T1.JPG>><<File: T2.JPG>><<File: T3.JPG>><<File: T4.JPG>><<File: T5.JPG>><<File: T6.JPG>><<File: T7.JPG>>  
Wayne,

Attached are the TCLP and Total metals analysis on the cooling tower sludge at the Indian Basin Gas Plant. As you requested, we included a total metals in addition to the TCLP. As we have done in previous years, we would like permission to mix the sludge with soil in the landfarm. Cleaning the cooling tower is a rare event, occurring about every 5 years.

Call me at (915)687-8302 if you have any questions or comments.

Troy Johnson  
Marathon Oil Company

# TRACE ANALYSIS, INC.

6701 Aberdeen Avenue, Suite D Lubbock, Texas 79424 800•378•1286 806•734•1280 FAX 806•734•1288  
4725 Ripley Avenue, Suite A El Paso, Texas 79922 898•588•3443 915•505•3443 FAX 915•588•4444  
E-Mail: [lab@traceanalysis.com](mailto:lab@traceanalysis.com)

## Analytical and Quality Control Report

Troy Johnson  
Marathon Oil Co.  
P. O. Box 552  
Midland, TX 79702

Report Date: August 31, 2000

Order ID Number: A00082111

Project Number: N/A  
Project Name: IB Cooling Tower  
Project Location: Indian Basin Gas Plant

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
151761	Cooling Tower Sludge	Sludge	8/16/00	14:00	8/21/00

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 5 pages and shall not be reproduced except in its entirety, without written approval of Trace Analysis, Inc.



Dr. Blair Leftwich, Director

# TRACE ANALYSIS, INC.

5000 Alameda Avenue, Suite 100 • Midland, Texas 79701 • 409 • 794 • 1200 • 895 • 294 • 1255 • FAX 409 • 794 • 1114  
4725 Popley Avenue, Suite 100 • Midland, Texas 79701 • 409 • 794 • 1200 • 895 • 294 • 1255 • FAX 409 • 794 • 1114  
1. North Latitude: 31.4231, Longitude: 104.2142

## ANALYTICAL RESULTS FOR MARATHON OIL CO.

August 31, 2000  
Receiving Date: 08/16/00  
Sample Type: Sludge  
Project #: N/A  
Project Location: Indian Basin Gas Plant

Attention: Troy Johnson  
P. O. Box 552  
Midland, Texas 79702

Sampling Date: 08/21/00  
Sample Condition: I & C  
Sample Received by: VH  
Project Name: IB Cooling Tower


TA#	FIELD CODE	TCLP As (mg/L)	TCLP Ba (mg/L)	TCLP Cd (mg/L)	TCLP Cr (mg/L)	TCLP Pb (mg/L)	TCLP Se (mg/L)	TCLP Ag (mg/L)	TCLP Hg (mg/L)
	EPA LIMIT =	5.0	100	1.0	5.0	5.0	1.0	5.0	0.20
T151761	Cooling Tower Sludge	<0.10	<0.10	<0.02	<0.02	<0.10	<0.10	<0.05	<0.010
ICV		2.48	5.03	0.50	1.00	2.49	2.49	0.50	0.00447
CCV		2.52	5.09	0.50	1.00	2.48	2.55	0.50	0.00480
REPORTING LIMIT		0.10	0.10	0.02	0.05	0.10	0.10	0.05	0.010
RPD		1	2	3	2	2	2	1	2
% Extraction Accuracy		93	95	92	98	95	82	98	118
% Instrument Accuracy		101	103	104	102	102	101	102	89
EXTRACTION DATE:		8/21/00	8/21/00	8/21/00	8/21/00	8/21/00	8/21/00	8/21/00	08/21/00
ANALYSIS DATE:		8/24/00	8/24/00	8/24/00	8/24/00	8/24/00	8/24/00	8/24/00	08/23/00

METHODS: EPA 846-1311, 6010B, 7470A

CHEMIST: As, Se, Cd, Cr, Pb, Ag, Ba: RR Hg: BP

TOTAL METALS SPIKE: 10 mg/L As, Se, Pb; 2.0 mg/L Ag, Cd; 4.0 mg/L Cr; 20 mg/L Ba; Hg SPIKE 0.050 mg/L

TOTAL METALS CV: 2.50 mg/L As, Pb, Se; 0.50 mg/L Ag, Cd; 5.0 mg/L Ba; 1.0 mg/L Cr; Hg CV: 0.0050 mg/L

  
Director, Dr. Blair Leftwich

  
Date

# TRACE ANALYSIS, INC.

6701 Clearyman Avenue, Suite B Midland, Texas 79404 P.O. Box 1215 MIDLAND, TEXAS 79701 FAX 806-734-7200  
 4725 Ripley Avenue, Suite A El Paso, Texas 79922 P.O. Box 308 EL PASO, TEXAS 79901 FAX 915-585-0442 FAX 915-585-4304  
 E-Mail: lab@traceanalysis.com

## ANALYTICAL RESULTS FOR

September 18, 2000

MARATHON OIL COMPANY

Receiving Date: 08/19/2000

Attention: Troy Johnson

Sampling Date: 08/15/2000

Sample Type: Sludge

P. O. Box 557

Sample Condition: Impact & Cool

Project No: NA

Midland, TX 79701

Sample Received by: MS

Project Location: Indian Basin Gas Plant

Project Name: I8 Cooling Tower

## TOTAL METALS (mg/kg)

IA#	Field Code	As	Ba	Cd	Cr	Pb	Se	Ag	Hg
T1S1761	Cooling Tower Sludge	29	133	<2.0	22	<5.0	<5.0	<2.0	0.19
ICV		2.53	5.03	0.31	1.00	2.49	2.58	0.50	0.00478
CCV		2.48	4.88	0.49	0.97	2.41	2.53	0.48	0.00512

Reporting Limit As: 5.0 Ba: 5.0 Cd: 2.0 Cr: 5.0 Pb: 5.0 Se: 5.0 Ag: 2.0 Hg: 0.19

RPD	1	1	0	0	1	1	0	0
% Extraction Accuracy	94	101	95	100	96	83	90	96
% Instrument Accuracy	99	98	98	97	96	101	96	96

PREP DATE 09/15/2000 09/15/2000 09/15/2000 09/15/2000 09/15/2000 09/15/2000 09/15/2000 09/15/2000 09/15/2000  
 ANALYSIS DATE 09/15/2000 09/15/2000 09/15/2000 09/15/2000 09/15/2000 09/15/2000 09/15/2000 09/15/2000 09/15/2000

CHEMIST: As, Se, Cd, Cr, Pb, Ag, Ba: RR Hg: MS

METHODS: EPA SW 846-3050B, 60105, 7471A.

TOTAL METALS SPIKE: 100 mg/kg As, Pb, Se; 200 mg/kg Ba; 20 mg/kg Cd, Ag; 40 mg/kg Cr; 2.5 mg/kg Hg

TOTAL METALS CV: 2.5 mg/L As, Pb, Se; 5.0 mg/L Ba; 0.50 mg/L Cd, Ag; 1.0 mg/L Cr; 0.005 mg/L Hg.

Director: Dr. Blair Leftwich

Date

## Analytical and Quality Control Report

### Sample: 151761 - Cooling Tower Sludge

Analysis: Corrosivity Analytical Method: S 1110 QC Batch: QC04589 Date Analyzed: 8/30/00  
Analyst: MS Preparation Method: N/A Prep Batch: PB03995 Date Prepared: 8/30/00

Param	Flag	Result	Units	Dilution	RDL
Corrosivity		Non	mm/yr	1	
pH		7.87	s.u.	1	

### Sample: 151761 - Cooling Tower Sludge

Analysis: Ignitability Analytical Method: SW-846 Ch. 7.1 QC Batch: QC04590 Date Analyzed: 8/30/00  
Analyst: MS Preparation Method: N/A Prep Batch: PB03996 Date Prepared: 8/30/00

Param	Flag	Result	Units	Dilution	RDL
Ignitability		non-ignitable		1	

### Sample: 151761 - Cooling Tower Sludge

Analysis: Reactivity Analytical Method: S 7.3 QC Batch: QC04591 Date Analyzed: 8/30/00  
Analyst: MS Preparation Method: N/A Prep Batch: PB03997 Date Prepared: 8/30/00

Param	Flag	Result	Units	Dilution	RDL
Reactivity		Non-reactive		1	
Hydrogen Sulfide		30		1	
Hydrogen Cyanide		4		1	

### Sample: 151761 - Cooling Tower Sludge

Analysis: TCLP Volatiles Analytical Method: S 8260B QC Batch: QC04592 Date Analyzed: 8/28/00  
Analyst: JG Preparation Method: E 5030 Prep Batch: PB03998 Date Prepared: 8/23/00

Param	Flag	Result	Units	Dilution	RDL
Vinyl Chloride		<0.100	mg/L	50	0.002
1,1-Dichloroethene		<0.100	mg/L	50	0.002
Methyl ethyl ketone		1.13	mg/L	50	0.01
Chloroform		<0.100	mg/L	50	0.002
1,2-Dichloroethane (EDC)		<0.100	mg/L	50	0.002
Benzene		<0.100	mg/L	50	0.002
Carbon Tetrachloride		<0.100	mg/L	50	0.002
Trichloroethene (TCE)		<0.100	mg/L	50	0.002
Tetrachloroethene (PCE)		<0.100	mg/L	50	0.002
Chlorobenzene		<0.100	mg/L	50	0.002
1,4-Dichlorobenzene		<0.100	mg/L	50	0.002

## Quality Control Report



## Method Blank

Sample: Method Blank

QCBatch: QC04592

Param	Flag	Results	Units	Reporting Limit
Vinyl Chloride		<0.100	mg/L	0.002
1,1-Dichloroethene		<0.100	mg/L	0.002
Methyl ethyl ketone		<0.500	mg/L	0.01
Chloroform		<0.100	mg/L	0.002
1,2-Dichloroethane (EDC)		<0.100	mg/L	0.002
Benzene		<0.100	mg/L	0.002
Carbon Tetrachloride		<0.100	mg/L	0.002
Trichloroethene (TCE)		<0.100	mg/L	0.002
Tetrachloroethene (PCE)		<0.100	mg/L	0.002
Chlorobenzene		<0.100	mg/L	0.002
1,4-Dichlorobenzene		<0.100	mg/L	0.002

## Quality Control Report Lab Control Spikes and Duplicate Spikes

Sample: LCS

QC Batch: QC04592

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Vinyl Chloride		2.79	mg/L	1	5	<0.100	55		80 - 120	20
1,1-Dichloroethene		4.40	mg/L	1	5	<0.100	88		80 - 120	20
Methyl ethyl ketone		4.75	mg/L	1	5	<0.500	95		80 - 120	20
Chloroform		4.87	mg/L	1	5	<0.100	97		80 - 120	20
1,2-Dichloroethane (EDC)		5.05	mg/L	1	5	<0.100	101		80 - 120	20
Benzene		4.99	mg/L	1	5	<0.100	99		80 - 120	20
Carbon Tetrachloride		5.13	mg/L	1	5	<0.100	102		80 - 120	20
Trichloroethene (TCE)		4.98	mg/L	1	5	<0.100	99		80 - 120	20
Tetrachloroethene (PCE)		3.73	mg/L	1	5	<0.100	74		80 - 120	20
Chlorobenzene		5.11	mg/L	1	5	<0.100	102		80 - 120	20
1,4-Dichlorobenzene		5.15	mg/L	1	5	<0.100	103		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
Dibromofluoromethane		49.75	mg/Kg	1	50	99	80 - 120
Toluene-d8		49.94	mg/Kg	1	50	99	80 - 120
4-Bromofluorobenzene		48.26	mg/Kg	1	50	96	80 - 120

Sample: LCSD

QC Batch: QC04592

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Vinyl Chloride		2.68	mg/L	1	5	<0.100	53	4	80 - 120	20
1,1-Dichloroethene		4.26	mg/L	1	5	<0.100	85	3	80 - 120	20
Methyl ethyl ketone		4.64	mg/L	1	5	<0.500	92	2	80 - 120	20
Chloroform		4.74	mg/L	1	5	<0.100	94	3	80 - 120	20
1,2-Dichloroethane (EDC)		4.90	mg/L	1	5	<0.100	98	3	80 - 120	20
Benzene		4.86	mg/L	1	5	<0.100	97	3	80 - 120	20
Carbon Tetrachloride		4.97	mg/L	1	5	<0.100	99	3	80 - 120	20
Trichloroethene (TCE)		4.82	mg/L	1	5	<0.100	96	3	80 - 120	20
Tetrachloroethene (PCE)		3.63	mg/L	1	5	<0.100	72	3	80 - 120	20
Chlorobenzene		4.98	mg/L	1	5	<0.100	99	2	80 - 120	20
1,4-Dichlorobenzene		5.02	mg/L	1	5	<0.100	100	2	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
Dibromofluoromethane		49.77	mg/Kg	1	50	99	80 - 120
Toluene-d8		50	mg/Kg	1	50	100	80 - 120
4-Bromofluorobenzene		48.08	mg/Kg	1	50	96	80 - 120

## Quality Control Report Duplicate Samples

Sample: Duplicate

QC Batch: QC04589

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Corrosivity		Non	Non	mm/yr	1	0	20

Sample: Duplicate

QC Batch: QC04590

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Ignitability		Non	non-ignitable		1	0	20

Sample: Duplicate

QC Batch: QC04591

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Reactivity		Non-reactive	Non-reactive		1	0	20
Hydrogen Cyanide		4	4		1	0	20
Hydrogen Sulfide		30	30		1	0	20

## Quality Control Report Continuing Calibration Verification Standards

Sample: CCV (1)

QC Batch: QC04592

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Vinyl Chloride		mg/L	100	101	101	80 - 120	8/28/00
1,1-Dichloroethene		mg/L	100	107	107	80 - 120	8/28/00
Methyl ethyl ketone		mg/L	100	115	115	80 - 120	8/28/00
Chloroform		mg/L	100	100	100	80 - 120	8/28/00
1,2-Dichloroethane (EDC)		mg/L	100	100	100	80 - 120	8/28/00
Benzene		mg/L	100	102	102	80 - 120	8/28/00
Carbon Tetrachloride		mg/L	100	102	102	80 - 120	8/28/00
Trichloroethene (TCE)		mg/L	100	104	104	80 - 120	8/28/00
Tetrachloroethene (PCE)		mg/L	100	81	81	80 - 120	8/28/00
Chlorobenzene		mg/L	100	101	101	80 - 120	8/28/00
1,4-Dichlorobenzene		mg/L	100	101	101	80 - 120	8/28/00
Dibromofluoromethane		mg/L	50	49.18	98	80 - 120	8/28/00
Toluene-d8		mg/L	50	48.66	97	80 - 120	8/28/00
4-Bromofluorobenzene		mg/L	50	52	104	80 - 120	8/28/00

## **Price, Wayne**

**From:** Price, Wayne  
**Sent:** Thursday, August 10, 2000 1:04 PM  
**To:** 'Troy R Johnson'  
**Subject:** RE: Indian Basin Gas Plant Discharge Plan

Please note all sumps with secondary containment and leak detection will not require annual testing. Please consider this as an approved amendment to the discharge plan conditions #8. Please attach to the original and sign the discharge plan approval conditions and return to this office within 10 days.

**From:** Troy R Johnson[SMTP:TRJohnson@MarathonOil.com]  
**Sent:** Friday, August 04, 2000 8:21 AM  
**To:** Price, Wayne  
**Cc:** MPPeacock@MarathonOil.com; TRJohnson@MarathonOil.com  
**Subject:** Indian Basin Gas Plant Discharge Plan

Wayne,

I am writing in response to our conversation yesterday regarding the "standard" approval conditions for the Indian Basin Gas Plant Discharge Plan (GW-021). As we discussed, condition #8 was not clear that below grade sumps with secondary containment and/or leak detection were not required to annually test for mechanical integrity of the system. Of course, the sumps still must be tested every 5 years to insure integrity for the plan renewal.

We really appreciate the indefinite extension you verbally gave us so we can resolve this issue and thanks again for taking the time to review the language in the approval conditions.

Sincerely,

Troy Johnson  
Marathon Oil Company  
(915) 687-8302

JUL 21 1990



**Marathon  
Oil Company**

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

July 18, 2000

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

RE: Groundwater Discharge Plan GW-21  
Indian Basin Gas Plant  
Marathon Oil Company

Dear Mr. Price:

As we discussed during our July 17, 2000 conversation, a revised Table 6 has been attached for the above referenced Groundwater Discharge Plan GW-21. Complete changes include dropping lease roads and pad sites as alternatives for soil usage and standardizing the TRPH clean-up standard at 1000 ppm for use of land farm soil in the plant. The benzene level was also dropped to 1 ppm to address safety concerns. Please contact me at (915) 687-8302 if you have any further comments or questions regarding the plan. Thanks again for all of your work regarding this matter.

Sincerely,

Troy Johnson  
Environmental Engineer

Attachment

Cc: M. C. Schweser w/ attachment

File: 524-03

**Table 6. Soil Treatment Cleanup Standards**

Soil Use (Within Gas Plant)	Cleanup Standards (mg/kg)		
	TRPH (EPA 418.1)	Total BTEX	Benzene
Replacement Soil	1000	50	1
Stormwater Control Dikes	1000	50	1
Secondary Containment Berms	1000	50	1

# OCD ENVIRONMENTAL BUREAU

## SITE INSPECTION SHEET

DATE: 3-8-00 Time: 10:15 AM

Type of Facility: Refinery ☐ Gas Plant ☒ Compressor St. ☐ Brine St. ☐ OilField Service Co. ☐  
Surface Waste Mgt. Facility ☐ E&P Site ☐ Crude Oil Pump Station ☐  
Other ☐ \_\_\_\_\_

Discharge Plan: No ☐ Yes ☒ DP# GLW-21

FACILITY NAME: MARATHON INDIAN BASIN GAS PLANT

PHYSICAL LOCATION: \_\_\_\_\_

Legal: QRT \_\_\_\_\_ QRT NE Sec 23 TS 21WR 23E County EDDY

OWNER/OPERATOR (NAME) MARATHON OIL COMPANY

Contact Person: MIKE SCHWESER Tele:# 457-2621 x109

### MAILING

ADDRESS: P.O. 1324 ARTESIA State NM ZIP 88211

Owner/Operator Rep's: MIKE SCHWESER - PLT SUPR.

TROY JOHNSON - ENV. ENGR. 915-687-8302

OCD INSPECTORS: W PRICE, ED MARTIN, MIKE STUBBLEFIELD

1. **Drum Storage:** All drums containing materials other than fresh water must be stored on an impermeable pad with curbing. All empty drums will be stored on their sides with the bungs in and lined up on a horizontal plane. Chemicals in other containers such as sacks or buckets will also be stored on an impermeable pad and curb type containment.

OK

2. **Process Areas:** All process and maintenance areas which show evidence that leaks and spills are reaching the ground surface must be either paved and curbed or have some type of spill collection device incorporated into the design.

OK

3. **Above Ground Tanks:** All above ground tanks which contain fluids other than fresh water must be bermed to contain a volume of one-third more than the total volume of the largest tank or of all interconnected tanks. All new tanks or existing tanks that undergo a major modification, as determined by the Division, must be placed within an impermeable bermed enclosure.

OK

4. **Above Ground Saddle Tanks:** Above ground saddle tanks must have impermeable pad and curb type containment unless they contain fresh water or fluids that are gases at atmospheric temperature and pressure.

OK

5. **Labeling:** All tanks, drums and containers will be clearly labeled to identify their contents and other emergency notification information.

OK

6. **Below Grade Tanks/Sumps:** All below grade tanks, sumps, and pits must be approved by the OCD prior to installation or upon modification and must incorporate secondary containment and leak-detection into the design. All pre-existing sumps and below-grade tanks must demonstrate integrity on an annual basis. Integrity tests include pressure testing to 3 pounds per square inch above normal operating pressure and/or visual inspection of cleaned out tanks and/or sumps, or other OCD approved methods. The OCD will be notified at least 72 hours prior to all testing.

TESTING COMPLETED - OK

7. **Underground Process/Wastewater Lines:** All underground process/wastewater pipelines must be tested to demonstrate their mechanical integrity at present and then every 5 years thereafter, or prior to discharge plan renewal. The permittee may propose various methods for testing such as pressure testing to 3 pounds per square inch above normal operating pressure or other means acceptable to the OCD. The OCD will be notified at least 72 hours prior to all testing.

TESTING COMPLETED + ONGOING!

8. **Onsite/Offsite Waste Disposal and Storage Practices:** Are all wastes properly characterized and disposed of correctly? Does the facility have an EPA hazardous waste number? ☒ Yes ☐ No

ARE ALL WASTE CHARACTERIZED AND DISPOSED OF PROPERLY? YES ☒ NO ☐ IF NO DETAIL BELOW.

PLANT WASTE WATER - OFF SITE INJECTION WELLS



9. **Class V Wells:** Leach fields and other wastewater disposal systems at OCD regulated facilities which inject non-hazardous fluid into or above an underground source of drinking water are considered Class V injection wells under the EPA UIC program. All Class V wells that inject non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes will be closed unless it can be demonstrated that groundwater will not be impacted in the reasonably foreseeable future. Closure of Class V wells must be in accordance with a plan approved by the Division's Santa Fe Office. The OCD allows industry to submit closure plans which are protective of human health, the environment and groundwater as defined by the WQCC, and are cost effective. Class V wells that inject domestic waste only must be permitted by the New Mexico Environment Department.

ANY CLASS V WELLS NO ☒ YES ☐ IF YES DESCRIBE BELOW ! Undetermined ☐

10. **Housekeeping:** All systems designed for spill collection/prevention will be inspected weekly and after each storm event to ensure proper operation and to prevent overtopping or system failure. A record of inspections will be retained on site for a period of five years.

GOOD to EXCELLANT

11. **Spill Reporting:** All spills/releases will be reported pursuant to OCD Rule 116 and WQCC 1203 to the proper OCD District Office.

OK

12. **Does the facility have any other potential environmental concerns/issues?**

ONGOING GROUNDWATER CONTAMINATION REMEDIATION!

13. **Does the facility have any other environmental permits - i.e. SPCC, Stormwater Plan, etc.?**

YES - SPCC YES - STORM WATER

14. **ANY WATER WELLS ON SITE ?** NO ☐ YES ☒ IF YES, HOW IS IT BEING USED ?

2 WELLS (1) ACTIVE

Miscellaneous Comments:

Number of Photos taken at this site: 19  
attachments-

**Marathon Indian Basin Gas  
Plant GW-21  
March 8, 2000 Pictures by  
Wayne Price-OCD**



Main Entrance.



Sump (single containment) for open drain system



Gas Plant Cry & demethanizer



Inlet gas turbine skid.



Cryogenic skid



Open top skimmer tank- water, oil & condensate.



**Marathon Indian Basin Gas  
Plant GW-21  
March 8, 2000 Pictures by  
Wayne Price-OCD**



Skimmer tank



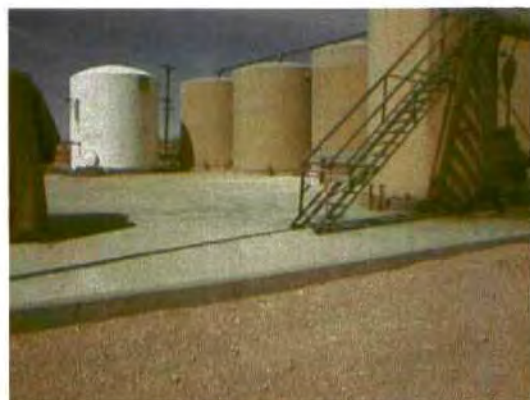
Amine storage tank.



plant landfarm



Loading pad & sump. Looking south.



Plant wastewater treater system



Background shows old condense tanks



Two new groundwater remediation recovery well.



Groundwater remediation treatment system.



Groundwater remediation recovery well. East of plant- looking SE.



Groundwater infiltration water well approximately 1 mile SE of plant.



SAB looking SE near Martha's creek



Plant Class II injection well.



**Marathon Indian Basin Gas  
Plant GW-21  
March 8, 2000 Pictures by  
Wayne Price-OCD**



Plant Class II injection well west of plant  
approximately  $\frac{1}{4}$  mi.

Mid-Continent Region  
Production United States



**Marathon  
Oil Company**

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

July 18, 2000

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

Post-it® Fax Note 7671		Date 7/19/00	# of pages 4
To	WAYNE PRICE	From	TROY JOHNSON
Co./Dept	OIL CONSERVATION	Co.	MARATHON
Phone #		Phone #	915687-8302
Fax #		Fax #	

RE: Groundwater Discharge Plan GW-21  
Indian Basin Gas Plant  
Marathon Oil Company

Dear Mr. Price:

As we discussed during our July 17, 2000 conversation, a revised Table 6 has been attached for the above referenced Groundwater Discharge Plan GW-21. Complete changes include dropping lease roads and pad sites as alternatives for soil usage and standardizing the TRPH clean-up standard at 1000 ppm for use of land farm soil in the plant. The benzene level was also dropped to 1 ppm to address safety concerns. Please contact me at (915) 687-8302 if you have any further comments or questions regarding the plan. Thanks again for all of your work regarding this matter.

Sincerely,

Troy Johnson  
Environmental Engineer

Attachment

Cc: M. C. Schweser w/ attachment

File: 524-03

RECEIVED  
JUL 19 2000  
Environmental Bureau  
Oil Conservation Division

Table 6. Soil Treatment Cleanup Standards

Soil Use (Within Gas Plant)	Cleanup Standards (mg/kg)		
	TRPH (EPA 418.1)	Total BTEX	Benzene
Replacement Soil	1000	50	1
Stormwater Control Dikes	1000	50	1
Secondary Containment Berms	1000	50	1

RECEIVED  
JUL 19 2000  
Environmental Bureau  
Oil Conservation Division

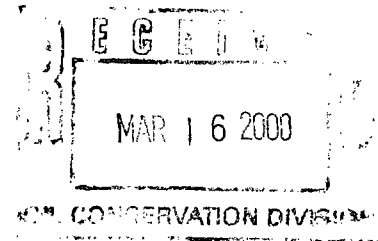


**Marathon  
Oil Company**

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

March 13, 2000

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



RE: Groundwater Discharge Plan GW-21  
Indian Basin Gas Plant  
Marathon Oil Company

Dear Mr. Price:

As we discussed during your site visit on March 8, 2000, a revised Table 6 has been attached for the above referenced Groundwater Discharge Plan GW-21. The only change in the table is that road spreading of treated soil from the landfarm was removed as an option for usage. Please contact me at (915) 687-8302 if you have any further comments or questions regarding the plan. Thanks again for all of your work regarding this matter.

Sincerely,

Troy Johnson  
Environmental Engineer

Attachment

Cc: M. C. Schweser w/ attachment

File: 524-03



**Table 6. Soil Treatment Cleanup Standards**

Use of Treated Soil	Cleanup Standards (mg/kg)		
	TRPH (EPA 418.1)	total BTEX	Benzene
Reburied	100	50	10
Stormwater control dikes	1000	50	10
Secondary containment berms in the gas plant	3000	50	10
Pad dirt on production locations	3000	50	10



NEW MEXICO ENERGY, MINERALS  
& NATURAL RESOURCES DEPARTMENT

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

April 12, 2000

Marathon Oil Company  
P.O. Box 552  
Midland, Texas 79702-0559

Attention: Mr. Paul Peacock

RE: 1<sup>st</sup> Amendment of Division Order SWD-55

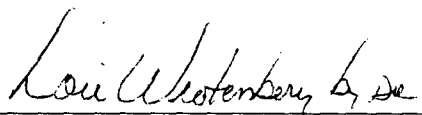
Dear Mr. Peacock:

Reference is made to your request dated April 10, 2000, to amend SWD-55, to include the injection of gas plant wastes into the Marathon Federal Well No. 1 (API No. 30-015-10373) located in Unit K of Section 24, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. Your request is hereby approved, subject to the following:

- (1) Within 30 days of implementation of gas plant wastes injection, the operator shall supply this office and the Artesia district office with a proper waste determination per 40 CFR 261 for the non-exempt gas plant wastes.

Division Order SWD-55 is hereby amended to include this condition. All other conditions of Division Order SWD-55 shall remain in full force and effect.

Sincerely,

  
LORI WROTENBERY,  
Division Director

LW/MWA/kv

cc: Oil Conservation Division - Artesia  
Oil Conservation Division - Environmental Bureau, Santa Fe /  
File - SWD-55



NEW MEXICO ENERGY, MINERALS  
& NATURAL RESOURCES DEPARTMENT

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

April 12, 2000

Marathon Oil Company  
P.O. Box 552  
Midland, Texas 79702-0559

Attention: Mr. Paul Peacock

RE: 2<sup>nd</sup> Amendment of Division Order SWD-416

Dear Mr. Peacock:

Reference is made to your request dated April 10, 2000, to amend SWD-416, to include the injection of gas plant wastes into the Indian Basin Gas Com Well No. 1 (API No. 30-015-00037) located in Unit E of Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. Your request is hereby approved, subject to the following:

- (1) Within 30 days of implementation of gas plant wastes injection, the operator shall supply this office and the Artesia district office with a proper waste determination per 40 CFR 261 for the non-exempt gas plant wastes.

Division Order SWD-416 is hereby amended to include this condition. All other conditions of Division Order SWD-416, as amended, shall remain in full force and effect.

Sincerely,

LORI WROTENBERY,  
Division Director

LW/MWA/kv

cc: Oil Conservation Division - Artesia  
Oil Conservation Division - Environmental Bureau, Santa Fe  
File - SWD-416

# OIL CONSERVATION DIVISION

2040 South Pacheco  
Santa Fe, NM 87505  
(505) 827-7133  
Fax: (505) 827-8177



(PLEASE DELIVER THIS FAX)

To: PAUL PEACOCK fax 915-687-8305

From: OCD

Date: 7/17/00

Number of Pages (Includes Cover Sheet) 3

Message: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

If you have any trouble receiving this, please call:  
(505) 827-7133

# The Santa Fe New Mexican

Since 1849. We Read You.

MAR - 9 2000

NM OCD  
ATTN: DONNA DOMINGUEZ

AD NUMBER: 136595 ACCOUNT: 56689  
LEGAL NO: 67003 P.O.#: 00199000278  
197 LINES 1 time(s) at \$ 86.84  
AFFIDAVITS: 5.25  
TAX: 5.76  
TOTAL: 97.85

## NOTICE OF PUBLICATION

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

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge plan application has been submitted to the Director of the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

(GW-21) - Marathon Oil Company, Mr. Paul Peacock, Advanced Environmental & Safety Engineer, P.O. Box 552, Midland, Texas, 79702-0552, has submitted a renewal application for the previously approved discharge plan for the Indian Basin Gas Plant located in the NE/4 Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. Plant waste water will be disposed of into two off-site OCD permitted Class II wells. Hydrocarbon-contaminated ground water from Marathon's ground water remediation project will be collected and treated to New Mexico Water Quality Control Commission standards by an air stripper/activated carbon system. The treated water will then be injected into the Lower Queen and/or the Shallow zone aquifer located in SE/4 of Section 23, Township 21 South, Range 23 East and NE/4 of Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. The renewal application consist of methods and procedures for handling products, waste,

waste water management, and site groundwater investigation/remediation plans.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge plan application may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling on any proposed discharge plan or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted to him and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed plan based on information available. If a public hearing is held, the director will approve or disapprove the proposed plan based on information in the plan and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this Third (3rd) day of March, 2000.

STATE OF NEW MEXICO  
OIL CONSERVATION  
DIVISION  
LORI WROTENBERY,  
Director

Legal #67003  
Pub. March 8, 2000

## AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO  
COUNTY OF SANTA FE

I, Betsy Perner being first duly sworn declare and say that I am Legal Advertising Representative of THE SANTA FE NEW MEXICAN, a daily newspaper published in the English language, and having a general circulation in the Counties of Santa Fe and Los Alamos, State of New Mexico and being a Newspaper duly qualified to publish legal notices and advertisements under the provisions of Chapter 167 on Session Laws of 1937; that the publication #67003 a copy of which is hereto attached was published in said newspaper 1 day(s) between 03/08/2000 and 03/08/2000 and that the notice was published in the newspaper proper and not in any supplement; the first publication being on the 8 day of March, 2000 and that the undersigned has personal knowledge of the matter and things set forth in this affidavit.

/S/

Betsy Perner  
LEGAL ADVERTISEMENT REPRESENTATIVE

Subscribed and sworn to before me on this  
8 day of March A.D., 2000

Notary

Commission Expires

Candace R. Dunton  
11/16/2003  
OK Wayne  
3/28/00

# Affidavit of Publication

NO. 16881

STATE OF NEW MEXICO

County of Eddy:

Gary D. Scott being duly

sworn, says: That he is the Publisher of The

Artesia Daily Press, a daily newspaper of general

circulation, published in English at Artesia, said county

and county and state, and that the here to attached

## Legal Notice

was published in a regular and entire issue of the said

Artesia Daily Press, a daily newspaper duly qualified

for that purpose within the meaning of Chapter 167 of

the 1937 Session Laws of the state of New Mexico for

1 consecutive weeks/days on the same

day as follows:

First Publication March 9 2000

Second Publication \_\_\_\_\_

Third Publication \_\_\_\_\_

Fourth Publication \_\_\_\_\_

Subscribed and sworn to before me this

9th day of March 2000

Barbara Ann Boams  
Notary Public, Eddy County, New Mexico

My Commission expires September 23, 2003

# Copy of Publication:

Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. The renewal application consist of methods and procedures for handling products, waste, waste water managment, and site groundwater investigation/remediation plans.

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GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this Third (3rd) day of March, 2000.

STATE OF NEW MEXICO  
OIL CONSERVATION  
DIVISION

s-Lori Wrotenbery,  
LORI WROTENBERY, Director  
SEAL  
Published in the Artesia Daily Press, Artesia, N.M. March 9, 2000.

Legal 16881

## LEGAL NOTICE

NOTICE OF PUBLICATION  
STATE OF NEW MEXICO  
ENERGY, MINERALS AND  
NATURAL RESOURCES  
DEPARTMENT  
OIL CONSERVATION DIVISION

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(GW-21) Marathon Oil Company, Mr. Paul Peacock, Advanced Environmental & Safety Engineer, P.O. Box 552, Midland, Texas, 79702-0552, has submitted a renewal application for the previously approved discharge plan for the Indian Basin Gas Plant located in the NE/4 Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. Plant waste water will be disposed of into two off-site OCD permitted class II wells. Hydrocarbon-contaminated ground water from Marathon's ground water remediation project will be collected and treated to New Mexico Water Quality Control Commission standards by an air stripper/activated carbon system. The treated water will then be injected into the Lower Queen and/or the Shallow zone aquifer located in SE/4 of Section 23, Township 21 South, Range 23 East and NE/4 of

*OK Jane Mally &c*

NOTICE OF PUBLICATION

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

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If no public hearing is held, the Director will approve or disapprove the proposed plan based on information available. If a public hearing is held, the director will approve or disapprove the proposed plan based on information in the plan and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this Third (3rd) day of March, 2000.

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION



for

LORI WROTENBERY, Director

S E A L



**Marathon  
Oil Company**

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

February 25, 2000

Mr. Roger Anderson  
Environment Bureau  
Oil Conservation Division  
2040 S. Pacheco  
Santa Fe, New Mexico 87505

RECEIVED  
FEB 28 2000  
Environmental Bureau  
Oil Conservation Division

RE: Groundwater Discharge Plan GW-21  
Indian Basin Gas Plant  
Marathon Oil Company

Dear Mr. Anderson:

I have enclosed the updated Groundwater Discharge Plan GW-21 dated February 25, 2000 for the Indian Basin Gas Plant. The updated discharge plan is submitted to your office for the renewal application dated July 21, 1999. I have also enclosed a check in the amount of \$1,667.50 for the renewal of the discharge plan.

If you have any questions or comments, then please call me at (915) 687-8312.

Sincerely,

A handwritten signature in black ink, appearing to read 'M. Paul Peacock'.

M. Paul Peacock  
Advanced Environmental & Safety Engineer

attachments  
MPP\OCD IBGP Disch Plan Renewal App.doc

cc: T. A. Deines w/o attachments  
F. D. Searle w/o attachments  
C. M. Schweser w/attachments

File: 524-03





NEW MEXICO ENERGY, MINERALS  
& NATURAL RESOURCES DEPARTMENT

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

April 10, 1999

**CERTIFIED MAIL**  
**RETURN RECEIPT NO. P 288 259 107**

Mr. Troy Johnson  
Marathon Oil Company  
P.O. Box 552  
Midland, Texas 79702-0552

Re: Disposal of Purafil Media  
Marathon Oil Company-Indian Basin Gas Plant (GW-021)

Dear Mr. Johnson:

The New Mexico Oil Conservation Division (NMOCD) is in receipt of Marathon Oil Company's (MOC) letter dated March 12, 1999 requesting disposal of the above referenced material into the Lea Land Industrial Landfill near Carlsbad, NM. This request is hereby approved subject to the following conditions:

1. The waste must be Non-hazardous pursuant to EPA CFR 40 part 261.
2. Waste disposal shall be pursuant to all New Mexico Environment Department (NMED) Solid Waste Management Regulations per 20 NMAC 9.1 and the NMED site specific permit conditions for the Lea Land Industrial Landfill.

Please be advised that NMOCD approval of this request does not relieve MOC of liability should their operations pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve MOC of responsibility for compliance with any other federal, state, or local laws and/or regulations.

If you require any further information or assistance please do not hesitate to write or call me at (505-827-7155).

Sincerely Yours,

Wayne Price-Pet. Engr. Spec.  
Environmental Bureau

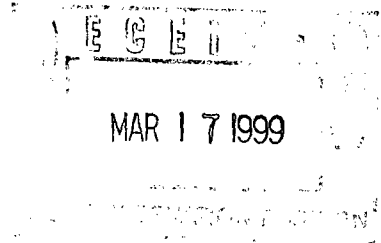
cc: OCD Hobbs Office  
OCD Artesia Office



**Marathon  
Oil Company**

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

March 12, 1999



Mr. Wayne Price  
Environmental Engineer  
Environmental Bureau  
Oil Conservation Division  
New Mexico Energy, Minerals, and Natural Resources Department  
2040 S. Pacheco  
Santa Fe, New Mexico 87505

RE: Disposal of Purafil Media  
Marathon Oil Company - Indian Basin Gas Plant *GW-021*

Dear Mr. Price:

Marathon Oil Company(Marathon) is requesting approval to dispose of Purafil Media, which is an inorganic oxidizer, at the Lea Land Industrial Landfill near Carlsbad, New Mexico. The Purafil Media is used at our Indian Basin Gas Plant to remove hydrogen sulfide and volatile hydrocarbons from breathing air before it is circulated in the control room.

Attached are the material safety data sheets(MSDS) and testing results for the Purafil Media. According to the MSDS, Purafil Media is a non-hazardous material when unused. Marathon personnel submitted a sample of the spent Purafil Media to Trace Analysis for analysis of benzene, toluene, ethyl-benzene, and total xylenes by EPA Method 8021. The analysis did not detect any concentrations above hazardous waste levels.

Thank you very much for your assistance in this matter. If you have any questions or comments, please contact me at 915/687-8302.

Sincerely,

Troy Johnson  
Environmental Engineer

Attachments

M:\Waste Management\Indian Basin Operations\OCD Purafil Disposal Request.doc

ATTN: PAT REYNOLDS

**Purafil, Inc.**  
P. O. Box 1188  
Norcross, Georgia 30091

**MATERIAL SAFETY DATA SHEET****Section 1. Identity of Material**

PRODUCT NAME OR NUMBER <b>PURAFIL® Media</b>			
SYNONYMS <b>PURAFIL® Chemisorbant, PURAFIL® FS Chemisorbant, PURAFIL® GP Odoroxidant, PURAFIL® CP Odoroxidant, PURAFIL® Diving Life Support, PURASORB® Media, PERMASORB Media, PIRALUM WW Media</b>			
FORMULA <b>KMnO<sub>4</sub> Impregnant</b>		CAS NUMBER <b>N/A</b>	CHEMICAL FAMILY <b>Inorganic Oxidizer</b>
REGULATED	DOT PROPER SHIPPING NAME <b>NMFC 13090 ALUMINA</b>		
IDENTIFICATION	SHIPPING ID NUMBER	UN <b>N/A</b>	HAZARD CLASS <b>N/A</b>
HAZARDOUS INGREDIENTS			
<b>Potassium Permanganate</b>		<b>4-6</b>	<b>7722-64-7</b>

**Section 2. Hazard Specifications**

KNOWN HAZARDS UNDER 29 CFR 1910.1200						TLV = <b>N/A</b>	ppm	mg/m <sup>3</sup>
	YES	NO		YES	NO	PEL = <b>N/A</b>	ppm	mg/m <sup>3</sup>
COMBUSTIBLE LIQUID		X	SKIN HAZARD		X	NEPA HAZARD SIGNAL <b>N/A</b>		
FLAMMABLE MATERIAL		X	FTF HAZARD	X				
PYROPHORIC MATERIAL		X	TOXIC AGENT		X	HEALTH	FLAMMABILITY	
EXPLOSIVE MATERIAL		X	HIGHLY TOXIC AGENT		X	STABILITY	SPECIAL	
UNSTABLE MATERIAL		X	SENSITIZER		X	DOT HAZARD CLASS <b>N/A</b>		
WATER REACTIVE MATERIAL		X	CARCINOGEN		X	EPA HAZARD WASTE CLASS <b>N/A</b>		
OXIDIZER	X		REPRODUCTIVE TOXIN		X			
ORGANIC PEROXIDE		X	BLOOD TOXIN		X			
CORROSIVE MATERIAL		X	NERVOUS SYSTEM TOXIN		X			
COMPRESSED GAS		X	LUNG TOXIN		X			
IRRITANT	X		LIVER TOXIN		X			
			KIDNEY TOXIN		X			

**Section 3. Safe Usage Data**

PROTECTIVE EQUIPMENT TYPES	EYES	Goggles or safety glasses recommended
	RESPIRATORY	Dust mask recommended
	GLOVES	Rubber gloves recommended
	OTHER	None
VENTILATION	GENERAL MECHANICAL	Yes
	LOCAL EXHAUST	If dusting is excessive
PRECAUTIONS	HANDLING & STORAGE	Store in cool dry area in closed containers
	OTHER	Do not eat, avoid contact with eyes and skin

LEADERSHIP TRAINING GRANTS PERMISSON TO USE THIS FORM WHEN IT IS USED TO COMPLY WITH THE MSDS REGULATIONS OF 29 CFR 1910.1200

TO TROY Johnson

NOTE: While the information and recommendations set forth herein are believed to be accurate, Purafil, Inc. makes no warranty implied or otherwise and disclaims all responsibility from reliance thereon.

**Section 4. Emergency Response Data**

FIRE	EXTINGUISHING MEDIA	PURAFIL® Media is not flammable
	SPECIAL PROCEDURES	None
	UNUSUAL HAZARDS	None
EXPOSURE	FIRST AID MEASURES	Dust Inhalation: move to fresh air. Ingestion: seek medical attention. Skin Contact: wash area. Eye Contact: Flush with large quantities of water, seek medical attention
SPILLS	STEPS TO BE TAKEN	Clean floor with broom or shovel
PG =	WASTE DISPOSAL METHOD	New material may be disposed of in landfill; spent material that has removed toxic chemicals should be examined for specific hazards.

**Section 5. Physical Hazard Data**

FLAMMABILITY	LFL = N/A UFL = N/A		%	FLASH POINT	N/A	°F	°C	METHOD USED
STABILITY	STABLE	<input checked="" type="checkbox"/>	CONDITIONS TO AVOID	None				
	UNSTABLE	<input type="checkbox"/>	HAZARDOUS DECOMP POS	Dilute KMnO <sub>4</sub> solution when wetted				
HAZARDOUS POLYMERIZATION	MAY OCCUR	<input type="checkbox"/>	CONDITIONS TO AVOID	None				
	WILL NOT OCCUR	<input checked="" type="checkbox"/>						
INCOMPATIBILITY	MATERIALS TO AVOID Protect from water and exposure to contaminated air otherwise media may be rendered useless							

**Section 6. Health Hazard Data**

EFFECTS OF EXPOSURE	PURAFIL media is non-toxic upon oral, dermal, and inhalation exposure and is a non-irritant of the skin. Breathing of dust may cause sneezing. Skin may feel dry after contact. PURAFIL media is an eye irritant.
EMERGENCY TREATMENT	Flush eye with large quantities of water; seek medical attention.

**Section 7. Physical and Chemical Properties**

BOILING Pt =	N/A	°F	°C	VAPOR DENSITY (AIR = 1)	N/A	VOLATILE COMPONENTS	N/A
VAPOR PRESS	N/A	mmHg	PSI	PH	N/A		
SOLUBILITY IN H <sub>2</sub> O	Partially soluble			WILL DISSOLVE IN	Concentrated acids & alkalis		
				EVAPORATION RATE	N/A		
APPEARANCE	Spherical purple pellets					IS MATERIAL	PASTE POWDER
ODOR	No significant odor					(SOLID)	LIQUID GAS

**Section 8. Manufacturer or Supplier Data**

FIRM'S NAME & MAILING ADDRESS  Purafil, Inc. P.O. Box 1188 Norcross, Georgia 30091 U.S.A.	NAME (PRINT)	Christopher O. Muller
	SIGNATURE	<i>Christopher O. Muller</i>
	TITLE	MGR. GAS TECHNOLOGY
	DATE	11/14/88
	EMERGENCY TELEPHONE NO	(404) 662-8546

TROY Johnson

# TRACEANALYSIS, INC.

3701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 806•379•1236 E06•794•1298 FAX 806•794•1298  
 4725 Risley Avenue, Suite 4 El Paso, Texas 79322 806•589•3443 E'5•585•3443 FAX 8'5•585•4944

E-Mail: lab@traceanalysis.com

## ANALYTICAL RESULTS FOR

Marathon Oil Co.  
 Attention Pat Reynolds  
 329 Marathon Road  
 Lakewood NM

Lab Receiving #: 9903000004  
 Sampling Date: 2/24/99  
 Sample Condition: Intact and Cool  
 Sample Received By: NG

Date: Mar 10, 1999  
 Date Rec: 3/1/99  
 Project: N/A  
 Proj Name: N/A  
 Proj Loc: Indian Basin

TA#	Field Code	MATRIX	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL- BENZENE (mg/Kg)	M,P,O XYLENE (mg/Kg)	TOTAL BTX (mg/Kg)
119924	Purfil-1	Solid	<0.050	<0.050	<0.050	0.054	0.054
	Method Blank		<0.050	<0.050	<0.050	<0.050	
QC			0.101	0.102	0.103	0.301	

RPD	6	6	5	5
% Extraction Accuracy	104	105	105	102
% Instrument Accuracy	101	102	103	101

TEST	PREP METHOD	PREP DATE	ANALYSIS METHOD	ANALYSIS COMPLETED	CHEMIST	QC: (mg/L)	SPIKE: (mg/Kg)
BTX	EPA 8030	3/4/99	EPA 8021B	3/4/99	RC	0.100 ea	0.1 ea

*R3*  
 Director, Dr. Blair Leftwich

*3-10-99*  
 Date



# NEW MEXICO ENERGY, MINERALS & NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION  
DISTRICT I HOBBBS  
P.O. BOX 1980, Hobbs, NM 88241  
(505) 393-6161  
FAX (505) 393-0720

Jennifer A. Salisbury  
CABINET SECRETARY

September 9, 1998

M. Paul Peacock  
Marathon Oil Company (MOC)  
P.O. Box 552  
Midland, Texas 79702-0552

Re: Disposal of Sulfur Recovery Unit Catalyst Waste  
Marathon Oil Company- Indian Basin Gas Plant (GW-21).

Dear Mr. Peacock:

New Mexico Oil Conservation Division (NMOCD) is in receipt of your letter dated August 25, 1998 requesting permission to dispose of approximately 20 tons of non-hazardous sulfur recovery unit catalyst waste generated at the Indian Basin Gas Plant, currently operating under NMOCD discharge plan GW-21, into the Lea Land, Inc. Landfill, Permit No. SWM-131401 located in Lea County, New Mexico.

Pursuant to our telephone conversation all waste generated at an OCD permitted facility i.e. gas plant, must conform to the approved discharge plan. Please note your request to dispose of this material deviates from the original plan as explained by your interpretation. The NMOCD can approve of different disposal options on a case-by-case basis or you may amend your original plan. It is NMOCD's understanding at this time you wish to work on approvals on a case-by-case basis.

Therefore in order for NMOCD to approve your request please provide the following information:

1. Please sample and test the waste stream to identify that it is Non-Hazardous per EPA CFR 40 part 261 using SW-846 methods. Please note the NMOCD will waive pesticides and herbicides if MOC can demonstrate these constituents will not be part of the waste stream. Also please verify this is not a listed hazardous waste per EPA CFR 40 part 261. Please provide analytical results for the Hazardous Characteristics for RCI, Metals, Volatiles and Semi-Volatiles;
2. In addition, the waste shall be accompanied by a "Certificate of Waste Status" this certification shall state that the waste not otherwise exempted pursuant to 20 NMAC 3.1 Subpart 1403, has been surveyed for Naturally Occurring Radioactive Material (NORM) and that the maximum radiation exposure reading and NORM concentrations do not exceed that listed in 20 NMAC 3.1 Subpart 1403.C and D. If the waste was surveyed for NORM the survey results must be included with the certification.

Please note after NMOCD receives the above requested information we will then review and notify MOC if this waste has been approved. Please note as per our telephone conversation NMOCD does not have regulatory authority over New Mexico Environment Department (NMED) permitted facilities, therefore we will contingent our approval upon NMED approval and include a disclaimer that MOC will retain certain future environmental liability. Also you are encouraged to coordinate this activity with all parties. NMOCD disclaims any liability if other parties cannot be satisfied with our requirements.

If you require any further information or assistance please do not hesitate to call (505-393-6161) or write this office.

Sincerely Yours,

Wayne Price-Environmental Engineer

cc: Chris Williams-NMOCD District I Supervisor

attachments- list of NMOCD permitted facilities per your request

# **SURFACE WASTE MANAGEMENT FACILITIES**

located in Southeast NM  
permitted by NMOCDD rule 711

## **C & C Landfarm**

Box 55

Monument, New Mexico 88265

Contact: Mr. Jimmy Cooper

505-397-2045

505-369-7108 mobil

Location: Southeast of Monument, NM

sec 3-Ts 20s-R 7 e

Lea Co. NM

## **Controlled Recovery Inc.**

P.O. Box 369

Hobbs, New Mexico 88240

Contact: Billy Charo-Office Manager

505-393-1079

Location: Half way between Hobbs & Carlsbad NM

sec 27-Ts 20s-R 32 e

Lea Co. NM

## **Environmental Plus, Inc. (EPI)**

P.O. Box 969

Eunice, New Mexico 88231

Contact: Mr. Charlie Bettis

505-394-2588

Location: South of Eunice, NM

sec 14,15- Ts 22s- R 37 e

Lea Co. NM

## **Gandy Marley, Inc.**

P.O. Box 827

Tatum, New Mexico 88267

Contact: Mr. Larry Gandy

505-398-4960

Location: Half way between Tatum and Roswell NM

of Hwy 380, sec 4,5,8,9- Ts 11 s - R 31 e

Chavez Co. NM

## **Goo-Yea Landfarm, Inc.**

P.O. Box 25547

Albuquerque, New Mexico 87125

Contact: Mr. Royce Cooper, Jr.

Mr. Steve Dyer-Rhino Environmental Ser.

1-800-762-0241

Location: 7 miles N of Bronco, Tx.

sec 14-Ts 11s-R 38 e

Lea Co. NM

## **Loco Hills Water Disposal**

P.O. Box 68

Loco Hills, NM 88255

Contact: James R. Maloney

505-677-2118

Location: Loco Hills, NM 88255

Eddy Co. NM

## **Parabo, INC.**

P.O. Box 1737

Eunice, New Mexico 88231

Contact: Donna Roach

505-394-2511

Location: 5 mi. east of Eunice, NM

sec 29-Ts 21s-R38 e

Lea Co. NM



**Marathon  
Oil Company**

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

August 25, 1998

AUG 28 1998

Mr. Roger C. Anderson  
Bureau Chief  
Environmental Bureau  
Oil Conservation Division  
2040 S. Pacheco  
Santa Fe, New Mexico 87505

RE: Disposal of Sulfur Recovery Unit Catalyst Waste  
Marathon Oil Company - Indian Basin Gas Plant

GW-21

Dear Mr. Anderson:

Marathon Oil Company, owner and operator of the Indian Basin Gas Plant, requests approval from your agency to dispose of waste generated from this location. This request addresses the disposal of approximately 20 tons of non-hazardous sulfur recovery unit catalyst waste in the Lea Land, Inc. landfill, Permit No. SWM-131401 located in Lea County, New Mexico.

If you have any questions, then please call me at (915) 687-8398.

Sincerely,

A handwritten signature in dark ink, appearing to read 'M. Paul Peacock'.

M. Paul Peacock  
Advanced Environmental & Safety Engineer

MPP\ocdsruwt.wpd

cc: F. D. Searle  
G. J. Schmidt

File 552-03

FAX 915-687-8305

REQUIRES  
ACTION!

9/8/98

Paul is going to  
re-search!





P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

June 2, 1998

Ms. Lori Wrotenbery  
Director  
Oil Conservation Division  
New Mexico Energy, Minerals & Natural Resources Department  
2040 S. Pacheco Street  
Santa Fe, New Mexico 87505

RE: Indian Basin Gas Plant/Remediation Project  
Discharge Plan GW-21 Minor Modification

Dear Ms. Wrotenbery:

Marathon Oil Company is in receipt of your approval letter dated May 14, 1998 concerning the discharge plan minor modification for the Indian Basin Gas Plant located in Eddy County, New Mexico. As you requested, I have enclosed one signed copy of your approval letter.

If you have any questions or comments, please do not hesitate to contact me at (915) 687-8398.

Sincerely,

*Donald E. O'Neil for M. Paul Peacock*

M. Paul Peacock  
Advanced Environmental & Safety Engineer

MPP\ocddisc1.wpd\lgh

File 524-03

xc: T. A. Deines  
D. E. Dix  
C. M. Schweser  
F. D. Searle

ATTACHMENT TO THE DISCHARGE PLAN MODIFICATION GW-21 APPROVAL  
MARATHON OIL COMPANY  
INDIAN BASIN GAS PLANT  
DISCHARGE PLAN MODIFICATION APPROVAL CONDITIONS  
(May 14, 1998)

1. Marathon Commitments: Marathon will abide by all commitments submitted in the discharge plan modification dated August 27, 1997, and the additional information dated April 1, 1998.
2. Waste Disposal: All wastes shall be disposed of at an OCD approved facility. Only oilfield exempt wastes shall be disposed of down Class II injection wells. Non-exempt oilfield wastes that are non-hazardous may be disposed of at an OCD approved facility upon proper waste characterization per 40 CFR Part 261.
3. Drum Storage: All drums containing materials other than fresh water must be stored on an impermeable pad with curbing. All empty drums will be stored on their sides with the bungs in and lined up on a horizontal plane. Chemicals in other containers such as sacks or buckets will also be stored on an impermeable pad and curb type containment.
4. Process Areas: All process and maintenance areas which show evidence that leaks and spills are reaching the ground surface must be either paved and curbed or have some type of spill collection device incorporated into the design.
5. Above Ground Tanks: All above ground tanks which contain fluids other than fresh water must be bermed to contain a volume of one-third more than the total volume of the largest tank or of all interconnected tanks. All new tanks or existing tanks that undergo a major modification, as determined by the Division, must be placed within an impermeable bermed enclosure.
6. Above Ground Saddle Tanks: Above ground saddle tanks must have impermeable pad and curb type containment unless they contain fresh water or fluids that are gases at atmospheric temperature and pressure.
7. Labeling: All tanks, drums and containers should be clearly labeled to identify their contents and other emergency notification information.
8. Below Grade Tanks/Sumps: All below grade tanks, sumps, and pits must be approved by the OCD prior to installation or upon modification and must incorporate secondary containment and leak-detection into the design. All pre-existing sumps and below-grade tanks must demonstrate integrity on an annual basis. Integrity tests include pressure testing to 3 pounds per square inch above normal operating pressure and/or visual

inspection of cleaned out tanks and/or sumps, or other OCD approved methods. The OCD will be notified at least 72 hours prior to all testing.

9. Underground Process/Wastewater Lines: All underground process/wastewater pipelines must be tested to demonstrate their mechanical integrity at present and then every 5 years thereafter, or prior to discharge plan renewal. Permittees may propose various methods for testing such as pressure testing to 3 pounds per square inch above normal operating pressure or other means acceptable to the OCD. The OCD will be notified at least 72 hours prior to all testing.
10. Class V Wells: Leach fields and other wastewater disposal systems at OCD regulated facilities which inject non-hazardous fluid into or above an underground source of drinking water are considered Class V injection wells under the EPA UIC program. All Class V wells that inject non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes will be closed unless it can be demonstrated that groundwater will not be impacted in the reasonably foreseeable future. Closure of Class V wells must be in accordance with a plan approved by the Division's Santa Fe Office. The OCD allows industry to submit closure plans which are protective of human health, the environment and groundwater as defined by the WQCC, and are cost effective. Class V wells that inject domestic waste only must be permitted by the New Mexico Environment Department.
11. Housekeeping: All systems designed for spill collection/prevention will be inspected weekly and after each storm event to ensure proper operation and to prevent overtopping or system failure. A record of inspections will be retained on site for a period of five years.
12. Spill Reporting: All spills/releases shall be reported pursuant to OCD Rule 116 and WQCC 1203 to the OCD Artesia District Office.
13. Transfer of Discharge Plan: The OCD will be notified prior to any transfer of ownership, control, or possession of a facility with an approved discharge plan. A written commitment to comply with the terms and conditions of the previously approved discharge plan must be submitted by the purchaser and approved by the OCD prior to transfer.
14. Closure: The OCD will be notified when operations of the facility are discontinued for a period in excess of six months. Prior to closure of the facility a closure plan will be submitted for approval by the Director. Closure and waste disposal will be in accordance with the statutes, rules and regulations in effect at the time of closure.
15. Treatment System Monitoring: Marathon will sample and analyze the treatment system effluent on a monthly basis for benzene, toluene, ethylbenzene and xylenes (BTEX) and on a quarterly basis for major cations/anions and polynuclear aromatic hydrocarbons

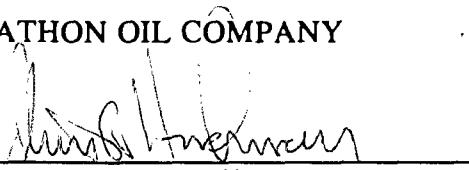
using EPA approved methods. The results of these sampling events will be included in the quarterly ground water remediation monitoring reports for the facility.

16. Reverse Osmosis (RO) Reject and Commingled Water: Marathon will sample and analyze the RO reject and commingled water on a quarterly basis for major cations/anions using EPA approved methods. The concentrations present in the water to be infiltrated will not exceed the WQCC limits as listed in WQCC Regulation 3101. The results of these sampling events will be included in the quarterly ground water remediation monitoring reports for the facility.
17. Certification: Marathon, by the officer whose signature appears below, accepts this permit and agrees to comply with all terms and conditions contained herein. Marathon further acknowledges that these conditions and requirements of this permit may be changed administratively by the Division for good cause shown as necessary to protect fresh water, human health and the environment.

Accepted: 5/29/99

MARATHON OIL COMPANY

by



Title

Production Manager

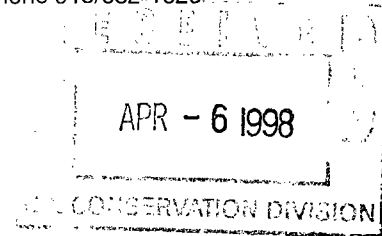


**Marathon  
Oil Company**

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

April 1, 1998

Mr. Mark Ashley  
Geologist  
Oil Conservation Division  
New Mexico Energy, Minerals & Natural Resources Department  
2040 S. Pacheco Street  
Santa Fe, New Mexico 87505



RE: Indian Basin Gas Plant/Remediation Project  
Discharge Plan GW-21 Minor Modification

Dear Mr. Ashley:

Marathon Oil Company (Marathon) is in receipt of your letter dated October 23, 1997 concerning the discharge plan minor modification dated August 27, 1997 for the Indian Basin Gas Plant located in Eddy County, New Mexico. The additional information that you requested in your letter dated October 23, 1997 is outlined below.

1. *A determination as to whether or not the RO reject water and the remediation project treated water will be commingled prior to infiltration into wells MW-45 and MW-51. The reverse osmosis (RO) reject water will be commingled prior to infiltration into Shallow Zone wells MW-45 and MW-51, and into Lower Queen Aquifer wells IW-1 and IW-2.*
2. *If the RO reject water and the remediation project treated water will be commingled prior to infiltration, please provide a cation/anion analysis of the commingled water. The RO reject water and the remediation project treated water will be commingled prior to infiltration. The commingled water was sampled on October 17, 1997 and submitted to American Environmental Network, Inc. for a cation/anion analysis. The laboratory report is attached.*
3. *The volume, by month of RO reject water to be infiltrated. The average volume of RO reject water to be infiltrated is 1,500 barrels per month.*

If you have any questions or comments, then please call me at (915) 687-8398.

Sincerely,

A handwritten signature in black ink, appearing to read 'M. Paul Peacock'.

M. Paul Peacock  
Advanced Environmental & Safety Engineer

MPP\oeddisch.wpd

File 524-03

cc: D. E. Dix  
C. M. Schweser  
F. D. Searle

# American Environmental Network, Inc.

AEN I.D. 710379

December 18, 1997

MARATHON OIL COMPANY  
P.O. BOX 552  
MIDLAND, TX 79702-0552

Project Name Indian Basin Remediation  
Project Number 023350224.63

Attention: PAUL PEACOCK

On 10/17/97 American Environmental Network (NM), Inc (ADHS License No. AZ0015), received a request to analyze aqueous samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA Method 8020 was performed by AEN(NM), Inc., Albuquerque, NM

Potassium and sodium analyses were performed by AEN(OR), Portland, OR

All other analyses were performed by AEN(AZ), Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.



H. Mitchell Rubenstein, Ph. D.  
General Manager

MR: mt

Enclosure

CLIENT	MARATHON OIL COMPANY	AEN ID	710379
PROJECT #	023350224 63	DATE RECEIVED	10/17/97
PROJECT NAME	Indian Basin Remediation	REPORT DATE	12/18/97

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	DI H2O	AQUEOUS	10/15/97
02	INT RB	AQUEOUS	10/15/97
03	MW-70RB	AQUEOUS	10/15/97
04	MW-70	AQUEOUS	10/15/97
05	MW-63	AQUEOUS	10/15/97
06	MW-63RB	AQUEOUS	10/15/97
07	MW-89	AQUEOUS	10/15/97
08	MW-89RB	AQUEOUS	10/15/97
09	MW-66	AQUEOUS	10/15/97
10	MW-66RB	AQUEOUS	10/15/97
11	MW-88	AQUEOUS	10/15/97
12	MW-88RB	AQUEOUS	10/15/97
13	MW-61A	AQUEOUS	10/15/97
14	MW-61ARB	AQUEOUS	10/16/97
15	MW-71	AQUEOUS	10/16/97
16	MW-71RB	AQUEOUS	10/16/97
17	MW-60	AQUEOUS	10/16/97
18	MW-60RB	AQUEOUS	10/16/97
19	MW-87	AQUEOUS	10/16/97
20	MW-87RB	AQUEOUS	10/16/97
21	MW-87A	AQUEOUS	10/16/97
22	MW-87ARB	AQUEOUS	10/16/97
23	MW-96	AQUEOUS	10/16/97
24	MW-96RB	AQUEOUS	10/17/97
25	MW-97	AQUEOUS	10/17/97
26	WEST STRIPPER RO Reset ON	AQUEOUS	10/17/97
27	MW-86	AQUEOUS	10/17/97
28	MW-94	AQUEOUS	10/17/97
29	MW-68	AQUEOUS	10/17/97
30	TRIP BLANK	AQUEOUS	10/10/97

AEN I.D. 710388

December 16, 1997

American Environmental Network-NM  
2709-D Pan American Frwy, NE  
Albuquerque, NM 87107

Project Name/Number: Marathon Oil CO./710379

Attention: Kimberly D. McNeill

On 10/24/97, American Environmental Network (Arizona), Inc., received a request to analyze aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Potassium and Sodium analyses were performed by AEN (Oregon), 17400 SW Upper Boones Ferry Rd., Ste. 270, Durham, OR 97224 (See Attachment 1).

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.



Marcia A. Smith  
Project Manager  
MS/acc  
Enclosure

ADHS License No. AZ0061  
Alan Kleinschmidt, Regional General Manager



CLIENT : AMERICAN ENV. NETWORK OF NM, INC. DATE RECEIVED : 10/24/97  
PROJECT # : 710379  
PROJECT NAME : MARATHON OIL REPORT DATE : 12/16/97  
ATI I.D. : 710388

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	710379-26	AQUEOUS	10/17/97

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	1

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

## GENERAL CHEMISTRY RESULTS

ATI I.D. : 710388

CLIENT : AMERICAN ENV. NETWORK OF NM, INC.  
PROJECT # : 710379  
PROJECT NAME : MARATHON OIL

DATE RECEIVED : 10/24/97

REPORT DATE : 12/16/97

PARAMETER	UNITS	01
CARBONATE (CACO3)	MG/L	<1
BICARBONATE (CACO3)	MG/L	311
HYDROXIDE (CACO3)	MG/L	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	311
BROMIDE (EPA 300.0)	MG/L	<0.6
CHLORIDE (EPA 325.2)	MG/L	38
CONDUCTIVITY, (UMHOS/CM)		1030
FLUORIDE (EPA 340.2)	MG/L	0.77
NITRATE AS N (EPA 353.2)	MG/L	0.75
PH (EPA 150.1)	UNITS	8.1
SULFATE (EPA 375.2)	MG/L	200
T. DISSOLVED SOLIDS (160.1)	MG/L	710

# GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : AMERICAN ENV. NETWORK OF NM, INC.  
PROJECT # : 710379  
PROJECT NAME : MARATHON OIL

ATI I.D. : 710388

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	71037401	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		122	121	0.8	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		122	121	0.8	NA	NA	NA
BROMIDE	MG/L	71039604	<7.5	<7.5	NA	51	50	102
CHLORIDE	MG/L	71035012	300	300	0	730	400	108
CONDUCTIVITY (UMHOS/CM)		71038801	1030	1030	0	NA	NA	NA
FLUORIDE	MG/L	71199903	0.11	0.11	0	0.62	0.50	102
NITRATE AS NITROGEN	MG/L	71038801	0.75	0.84	11	2.91	2.0	108
PH	UNITS	71038801	8.1	8.1	0	NA	NA	NA
SULFATE	MG/L	71038801	200	210	5	410	200	105
TOTAL DISSOLVED SOLIDS	MG/L	71037403	340	360	6	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

METALS RESULTS

ATI I.D. : 710388

CLIENT : AMERICAN ENV. NETWORK OF NM, INC.  
PROJECT # : 710379  
PROJECT NAME : MARATHON OIL

DATE RECEIVED : 10/24/97

REPORT DATE : 12/16/97

PARAMETER	UNITS	01
CALCIUM (EPA 200.7/6010)	MG/L	114
MAGNESIUM (EPA 200.7/6010)	MG/L	47.6

# METALS - QUALITY CONTROL

CLIENT : AMERICAN ENV. NETWORK OF NM, INC.

PROJECT # : 710379

PROJECT NAME : MARATHON OIL

ATI I.D. : 710388

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CALCIUM	MG/L	71199921	59.9	59.9	0	112	50.0	104
MAGNESIUM	MG/L	71199921	25.0	24.9	0.4	50.1	25.0	100

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

# DATE OF ANALYSIS REPORT

AEN ID: 710388

16-Dec-97

METHOD	SAMPLE #	DATE	ANALYST
ALKALINITY (EPA 310.1)	01	10/29/97	DIPTI A. SHAH
BROMIDE (EPA 300.0)	01	11/06/97	MARLA WILSON
CALCIUM (EPA 200.7/6010)	01	11/24/97	JACKIE L. CLEMENT
CHLORIDE (EPA 325.2)	01	11/02/97	CARLENE MCCUTCHEON
CONDUCTIVITY, (UMHOS/CM)	01	10/30/97	PAUL STRICKLER
FLUORIDE (EPA 340.2)	01	10/31/97	DIPTI A. SHAH
MAGNESIUM (EPA 200.7/6010)	01	11/24/97	JACKIE L. CLEMENT
NITRATE AS N (EPA 353.2)	01	11/11/97	MELISSA HUGHES
PH (EPA 150.1)	01	10/27/97	MARLA WILSON
SULFATE (EPA 375.2)	01	11/12/97	CARLENE MCCUTCHEON
T. DISSOLVED SOLIDS (160.1)	01	10/27/97	DIPTI A. SHAH

Methods for Chemical Analysis of Water and Wastes, EPA-600 4-79-020, March 1983

Methods for the Determination of Inorganic Substances in Environmental Samples, EPA-600-R-93/100

DATE: 12-16-97

ION BALANCE

AEN ACCESSION NUMBER: 71038801  
SAMPLE IDENTIFICATION: 710379-26  
CLIENT: AMERICAN ENV. NETWORK OF NM, INC.

ANIONS	RESULT MG/L	FACTOR ME/L	TOTAL
ALKALINITY (AS $\text{CaCO}_3$ )	311.000	0.02000	6.22000
CHLORIDE	38.000	0.02821	1.07198
FLUORIDE	0.770	0.05264	0.04053
NITRATE AS N ( $\text{NO}_3(\text{NO}_3\text{-N} \times 4.43)$ )	0.750	0.01613	0.05359
$\text{SiO}_2$ (SILICON $\times 2.71$ )	NA	0.02629	0.00000
SULFATE	200.000	0.02082	4.16400

TOTAL ANIONS 11.5501

CATIONS	RESULT	FACTOR	TOTAL
CALCIUM	114.000	0.04990	5.6886
POTASSIUM	4.500	0.02558	0.11511
MAGNESIUM	47.600	0.08229	3.91700
SODIUM	40.000	0.04350	1.74000

TOTAL CATIONS 11.46071

		%RPD (<10%)*	0.78
TOTAL ANIONS/CATIONS	(CALCULATED)	632.220	
TOTAL DISSOLVED SOLIDS	(ANALYZED)	710	%RPD (<15%)* -11.59
ELECTRICAL COND.		1030	TDS/EC RATIO (0.65+/-0.10) 0.69

\* If either Total Cations or Total Anions <10, then the %RPD Limit is not applicable.



American Environmental Network  
Albuquerque, New Mexico

# Interlab Chain of Custody

DATE 10-23-97 PAGE ( 1 )

<b>NETWORK PROJECT MANAGER:</b> KIMBERLY D. McNEILL  <b>COMPANY:</b> American Environmental Network <b>ADDRESS:</b> 2708-D Pan American Freeway, NE Albuquerque, NM 87107					<b>ANALYSIS REQUEST</b>																				
<b>CLIENT PROJECT MANAGER:</b>  Kim McNeill					Metals - TAL	Metals - Pb List	Metals - RCRA	RCRA Metals by TCLP (1311)	Cation/Anion	TOX	TOC	Gen Chemistry	Oil and Grease	BOD	COD	Pesticides/PCs (608/8080)	Herbicides (615/8150)	Base Neutral Acid Compounds GC/MS (625/6270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	6240 TCLP (1311) ZHE	6270 TCLP (1311)	TOC	GC/MS	NUMBERS CONTAINED
SAMPLE ID	DATE	TIME	MATRIX	LAB ID																					
710379-26	10-17-97	0800	AQ	1				X																	

<b>PROJECT INFORMATION</b> PROJECT NUMBER <u>710379</u> PROJECT NAME <u>Marathon Oil Co</u> IN LEVEL <u>6th</u> IV (IF RETURNED) MS MSD BLANK (IF STABILIZED) INISH		<b>SAMPLE RECEIPT</b> TOTAL NUMBER OF CONTAINERS <u>2</u> CHAIN OF CUSTODY SEALS <u>NA</u> CONTACT <u>Y</u> RECEIVED GOOD CONTAINER <u>BLUE</u> LAB NUMBER <u>710388</u>		<b>SAMPLES SENT TO:</b> SAN DIEGO PARAGON BENTON PENSACOLA PORTLAND PHOENIX <u>X</u>		<b>RELINQUISHED BY:</b> Signature <u>[Signature]</u> Time <u>1700</u> Printed Name <u>Brian Price</u> Date <u>10-23-97</u> Albuquerque <u>NM</u> <b>RECEIVED BY:</b> Signature: _____ Time: _____ Printed Name: _____ Date: _____ Company: _____		<b>RELINQUISHED BY:</b> Signature _____ Time _____ Printed Name _____ Date _____ Company _____ <b>RECEIVED BY: (LAB)</b> Signature <u>[Signature]</u> Time <u>9561</u> Printed Name <u>Hartley</u> Date <u>10/24/97</u> Company <u>AGU-PIX</u>	
DATE: <u>10-31-97</u> INISH/BLANKING: _____ FINAL INSCOUT: _____ SPECIAL CERTIFICATION (REQUIRED) YES NO		<u>Will Fox</u> <u>AM. Friday</u> <u>10-24-97</u>							

Rechecked by: \_\_\_\_\_



DATE 10/15/92 PAGE: 1 OF 4

**Abstract**

710579

SAMPLE NO.	DATE/TIME	MATRIX	LAB ID	
DI H <sub>2</sub> O	12/15/97	0800	WATER	01K
INT RB		0805		02K
MW-70RB		1025		03K
MW-70		0935		04K
MW-63		1110		05K
MW-63RB		1130		06K
MW-89		1235		07K
MW-89RB		1250		08K
MW-66		1335		09K
MW-66RB	↓	1410	↓	10K

[illegible]

PROJECT INFORMATION	
PROJ NO:	023350224.63
PROJ NAME:	Indian Basin Rancheria
P.O. NO.:	
SHIPPED VIA:	
CAMPBELL	

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☒ 24hr    ☐ 48hr    ☐ 72hr    ☐ 1 WEEK    (NORMAL) ☒

CERTIFICATION REQUIRED: ☐ IHM    ☐ SDWA    ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS:    FIXED FEE ☐

RELINQUISHED BY: 1.	
Signature: <i>Ken Cook</i>	Time: 1730
Printed Name: <i>Ken W Cook</i>	Date: 80/12/92
Company: <i>FDOT</i>	
RECEIVED BY: [Signature]	
Signature:	Time:
Printed Name:	Date:
Company:	

RELINQUISHED BY: <i>[Signature]</i>	
Signature	Date
Printed Name	
Date	
Company	



American  
Environmental  
Network (Arizona), Inc.

# CHAIN OF CUSTODY

DATE 10/16/97 PAGE 3 OF 4

AEN LAB I.D.

710379

REPORT: Attn. to: Paul Percale

COMPANY: Marathon O/C

ADDRESS: PO BOX 552  
Milled TX 79202

PHONE: (915) 687-8310

FAX: (915) 687-8305

BILL TO:

COMPANY:

ADDRESS:

*Same as Above*

## ANALYSIS REQUEST

COMPOSITE OR GRAB	General Chemistry	BTX Panel (802/803)	(BLS-191) Diesel	(M8015) Gas	(MOD-8015) Fuel Fingerprint	Petroleum Hydrocarbons (418.1)	Volatiles 502.2 (SDWA/UST)	Aromatic Hydrocarbons (602/8020)	Chlorinated Hydrocarbons (601/8010)	Pesticides/PCB (608/8080/505/508)	Semi-Volatiles GC/MS (Tics/No Tics)	Herbicides (615/8150/515)	Polyuclear Aromatics (610/8310)	Volatile Organics GC/MS (624/8240/8250)	RCRA Metals by Total Digestion	RCRA Metals by TCEP (13.1)	NUMBER OF CONTAINERS
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
mw-87A	10/16/97	1445	WATER	-21
mw-87ARB		1510		-22
mw-94		1545		-23
mw-96RB	10/17/97	0800		-24
mw-97		0905		-25
West Stripper Res Reservoir		0800		-26
mw-86		1035		-27
mw-94		1050		-28
mw-68		1110		-29

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ NO: <u>023250224.62</u>	<input type="checkbox"/> UST (72 hr ext)	NO. CONTAINERS <u>16</u>	
PROJ NAME: <u>Indian Basin Remediation</u>	<input type="checkbox"/> NPDES	CUSTODY SEALS <u>Y/N/NA</u>	
P.O. NO:	<input type="checkbox"/> SDWA	RECEIVED INTACT <u>Y/N/NA</u>	
SHIPPED VIA:	<input type="checkbox"/> RCRA	RECEIVED ICE <u>Y/N/NA</u>	
	<input type="checkbox"/> OTHER		

SAMPLED & RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
Signature: <u>Kevin Cook</u>	Time: <u>1730</u>	Signature:	Time:	Signature:	Time:
Printed Name: <u>Kevin Cook</u>	Date: <u>10/17/97</u>	Printed Name:	Date:	Printed Name:	Date:
Company: <u>EPRI</u>	Phone:	Company:		Company:	

**PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS**

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEKS

Comments: temp 2°

RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: (LAB) 3.	
Signature:	Time:	Signature:	Time:	Signature: <u>BR</u>	Time: <u>1730</u>
Printed Name:	Date:	Printed Name:	Date:	Printed Name: <u>Brian Price</u>	Date: <u>10-17-97</u>
Company:		Company:		Company: <u>American Environmental Network</u>	

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

**ATTACHMENT 1**

# American Environmental Network, Inc.

17400 SW Upper Boones Ferry Road • Suite 270 • Portland, OR 97224 • (503) 684-0447

Marcia Smith  
AEN - Phoenix  
9830 S 51st Street  
Suite B-113  
Phoenix, AZ 85044

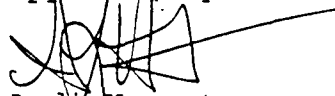
Date: 12/10/1997  
AEN Account No.: 80  
AEN Job Number: 97.03082

Project: 710388  
Location:

Sample analysis in support of the project referenced above has been completed and results are presented on the following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Sample Number	Sample Description	Matrix Type	Date Taken	Date Received
88189	710388-01	Water	10/17/1997	12/04/1997

Approved by:

  
Andy Hoevet  
Project Manager  
AEN, INC.

  
Technical Review  
AEN, INC.

The results from these samples relate only to the items tested. This report shall not be reproduced, except in full, without the written approval of the laboratory.

ANALYTICAL SERVICES FOR THE ENVIRONMENT

## ANALYTICAL REPORT

Marcia Smith  
AEN - Phoenix  
9830 S 51st Street  
Suite B-113  
Phoenix, AZ 85044

12/10/1997  
Job No.: 97.03082

Page: 2

Project Name: 710388  
Date Received: 12/04/1997

Sample Number      Sample Description  
88189                710388-01

<u>PARAMETERS</u>	<u>METHODS</u>	<u>RESULTS</u>	<u>REPORT LIMIT</u>	<u>UNITS</u>	<u>DATE ANALYZED</u>	<u>FLAG</u>
ICP/AA Digestion - Water	ICP	-			12/05/1997	
Potassium, ICP 200.7	200.7	4.5	0.2	mg/L	12/09/1997	
Sodium, ICP 200.7	200.7	40	2.0	mg/L	12/09/1997	DIL.Q

A sample result of ND indicates the parameter was Not Detected at the reporting limit.

American Environmental Network, Inc. (503) 684-0447 (503) 620-0393 FAX  
17400 SW Upper Boones Ferry Rd., Suite 270, Portland, OR 97224

# QUALITY CONTROL REPORT CONTINUING CALIBRATION VERIFICATION

AEN - Phoenix  
9830 S 51st Street  
Suite B-113  
Phoenix, AZ 85044

Date: 12/10/1997

Job Number: 97.03082

Contact: Marcia Smith  
Project: 710388

Analyte	CCV	Concentration Found	Percent Recovery	Date Analyzed
	True Concentration			
Potassium, ICP 200.7	5.00	4.83	96.6	12/09/1997
Sodium, ICP 200.7	5.00	4.91	98.2	12/09/1997

CCV - Continuing Calibration Verification

American Environmental Network, Inc. (503)684-0447 (503)620-0393 FAX  
17400 SW Upper Boones Ferry Rd., Suite 270, Portland, OR 97224

# QUALITY CONTROL REPORT LABORATORY CONTROL STANDARD

AEN - Phoenix  
9830 S 51st Street  
Suite B-113  
Phoenix, AZ 85044

Date: 12/10/1997

Job Number: 97.03082

Contact: Marcia Smith  
Project: 710388

Analyte	LCS	Concentration Found	LCS % Recovery	Flags	Date Analyzed
	True Concentration				
Potassium, ICP 200.7	5.00	6.77	135.4		12/09/1997
Sodium, ICP 200.7	5.00	5.25	105.0		12/09/1997

LCS - Laboratory Control Standard

American Environmental Network, Inc. (503)684-0447 (503)620-0393 FAX  
17400 SW Upper Boones Ferry Rd., Suite 270, Portland OR 97224

# QUALITY CONTROL REPORT MATRIX SPIKE/MATRIX SPIKE DUPLICATE

AEN - Phoenix  
9830 S 51st Street  
Suite B-113  
Phoenix, AZ 85044

Date: 12/10/1997

Job Number: 97.03082

Contact: Marcia Smith  
Project: 710388

Analyte	Matrix	Sample	Spike	Units	Percent	MSD	Spike	Units	Percent	MS/MSD	Flags
	Spike		Result			Amount	Result			Amount	
Potassium, ICP 200.7	20.4	12	5.00	mg/L	168.0	20.4	5.00	mg/L	168.0	0.0	DILQ,M
Sodium, ICP 200.7		350	5.00	mg/L			5.00	mg/L			DIL,Q,

QC Sample:

NOTE: Matrix Spike Samples may not be samples from this job.

MS = Matrix Spike  
MSD = Matrix Spike Duplicate  
RPD = Relative Percent Difference  
dil. = Diluted Out

American Environmental Network, Inc. (503)684-0447 (503)620-0393 FAX  
17400 SW Upper Boones Ferry Rd., Portland, OR 97224



## QUALITY CONTROL REPORT BLANKS

AEN - Phoenix  
9830 S 51st Street  
Suite B-113  
Phoenix, AZ 85044

Date: 12/10/1997

Job Number: 97.03082

Contact: Marcia Smith  
Project: 710388  
Location:

Analyte	Blank Analysis	Report Limit	Units	Date Analyzed
Potassium, ICP 200.7	ND	0.2	mg/L	12/09/1997
Sodium, ICP 200.7	ND	0.2	mg/L	12/09/1997

# FLAG GLOSSARY

A	This sample does not have a typical gasoline pattern.
B1	This sample does not have a typical diesel pattern.
B	Analyte found in the associated blank as well as the sample.
C	The sample contains a lighter hydrocarbon than gasoline.
CN	See case narrative
CS	Outside control limits or unusual matrix; see case narrative.
D	The sample extends to a heavier hydrocarbon range than gasoline.
d	Results on a dry weight basis
DIL	Result was calculated from dilution.
E	The sample extends to a lighter hydrocarbon range than diesel.
F	The sample extends to a heavier hydrocarbon range than diesel.
G	The positive result for gasoline is due to single component contamination.
I	The oil pattern for this sample is not typical.
J	The result for this compound is an estimated concentration.
L	The LCS recovery exceeded control limits. See the LCS page of this report.
LM	The LCS recovery exceeded control limits; the MS/MSD were in control validating the batch.
M	MS and/or MSD percent recovery exceeds control limits.
MD	Unable to calculate MS/MSD recovery due to high amount of analyte; greater than 4 times spike level.
MR	The MS/MSD RPD is greater than method criteria. The sample was re-extracted and re-analyzed with similar results indicating a non-homogeneous sample.
MM	The Matrix Spike exceeded control limits; LCS/LCS-D were in control validating the batch.
MI	Outside control limits due to matrix interference.
N	Manual integration performed on sample for quantification.
N/A	Not Applicable.
NC	Not calculable.
NO	Not Analyzed.
P	A post digestion spike was analyzed, and recoveries were within control limits.
Q	Detection limits elevated due to sample matrix.
Q1	Detection limits elevated due to high levels of non-target compounds. Sample(s) run at a dilution.
R	The duplicate RPD was greater than 20%. The sample was re-extracted and re-analyzed with similar results. This indicates a matrix interference in the sample, likely a non-homogeneity of the sample.
RD	RPD not applicable for results less than five times the reporting limit.
RP	MS/MSD RPD is greater than 20%
SR	Surrogate recovery outside control limits. See the surrogate page of the report.
SD	Unable to quantitate surrogate due to sample dilution.
SC	Sample not provided to laboratory in proper sampling container.
V	Volatile analysis was requested, sample container received with headspace.
X1	The duplicate RPD was greater than 20%. Due to insufficient sample, re-analysis was not possible.
X	Sample was analyzed outside recommended holding times.
Y	The result for this parameter was greater than the TCLP regulatory limit.
Z	The pattern seen for the parameter being analyzed is not typical.

# Interlab Chain of Custody

DATE 12/3/97 PAGE 1 OF 1

PROJECT MANAGER <b>MARLIA SMITH</b>					ANALYSIS REQUEST																					
COMPANY: American Environmental Network (Arizona), Inc.					AIR - O <sub>2</sub> , CO <sub>2</sub> , METHANE, CO, N <sub>2</sub>	NUMBER OF CONTAINERS	GROSS ALPHA / BETA	RADON 222	ISOTOPIC URANIUM	RADIUM 226 / 228	SURFACTANTS (MBAS)	FECAL COLIFORM	TOTAL COLIFORM	COD	BOD	VOLATILE ORGANICS ( )	EPA 610 / 8310	EPA 547	EPA 548	EPA 549	EPA 1613	EPA 925	KARL FISHER % MOISTURE	SULFIDE	TOC	TOX
ADDRESS: 9830 S. 51st Street, Suite B-113 Phoenix, Arizona 85044 (602) 496-4400																										
SAMPLE ID	DATE	TIME	MATRIX	LAB ID																						
710388-01	10/17/97	0800	AS		1																					

PROJECT INFORMATION		SAMPLE RECEIPT		SAMPLES SENT TO:		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.	
PROJECT NUMBER: 710388		TOTAL NUMBER OF CONTAINERS		PENSACOLA		Signature: [Signature] Time: 1100		Signature: [Signature] Time: [ ]	
PROJECT NAME:		CHAIN OF CUSTODY SEALS		PORTLAND		Printed Name: MARLIA SMITH Date: 12/3/97		Printed Name: [ ] Date: [ ]	
QC LEVEL: STD IV		INTACT?		AQUATIC		American Environmental Network		Company: [ ]	
IAT: STANDARD RUSH		RECEIVED GOOD CONO. / COLD		CORE		Phoenix		RECEIVED BY: 1.	
ALN WORKORDER #		LAB NUMBER 97.03082		ALBUQUERQUE		Signature: [Signature] Time: 12W		Signature: [Signature] Time: [ ]	
				ATEL		Printed Name: A. Smith Date: 12/4/97		Printed Name: [ ] Date: [ ]	
				WEST COAST		Company: PEN		Company: [ ]	
				FORT COLLINS					

ASAP please (prelims + h/copy)

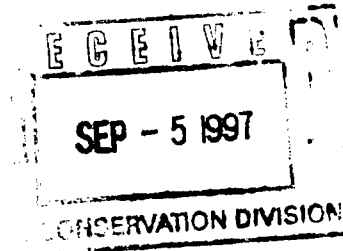


August 27, 1997

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

Mr. Mark Ashley  
Oil Conservation Division  
2040 Pacheco St.  
Santa Fe, New Mexico 87501

RE: Indian Basin Gas Plant/ Remediation Project  
Groundwater Discharge Plan (GW-21) Minor Modification



Dear Mr. Ashley:

As discussed by telephone on July 14, Marathon is submitting this Groundwater Discharge Plan (GW-21) minor modification with the required \$50 filing fee to infiltrate exempt reverse osmosis (RO) reject water into the Lower Queen or Shallow zone aquifer. Infiltration of remediation project treated (air stripping) groundwater has been previously permitted. Treated water is currently infiltrated (discharged) into Lower Queen infiltration well IW-2 and Shallow infiltration wells MW-45 and MW-51 consistent with permit conditions.

The modification consists of constructing an underground 2-inch polypropylene pipeline to convey RO reject water from the plant's water treatment building to the remediation project groundwater treatment compound. The pipeline connects with the discharge pipeline to the Lower Queen infiltration wells downstream of the air strippers and upstream of the infiltration meter located at the treatment compound. This piping arrangement allows mixing of the RO reject water with the treated groundwater prior to infiltration.

In our telephone conversation you requested that a sample of the RO reject water be collected and analyzed for volatile organic compounds (EPA method 8260), semivolatile organic compounds (EPA method 8270), polynuclear aromatic hydrocarbons (PAH) by EPA method 8310, and cation/anion balance based on process information. Attached is the laboratory report from the water sample collected on July 15, 1997.

The cation/anion balance results are typical of RO reject water. Please note that the RO reject water was non detect for all hydrocarbon tests except 2-Butanone. Chemical information for 2-Butanone or methyl ethyl ketone (MEK) is attached. The RO reject water should not have contained this compound. The presence of MEK in the sample likely resulted from the installation of the sample port in the polyvinyl chloride (PVC) RO reject water discharge piping. Earlier during the same day that the sample was collected, the RO system was shut down so that a sample valve could be installed. Both PVC primer and pipe cement was used to install the valve in the PVC piping. The attached material safety data sheets show that both products contain MEK. Since the sample was collected the same day, residual primer and cement was dissolved into the sample.

If you have any questions, please contact me at (915) 687-8312 or [rjmenzie@marathonoil.com](mailto:rjmenzie@marathonoil.com).

Sincerely,

A handwritten signature in cursive script that reads 'Robert J. Menzie, Jr.'.

Robert J. Menzie, Jr.  
Advanced Health, Environmental, & Safety Professional

Attachments

c: D. E. Dix  
M. P. Peacock  
C. M. Schweser

File: 556-01



NEW MEXICO ENERGY, MINERALS  
& NATURAL RESOURCES DEPARTMENT

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

October 23, 1997

**CERTIFIED MAIL**  
**RETURN RECEIPT NO. P-288-258-986**

Mr. Robert J. Menzie, Jr.  
Marathon Oil Company  
P.O. Box 552  
Midland, Texas 79702-0552

**Re: Indian Basin Gas Plant/Remediation Project  
Discharge Plan GW-21 Minor Modification  
Eddy County, New Mexico**

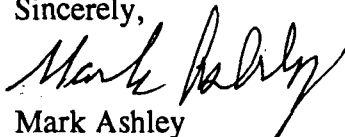
Dear Mr. Menzie:

The New Mexico Oil Conservation Division (OCD) has reviewed the Marathon Oil Company (Marathon) discharge plan minor modification dated August 27, 1997 for the Indian Basin Gas Plant located in Eddy County, New Mexico. The modification is a request to infiltrate exempt reverse osmosis (RO) reject water into the Lower Queen or Shallow zone aquifer. Based on the information received, and the fact that the total dissolved solids of the reverse osmosis (RO) reject water of 1,900 mg/l is above the Water Quality Control Commission (WQCC) standard of 1,000 mg/l, the OCD is requiring the following additional information:

1. A determination as to whether or not the RO reject water and the remediation project treated water will be commingled prior to infiltration into wells MW-45 and MW-51.
2. If the RO reject water and the remediation project treated water will be commingled prior to infiltration, please provide a cation/anion analysis of the commingled water.
3. The volume, by month, of RO reject water to be infiltrated.

If you have any questions, please do not hesitate to contact me at (505) 827-7155.

Sincerely,

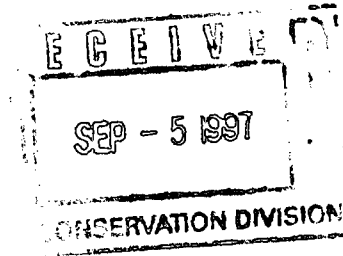
  
Mark Ashley  
Geologist



August 27, 1997

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

Mr. Mark Ashley  
Oil Conservation Division  
2040 Pacheco St.  
Santa Fe, New Mexico 87501



RE: Indian Basin Gas Plant/ Remediation Project  
Groundwater Discharge Plan (GW-21) Minor Modification

Dear Mr. Ashley:

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The modification consists of constructing an underground 2-inch polypropylene pipeline to convey RO reject water from the plant's water treatment building to the remediation project groundwater treatment compound. The pipeline connects with the discharge pipeline to the Lower Queen infiltration wells downstream of the air strippers and upstream of the infiltration meter located at the treatment compound. This piping arrangement allows mixing of the RO reject water with the treated groundwater prior to infiltration.

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Sincerely,

A handwritten signature in cursive script that reads 'Robert J. Menzie, Jr.'.

Robert J. Menzie, Jr.  
Advanced Health, Environmental, & Safety Professional

Attachments

c: D. E. Dix  
M. P. Peacock  
C. M. Schweser

File: 556-01

## N-Methylepinephrine

ether or methanol, mp 63.5°; solvents.

*heph.* Crystals from acetone.

5°.  $[\alpha]_D^{25} + 29.2$  ( $c = 4$  in

stals from ethyl acetate, mp

ther, mp 87-88°  $[\alpha]_D - 29.5$

als from ethyl acetate or alco-

4.6). Readily sol in water;

1 in acetone.

*hylephedrine camylate*, Ty-

4-[2-(Dimethylamino)-1-  
n-[(dimethylamino)methyl]-  
(3,4-dihydroxyphenyl)-2-di-  
hydroxyphenyl]- $\alpha$ -hydroxy-  
n-aminomethyl-(3,4-dihydr-  
thylaminomethyl)protocate-  
choline  $C_{20}H_{27}NO_5$ ; mol wt  
341.44.  $[\alpha]_D^{25} + 24.34$ . Prep'n  
Manna, Campiglio, *Farmaco*  
uration: Manna, Ghislandi.

$CH_2N(CH_3)_2$

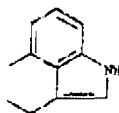
stals from alcohol + ethyl

thyl acetate, mp 149-150°

HCl).  $[\alpha]_D^{25} + 62.3$  ( $c =$

190°).

10-Didehydro-N-[1-(hydro-  
line-8-carboxamide; N-[a-  
mido]- $\beta$ -lysine acid (-)-  
d-d-hydroxybutylamide-2;  
sine.  $C_{10}H_{16}N_2O_5$ ; mol wt  
238.28.  $[\alpha]_D^{25} + 9.43$ . A homo-  
ore  $CH_2$  group. Prep'd by  
with d-2-amino-1-butanol  
duct to an isomerization  
S. pat. 2,365,207 (1941 to



mp 172° (some decompn).  
Sparsely sol in water.

na. *Methergin*, *Methergine*,  
*egonovin*, *Partergin*, *Spa-*  
*microcryst* powder; odor-  
ater. alcohol; very slightly

clusters of needles, usually  
Easily sol in water, alco-  
roform. pH of aq solns

methana; dimethyl ether.

$C_7H_9O$ ; mol wt 46.07. C 52.14%, H 13.13%, O 34.73%.  
 $CH_3OCH_2$

Colorless gas; ethereal odor; burns with a slightly lumi-  
nous flame, d 1.617 (air = 1). bp -23.6°. Flash pt -41°.  
Onc vol water takes up 37 vols gas; far more sol in alcohol.  
USE: In refrigeration.

5945. Methyl Ethyl Ketone. 2-Butanone; ethyl methyl  
ketone.  $C_5H_{10}O$ ; mol wt 72.10. C 66.63%, H 11.18%, O  
22.19%.  $CH_3COCH_2CH_3$ . Obtained by refluxing methyl  
acetate and dil  $H_2SO_4$ , or by the oxidation of secondary  
butyl alcohol; also by fermentation. Manuf: Faith, Keyes &  
Clark's Industrial Chemicals, F. A. Lowenheim, M. K.  
Moran, Eds. (Wiley-Interscience, New York, 4th ed., 1973)  
pp 539-542.

Flammable liquid; acetone-like odor.  $d_4^{20} 0.805$ . Solidif  
-86° (bp 79.6°). Flash pt 35°F.  $n_D^{20} 1.3814$ . Sol in about 4  
parts water (27.5%); less sol at higher temp; miscible with  
alcohol, ether, benzene. Constant boiling mixture with  
water, bp 73.4°, contains 88.7% methyl ethyl ketone. Sol of  
water in methyl ethyl ketone: 12.5% at 25°. LD<sub>50</sub> orally in  
rats: 6.86 ml/kg. Smyth *et al.*, *Am. Ind. Hyg. Assoc. J.* 23, 93  
(1962).

USE: As solvent; in the surface coating industry; manuf  
smokeless powder; colorless synthetic resins.

5946. Methyl Fluorosulfonate. Fluorosulfuric acid  
methyl ester; methyl fluorosulfate; methyl fluosulfonate;  
Magic Methyl.  $CH_3FO_3S$ ; mol wt 114.09. C 10.53%, H  
2.65%, F 16.65%, O 42.07%, S 28.10%.  $CH_3OSO_2F$ . Prep'n  
from dimethyl ether and fluosulfonic acid; J. Meyer, G.  
Schramm, *Z. Anorg. Allgem. Chem.* 206, 24 (1932); from  
dimethyl sulfate and fluosulfonic acid; R. W. Alder, *Chem.*  
*& Ind. (London)* 1973, 983. Electrochemical prep'n: J. P.  
Coleman, D. Pletcher, *Tetrahedron Letters* 1974, 147. Pow-  
erful methylating agent: M. G. Ahmad *et al.*, *Chem. Com-*  
*mun.* 1968, 1333. Extremely toxic to humans: D. M. W.  
vanden Ham, D. van der Meer, *Chem. & Eng. News* 54, 5  
(Aug. 30, 1976); *idem*, *Chem. & Ind. (London)* 1976, 782.  
Volatile liq, bp 92-94°, mp -95°. *Severe Poison!* d 1.412.  
 $n_D^{20} 1.3326$ . Good solvent for most organic compounds.  
Proton NMR absorption at  $\tau$  5.88. LD<sub>50</sub> orally in mice:  
< 112 mg/kg; LC<sub>50</sub> 1 hr for rats: 5-6 ppm. M. Hite *et al.*,  
*Am. Ind. Hyg. Assoc. J.* 40, 600 (1979).

Caution: Exposure can cause fatal pulmonary edema.  
USE: In organic synthesis as methylating agent.

5947. Methyl Formate. Formic acid methyl ester.  $C_2H_4O_2$ ;  
mol wt 60.05. C 40.00%, H 6.71%, O 53.29%.  $HCOOCH_3$ .

Colorless flammable liquid, agreeable odor.  $d_4^{20} 0.987$ . bp  
31.5°.  $n_D^{20} 1.3440$ . Flash pt, closed cup: -2°F (-19°C).  
Solidif about -100°. Sol in about 3.3 parts water; miscible  
with alcohol.

USE: Fumigant and larvicide for tobacco, dried fruits, cere-  
als, etc. Fire hazard is avoided by use with  $CO_2$ . Caution:  
Inhalation of vapor produces nasal and conjunctival irrita-  
tion, retching, narcosis, death from pulmonary effects, Pat-  
ty's *Industrial Hygiene and Toxicology* vol. 2A, G. D. Clay-  
ton, F. E. Clayton, Eds. (Wiley-Interscience, New York, 3rd  
ed., 1981) p 2263.

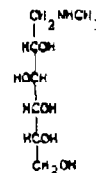
5948. Methyl Gallate. 3,4,5-Trihydroxybenzoic acid  
methyl ester; gallicin.  $C_9H_8O_6$ ; mol wt 184.14. C 52.18%, H  
4.38%, O 43.44%.  $C_6H_2(OH)_3COOCH_3$ .

Monoclinic prisms from methanol, often hydrated or sol-  
vated. When dry, mp 202°. Sol in hot water, alcohol, meth-  
anol, ether.

USE: Antioxidant.

5949. N-Methylglucamine. 1-Deoxy-J-(methylamino)-  
D-glucitol; N-methyl-D-glucamine; meglumine.  $C_7H_{15}NO_5$ ;  
mol wt 195.22. C 43.06%, H 7.78%, N 7.18%, O 40.98%.  
Prep'd from D-glucose and methylamine: Karrer, Herken-  
rath, *Helv. Chim. Acta* 20, 83 (1937).

## Methylhydrazimide Hydro

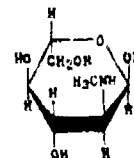


Crystals from methanol, mp 128-129°. Does not polymer-  
ize or dehydrate unless heated above 150° for prolonged per-  
iods.  $[\alpha]_D^{25} - 18.5$  (Karrer);  $[\alpha]_D^{25} - 23$  (Rhône-Poulenc  
data sheet). Sol (g/100 ml): water at 25°: ~100; alcohol  
at 25°: 1.2; alcohol at 70°: 21. pH of 1% aq soln: 10.5.  
Forms salts with acids and complexes with metals. Salts  
with alkyl aryl sulfonic acids act as detergents.

Antimolate,  $C_7H_{15}NO_5$ , RP 2168, *Glucantime*, *Proso-*  
*stib*. Powder. Sol in water about 35% ww. Practically  
insol in alcohol, ether, chloroform. pH of aq solns 6-7.  
USE: In the synthesis of surface active agents, pharmaceu-  
ticals, dyes. *Human Toxicity*: Mild irritant.

THERAP CAT: Anticishmanial.

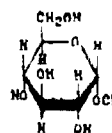
5950. N-Methyl- $\alpha$ -L-glucosamine. 2-(Methylamino)-2-  
deoxy- $\alpha$ -L-glucopyranoside.  $C_7H_{15}NO_5$ ; mol wt 193.20. C  
43.50%, H 7.83%, N 7.25%, O 41.41%. Together with strep-  
tose forms the streptobiosamine moiety of streptomycin:  
Kuehl *et al.*, *J. Am. Chem. Soc.* 69, 3032 (1947). Prep'n from  
D-glucose by *Streptomyces griseus*: Silverman, Rieder, *J.*  
*Biol. Chem.* 236, 1251 (1960); from the antibiotic, bluenso-  
mycin: Bannister, Argoudidis, *J. Am. Chem. Soc.* 85, 34  
(1963). Review: Lemieux, Wolfson, *Advan. Carbohydr.*  
*Chem.* 3, 337 (1948).



Glass.  $[\alpha]_D^{25} - 62$  ( $c = 1$  in methanol).  
Hydrochloride,  $C_7H_{15}NO_5 \cdot HCl$ , needles from ethanol, mp  
160-163°. Freely sol in water. Shows mutarotation.  $[\alpha]_D^{25}$   
-103° ( $c = 0.6$ ).

N-acetyl deriv, mp 165-166°.  $[\alpha]_D^{25} - 51$  ( $c = 0.4$ ).  
Pentaacetyl deriv,  $C_{12}H_{21}NO_{10}$ , mp 160.3-161.5°.  $[\alpha]_D^{25}$   
-100° ( $c = 0.7$  in chloroform).

5951.  $\alpha$ -Methylglucoside. Methyl- $\alpha$ -D-glucopyranoside.  
 $C_7H_{14}O_6$ ; mol wt 194.18. C 43.30%, H 7.27%, O 49.44%.  
Prep'd by refluxing finely powdered glucose with methanol-  
HCl: Fischer, *Ber.* 26, 2405, 27, 2987; 28, 1151 (1895). Hel-  
ferich, Schläfer, *Org. Syn. coll. vol. I*, (2nd ed., 1941) 364.  
Enzymatic synthesis by means of  $\alpha$ -glucosidase from yeast:  
Bourquelot *et al.*, *Compt. Rend.* 156, 491 (1913). Prep'd  
industrially by reacting glucose with methanol in the pres-  
ence of a cation exchange material: *Chem. Eng. News* 33,  
4592 (1955). Monograph: G. N. Rollenback, *Methyl Gluco-*  
*sides. Preparation, Physical Constants, Derivatives* (Academic  
Press, New York, 1958).



Orthorhombic bisphenoidal crystals,  $d_4^{20} 1.46$ . mp 168°.  
bp<sub>10</sub> 200°.  $[\alpha]_D^{25} + 158.9$  ( $p = 10$ ).  $K_a$  at 25° =  $1.97 \times 10^{-4}$ .  
Soly at 17° in water 63% (w/w); in 80% alcohol 7.3%;  
in 90% alcohol 1.6%; practically insol in ether. Soly also  
reported as 108 g/100 g  $H_2O$  at 20° and as 5.2 g/100 g  
methanol at 20°.

USE: Manuf reconstituted and upgraded drying oils; tall

oil esters  
ionic surf  
and so-c  
hydroxyf

5952.  
(dimethyl  
ethyl-N,N  
(dimethyl  
2,3-cyclo  
ethanone  
62.73%, 1  
solid as th  
4 (3rd ed

8r

Green 1  
turning g  
Note: 1  
analog.  
USE: D

5953.  
32.86%, 1  
Prepn: 1  
Chem. Sc  
Soc 43, 1  
Davis, R

Colorle  
Very sol  
MLD s.c  
Sulfate,  
Nitrate

5954.  
octamoxin  
C 66.60%  
methyl h  
hydrogen  
899,385 (

Sulfate,  
THERAP

5955.  
amino-4-  
 $C_7H_{11}N$ ;  
Prepn: 1  
Lilly).

Liquid,  
bp<sub>10</sub> 130  
chloroform  
THERAP

5956.  
(Dimethyl  
dihydro-

Consult the cross index before using

Consult the cross index before using this section.

IPS WELD-ON		<b>MATERIAL SAFETY DATA SHEET</b>		Date Revised: NOV 1995 Supersedes: APR 1994																					
<small>Information on this form is furnished solely for the purpose of compliance with the Occupational Safety and Health Act and shall not be used for any other purpose. IPS Corporation urges the customers receiving this Material Safety Data Sheet to study it carefully to become aware of the hazards, if any, of the product involved. In the interest of safety, you should notify your employer, agents and contractors of the information on this sheet.</small>																									
<b>SECTION I</b>																									
<b>MANUFACTURER'S NAME</b> IPS Corporation <b>ADDRESS</b> 17109 S. Main St., P.O. Box 379, Gardena, CA. 90248			<b>Transportation Emergencies:</b> CHEMTREC: (800) 424-9300 <b>Medical Emergencies:</b> (213) 222-3212 (L.A. Poison Center 24 Hour No.) <b>Business:</b> (310) 898-3300																						
<b>CHEMICAL NAME and FAMILY</b> Mixture of Organic Solvents			<b>TRADE NAME:</b> WELD-ON P-68 Primer for PVC/CPVC Plastic Pipe <b>FORMULA:</b> Proprietary																						
<b>SECTION II - HAZARDOUS INGREDIENTS</b>																									
None of the ingredients below are listed as carcinogens by IARC, NTP or OSHA																									
	CAS#	APPROX %	ACGIH-TLV	ACGIH-STEL	OSHA-PEL	OSHA-STEL																			
Methyl Ethyl Ketone (MEK)	78-93-3	27*	200 PPM	300 PPM	200 PPM	300 PPM																			
Tetrahydrofuran (THF)	109-99-9	15 - 25	200 PPM	250 PPM	200 PPM	250 PPM																			
Acetone	67-64-1	27*	750 PPM	1000 PPM	750 PPM	1000 PPM																			
Cyclohexanone	108-94-1	10 - 30	25 PPM Skin		25 PPM Skin																				
<small>* Title III Section 313 Supplier Notification: This product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR372. This information must be included in all MSDS's that are copied and distributed for this material.</small>																									
<b>SHIPPING INFORMATION FOR GALLON CONTAINERS OR ABOVE</b>			<b>SPECIAL HAZARD DESIGNATIONS</b>																						
DOT Shipping Name: Flammable Liquid N.O.S. contains: (Tetrahydrofuran, Methyl Ethyl Ketone, Acetone) DOT Hazard Class: 3 Identification Number: UN 1993 Packaging Group: II Label Required: Flammable Liquid			<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th></th><th style="text-align: center;">HMIS</th><th style="text-align: center;">NFPA</th><th style="text-align: center;">HAZARD RATING</th></tr></thead><tbody><tr><td>HEALTH:</td><td style="text-align: center;">2</td><td style="text-align: center;">2</td><td style="text-align: center;">0 - MINIMAL</td></tr><tr><td>FLAMMABILITY:</td><td style="text-align: center;">3</td><td style="text-align: center;">3</td><td style="text-align: center;">1 - SLIGHT</td></tr><tr><td>REACTIVITY:</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">2 - MODERATE</td></tr><tr><td>PROTECTIVE EQUIPMENT:</td><td style="text-align: center;">H</td><td></td><td style="text-align: center;">3 - SERIOUS 4 - SEVERE</td></tr></tbody></table>				HMIS	NFPA	HAZARD RATING	HEALTH:	2	2	0 - MINIMAL	FLAMMABILITY:	3	3	1 - SLIGHT	REACTIVITY:	0	1	2 - MODERATE	PROTECTIVE EQUIPMENT:	H		3 - SERIOUS 4 - SEVERE
	HMIS	NFPA	HAZARD RATING																						
HEALTH:	2	2	0 - MINIMAL																						
FLAMMABILITY:	3	3	1 - SLIGHT																						
REACTIVITY:	0	1	2 - MODERATE																						
PROTECTIVE EQUIPMENT:	H		3 - SERIOUS 4 - SEVERE																						
<b>SHIPPING INFORMATION FOR CONTAINERS LESS THAN ONE GALLON</b>																									
DOT Shipping Name: Consumer Commodity DOT Hazard Class: ORM-D																									
<b>SECTION III - PHYSICAL DATA</b>																									
<b>APPEARANCE</b> Clear or Purple, thin liquid	<b>ODOR</b> Ethereal		<b>BOILING POINT (°F/°C)</b> 133°F Based on first boiling component: Acetone																						
<b>SPECIFIC GRAVITY @ 73 ± 2°F</b> Typical 0.845 ± 0.040	<b>VAPOR PRESSURE (mm Hg.)</b> 190 mm Hg. based on first boiling component, Acetone @ 20°C		<b>PERCENT VOLATILE BY VOLUME (%)</b> 100%																						
<b>VAPOR DENSITY (Air = 1)</b> 2.0	<b>EVAPORATION RATE (BUAC = 1)</b> 6-11		<b>SOLUBILITY IN WATER</b> Completely soluble in water.																						
VOC STATEMENT: VOC as manufactured: 845 Grams/Liter, Maximum VOC emission per SCAQMD Rule 1168, Test Method 316A: 650 Grams/Liter.																									
<b>SECTION IV - FIRE AND EXPLOSION HAZARD DATA</b>																									
<b>FLASH POINT</b> 0*-6°F T.C.C. Based on Acetone		<b>FLAMMABLE LIMITS</b> (PERCENT BY VOLUME)		<b>LEL</b> 2.1	<b>UEL</b> 13.0																				
<b>FIRE EXTINGUISHING MEDIA</b> Ansul "Purple K" potassium bicarbonate dry chemical, carbon dioxide, National Aer-O-Foam universal alcohol resistant foam, water spray.																									
<b>SPECIAL FIRE FIGHTING PROCEDURES</b> Evacuate enclosed areas, stay upwind. Close or confine quarters require self-contained breathing apparatus, positive pressure hose masks or airline masks. Use water spray to cool containers, to flush spills from source of ignition and to disperse vapors.																									
<b>UNUSUAL FIRE AND EXPLOSION HAZARDS</b> Fire hazard because of low flash point and high volatility. Vapors are heavier than air and may travel to source of ignition.																									



**SECTION V - HEALTH HAZARD DATA****PRIMARY ROUTES  
OF ENTRY:**☒ Inhalation    ☒ Skin Contact    ☐ Eye Contact    ☐ Ingestion**EFFECT OF OVEREXPOSURE****ACUTE:** Inhalation: Severe overexposure may result in nausea, dizziness, headache. Can cause drowsiness, irritation of eyes and nasal passages.Skin Contact: Skin irritant. Liquid contact may remove natural skin oils resulting in skin irritation. Dermatitis may occur with prolonged contact.Skin Absorption: Prolonged or widespread exposure may result in the absorption of harmful amounts of material.Eye Contact: Overexposure may result in severe eye injury with corneal or conjunctival inflammation on contact with the liquid. Vapors slightly uncomfortable.Ingestion: Moderately toxic. May cause nausea, vomiting, diarrhea. May cause mental sluggishness.**CHRONIC:** High vapor concentrations may produce CNS depression. Depression may be evidenced by headache, dizziness and nausea. Aspirated material may cause severe lung damage and present a significant hazard.**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Individuals with pre-existing diseases of the eyes, skin or respiratory system may have increased susceptibility to the toxicity of excessive exposures.**EMERGENCY AND FIRST AID PROCEDURES**Inhalation: If overcome by vapors, remove to fresh air and if breathing stopped, give artificial respiration. If breathing is difficult, give oxygen. Call physician.Eye Contact: Flush eyes with plenty of water for 15 minutes and call a physician.Skin Contact: Remove contaminated clothing and shoes. Wash skin with plenty of soap and water for at least 15 minutes. If irritation develops, get medical attention.Ingestion: Give 1 or 2 glasses of water or milk. Do not induce vomiting. Call physician or poison control center immediately.**SECTION VI - REACTIVITY****STABILITY**

UNSTABLE

**CONDITIONS TO AVOID**

STABLE

X

Keep away from heat, sparks, open flame and other sources of ignition.

**INCOMPATIBILITY**

(MATERIALS TO AVOID) Caustics, ammonia, inorganic acids, chlorinated compounds, strong oxidizers and isocyanates.

**HAZARDOUS DECOMPOSITION PRODUCTS**

When forced to burn, this product gives out carbon monoxide, carbon dioxide, hydrogen chloride and smoke.

**HAZARDOUS  
POLYMERIZATION**

MAY OCCUR

WILL NOT OCCUR

**CONDITIONS TO AVOID**

Keep away from heat, sparks, open flame and other sources of ignition

**SECTION VII - SPILL OR LEAK PROCEDURES****STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Eliminate all ignition sources. Avoid breathing of vapors. Keep liquid out of eyes. Flush with large amount of water. Contain liquid with sand or earth. Absorb with sand or nonflammable absorbent material and transfer into steel drums for recovery or disposal. Prevent liquid from entering drains.

**WASTE DISPOSAL METHOD**

Follow local, State and Federal regulations. Consult disposal expert. Can be disposed of by incineration. Excessive quantities should not be permitted to enter drains. Empty containers should be air dried before disposing. Hazardous Waste Code: 214.

**SECTION VIII - SPECIAL PROTECTION INFORMATION****RESPIRATORY PROTECTION (Specify type)**

Atmospheric levels should be maintained below established exposure limits contained in Section II. If airborne concentrations exceed those limits, use of a NIOSH-approved organic vapor cartridge respirator with full face-piece is recommended. The effectiveness of an air purifying respirator is limited. Use it only for a single short-term exposure. For emergency and other conditions where short term exposure guidelines may be exceeded, use an approved positive pressure self-contained breathing apparatus.

**VENTILATION**

Use only with adequate ventilation. Provide sufficient ventilation in volume and pattern to keep contaminants below applicable exposure limits set forth in Section II. Use only explosion proof ventilation equipment.

**PROTECTIVE GLOVES**  
PVA coated**EYE PROTECTION**

Splashproof chemical goggles

**OTHER PROTECTIVE EQUIPMENT AND HYGIENIC PRACTICES**

Impervious apron and a source of running water to flush or wash the eyes and skin in case of contact.

**SECTION IX - SPECIAL PRECAUTIONS****PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING**

Store in the shade between 40°F - 110°F. Keep away from heat, sparks, open flame and other sources of ignition. Avoid prolonged breathing of vapor. Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Train employees on all special handling procedures before they work with this product.

**OTHER PRECAUTIONS**

Follow all precautionary information given on container label, product bulletins and our solvent cementing literature. All handling equipment should be electrically grounded.

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof.

Prepared by George Bianco of IPS

AC 09/94

**MATERIAL SAFETY DATA SHEET**Page 1  
MCR

Para-Chem Southern, Inc.®, PO Box 127, Simpsonville, SC 29681  
24 Hour Emergency Telephone: (803) 967-7691

AUG 21 1997

Environmental &amp; Safety

**Section 1. PRODUCT IDENTIFICATION**

PRODUCT NAME: PARABOND® P-30 Blue  
CHEMICAL FAMILY: Pipe Cement

**Section 2. HAZARDOUS INGREDIENTS AND EXPOSURE LIMITS**

Chemical Name	CAS Number	% by Weight	ACGIH TLV	OSHA PEL
Tetrahydrofuran	109-99-9	63%	200 ppm	200 ppm
Methyl Ethyl Ketone	78-93-3	9%	200 ppm	200 ppm
Cyclohexanone	108-94-1	11%	25 ppm	25 ppm

**Section 3. HAZARDS IDENTIFICATION**

PRIMARY ROUTES OF ENTRY: Eyes, skin, and respiratory system.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Respiratory problems.

**POTENTIAL HEALTH EFFECTS:**

EYE CONTACT: Can cause severe irritation. Vapors can cause slight to moderate irritation.

SKIN CONTACT: Can cause moderate irritation, defatting, and dermatitis.

INGESTION: Can cause gastrointestinal irritation, nausea, vomiting, and diarrhea.

INHALATION: Can cause nasal and respiratory irritation, dizziness, weakness, fatigue, nausea, headache, possible unconsciousness, and even asphyxiation.

CHRONIC: None known.

CARCINOGENICITY: This product contains no ingredient listed as a carcinogen by IARC, NTP, or OSHA.

**Section 4. FIRST AID MEASURES**

EYE CONTACT: Flush with water for 15 minutes. Call physician if irritation occurs.

SKIN CONTACT: Wash with soap and water. Call physician if irritation occurs.

INGESTION: To conscious person, give two glasses of water. Do not induce vomiting and call physician immediately.

INHALATION: Move person to fresh air. If breathing stops, administer artificial respiration and call physician immediately.

**MATERIAL SAFETY DATA SHEET**

Page 2

**Section 5. FIRE-FIGHTING MEASURES****FLASH POINT (°F):** Less than 20, TOC**LOWER FLAMMABLE LIMIT:** 1.0**UPPER FLAMMABLE LIMIT:** 12.8**FIRE-FIGHTING INSTRUCTIONS:** Alcohol foam, CO<sub>2</sub>, and dry chemical. Use protective clothing and self-contained breathing apparatus. Eliminate sources of ignition because vapors may travel along the ground or be moved by ventilation.**DECOMPOSITION PRODUCTS:** Material may produce CO, CO<sub>2</sub>, H<sub>2</sub>O, and materials listed in Section II.**SECTION 6. ACCIDENTAL RELEASE MEASURES****STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Eliminate all ignition sources. Dike and pump liquid to waste containers. Dispense sand, sawdust, or vermiculite. Shovel into closed waste containers.**SECTION 7. HANDLING AND STORAGE****HANDLING:** Store in well ventilated area. Use good hygienic practices. (Wash hands before eating, using washroom, or smoking.) Keep closure tight and container upright to prevent leakage. Keep out of the reach of children. Drums of this material should be grounded and bonded when pouring. Do not puncture, drag, or slide container. Prevent prolonged or repeated breathing of vapor or mist. Do not weld or flame cut an empty drum. Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. This product as supplied is a liquid, and there are no dust hazards from the powders in it. When the product is processed, the powders should be encapsulated. The user must determine if there is a dust hazards because of the process used or the end use of the dried material.**STORAGE:** Store above 40°F or below 100°F. Do not store or use near heat, sparks, or flame.**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION****PERSONAL PROTECTIVE EQUIPMENT:****EYE/FACE PROTECTION:** Wear splash goggles if contact with liquid is likely.**SKIN PROTECTION:** Wear gloves if contact with liquid is likely.**RESPIRATORY PROTECTION:** If PEL or TLV is exceeded, use a NIOSH/MSHA approved respirator.**ENGINEERING CONTROLS:** Use sufficient ventilation, in volume and pattern, to keep air contaminant concentration below PEL or TLV.

**MATERIAL SAFETY DATA SHEET**

Page 3

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

BOILING POINT (°F): 146-313

VAPOR PRESSURE: 86

VAPOR DENSITY (air=1): 2.5

SPECIFIC GRAVITY (water = 1): 0.96

% VOLATILE BY WEIGHT: 83

APPEARANCE AND ODOR: Blue liquid with ketone odor.

GRAMS VOLATILE ORGANIC COMPOUNDS/LITER OF COATING: 770

GRAMS VOLATILE ORGANIC COMPOUNDS/LITER OF MATERIAL: 770

**SECTION 10. STABILITY AND REACTIVITY**

CHEMICAL STABILITY: Stable.

POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: None known.

HAZARDOUS DECOMPOSITION PRODUCTS: None.

**SECTION 11. TOXICOLOGICAL INFORMATION**

No information available.

**SECTION 12. ECOLOGICAL INFORMATION**

No information available.

**SECTION 13. DISPOSAL CONSIDERATIONS**

Disposed of in accordance with federal, state and local regulations.

**SECTION 14. TRANSPORT INFORMATION**

DOT CLASSIFICATION:

Hazard Class: Flammable

Proper Shipping Name: Cement Liquid, NOS

ID Number: UN 1993

Label: Flammable

## MATERIAL SAFETY DATA SHEET

Page 4

## SECTION 15. REGULATORY INFORMATION

TSCA: All Ingredients listed.

CERCLA:

<u>Chemical Name</u>	<u>RO</u>
Cyclohexanone	5,000 lbs.
Methyl Ethyl Ketone	5,000 lbs

SARA TITLE III:

Section 311 and 312 Health and Physical Hazards:

Immediate	Delayed	Fire	Pressure	Reactivity
[ X ]	[ ]	[ X ]	[ ]	[ ]

Section 313 Chemicals:

<u>Chemical Name</u>	<u>CAS#</u>	<u>% by Weight</u>
Methyl Ethyl Ketone	78-93-3	9%
Cyclohexanone	108-94-1	11%

## SECTION 16. OTHER INFORMATION

HMIS RATINGS: Health = 3      Flammability = 3  
Reactivity = 0      Personal Protective Equipment = H  
Hazard rating scale: 0=Minimal, 1=Slight, 2=Moderate, 3=Serious, 4=Severe

Para-Chem Southern, Inc. believes the statements, technical information and recommendations contained herein are reliable. They are given without warranty or guarantee of any kind, expressed or implied.

DATE ISSUED: August 30, 1993

PREPARED BY: B. L. Eudy

# *American Environmental Network, Inc.*

AEN I.D. 707346

**August 14, 1997**

MARATHON OIL COMPANY  
P.O. BOX 552  
MIDLAND, TX 79702-0552

Project Name IBRP  
Project Number (NONE)

Attention: BOB MENZIE

On 7/17/97 American Environmental Network (NM), Inc. (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 8260 was performed by American Environmental Network (NM) Inc., Albuquerque, NM.

EPA method 8310 was performed by American Environmental Network (FL) Inc., 11 East Olive Road, Pensacola, FL.

All other analyses were performed by American Environmental Network (AZ) Inc., 9830 S. 51st Street, Suite B113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.



Kimberly D. McNeill  
Project Manager



H. Mitchell Rubenstein, Ph. D.  
General Manager

MR: mt

Enclosure

*American Environmental Network, Inc.*

CLIENT	: MARATHON OIL COMPANY	AEN I.D.	: 707346
PROJECT #	: (NONE)	DATE RECEIVED	: 7/17/97
PROJECT NAME	: IBRP	REPORT DATE	: 8/14/97
AEN			DATE
ID. #	CLIENT DESCRIPTION	MATRIX	COLLECTED
01	R.O. UNIT REJECT	AQUEOUS	7/15/97
02	TRIP BLANK	AQUEOUS	7/14/97

*American Environmental Network, Inc.*

CLIENT : AMERICAN ENV. NETWORK OF NM, INC.  
PROJECT # : 707346  
PROJECT NAME : MARATHON OIL  
ATI I.D. : 707250

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	707346-01	AQUEOUS	07/15/97

=====

----- TOTALS -----

MATRIX	# SAMPLES
-----	-----
AQUEOUS	1

ATI STANDARD DISPOSAL PRACTICE

-----

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



GENERAL CHEMISTRY RESULTS

CLIENT : AMERICAN ENV. NETWORK OF NM, INC.  
PROJECT # : 707346  
PROJECT NAME : MARATHON OIL

PARAMETER	UNITS	01
CARBONATE (CACO3)	MG/L	<1
BICARBONATE (CACO3)	MG/L	304
HYDROXIDE (CACO3)	MG/L	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	304
BROMIDE (EPA 300.0)	MG/L	0.5
CHLORIDE (EPA 325.2)	MG/L	70
CONDUCTIVITY, (UMHOS/CM)		2700
FLUORIDE (EPA 340.2)	MG/L	1.87
NO2/NO3-N, TOTAL (353.2)	MG/L	3.1
PH (EPA 150.1)	UNITS	8.0
SULFATE (EPA 375.2)	MG/L	530
T. DISSOLVED SOLIDS (160.1)	MG/L	1900

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : AMERICAN ENV. NETWORK OF NM, INC.  
PROJECT # : 707346  
PROJECT NAME : MARATHON OIL

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	70725001	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		304	302	0.7	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		304	302	0.7	NA	NA	NA
BROMIDE	MG/L	70719308	<0.3	<0.3	NA	2.4	2.0	120
CHLORIDE	MG/L	70715603	3.5	3.6	3	14	10	105
CONDUCTIVITY (UMHOS/CM)		70725001	2700	2710	0.4	NA	NA	NA
FLUORIDE	MG/L	70799917	1.85	1.85	0	4.03	2.00	109
NITRITE/NITRATE-N	MG/L	70718601	<0.06	<0.06	NA	1.94	2.00	97
PH	UNITS	70724205	5.8	5.8	0	NA	NA	NA
SULFATE	MG/L	70725001	530	550	4	930	400	100
TOTAL DISSOLVED SOLIDS	MG/L	70726601	<10	<10	NA	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

**METALS RESULTS**

CLIENT : AMERICAN ENV. NETWORK OF NM, INC.  
PROJECT # : 707346  
PROJECT NAME : MARATHON OIL

PARAMETER	UNITS	01
CALCIUM (EPA 200.7/6010)	MG/L	1.1
POTASSIUM (EPA 200.7/6010)	MG/L	<1.0
MAGNESIUM (EPA 200.7/6010)	MG/L	<0.5
SODIUM (EPA 200.7/6010)	MG/L	670
SILICON (EPA 200.7/6010)	MG/L	32.4

METALS - QUALITY CONTROL

CLIENT : AMERICAN ENV. NETWORK OF NM, INC.  
 PROJECT # : 707346  
 PROJECT NAME : MARATHON OIL

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CALCIUM	MG/L	70727001	107	105	2	157	50.0	100
POTASSIUM	MG/L	70727001	3.2	4.0	22	54.2	50.0	102
MAGNESIUM	MG/L	70727001	56.2	57.4	2	83.8	25.0	110
SODIUM	MG/L	70727001	68.6	66.4	3	124	50.0	111
SILICON	MG/L	70899903	11.4	11.1	3	21.8	10.0	104

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

DATE: 08-07-97

ION BALANCE

AEN ACCESSION NUMBER: 70725001  
 SAMPLE IDENTIFICATION: 70734601  
 CLIENT: AMERICAN ENVIRON. NETWORK OF NM, INC.

ANIONS	RESULT MG/L	FACTOR ME/L	TOTAL
ALKALINITY (AS CaCO <sub>3</sub> )	304.000	0.02000	6.08000
CHLORIDE	70.000	0.02821	1.97470
FLUORIDE	1.870	0.05264	0.09844
NITRATE AS N (NO <sub>3</sub> (NO <sub>3</sub> -N X 4.43)	3.100	0.01613	0.22151
SiO <sub>3</sub> (SILICON X 2.71)	87.804	0.02629	2.30837
SULFATE	530.000	0.02082	11.03460
TOTAL ANIONS			21.71762

CATIONS	RESULT	FACTOR	TOTAL
CALCIUM	1.100	0.04990	0.05489
POTASSIUM	<1.0	0.02558	0.00000
MAGNESIUM	<0.5	0.08229	0.00000
SODIUM	670.000	0.04350	29.14500
TOTAL CATIONS			29.19989

		%RPD (<10%)*	-29.39
TOTAL ANIONS/CATIONS	(CALCULATED)	1546.274	
TOTAL DISSOLVED SOLIDS	(ANALYZED)	1900	%RPD (<15%)*
ELECTRICAL COND.		2700	TDS/EC RATIO
			(0.65+/-0.10)
			0.70

\* If either Total Cations or Total Anions <10, then the %RPD Limit is not applicable.

## GC/MS RESULTS

TEST : VOLATILE ORGANICS EPA METHOD 8260 EXTENDED  
 CLIENT : MARATHON OIL CO. AEN I.D. : 707346  
 PROJECT # : IBRP DATE RECEIVED : 7/17/97  
 PROJECT NAME : IBRP

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
707346-01	R O.UNIT REJECT	AQUEOUS	7/15/97	N/A	07/19/97	1
PARAMETER	DET. LIMIT		UNITS			
Dichlorodifluoromethane	1.0	< 1.0	ug/L			
Chloromethane	1.0	< 1.0	ug/L			
Vinyl Chloride	1.0	< 1.0	ug/L			
Bromomethane	1.0	< 1.0	ug/L			
Chloroethane	1.0	< 1.0	ug/L			
Trichlorofluoromethane	1.0	< 1.0	ug/L			
Acetone	10	< 10	ug/L			
Acrolein	5.0	< 5.0	ug/L			
1,1-Dichloroethene	1.0	< 1.0	ug/L			
Iodomethane	1.0	< 1.0	ug/L			
Methylene Chloride	1.0	< 1.0	ug/L			
Acrylonitrile	5.0	< 5.0	ug/L			
cis-1,2-Dichloroethene	1.0	< 1.0	ug/L			
Methyl-t-butyl Ether	1.0	< 1.0	ug/L			
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	< 1.0	ug/L			
1,1-Dichloroethane	1.0	< 1.0	ug/L			
trans-1,2-Dichloroethene	1.0	< 1.0	ug/L			
<b>2-Butanone</b>	<b>10</b>	<b>28</b>	<b>ug/L</b>			
Carbon Disulfide	1.0	< 1.0	ug/L			
Bromochloromethane	1.0	< 1.0	ug/L			
Chloroform	1.0	< 1.0	ug/L			
2,2-Dichloropropane	1.0	< 1.0	ug/L			
1,2-Dichloroethane	1.0	< 1.0	ug/L			
Vinyl Acetate	1.0	< 1.0	ug/L			
1,1,1-Trichloroethane	1.0	< 1.0	ug/L			
1,1-Dichloropropene	1.0	< 1.0	ug/L			
Carbon Tetrachloride	1.0	< 1.0	ug/L			
Benzene	1.0	< 1.0	ug/L			
1,2-Dichloropropane	1.0	< 1.0	ug/L			
Trichloroethene	1.0	< 1.0	ug/L			
Bromodichloromethane	1.0	< 1.0	ug/L			
2-Chloroethyl Vinyl Ether	10	< 10	ug/L			
cis-1,3-Dichloropropene	1.0	< 1.0	ug/L			
trans-1,3-Dichloropropene	1.0	< 1.0	ug/L			
1,1,2-Trichloroethane	1.0	< 1.0	ug/L			
1,3-Dichloropropane	1.0	< 1.0	ug/L			
Dibromomethane	1.0	< 1.0	ug/L			
Toluene	1.0	< 1.0	ug/L			
1,2-Dibromoethane	1.0	< 1.0	ug/L			
4-Methyl-2-Pentanone	10	< 10	ug/L			
2-Hexanone	10	< 10	ug/L			
Dibromochloromethane	1.0	< 1.0	ug/L			
Tetrachloroethene	1.0	< 1.0	ug/L			
Chlorobenzene	1.0	< 1.0	ug/L			
Ethylbenzene	1.0	< 1.0	ug/L			
1,1,1,2-Tetrachloroethane	1.0	< 1.0	ug/L			
o-Xylene	1.0	< 1.0	ug/L			

## GC/MS RESULTS

TEST : VOLATILE ORGANICS EPA METHOD 8260 EXTENDED  
 CLIENT : MARATHON OIL CO. AEN I.D. : 707346  
 PROJECT # : IBRP DATE RECEIVED : 7/17/97  
 PROJECT NAME : IBRP

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
707346-01	R.O. UNIT REJECT	AQUEOUS	7/15/97	N/A	07/19/97	1
PARAMETER	DET. LIMIT		UNITS			
m&p Xylenes	1.0	< 1.0	ug/L			
Styrene	1.0	< 1.0	ug/L			
Bromoform	1.0	< 1.0	ug/L			
1,1,2,2-Tetrachloroethane	1.0	< 1.0	ug/L			
1,2,3-Trichloropropane	1.0	< 1.0	ug/L			
Isopropyl Benzene	1.0	< 1.0	ug/L			
Bromobenzene	1.0	< 1.0	ug/L			
trans-1,4-Dichloro-2-Butene	1.0	< 1.0	ug/L			
n-Propylbenzene	1.0	< 1.0	ug/L			
2-Chlorotoluene	1.0	< 1.0	ug/L			
4-Chlorotoluene	1.0	< 1.0	ug/L			
1,3,5-Trimethylbenzene	1.0	< 1.0	ug/L			
tert-Butylbenzene	1.0	< 1.0	ug/L			
1,2,4-Trimethylbenzene	1.0	< 1.0	ug/L			
sec-Butylbenzene	1.0	< 1.0	ug/L			
1,3-Dichlorobenzene	1.0	< 1.0	ug/L			
1,4-Dichlorobenzene	1.0	< 1.0	ug/L			
p-Isopropyltoluene	1.0	< 1.0	ug/L			
1,2-Dichlorobenzene	1.0	< 1.0	ug/L			
n-Butylbenzene	1.0	< 1.0	ug/L			
1,2-Dibromomo-3-chloropropane	1.0	< 1.0	ug/L			
1,2,4-Trichlorobenzene	1.0	< 1.0	ug/L			
Napthalene	1.0	< 1.0	ug/L			
Hexachlorobutadiene	1.0	< 1.0	ug/L			
1,2,3-Trichlorobenzene	1.0	< 1.0	ug/L			

## SURROGATE % RECOVERY

1,2-Dichloroethane-d4 86  
 ( 80 - 120 )  
 Toluene-d8 90  
 ( 88 - 110 )  
 Bromofluorobenzene 102  
 ( 86 - 115 )

## GC/MS RESULTS

TEST : VOLATILE ORGANICS EPA METHOD 8260 EXTENDED  
 CLIENT : MARATHON OIL CO. AEN I.D. : 707346  
 PROJECT # : IBRP DATE RECEIVED : 7/17/97  
 PROJECT NAME : IBRP

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
707346-02	TRIP BLANK	AQUEOUS	7/14/97	N/A	07/18/97	1
PARAMETER	DET. LIMIT		UNITS			
Dichlorodifluoromethane	1.0	< 1.0	ug/L			
Chloromethane	1.0	< 1.0	ug/L			
Vinyl Chloride	1.0	< 1.0	ug/L			
Bromomethane	1.0	< 1.0	ug/L			
Chloroethane	1.0	< 1.0	ug/L			
Trichlorofluoromethane	1.0	< 1.0	ug/L			
Acetone	10	< 10	ug/L			
Acrolein	5.0	< 5.0	ug/L			
1,1-Dichloroethene	1.0	< 1.0	ug/L			
Iodomethane	1.0	< 1.0	ug/L			
Methylene Chloride	1.0	< 1.0	ug/L			
Acrylonitrile	5.0	< 5.0	ug/L			
cis-1,2-Dichloroethene	1.0	< 1.0	ug/L			
Methyl-t-butyl Ether	1.0	< 1.0	ug/L			
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	< 1.0	ug/L			
1,1-Dichloroethane	1.0	< 1.0	ug/L			
trans-1,2-Dichloroethene	1.0	< 1.0	ug/L			
2-Butanone	10	< 10	ug/L			
Carbon Disulfide	1.0	< 1.0	ug/L			
Bromochloromethane	1.0	< 1.0	ug/L			
Chloroform	1.0	< 1.0	ug/L			
2,2-Dichloropropane	1.0	< 1.0	ug/L			
1,2-Dichloroethane	1.0	< 1.0	ug/L			
Vinyl Acetate	1.0	< 1.0	ug/L			
1,1,1-Trichloroethane	1.0	< 1.0	ug/L			
1,1-Dichloropropene	1.0	< 1.0	ug/L			
Carbon Tetrachloride	1.0	< 1.0	ug/L			
Benzene	1.0	< 1.0	ug/L			
1,2-Dichloropropane	1.0	< 1.0	ug/L			
Trichloroethene	1.0	< 1.0	ug/L			
Bromodichloromethane	1.0	< 1.0	ug/L			
2-Chloroethyl Vinyl Ether	10	< 10	ug/L			
cis-1,3-Dichloropropene	1.0	< 1.0	ug/L			
trans-1,3-Dichloropropene	1.0	< 1.0	ug/L			
1,1,2-Trichloroethane	1.0	< 1.0	ug/L			
1,3-Dichloropropane	1.0	< 1.0	ug/L			
Dibromomethane	1.0	< 1.0	ug/L			
Toluene	1.0	< 1.0	ug/L			
1,2-Dibromoethane	1.0	< 1.0	ug/L			
4-Methyl-2-Pentanone	10	< 10	ug/L			
2-Hexanone	10	< 10	ug/L			
Dibromochloromethane	1.0	< 1.0	ug/L			
Tetrachloroethene	1.0	< 1.0	ug/L			
Chlorobenzene	1.0	< 1.0	ug/L			
Ethylbenzene	1.0	< 1.0	ug/L			
1,1,1,2-Tetrachloroethane	1.0	< 1.0	ug/L			



GC/MS RESULTS

TEST : VOLATILE ORGANICS EPA METHOD 8260 EXTENDED  
 CLIENT : MARATHON OIL CO. AEN I.D. : 707346  
 PROJECT # : IBRP DATE RECEIVED : 7/17/97  
 PROJECT NAME : IBRP

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
707346-02	TRIP BLANK	AQUEOUS	7/14/97	N/A	07/18/97	1
PARAMETER	DET. LIMIT		UNITS			
o-Xylene	1.0	< 1.0	ug/L			
m&p Xylenes	1.0	< 1.0	ug/L			
Styrene	1.0	< 1.0	ug/L			
Bromoform	1.0	< 1.0	ug/L			
1,1,2,2-Tetrachloroethane	1.0	< 1.0	ug/L			
1,2,3-Trichloropropane	1.0	< 1.0	ug/L			
Isopropyl Benzene	1.0	< 1.0	ug/L			
Bromobenzene	1.0	< 1.0	ug/L			
trans-1,4-Dichloro-2-Butene	1.0	< 1.0	ug/L			
n-Propylbenzene	1.0	< 1.0	ug/L			
2-Chlorotoluene	1.0	< 1.0	ug/L			
4-Chlorotoluene	1.0	< 1.0	ug/L			
1,3,5-Trimethylbenzene	1.0	< 1.0	ug/L			
tert-Butylbenzene	1.0	< 1.0	ug/L			
1,2,4-Trimethylbenzene	1.0	< 1.0	ug/L			
sec-Butylbenzene	1.0	< 1.0	ug/L			
1,3-Dichlorobenzene	1.0	< 1.0	ug/L			
1,4-Dichlorobenzene	1.0	< 1.0	ug/L			
p-Isopropyltoluene	1.0	< 1.0	ug/L			
1,2-Dichlorobenzene	1.0	< 1.0	ug/L			
n-Butylbenzene	1.0	< 1.0	ug/L			
1,2-Dibromomono-3-chloropropane	1.0	< 1.0	ug/L			
1,2,4-Trichlorobenzene	1.0	< 1.0	ug/L			
Napthalene	1.0	< 1.0	ug/L			
Hexachlorobutadiene	1.0	< 1.0	ug/L			
1,2,3-Trichlorobenzene	1.0	< 1.0	ug/L			

SURROGATE % RECOVERY

1,2-Dichloroethane-d4 109  
 ( 80 - 120 )  
 Toluene-d8 98  
 ( 88 - 110 )  
 Bromofluorobenzene 107  
 ( 86 - 115 )

GC/MS RESULTS

TEST : VOLATILE ORGANICS EPA METHOD 8260 EXTENDED  
 CLIENT : MARATHON OIL CO. AEN I.D. : 707346  
 PROJECT # : IBRP  
 PROJECT NAME : IBRP

SAMPLE ID #	BATCH	MATRIX	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
REAGENT BLANK	071897	AQUEOUS	N/A	07/18/97	1
PARAMETER	DET. LIMIT	UNITS			
Dichlorodifluoromethane	1.0	< 1.0	ug/L		
Chloromethane	1.0	< 1.0	ug/L		
Vinyl Chloride	1.0	< 1.0	ug/L		
Bromomethane	1.0	< 1.0	ug/L		
Chloroethane	1.0	< 1.0	ug/L		
Trichlorofluoromethane	1.0	< 1.0	ug/L		
Acetone	10	< 10	ug/L		
Acrolein	5.0	< 5.0	ug/L		
1,1-Dichloroethene	1.0	< 1.0	ug/L		
Iodomethane	1.0	< 1.0	ug/L		
Methylene Chloride	1.0	< 1.0	ug/L		
Acrylonitrile	5.0	< 5.0	ug/L		
cis-1,2-Dichloroethene	1.0	< 1.0	ug/L		
Methyl-t-butyl Ether	1.0	< 1.0	ug/L		
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	< 1.0	ug/L		
1,1-Dichloroethane	1.0	< 1.0	ug/L		
trans-1,2-Dichloroethene	1.0	< 1.0	ug/L		
2-Butanone	10	< 10	ug/L		
Carbon Disulfide	1.0	< 1.0	ug/L		
Bromochloromethane	1.0	< 1.0	ug/L		
Chloroform	1.0	< 1.0	ug/L		
2,2-Dichloropropane	1.0	< 1.0	ug/L		
1,2-Dichloroethane	1.0	< 1.0	ug/L		
Vinyl Acetate	1.0	< 1.0	ug/L		
1,1,1-Trichloroethane	1.0	< 1.0	ug/L		
1,1-Dichloropropene	1.0	< 1.0	ug/L		
Carbon Tetrachloride	1.0	< 1.0	ug/L		
Benzene	1.0	< 1.0	ug/L		
1,2-Dichloropropane	1.0	< 1.0	ug/L		
Trichloroethene	1.0	< 1.0	ug/L		
Bromodichloromethane	1.0	< 1.0	ug/L		
2-Chloroethyl Vinyl Ether	10	< 10	ug/L		
cis-1,3-Dichloropropene	1.0	< 1.0	ug/L		
trans-1,3-Dichloropropene	1.0	< 1.0	ug/L		
1,1,2-Trichloroethane	1.0	< 1.0	ug/L		
1,3-Dichloropropane	1.0	< 1.0	ug/L		
Dibromomethane	1.0	< 1.0	ug/L		
Toluene	1.0	< 1.0	ug/L		
1,2-Dibromoethane	1.0	< 1.0	ug/L		
4-Methyl-2-Pentanone	10	< 10	ug/L		
2-Hexanone	10	< 10	ug/L		
Dibromochloromethane	1.0	< 1.0	ug/L		
Tetrachloroethene	1.0	< 1.0	ug/L		
Chlorobenzene	1.0	< 1.0	ug/L		
Ethylbenzene	1.0	< 1.0	ug/L		
1,1,1,2-Tetrachloroethane	1.0	< 1.0	ug/L		

GC/MS RESULTS

TEST : VOLATILE ORGANICS EPA METHOD 8260 EXTENDED  
 CLIENT : MARATHON OIL CO. AEN I.D. : 707346  
 PROJECT # : IBRP  
 PROJECT NAME : IBRP

SAMPLE ID #	BATCH	MATRIX	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
REAGENT BLANK	071897	AQUEOUS	N/A	07/18/97	1

PARAMETER	DET. LIMIT	UNITS
o-Xylene	1.0 < 1.0	ug/L
m&p Xylenes	1.0 < 1.0	ug/L
Styrene	1.0 < 1.0	ug/L
Bromoform	1.0 < 1.0	ug/L
1,1,2,2-Tetrachloroethane	1.0 < 1.0	ug/L
1,2,3-Trichloropropane	1.0 < 1.0	ug/L
Isopropyl Benzene	1.0 < 1.0	ug/L
Bromobenzene	1.0 < 1.0	ug/L
trans-1,4-Dichloro-2-Butene	1.0 < 1.0	ug/L
n-Propylbenzene	1.0 < 1.0	ug/L
2-Chlorotoluene	1.0 < 1.0	ug/L
4-Chlorotoluene	1.0 < 1.0	ug/L
1,3,5-Trimethylbenzene	1.0 < 1.0	ug/L
tert-Butylbenzene	1.0 < 1.0	ug/L
1,2,4-Trimethylbenzene	1.0 < 1.0	ug/L
sec-Butylbenzene	1.0 < 1.0	ug/L
1,3-Dichlorobenzene	1.0 < 1.0	ug/L
1,4-Dichlorobenzene	1.0 < 1.0	ug/L
p-Isopropyltoluene	1.0 < 1.0	ug/L
1,2-Dichlorobenzene	1.0 < 1.0	ug/L
n-Butylbenzene	1.0 < 1.0	ug/L
1,2-Dibromomo-3-chloropropane	1.0 < 1.0	ug/L
1,2,4-Trichlorobenzene	1.0 < 1.0	ug/L
Napthalene	1.0 < 1.0	ug/L
Hexachlorobutadiene	1.0 < 1.0	ug/L
1,2,3-Trichlorobenzene	1.0 < 1.0	ug/L

SURROGATE % RECOVERY

1,2-Dichloroethane-d4	106 ( 80 - 120 )
Toluene-d8	100 ( 88 - 110 )
Bromofluorobenzene	113 ( 86 - 115 )

## GC/MS RESULTS

TEST : VOLATILE ORGANICS EPA METHOD 8260 EXTENDED  
 CLIENT : MARATHON OIL CO.  
 PROJECT # : IBRP  
 PROJECT NAME : IBRP

AEN I.D. :

707346

SAMPLE ID #	BATCH	MATRIX	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
REAGENT BLANK	071997	AQUEOUS	N/A	07/19/97	1
PARAMETER	DET. LIMIT	UNITS			

Dichlorodifluoromethane	1.0	< 1.0	ug/L
Chloromethane	1.0	< 1.0	ug/L
Vinyl Chloride	1.0	< 1.0	ug/L
Bromomethane	1.0	< 1.0	ug/L
Chloroethane	1.0	< 1.0	ug/L
Trichlorofluoromethane	1.0	< 1.0	ug/L
Acetone	10	< 10	ug/L
Acrolein	5.0	< 5.0	ug/L
1,1-Dichloroethene	1.0	< 1.0	ug/L
Iodomethane	1.0	< 1.0	ug/L
Methylene Chloride	1.0	< 1.0	ug/L
Acrylonitrile	5.0	< 5.0	ug/L
cis-1,2-Dichloroethene	1.0	< 1.0	ug/L
Methyl-t-butyl Ether	1.0	< 1.0	ug/L
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	< 1.0	ug/L
1,1-Dichloroethane	1.0	< 1.0	ug/L
trans-1,2-Dichloroethene	1.0	< 1.0	ug/L
2-Butanone	10	< 10	ug/L
Carbon Disulfide	1.0	< 1.0	ug/L
Bromochloromethane	1.0	< 1.0	ug/L
Chloroform	1.0	< 1.0	ug/L
2,2-Dichloropropane	1.0	< 1.0	ug/L
1,2-Dichloroethane	1.0	< 1.0	ug/L
Vinyl Acetate	1.0	< 1.0	ug/L
1,1,1-Trichloroethane	1.0	< 1.0	ug/L
1,1-Dichloropropene	1.0	< 1.0	ug/L
Carbon Tetrachloride	1.0	< 1.0	ug/L
Benzene	1.0	< 1.0	ug/L
1,2-Dichloropropane	1.0	< 1.0	ug/L
Trichloroethene	1.0	< 1.0	ug/L
Bromodichloromethane	1.0	< 1.0	ug/L
2-Chloroethyl Vinyl Ether	10	< 10	ug/L
cis-1,3-Dichloropropene	1.0	< 1.0	ug/L
trans-1,3-Dichloropropene	1.0	< 1.0	ug/L
1,1,2-Trichloroethane	1.0	< 1.0	ug/L
1,3-Dichloropropane	1.0	< 1.0	ug/L
Dibromomethane	1.0	< 1.0	ug/L
Toluene	1.0	< 1.0	ug/L
1,2-Dibromoethane	1.0	< 1.0	ug/L
4-Methyl-2-Pentanone	10	< 10	ug/L
2-Hexanone	10	< 10	ug/L
Dibromochloromethane	1.0	< 1.0	ug/L
Tetrachloroethene	1.0	< 1.0	ug/L
Chlorobenzene	1.0	< 1.0	ug/L
Ethylbenzene	1.0	< 1.0	ug/L
1,1,1,2-Tetrachloroethane	1.0	< 1.0	ug/L

GC/MS RESULTS

TEST : VOLATILE ORGANICS EPA METHOD 8260 EXTENDED  
 CLIENT : MARATHON OIL CO. AEN I.D. : 707346  
 PROJECT # : IBRP  
 PROJECT NAME : IBRP

SAMPLE ID #	BATCH	MATRIX	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
REAGENT BLANK	071997	AQUEOUS	N/A	07/19/97	1
PARAMETER	DET. LIMIT	UNITS			
o-Xylene	1.0	< 1.0	ug/L		
m&p Xylenes	1.0	< 1.0	ug/L		
Styrene	1.0	< 1.0	ug/L		
Bromoform	1.0	< 1.0	ug/L		
1,1,2,2-Tetrachloroethane	1.0	< 1.0	ug/L		
1,2,3-Trichloropropane	1.0	< 1.0	ug/L		
Isopropyl Benzene	1.0	< 1.0	ug/L		
Bromobenzene	1.0	< 1.0	ug/L		
trans-1,4-Dichloro-2-Butene	1.0	< 1.0	ug/L		
n-Propylbenzene	1.0	< 1.0	ug/L		
2-Chlorotoluene	1.0	< 1.0	ug/L		
4-Chlorotoluene	1.0	< 1.0	ug/L		
1,3,5-Trimethylbenzene	1.0	< 1.0	ug/L		
tert-Butylbenzene	1.0	< 1.0	ug/L		
1,2,4-Trimethylbenzene	1.0	< 1.0	ug/L		
sec-Butylbenzene	1.0	< 1.0	ug/L		
1,3-Dichlorobenzene	1.0	< 1.0	ug/L		
1,4-Dichlorobenzene	1.0	< 1.0	ug/L		
p-Isopropyltoluene	1.0	< 1.0	ug/L		
1,2-Dichlorobenzene	1.0	< 1.0	ug/L		
n-Butylbenzene	1.0	< 1.0	ug/L		
1,2-Dibromomo-3-chloropropane	1.0	< 1.0	ug/L		
1,2,4-Trichlorobenzene	1.0	< 1.0	ug/L		
Napthalene	1.0	< 1.0	ug/L		
Hexachlorobutadiene	1.0	< 1.0	ug/L		
1,2,3-Trichlorobenzene	1.0	< 1.0	ug/L		

SURROGATE % RECOVERY

1,2-Dichloroethane-d4 90  
 ( 80 - 120 )  
 Toluene-d8 92  
 ( 88 - 110 )  
 Bromofluorobenzene 105  
 ( 86 - 115 )

## GC/MS RESULTS

TEST : VOLATILE ORGANICS EPA METHOD 8260 EXTENDED  
 CLIENT : MARATHON OIL CO.  
 PROJECT # : IBRP  
 PROJECT NAME : IBRP

AEN I.D. : 707346

SAMPLE ID #	BATCH	MATRIX	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
REAGENT BLANK	071797	AQUEOUS	N/A	07/17/97	1
PARAMETER	DET. LIMIT	UNITS			
Dichlorodifluoromethane	1.0	< 1.0	ug/L		
Chloromethane	1.0	< 1.0	ug/L		
Vinyl Chloride	1.0	< 1.0	ug/L		
Bromomethane	1.0	< 1.0	ug/L		
Chloroethane	1.0	< 1.0	ug/L		
Trichlorofluoromethane	1.0	< 1.0	ug/L		
Acetone	10	< 10	ug/L		
Acrolein	5.0	< 5.0	ug/L		
1,1-Dichloroethene	1.0	< 1.0	ug/L		
Iodomethane	1.0	< 1.0	ug/L		
Methylene Chloride	1.0	< 1.0	ug/L		
Acrylonitrile	5.0	< 5.0	ug/L		
cis-1,2-Dichloroethene	1.0	< 1.0	ug/L		
Methyl-t-butyl Ether	1.0	< 1.0	ug/L		
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	< 1.0	ug/L		
1,1-Dichloroethane	1.0	< 1.0	ug/L		
trans-1,2-Dichloroethene	1.0	< 1.0	ug/L		
2-Butanone	10	< 10	ug/L		
Carbon Disulfide	1.0	< 1.0	ug/L		
Bromochloromethane	1.0	< 1.0	ug/L		
Chloroform	1.0	< 1.0	ug/L		
2,2-Dichloropropane	1.0	< 1.0	ug/L		
1,2-Dichloroethane	1.0	< 1.0	ug/L		
Vinyl Acetate	1.0	< 1.0	ug/L		
1,1,1-Trichloroethane	1.0	< 1.0	ug/L		
1,1-Dichloropropene	1.0	< 1.0	ug/L		
Carbon Tetrachloride	1.0	< 1.0	ug/L		
Benzene	1.0	< 1.0	ug/L		
1,2-Dichloropropane	1.0	< 1.0	ug/L		
Trichloroethene	1.0	< 1.0	ug/L		
Bromodichloromethane	1.0	< 1.0	ug/L		
2-Chloroethyl Vinyl Ether	10	< 10	ug/L		
cis-1,3-Dichloropropene	1.0	< 1.0	ug/L		
trans-1,3-Dichloropropene	1.0	< 1.0	ug/L		
1,1,2-Trichloroethane	1.0	< 1.0	ug/L		
1,3-Dichloropropane	1.0	< 1.0	ug/L		
Dibromomethane	1.0	< 1.0	ug/L		
Toluene	1.0	< 1.0	ug/L		
1,2-Dibromoethane	1.0	< 1.0	ug/L		
4-Methyl-2-Pentanone	10	< 10	ug/L		
2-Hexanone	10	< 10	ug/L		
Dibromochloromethane	1.0	< 1.0	ug/L		
Tetrachloroethene	1.0	< 1.0	ug/L		
Chlorobenzene	1.0	< 1.0	ug/L		
Ethylbenzene	1.0	< 1.0	ug/L		
1,1,1,2-Tetrachloroethane	1.0	< 1.0	ug/L		

GC/MS RESULTS

TEST : VOLATILE ORGANICS EPA METHOD 8260 EXTENDED  
 CLIENT : MARATHON OIL CO. AEN I.D. : 707346  
 PROJECT # : IBRP  
 PROJECT NAME : IBRP

SAMPLE ID #	BATCH	MATRIX	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
REAGENT BLANK	071797	AQUEOUS	N/A	07/17/97	1
PARAMETER	DET. LIMIT	UNITS			
o-Xylene	1.0	< 1.0	ug/L		
m&p Xylenes	1.0	< 1.0	ug/L		
Styrene	1.0	< 1.0	ug/L		
Bromoform	1.0	< 1.0	ug/L		
1,1,2,2-Tetrachloroethane	1.0	< 1.0	ug/L		
1,2,3-Trichloropropane	1.0	< 1.0	ug/L		
Isopropyl Benzene	1.0	< 1.0	ug/L		
Bromobenzene	1.0	< 1.0	ug/L		
trans-1,4-Dichloro-2-Butene	1.0	< 1.0	ug/L		
n-Propylbenzene	1.0	< 1.0	ug/L		
2-Chlorotoluene	1.0	< 1.0	ug/L		
4-Chlorotoluene	1.0	< 1.0	ug/L		
1,3,5-Trimethylbenzene	1.0	< 1.0	ug/L		
tert-Butylbenzene	1.0	< 1.0	ug/L		
1,2,4-Trimethylbenzene	1.0	< 1.0	ug/L		
sec-Butylbenzene	1.0	< 1.0	ug/L		
1,3-Dichlorobenzene	1.0	< 1.0	ug/L		
1,4-Dichlorobenzene	1.0	< 1.0	ug/L		
p-Isopropyltoluene	1.0	< 1.0	ug/L		
1,2-Dichlorobenzene	1.0	< 1.0	ug/L		
n-Butylbenzene	1.0	< 1.0	ug/L		
1,2-Dibromomo-3-chloropropane	1.0	< 1.0	ug/L		
1,2,4-Trichlorobenzene	1.0	< 1.0	ug/L		
Napthalene	1.0	< 1.0	ug/L		
Hexachlorobutadiene	1.0	< 1.0	ug/L		
1,2,3-Trichlorobenzene	1.0	< 1.0	ug/L		

SURROGATE % RECOVERY

1,2-Dichloroethane-d4 84  
 ( 80 - 120 )  
 Toluene-d8 102  
 ( 88 - 110 )  
 Bromofluorobenzene 100  
 ( 86 - 115 )

GCMS - RESULTS

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT	: AMERICAN ENV. NETWORK OF NM, INC.	DATE SAMPLED	: 07/15/97
PROJECT #	: 707346		
PROJECT NAME	: MARATHON OIL	DATE EXTRACTED	: 07/21/97
CLIENT I.D.	: 707346-01	DATE ANALYZED	: 07/28/97
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL) ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL) ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<20
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY) METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<50
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<10
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<10
DIMETHYLPHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANILINE	<10
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<20
4-NITROPHENOL	<10
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10



GCMS - RESULTS

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
DIETHYLPHTHALATE	<10
4-CHLOROPHENYL-PHENYLETHER	<10
FLUORENE	<10
4-NITROANILINE	<10
4,6-DINITRO-2-METHYLPHENOL	<10
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL-PHENYLETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<10
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYLPHTHALATE	<10
FLUORANTHENE	<10
BENZIDINE	<50
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3'-DICHLOROBENZIDINE	<10
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL) PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYLPHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10
1,2-DPH (AS AZOBENZENE)	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	57
2-FLUOROBIPHENYL (%)	62
TERPHENYL (%)	55
PHENOL-D6 (%)	53
2-FLUOROPHENOL (%)	49
2,4,6-TRIBROMOPHENOL (%)	54

GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT	: AMERICAN ENV. NETWORK OF NM, INC.	DATE EXTRACTED	: 07/21/97
PROJECT #	: 707346	DATE ANALYZED	: 07/28/97
PROJECT NAME	: MARATHON OIL	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
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N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL) ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL) ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<20
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY) METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<50
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<10
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<10
DIMETHYLPHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANILINE	<10
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<20
4-NITROPHENOL	<10
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYLPHTHALATE	<10
4-CHLOROPHENYL-PHENYLETHER	<10

GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
FLUORENE	<10
4-NITROANILINE	<10
4,6-DINITRO-2-METHYLPHENOL	<10
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL-PHENYLEETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<10
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYLPHTHALATE	<10
FLUORANTHENE	<10
BENZIDINE	<50
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3'-DICHLOOROBENZIDINE	<10
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL) PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYLPHTHALATE	<10
BENZO(b) FLUORANTHENE	<10
BENZO(k) FLUORANTHENE	<10
BENZO(a) PYRENE	<10
INDENO(1,2,3-cd) PYRENE	<10
DIBENZO(a,h) ANTHRACENE	<10
BENZO(g,h,i) PERYLENE	<10
1,2-DPH (AS AZOBENZENE)	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	65
2-FLUOROBIPHENYL (%)	71
TERPHENYL (%)	58
PHENOL-D6 (%)	62
2-FLUOROPHENOL (%)	58
2,4,6-TRIBROMOPHENOL (%)	59

QUALITY CONTROL DATA

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT : AMERICAN ENV. NETWORK OF NM, INC.  
 PROJECT # : 707346  
 PROJECT NAME : MARATHON OIL  
 REF I.D. : 70799914

DATE ANALYZED : 07/28/97  
 SAMPLE MATRIX :  
 UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,2,4-TRICHLOROBENZENE	<10	50	25	50	25	50	0
ACENAPHTHENE	<10	50	32	64	28	56	13*
2,4-DINITROTOLUENE	<10	50	31	62	28	56	10
PYRENE	<10	50	34	68	30	60	13*
N-NITROSO-DI-N-PROPYL AMINE	<10	50	32	64	27	54	17*
1,4-DICHLOROBENZENE	<10	50	24	48	25	50	4
PENTACHLOROPHENOL	<10	50	23	46	22	44	4
PHENOL	<10	50	22	44	26	52	17*
2-CHLOROPHENOL	<10	50	24	48	27	54	12
4-CHLORO-3-METHYLPHENOL	<10	50	27	54	27	54	0
4-NITROPHENOL	<10	50	28	56	29	58	4

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

\* Result out of limits due to sample matrix interference

"FINAL REPORT FORMAT - SINGLE"

Accession: 707250  
 Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.  
 Project Number: 707346  
 Project Name: MARATHON OIL CO.  
 Project Location: 1BRP  
 Test: POLYNUCLEAR AROMATICS BY 8310  
 Analysis Method: 8310/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.  
 Extraction Method: 3510/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.  
 Matrix: WATER  
 QC Level: II

Lab Id:	001	Sample Date/Time:	15-JUL-97 1550
Client Sample Id:	707346-01	Received Date:	18-JUL-97
Batch: PAW145		Extraction Date:	21-JUL-97
Blank: A	Dry Weight %: N/A	Analysis Date:	28-JUL-97

Parameter:	Units:	Results:	Rpt Lmts:	Q:
ACENAPHTHENE	UG/L	ND	1	
ACENAPHTHYLENE	UG/L	ND	1	
ANTHRACENE	UG/L	ND	1	
BENZO(a) ANTHRACENE	UG/L	ND	1	
BENZO(a) PYRENE	UG/L	ND	1	
BENZO(b) FLUORANTHENE	UG/L	ND	1	
BENZO(g,h,i) PERYLENE	UG/L	ND	1	
BENZO(k) FLUORANTHENE	UG/L	ND	1	
CHRYSENE	UG/L	ND	1	
DIBENZO(a,h) ANTHRACENE	UG/L	ND	1	
FLUORANTHENE	UG/L	ND	1	
FLUORENE	UG/L	ND	1	
INDENO(1,2,3-cd) PYRENE	UG/L	ND	1	
NAPHTHALENE	UG/L	ND	1	
PHENANTHRENE	UG/L	ND	1	
PYRENE	UG/L	ND	1	
1-METHYLNAPHTHALENE	UG/L	ND	1	
2-METHYLNAPHTHALENE	UG/L	ND	1	
2-CHLOROANTHRACENE	%REC/SURR	94	28-138	
ANALYST	INITIALS	JO		

Comments:

"QC Report"

Title: Water Blank  
Batch: PAW145  
Analysis Method: 8310/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.  
Extraction Method: 3510/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.

Blank Id: A Date Analyzed: 25-JUL-97 Date Extracted: 21-JUL-97

Parameters:	Units:	Results:	Reporting Limits:
ACENAPHTHENE	UG/L	ND	1
ACENAPHTHYLENE	UG/L	ND	1
ANTHRACENE	UG/L	ND	1
BENZO(a) ANTHRACENE	UG/L	ND	1
BENZO(a) PYRENE	UG/L	ND	1
BENZO(b) FLUORANTHENE	UG/L	ND	1
BENZO(g,h,i) PERYLENE	UG/L	ND	1
BENZO(k) FLUORANTHENE	UG/L	ND	1
CHRYSENE	UG/L	ND	1
DIBENZO(a,h) ANTHRACENE	UG/L	ND	1
FLUORANTHENE	UG/L	ND	1
FLUORENE	UG/L	ND	1
INDENO(1,2,3-cd) PYRENE	UG/L	ND	1
NAPHTHALENE	UG/L	ND	1
PHENANTHRENE	UG/L	ND	1
PYRENE	UG/L	ND	1
1-METHYLNAPHTHALENE	UG/L	ND	1
2-METHYLNAPHTHALENE	UG/L	ND	1
2-CHLOROANTHRACENE	%REC/SURR	110	28-138
ANALYST	INITIALS	JO	

Comments:

"QC Report"

Title: Water Reagent  
 Batch: PAW145  
 Analysis Method: 8310/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.  
 Extraction Method: 3510/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.

RS Date Analyzed: 25-JUL-97  
 RSD Date Analyzed: 25-JUL-97

RS Date Extracted: 21-JUL-97  
 RSD Date Extracted: 21-JUL-97

Parameters:	Spike Added	Sample Conc	RS Conc	RS %Rec	RSD Conc	RSD %Rec	RPD	Rec Lmts
ACENAPHTHYLENE	10.0	<1	10.3	103	9.0	90	13	45-127
BENZO(k) FLUORANTHENE	10.0	<1	10.7	107	10.1	101	6	68-131
CHRYSENE	10.0	<1	10.8	108	10.2	102	6	69-131
PHENANTHRENE	10.0	<1	9.9	99	9.4	94	5	63-124
PYRENE	10.0	<1	9.5	95	8.8	88	8	61-126

Surrogates:	RS	RSD	Rec Lmts
2-CHLOROANTHRACENE	118	112	28-138

Comments:

Notes:

N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT  
 UG/L = PARTS PER BILLION. < = LESS THAN REPORTING LIMIT.  
 \* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.  
 SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

"QC Report"

Title: Water Matrix  
Batch: PAW145  
Analysis Method: 8310/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.  
Extraction Method: 3510/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.

Dry Weight %:  
Sample Spiked:

MS Date Analyzed:  
MSD Date Analyzed:

MS Date Extracted:  
MSD Date Extracted:

Parameters:	Spike Added	Sample Conc	MS Conc	MS %Rec	MSD Conc	MSD %Rec	RPD	Rec Lmts
ACENAPHTHYLENE							51	18-146
BENZO(k) FLUORANTHENE							40	26-137
CHRYSENE							69	16-156
PHENANTHRENE							36	30-145
PYRENE							41	39-137

Surrogates:  
2-CHLOROANTHRACENE 28-138

Comments:  
NOT ENOUGH SAMPLE SUBMITTED TO EXTRACT MATRIX SPIKE/  
MATRIX SPIKE DUPLICATE.

Notes:  
N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT  
UG/L = PARTS PER BILLION. < = LESS THAN REPORTING LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.  
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE  
PROGRAM AND REFERENCED METHOD.



Common notation for Organic reporting

N/S = NOT SUBMITTED  
N/A = NOT APPLICABLE  
D = DILUTED OUT  
UG = MICROGRAMS  
UG/L = PARTS PER BILLION.  
UG/KG = PARTS PER BILLION.  
MG/M3 = MILLIGRAM PER CUBIC METER.  
PPMV = PART PER MILLION BY VOLUME.  
MG/KG = PARTS PER MILLION.  
MG/L = PARTS PER MILLION.  
< = LESS THAN DETECTION LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS  
Y = IMPROPER PRESERVATION, NO PRESERVATIVE PRESENT IN SAMPLE UPON RECEIPT.

SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

ORGANIC SOILS ARE REPORTED ON A DRYWEIGHT BASIS.

ND = NOT DETECTED ABOVE REPORTING LIMIT.

RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.

RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION)

AEN/GC/FID

AEN GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH FLAME IONIZATION DETECTOR (FID).

AEN/GC/FIX

AEN GAS CHROMATOGRAPHIC METHOD FOR ANALYSIS OF FIXED GASES EMPLOYING DIRECT INJECTION ON COLUMN WITH THERMAL CONDUCTIVITY DETECTOR (TCD) AND FLAME IONIZATION DETECTOR (FID).

AEN/GC/FPD

AEN GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH FLAME PHOTOMETRIC DETECTOR (FPD) IN SULFUR-SPECIFIC MODE.

AEN/GC/PID

AEN GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH PHOTOIONIZATION DETECTOR (PID).

AEN/GC/TCD

AEN GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH THERMAL CONDUCTIVITY DETECTOR (TCD).

SW-846 METHOD 9020

PARTICULATE MATTER IS REMOVED BY ALLOWING PARTICULATES TO SETTLE IN THE SAMPLE CONTAINER AND DECANTING THE SUPERNATANT LIQUID. EXCESSIVE PARTICULATES ARE REMOVED BY FILTRATION OF THE SUPERNATANT LIQUID.

AEN-PN USES THE MOST CURRENT PROMULGATED METHODS CONTAINED IN THE REFERENCE MANUALS.

SW = STEVE WILHITE  
RW = ROBERT WOLFE  
KS = KENDALL SMITH  
KL = KERRY LEMONT  
JO = JENNIFER O'NEAL  
LP = LEVERNE PETERSON  
PLD = PAULA DOUGHTY

# CHAIN OF CUSTODY

DATE: 07/15/97 PAGE: 1 OF 1

AEN LAB ID:

707346

SHADED AREAS ARE FOR LAB USE ONLY

PROJECT MANAGER: Bob Menzie  
COMPANY: Marathon Oil Co.  
ADDRESS: P.O. 552  
Midland, TX 79702  
PHONE: (915) 687-8312  
FAX: (915) 687-8337-05  
BILL TO: Bob Menzie  
COMPANY: Marathon Oil Co.  
ADDRESS: P.O. Box 552  
Midland, TX 79702

## ANALYSIS REQUEST

Petroleum Hydrocarbons (418.1) TRPH

(MOD 8015) Diesel/Direct/Inject

(M8015) Gas/Purge & Trap

Gasoline/BTEX & MTBE (M8015/8020)

BTXE/MTBE (8020)

BTEX & Chlorinated Aromatics (602/8020)

BTEX/MTBE/EDC & EDB (8020/8010/Short)

Chlorinated Hydrocarbons (601/8010)

504

EDB ☐ / DBCP ☐

Polynuclear Aromatics (610/8310)

Volatile Organics (624/8240) GC/MS

Volatile Organics (8260) GC/MS

Pesticides/PCB (608/8080)

Herbicides (615/8150)

Base/Neutral: Acid Compounds GC/MS (625/8270)

General Chemistry:

cation/anion balance

Priority Pollutant Metals (13)

Target Analyte List Metals (23)

RCRA Metals (8)

RCRA Metals by TCLP (Method 1311)

Metals:

NUMBER OF CONTAINERS

SAMPLE ID DATE TIME MATRIX LAB ID.

R.O. Unit Reject 07/15/97 1550 aqueous -01  
Trip Blank 7/14/97 1425 AQ -02

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT INFORMATION		PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.	
PROJ NO: <u>1BRP</u>		(RUSH) <input type="checkbox"/> 12hr <input type="checkbox"/> 48hr <input type="checkbox"/> 72hr <input type="checkbox"/> 1 WEEK (NORMAL) <input checked="" type="checkbox"/>		Signature: <u>Bob Menzie</u> Time: <u>9:00am</u>		Signature: _____ Time: _____	
PROJ NAME: <u>1BRP</u>		CERTIFICATION REQUIRED: <input type="checkbox"/> INM <input type="checkbox"/> SDWA <input type="checkbox"/> OTHER		Printed Name: <u>R.J. Menzie</u> Date: <u>7-16-97</u>		Printed Name: _____ Date: _____	
P.O. NO.:		METHANOL PRESERVATION <input type="checkbox"/>		Company: <u>Marathon</u>		Company: _____	
SHIPPED VIA:		COMMENTS: FIXED FEE <input type="checkbox"/>		RECEIVED BY: 1.		RECEIVED BY: (LAB) 2.	
SAMPLE RECEIPT				Signature: _____ Time: _____		Signature: <u>John Caldwell</u> Time: <u>1035</u>	
NO. CONTAINERS: <u>8</u>				Printed Name: _____ Date: _____		Printed Name: <u>John Caldwell</u> Date: <u>7/16/97</u>	
CUSTODY SEALS: <u>5/1/97</u>				Company: _____		Company: <u>American Environmental Network (AEN), Inc.</u>	
RECEIVED INACT: <u>Yes</u>							
BLUE ICE: <u>Yes</u>							



American Environmental Network  
Albuquerque, New Mexico

## Interlab Chain of Custody

DATE: 7-17 PAGE: 1 OF 1

[illegible]

PROJECT INFORMATION		SAMPLE RECEIPT		SAMPLES SENT TO:	RELINQUISHED BY:	1.	RELINQUISHED BY:	2.
PROJECT NUMBER:	707346	TOTAL NUMBER OF CONTAINERS	3	SAN DIEGO	Signature:	Time:	Signature:	Time:
PROJECT NAME:	Marathon Oil Co	CHAIN OF CUSTODY SEALS	NA	Paragon				
QC LEVEL:	STD IV	INTACT?	Y	RENTON	Printed Name:	Date:	Printed Name:	Date:
QC REQUIRED:	MS MSD BLANK	RECEIVED GOOD COND./COLD	OK	PENSACOLA				
TAT:	STANDARD RUSH	LAB NUMBER	707250	PORTLAND	Albuquerque	NM	Company:	
				PHOENIX	RECEIVED BY:	1.	RECEIVED BY: (LAB)	2.
					Signature:	Time:	Signature:	Time:
					Printed Name:	Date:	Printed Name:	Date:
					Company:		Company:	
DUE DATE: 7-30-97								
RUSH SURCHARGE: _____								
CLIENT DISCOUNT: _____								
SPECIAL CERTIFICATION REQUIRED: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO								

[illegible]

	Petroleum Hydrocarbons (418.1) TRPH
	(MOD.8015) Diesel/Direct/Inject
	(M8015) Gas/Purge & Trap
	Gasoline/BTEX & MTBE (M8015/8020)
	BTEX/MTBE (8020)
	BTEX & Chlorinated Aromatics (602/8020)
	BTEX/MTBE/EDC & EDB (8020/8010/Short)
	Chlorinated Hydrocarbons (601/8010)
	504 EDB □ / DBCP □
X	Polynuclear Aromatics (610/8310)
	Volatile Organics (624/8240) GC/MS
X	Volatile Organics (8260) GC/MS
	Pesticides/PCB (608/8080)
	Herbicides (615/8150)
X	Base Neutral Acid Compounds GC/MS (625-8270)
	General Chemistry:
X	cation/anion balance
	Priority Pollutant Metals (13)
	Target Analyte List Metals (23)
	RCRA Metals (8)
	RCRA Metals by TCLP Method (311)
	Metals
Z	

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS			
(RUSH)	<input type="checkbox"/> 24hr	<input type="checkbox"/> 48hr	<input type="checkbox"/> 72hr
WEEK			(NORMAL) <input checked="" type="checkbox"/>
CERTIFICATION REQUIRED: <input type="checkbox"/> NM <input type="checkbox"/> SDWA <input type="checkbox"/> OTHER			
METHANOL PRESERVATION <input type="checkbox"/>			
COMMENTS: FIXED FEE <input type="checkbox"/>			

RELINQUISHED BY:	
Signature: <i>R. J. Mentie</i>	Time: 9:00am
Printed Name: R. J. Mentie	Date: 7-16-97
Company: Marathon	

RELINQUISHED BY: <b>13</b>	
Signature	Time
Printed Name	Date
Company	

**RECEIVED BY:**

**Signature**

**Date**

Lab Accession #: 707250 Date Received: 18-Jul-97

8. Were samples checked for Yes No\* N/A

- Airbill Number(s): 2789616304

Shipped By: Yedx

Cooler Number(s): N/S

Shipping Charges: N/A

Cooler Weight(s): N/A

Cogler Temp(s) (°C): 4°C

(CK1)  
(LIST THERMOMETER NUMBER(S) FOR VERIFICATION)

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(USE BACK OF PSIF FOR ADDITIONAL NOTES AND COMMENTS)

Inspected By: A. D. T. Date: 8-10-97 Logged By: A. D. T. Date: 8-10-97

- WWDPELEINTFRAMPCTH.WPWP.DOC FEBRUARY 24, 1997



### INTERNAL CHAIN OF CUSTODY

DATE 7-17-97 PAGE 1 OF

[illegible]

PROJECT INFORMATION		SAMPLE RECEIPT		SAMPLES SENT TO:		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.	
PROJECT NUMBER: 707346		TOTAL NUMBER OF CONTAINERS		SAN DIEGO		Signature: [Signature]	Time: 1700	Signature	Time
PROJECT NAME: Marathon Oil CO		CHAIN OF CUSTODY SEALS		Paragon		Printed Name: [Signature]	Date: 7-17-97	Printed Name	Date
QC LEVEL: STD IV		INTACT?		RENTON					
QC REQUIRED: MS MSD BLANK		RECEIVED GOOD COND/COLD		PENSACOLA	X	Albuquerque	NM	Company	
IAI: STANDARD RUSH		LAB NUMBER		PORTLAND		RECEIVED BY: 1.		RECEIVED BY: (LAB) 2.	
				PHOENIX		Signature: [Signature]	Time: 0855	Signature	Time
						Printed Name: Linda Kitt	Date: 7/18/97	Printed Name	Date
						Company: [Signature]		Company	
DUE DATE: 7-31-97									
RUSH SURCHARGE: _____									
CLIENT DISCOUNT: _____									
SPECIAL CERTIFICATION REQUIRED: YES NO									

# SHADES ARE FOR LIFE

**PLEASE FILL THIS FORM IN COMPLETELY.**

[illegible]

PROJECT INFORMATION		PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS		RELINQUISHED BY: [Signature]		RELINQUISHED BY: [Signature]	
PROJ NO: IBRP		(RUSH) <input type="checkbox"/> 24hr <input type="checkbox"/> 48hr <input type="checkbox"/> 72hr <input type="checkbox"/> 1 WEEK	(NORMAL) <input checked="" type="checkbox"/>	Signature: [Signature]	Time: 9:00am	Signature: [Signature]	Time: [Blank]
PROJ NAME: IBRP		CERTIFICATION REQUIRED: <input type="checkbox"/> INM <input type="checkbox"/> ISDWA <input type="checkbox"/> OTHER		Printed Name: R.J. Mentie	Date: 7-16-97	Printed Name: [Blank]	Date: [Blank]
PO NO:		METHANOL PRESERVATION <input type="checkbox"/>		Company: Marathon		Company: [Blank]	
SHIPPED VIA:		COMMENTS: FIXED FEE <input type="checkbox"/>		RECEIVED BY: [Signature]		RECEIVED BY: [Signature]	
DATE RECEIVED: [Blank]				Signature: [Signature]	Time: [Blank]	Signature: [Signature]	Time: [Blank]
				Printed Name: [Blank]	Date: [Blank]	Printed Name: [Blank]	Date: [Blank]
				Company: [Blank]		Company: [Blank]	

## EXHIBIT A

## ITEM ANALYSIS DESCRIPTION

025 Cations and Anions  
(General Chemistry) Method:  
From 40 CFR 136.3  
List of approved  
inorganic test  
procedures.

AnalysisMethod

Fluoride	340.2	12	
Bromide Br	300.0	15	
Calcium	200.7	9	
Potassium	200.7	9	
Magnesium	200.7	9	
Sodium	200.7	9	
Bicarbonate	310.1		
Carbonate	310.1		
Chloride	325.2	12	
Sulfate	375.2	15	
Total dissolved solids	160.1	15	
Cation/Anion Balance (5%)	--		
Ph	150.1		
Conductivity	120.1	15	
Nitrate			
Silica			

Bicarbonate > Total Alk  
 Carbonate > Total Alk  
 Chloride > 25 Total Alk  
 Sulfate > 15 Total Alk  
 Total dissolved solids > 15  
 Cation/Anion Balance (5%) --  
 Ph > 150.1  
 Conductivity > 120.1  
 Nitrate  
 Silica

20%

Should be Nitrate/Nitrite due to hold time



**DATE OF ANALYSIS REPORT****AEN ID: 707250**

12-Aug-97

METHOD	SAMPLE #	DATE	ANALYST
ALKALINITY (EPA 310.1)	01	07/18/97	DIPTI A. SHAH
BROMIDE (EPA 300.0)	01	07/29/97	CARLENE MCCUTCHEON
CALCIUM (EPA 200.7/6010)	01	08/01/97	MARK R. NIEMCZYNSKI
CHLORIDE (EPA 325.2)	01	07/24/97	CARLENE MCCUTCHEON
CONDUCTIVITY, (UMHOS/CM)	01	07/23/97	PAUL STRICKLER
FLUORIDE (EPA 340.2)	01	07/29/97	DANIELLE M. SPEHAR
MAGNESIUM (EPA 200.7/6010)	01	08/01/97	MARK R. NIEMCZYNSKI
NO2/NO3-N, TOTAL (353.2)	01	07/22/97	MELISSA HUGHES
PH (EPA 150.1)	01	07/24/97	CARLENE MCCUTCHEON
POTASSIUM (EPA 200.7/6010)	01	08/01/97	MARK R. NIEMCZYNSKI
SEMI-VOLATILE ORGANICS (EPA 8270)	01	07/28/97	CORA L. LAURIE
SILICON (EPA 200.7/6010)	01	08/01/97	MARK R. NIEMCZYNSKI
SODIUM (EPA 200.7/6010)	01	08/04/97	JACKIE L. CLEMENT
SULFATE (EPA 375.2)	01	07/31/97	CARLENE MCCUTCHEON
T. DISSOLVED SOLIDS (160.1)	01	07/19/97	CARLENE MCCUTCHEON

40 Code of Federal Regulations (40 CFR) Part 136

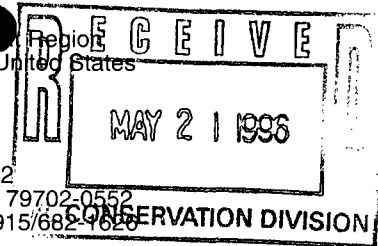
Methods for Chemical Analysis of Water and Wastes, EPA-600 4-79-020, March 1983

Methods for the Determination of Inorganic Substances in Environmental Samples, EPA-600-R-93/100



**Marathon  
Oil Company**

Mid-Continent Region  
Production Unit, United States



P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1620

May 20, 1996

Mr. William J. LeMay  
Director  
State of New Mexico  
Energy, Minerals and Natural Resources Department  
Oil Conservation Division  
2040 S. Pacheco St.  
Santa Fe, New Mexico 87505

Re: Discharge Plan GW-21 Modification  
Indian Basin Gas Plant  
Eddy County, New Mexico

Dear Mr. LeMay:

Pursuant to your letter dated May 9, 1996, a signed copy of the groundwater discharge plan is attached with this cover letter. Marathon requests that all future correspondence regarding this groundwater discharge plan (GW-21) be direct to:

Robert F. Unger  
Production Manager, Midland Operations  
Marathon Oil Company  
P.O. Box 552  
Midland, Texas 79702-0552

In regard to condition #14 (Treatment System Monitoring), Marathon intends to submit a letter to OCD requesting a change in the reporting requirement from quarterly to annual. The move to annual reporting was suggested by the OCD during a meeting in Santa Fe.

If you have any questions concerning this matter, please feel free to contact me at (915) 687-8214 or Bob Menzie at (915) 687-8312.

Sincerely,

R. F. Unger  
Production Manager  
Midland Operations

cc: R. J. Menzie  
T. L. Guillory  
F. D. Searle

H:\RFU96\LETTERS\9608.JMH



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 9, 1996

**CERTIFIED MAIL**

**RETURN RECEIPT NO. P-269-269-144**

Mr. Robert J. Menzie  
Marathon Oil Company  
P.O. Box 552  
Midland, Texas 79702-0552

**RE: Discharge Plan GW-21 Modification  
Indian Basin Gas Plant  
Eddy County, New Mexico**

Dear Mr. Menzie:

The groundwater discharge plan modification, GW-21, for Marathon's Indian Basin Gas Plant Facility located in the NE/4 of Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico, **is hereby approved** under the conditions contained in the enclosed attachment. The application consists of the discharge plan modification application dated January 15, 1996; and the amended modification dated April 18, 1996. Enclosed are two copies of the conditions of approval. **Please sign and return one copy to the New Mexico Oil Conservation Division (OCD) Santa Fe Office within five working days of receipt of this letter.**

The discharge plan modification application was submitted pursuant to Section 3109.F of the Water Quality Control Commission (WQCC) Regulations. It is approved pursuant to Section 3109.A. Please note Section 3109.F., which provides for possible future amendments or modifications of the plan. Please be advised that approval of this plan does not relieve Marathon of liability should operations result in pollution of surface or ground waters, or the environment.

Please be advised that all exposed pits, including lined pits and open top tanks (exceeding 16 feet in diameter) shall be screened, netted, or otherwise rendered nonhazardous to wildlife including migratory birds.

Please note that Section 3104 of the regulations requires that "when a plan has been approved, discharges must be consistent with the terms and conditions of the plan." Pursuant to Section

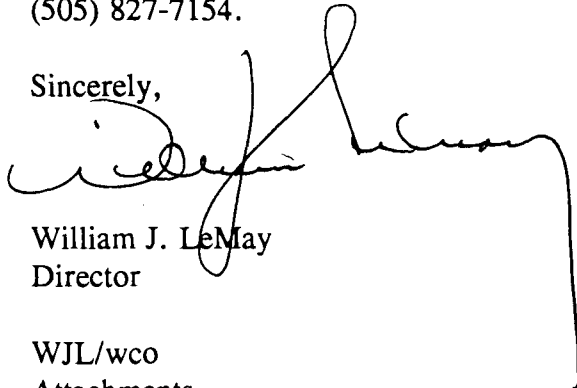
Mr. Robert J. Menzie  
May 9, 1996  
Page 2

3107.C. Marathon is required to notify the Director of any facility expansion, production increase, or process modification that would result in any change in the discharge of water quality or volume.

The discharge plan modification application for the Marathon Indian Basin Gas Plant is subject to WQCC Regulation 3114. Every billable facility submitting a discharge plan modification will be assessed a fee equal to the filing fee of \$50 plus one half of the flat fee or \$1,667.50 for gas processing plants. The \$50 filing fee was received by the OCD on January 19, 1996. The OCD has not received the flat fee of \$1,667.50 which may be paid in a single payment due on the date of the discharge plan modification or in equal installments over the remaining duration of the discharge plan. Installment payments shall be remitted yearly, with the first installment due on the date of the discharge plan approval and subsequent installments due on this date of each calendar year.

On behalf of the staff of the OCD, I wish to thank you and your staff for your cooperation during this discharge plan review. If you have any questions, please contact Bill Olson of my staff at (505) 827-7154.

Sincerely,

A handwritten signature in black ink, appearing to read 'William J. LeMay', is written over the typed name and title. The signature is fluid and cursive, with a long horizontal stroke extending to the right.

William J. LeMay  
Director

WJL/wco  
Attachments

xc: OCD Artesia Office

ATTACHMENT TO THE DISCHARGE PLAN MODIFICATION GW-21 APPROVAL  
MARATHON INDIAN BASIN GAS PLANT  
DISCHARGE PLAN MODIFICATION REQUIREMENTS  
(May 8, 1996)

1. Payment of Discharge Plan Fees: The \$1,667.50 flat fee shall be submitted upon receipt of this approval. The required flat fee may be paid in a single payment due at the time of approval, or in equal annual installments over the remaining duration of the plan, with the first payment due upon receipt of this approval.
2. Marathon Commitments: Marathon will abide by all commitments submitted in the Discharge plan modification application dated January 15, 1996; and additional information dated April 18, 1996.
3. Drum Storage: All drums containing materials other than fresh water must be stored on an impermeable pad and curb type containment. All empty drums should be stored on their sides with the bungs in place and lined up on a horizontal plane. Chemicals in other containers such as sacks or buckets should also be stored on an impermeable pad and curb type containment.
4. Process Areas: All process and maintenance areas which show evidence that leaks and spills are reaching the ground surface must be either paved and curbed or have some type of spill collection device incorporated into the design.
5. Above Ground Tanks: All above ground tanks which contain fluids other than fresh water must be bermed to contain a volume of one-third more than the total volume of the largest tank or of all interconnected tanks. All new facilities or modifications to existing facilities must place the tank on an impermeable type pad.
6. Above Ground Saddle Tanks: Above ground saddle tanks must have impermeable pad and curb type containment unless they contain fresh water or fluids that are gases at atmospheric temperature and pressure.
7. Tank Labeling: All tanks should be clearly labeled to identify their contents and other emergency information necessary if the tank were to rupture, spill, or ignite.
8. Below Grade Tanks/Sumps: All below grade tanks, sumps, and pits must be approved by the OCD prior to installation or upon modification and must incorporate secondary containment and leak-detection into the design. All pre-existing sumps and below-grade tanks must demonstrate integrity on an annual basis. Integrity tests include pressure testing to 3 pounds per square inch above normal operating pressure and/or visual inspection of

Mr. Robert J. Menzie  
May 9, 1996  
Page 4

cleaned out tanks /or sumps.

9. Underground Process/Wastewater Lines: All underground process/wastewater pipelines must be tested to demonstrate their mechanical integrity at present and then every 5 years there after. Permittees may propose various methods for testing such as pressure testing to 3 pounds per square inch above normal operating pressure or other means acceptable to the OCD.
10. Housekeeping: All systems designed for spill collection/prevention should be inspected to ensure proper operation and to prevent overtopping or system failure.
11. Spill Reporting: All spills/releases or exceedances of WQCC standards in the injected effluent shall be reported pursuant to OCD Rule 116 and WQCC 1203 to the OCD Santa Fe Office.
12. Transfer of Discharge Plan: The OCD will be notified prior to any transfer of ownership, control, or possession of a facility with an approved discharge plan. A written commitment to comply with the terms and conditions of the previously approved discharge plan must be submitted by the purchaser and approved by the OCD prior to transfer.
13. Closure: The OCD will be notified when operations of the facility are discontinued for a period in excess of six months. Prior to closure of the facility a closure plan will be submitted for approval by the Director. Closure and waste disposal will be in accordance with the statutes, rules and regulations in effect at the time of closure.
14. Treatment System Monitoring: Marathon will sample and analyze the treatment system effluent on a monthly basis for benzene, toluene, ethylbenzene and xylenes (BTEX) and on a quarterly basis for major cations/anions and polynuclear aromatic hydrocarbons using appropriate EPA methods. The results of these sampling events will be included in the quarterly ground water remediation monitoring reports for the facility.

15. Conditions accepted by:

  
Company Representative

5/18/96  
Date

Title **PRODUCTION MANAGER**  
**MIDLAND OPERATIONS**



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 9, 1996

**CERTIFIED MAIL**  
**RETURN RECEIPT NO. P-269-269-144**

Mr. Robert J. Menzie  
Marathon Oil Company  
P.O. Box 552  
Midland, Texas 79702-0552

**RE: Discharge Plan GW-21 Modification  
Indian Basin Gas Plant  
Eddy County, New Mexico**

Dear Mr. Menzie:

The groundwater discharge plan modification, GW-21, for Marathon's Indian Basin Gas Plant Facility located in the NE/4 of Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico, **is hereby approved** under the conditions contained in the enclosed attachment. The application consists of the discharge plan modification application dated January 15, 1996; and the amended modification dated April 18, 1996. Enclosed are two copies of the conditions of approval. **Please sign and return one copy to the New Mexico Oil Conservation Division (OCD) Santa Fe Office within five working days of receipt of this letter.**

The discharge plan modification application was submitted pursuant to Section 3109.F of the Water Quality Control Commission (WQCC) Regulations. It is approved pursuant to Section 3109.A. Please note Section 3109.F., which provides for possible future amendments or modifications of the plan. Please be advised that approval of this plan does not relieve Marathon of liability should operations result in pollution of surface or ground waters, or the environment.

Please be advised that all exposed pits, including lined pits and open top tanks (exceeding 16 feet in diameter) shall be screened, netted, or otherwise rendered nonhazardous to wildlife including migratory birds.

Please note that Section 3104 of the regulations requires that "when a plan has been approved, discharges must be consistent with the terms and conditions of the plan." Pursuant to Section

Mr. Robert J. Menzie

May 9, 1996

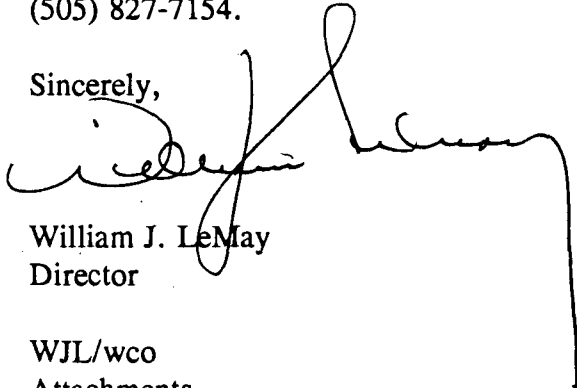
Page 2

3107.C. Marathon is required to notify the Director of any facility expansion, production increase, or process modification that would result in any change in the discharge of water quality or volume.

The discharge plan modification application for the Marathon Indian Basin Gas Plant is subject to WQCC Regulation 3114. Every billable facility submitting a discharge plan modification will be assessed a fee equal to the filing fee of \$50 plus one half of the flat fee or \$1,667.50 for gas processing plants. The \$50 filing fee was received by the OCD on January 19, 1996. The OCD has not received the flat fee of \$1,667.50 which may be paid in a single payment due on the date of the discharge plan modification or in equal installments over the remaining duration of the discharge plan. Installment payments shall be remitted yearly, with the first installment due on the date of the discharge plan approval and subsequent installments due on this date of each calendar year.

On behalf of the staff of the OCD, I wish to thank you and your staff for your cooperation during this discharge plan review. If you have any questions, please contact Bill Olson of my staff at (505) 827-7154.

Sincerely,



William J. LeMay  
Director

WJL/wco  
Attachments

xc: OCD Artesia Office



ATTACHMENT TO THE DISCHARGE PLAN MODIFICATION GW-21 APPROVAL  
MARATHON INDIAN BASIN GAS PLANT  
DISCHARGE PLAN MODIFICATION REQUIREMENTS  
(May 8, 1996)

1. Payment of Discharge Plan Fees: The \$1,667.50 flat fee shall be submitted upon receipt of this approval. The required flat fee may be paid in a single payment due at the time of approval, or in equal annual installments over the remaining duration of the plan, with the first payment due upon receipt of this approval.
2. Marathon Commitments: Marathon will abide by all commitments submitted in the Discharge plan modification application dated January 15, 1996; and additional information dated April 18, 1996.
3. Drum Storage: All drums containing materials other than fresh water must be stored on an impermeable pad and curb type containment. All empty drums should be stored on their sides with the bungs in place and lined up on a horizontal plane. Chemicals in other containers such as sacks or buckets should also be stored on an impermeable pad and curb type containment.
4. Process Areas: All process and maintenance areas which show evidence that leaks and spills are reaching the ground surface must be either paved and curbed or have some type of spill collection device incorporated into the design.
5. Above Ground Tanks: All above ground tanks which contain fluids other than fresh water must be bermed to contain a volume of one-third more than the total volume of the largest tank or of all interconnected tanks. All new facilities or modifications to existing facilities must place the tank on an impermeable type pad.
6. Above Ground Saddle Tanks: Above ground saddle tanks must have impermeable pad and curb type containment unless they contain fresh water or fluids that are gases at atmospheric temperature and pressure.
7. Tank Labeling: All tanks should be clearly labeled to identify their contents and other emergency information necessary if the tank were to rupture, spill, or ignite.
8. Below Grade Tanks/Sumps: All below grade tanks, sumps, and pits must be approved by the OCD prior to installation or upon modification and must incorporate secondary containment and leak-detection into the design. All pre-existing sumps and below-grade tanks must demonstrate integrity on an annual basis. Integrity tests include pressure testing to 3 pounds per square inch above normal operating pressure and/or visual inspection of

cleaned out tanks /or sumps.

9. Underground Process/Wastewater Lines: All underground process/wastewater pipelines must be tested to demonstrate their mechanical integrity at present and then every 5 years there after. Permittees may propose various methods for testing such as pressure testing to 3 pounds per square inch above normal operating pressure or other means acceptable to the OCD.
10. Housekeeping: All systems designed for spill collection/prevention should be inspected to ensure proper operation and to prevent overtopping or system failure.
11. Spill Reporting: All spills/releases or exceedances of WQCC standards in the injected effluent shall be reported pursuant to OCD Rule 116 and WQCC 1203 to the OCD Santa Fe Office.
12. Transfer of Discharge Plan: The OCD will be notified prior to any transfer of ownership, control, or possession of a facility with an approved discharge plan. A written commitment to comply with the terms and conditions of the previously approved discharge plan must be submitted by the purchaser and approved by the OCD prior to transfer.
13. Closure: The OCD will be notified when operations of the facility are discontinued for a period in excess of six months. Prior to closure of the facility a closure plan will be submitted for approval by the Director. Closure and waste disposal will be in accordance with the statutes, rules and regulations in effect at the time of closure.
14. Treatment System Monitoring: Marathon will sample and analyze the treatment system effluent on a monthly basis for benzene, toluene, ethylbenzene and xylenes (BTEX) and on a quarterly basis for major cations/anions and polynuclear aromatic hydrocarbons using appropriate EPA methods. The results of these sampling events will be included in the quarterly ground water remediation monitoring reports for the facility.
15. Conditions accepted by:

\_\_\_\_\_  
Company Representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
Title

CONSERVATION DIVISION  
RECEIVED



**Marathon  
Oil Company**

1996 APR 22

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

April 18, 1996

Mr. Mark Ashley  
Oil Conservation Division  
2040 Pacheco St.  
Santa Fe, New Mexico 87501

RECEIVED

APR 22 1996

RE: Indian Basin Gas Plant  
Groundwater Discharge Plan (GW-21) Amended Modification

Environmental Bureau  
Oil Conservation Division

Dear Mr. Ashley:

Attached are three copies of an amended modification to the Indian Basin Gas Plant Groundwater Discharge Plan (GW-21) submitted by Marathon Oil Company on behalf of the Indian Basin Gas Plant owners for your review and approval. The discharge plan modification is necessary to permit the addition of a treated groundwater infiltration system. This document includes the following changes to the original modification document dated January 15, 1996:

- 1) the locations of two infiltration wells (IW-1 and IW-2);
- 2) the location of the underground discharge (infiltration) pipeline to Lower Queen infiltration wells, IW-1 and IW-2;
- 3) the addition of third aboveground tank at the treatment compound;
- 4) the addition of a second air stripper at the treatment compound; and,
- 5) installation of the carbon filtration system will be dependent on whether air stripping is effective in treating the discharge (infiltration) water to less than New Mexico Water Quality Control Commission Groundwater Quality Standards (Section 3-103).

If you have any questions concerning the discharge plan, please call me.

Sincerely,

A handwritten signature in cursive script that reads 'Robert J. Menzie, Jr.'.

Robert J. Menzie, Jr.  
Advanced Environmental & Safety Representative

c: T. L. Guillory  
F. D. Searle  
R. F. Unger

File: 556-01

**MARATHON OIL COMPANY  
INDIAN BASIN GAS PLANT  
GROUNDWATER DISCHARGE PLAN (GW-21) MODIFICATION**

Submitted on behalf of the working interest owners to  
State of New Mexico  
Energy, Minerals and Natural Resources Department  
Oil Conservation Division

**April 18, 1996**

## **INTRODUCTION**

This Groundwater Discharge Plan modification is to address the addition of a treated groundwater infiltration system at the Indian Basin Gas Plant which includes up to two Lower Queen infiltration wells (IW-1 and IW-2), up to two Shallow zone infiltration wells (MW-45 and MW-51), an underground groundwater collection pipeline to the water treatment compound, an underground treated groundwater discharge pipeline to the two Lower Queen infiltration wells, an aboveground treated water discharge pipeline to MW-45, and an underground pipeline conveying treated water to MW-51. This document is an amendment to the existing Groundwater Discharge Plan document dated November 26, 1994, as approved.

## **TYPE OF OPERATION**

A discharge system to collect and treat hydrocarbon-contaminated groundwater and infiltrate (discharge) the treated water into wells completed within the Shallow alluvial and Lower Queen aquifers.

## **OPERATOR/LEGALLY RESPONSIBLE PARTY & LOCAL REPRESENTATIVE**

No change from approved Groundwater Discharge Plan dated November 26, 1994.

## **LOCATION OF FACILITY**

Figures 1 and 2 show the locations of the various components of the infiltration system. The two Lower Queen infiltration wells (IW-1 and IW-2) are located on Bureau of Land Management (BLM) property in the northeast 1/4 of Section 26, Township 21S, Range 23E, in Eddy County, New Mexico. Shallow zone infiltration wells MW-45 and MW-51, the aboveground treated water discharge pipeline to MW-45, and the underground pipeline conveying treated water to MW-51 are located on Marathon's Indian Basin Gas Plant property in the northeast 1/4 of Section 23, Township 21S, Range 23E. The underground gathering pipeline conveying hydrocarbon-contaminated groundwater to the water treatment compound is located on both BLM and the Indian Basin Gas Plant property in Sections 23, 24, and 25, Township 21S, Range 23E. The treated groundwater underground discharge pipeline to the two Lower Queen infiltration wells is located on both BLM and Indian Basin Gas Plant property in Section 23 and 26, Township 21S, Range 23E.

## **LANDOWNER**

The landowner of the Indian Basin Gas Plant property has not changed from approved Groundwater Discharge Plan dated November 26, 1994; however, two underground pipelines and the two Lower Queen infiltration wells are located on BLM property.

## **FACILITY DESCRIPTION**

Figures 1 and 2 show the specific facilities associated with the treatment of hydrocarbon-contaminated groundwater and infiltration into the Shallow alluvial and Lower Queen aquifers. The treatment compound facilities include an underground gathering pipeline, two air strippers, and carbon vessels, if needed. The infiltration system consists of two underground discharge pipelines (one to MW-51; one to IW-1 and IW-2), an aboveground discharge pipeline (to MW-45), two Shallow alluvial infiltration wells, and up to two Lower Queen infiltration wells.

## **SOURCES AND QUANTITIES OF EFFLUENTS & WASTE SOLIDS**

### Effluents

The two effluents of the infiltration system are: 1) hydrocarbon-contaminated groundwater; and, 2) treated water cleaned to less than New Mexico Water Quality Control Commission (WQCC) groundwater quality standards described in the WQCC Regulations in Section 3-103. The quantity of hydrocarbon-contaminated groundwater gathered in the underground pipeline is approximately 6857 barrels per day (bbl/day) or 200 gallons per minute (gpm). The quantity of treated water infiltrated into the Lower Queen aquifer via the two infiltration wells will range from 0 to 150 gpm. The quantity of treated water infiltrated into the Shallow alluvial aquifer via the two infiltration wells will range from 0 to 50 gpm. The water that is not infiltrated into either aquifer will be used as plant process water or diverted to one of the Class II disposal wells as described in the approved Groundwater Discharge Plan dated November 26, 1994.

### Waste Solid

The waste solid generated from the infiltration system is spent carbon contained within the vessels. This waste will be recycled by a carbon regeneration service company. Regenerated carbon will be used to replace the spent carbon. If disposal of spent carbon is required, appropriate analytical tests will be performed to properly characterize the waste for disposal.

## **EFFLUENT AND SOLID WASTE QUALITY CHARACTERISTICS**

### Effluent

Appendix A is an October 1995 laboratory analysis report of the two effluents: 1) hydrocarbon-contaminated groundwater in the underground gathering pipeline which was sampled from the air stripper inlet (stripper inlet); and, 2) treated groundwater sampled at the outlet of the air stripper (stripper outlet). Appendix B contains an April 1995 laboratory analysis report of the treated groundwater from a sample collected at the outlet of the air stripper and provides full-suite analyses of WQCC groundwater quality standards.

### Waste

No laboratory analysis is available for spent carbon because the system has not been constructed yet. Under current plans, spent carbon will be recycled via a regeneration service. Analysis of spent carbon will be performed if waste characterization is required for disposal. The laboratory report will be kept on file at the gas plant.

## **TRANSFER AND STORAGE OF PROCESS FLUIDS AND EFFLUENTS**

Transfer of hydrocarbon-contaminated groundwater is by an underground gathering pipeline. Transfer of treated water is by both aboveground and underground pipelines. Storage of hydrocarbon-contaminated groundwater prior to treatment by air stripping and carbon was previously in two aboveground steel tanks that are described in the approved Groundwater Discharge Plan dated November 26, 1994. A third aboveground tank and a second air stripper will be installed at the treatment compound. Figure 2 is a generalized flow schematic of the gathering, storage, treatment, and discharge (infiltration) system.

Discharges of effluents can occur throughout the system. Spills from the two air strippers, three storage tanks, or carbon vessels at the treatment compound are within an unlined secondary containment. Containment is afforded by an earthen berm that is capable of containing 133% of the storage tank volume.

### Underground Pipelines

The infiltration system includes two underground pipelines. The pipelines will be hydrostatically integrity tested after initial construction to maintain 5 pounds per square inch (psi) above normal operating pressure for a duration of 4 hours. For polyethylene lines, integrity will be verified by visual inspection of pressured line. Results of the pressure tests will be kept on file at the gas plant.

## **EFFLUENT DISPOSAL**

### Infiltration Wells

Hydrocarbon-contaminated groundwater will be treated water to less than WQCC groundwater quality standards at the treatment compound by air stripping. If air stripping does not reduce the concentration of contaminants in the treated water to less than WQCC groundwater quality standards, a carbon system will be installed to remove the residual contamination in the treated water stream. Following treatment, the treated water will be infiltrated into the Shallow alluvial and/or Lower Queen aquifers as previously described. Up to 200 gpm of treated water will be infiltrated into the Lower Queen aquifer through wells IW-1 and IW-2. Up to 50 gpm of treated water will be infiltrated into the Shallow alluvial aquifer via wells MW-45 and MW-51. The proposed well construction diagrams for IW-1 and IW-2 and the well completion diagrams for wells MW-45 and MW-51 are included in Appendix C. Construction of these

wells will confine the infiltration (recharge) of treated water to the zone of completion.

Overflow of treated water from infiltration wells will be prevented by installation of a high level shut-off mechanism. This will prevent treated water from flowing out of the casing and onto the ground.

Monitoring of the treated water effluent will be conducted on a monthly basis to ensure that water treatment to less than WQCC groundwater quality standards is accomplished by air stripping (and carbon filtration if required). Water samples will be collected at the outlet of both air strippers (or after carbon vessels if required) prior to the treated water entering the discharge pipelines that convey the treated water to the infiltration wells. The water samples will be analyzed for benzene, ethylbenzene, toluene, and total xylenes by Environmental Protection Agency Method 8020. Monthly laboratory reports of treated water samples will be kept on file at the gas plant. If the laboratory report indicates that WQCC groundwater standards have been exceeded, the OCD will be notified.

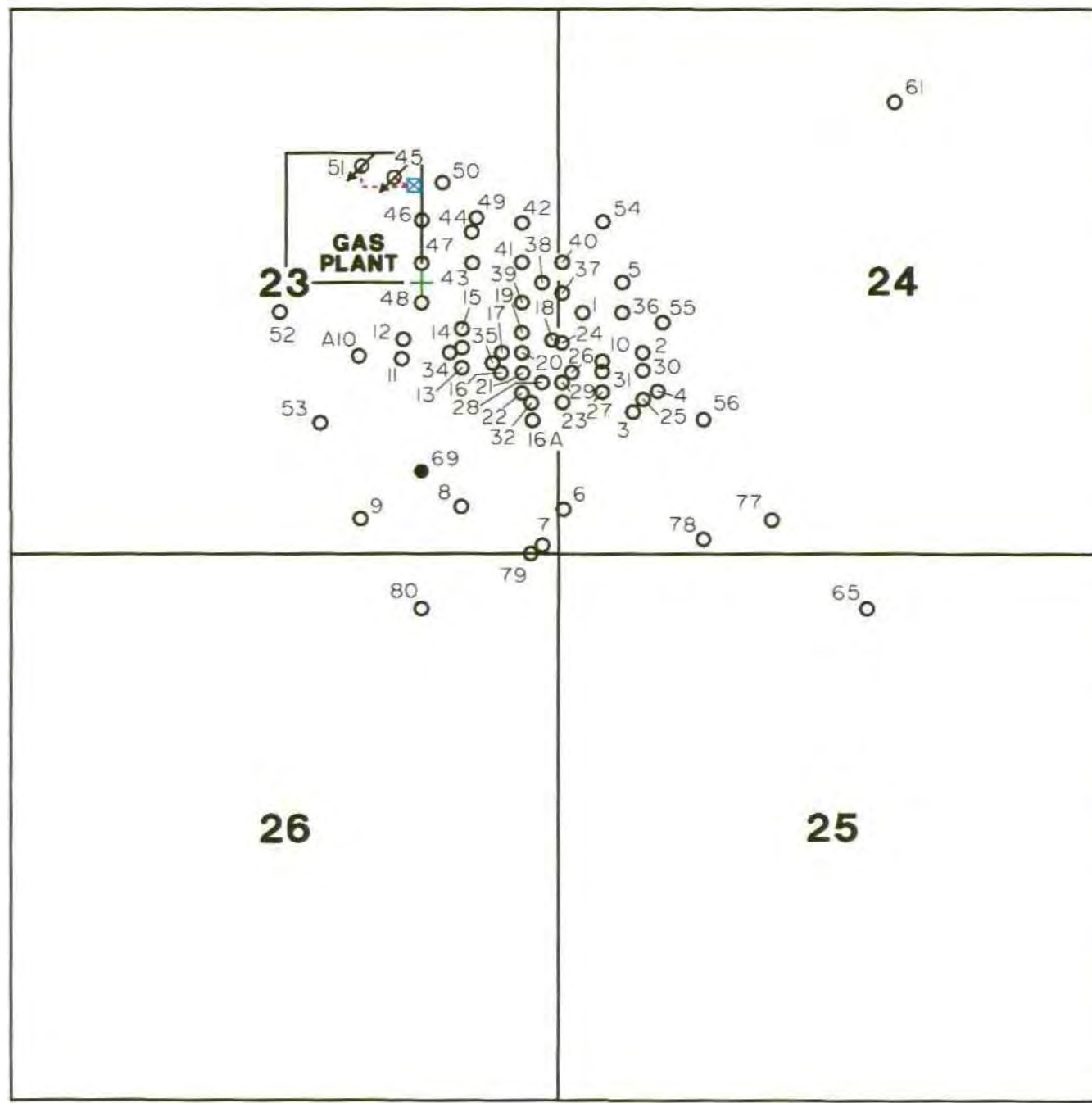
#### **INSPECTION, MAINTENANCE AND REPORTING**

Inspections of the underground pipeline right-of-way will be conducted to search for moist soils or staining that may indicate a potential pipeline leak. In addition, flow meters will be placed on both ends of the pipeline for daily comparison purposes to detect potential pipeline leaks. An apparent leak will be investigated immediately. A confirmed leak will be reported to the OCD according to WQCC Regulations.



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21  
S



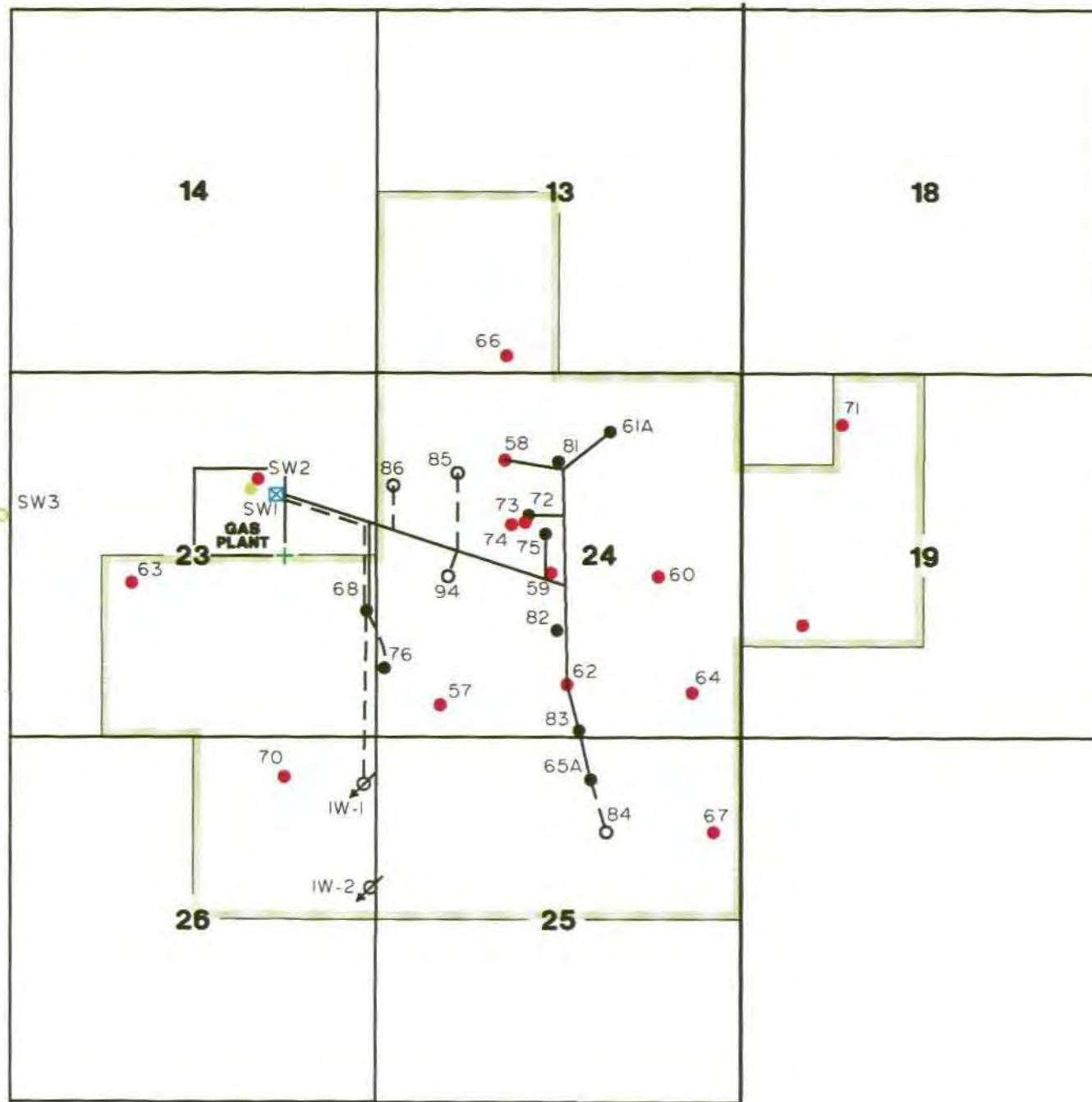
- RECOVERY WELL
- MONITOR WELL
- ⊠ TREATMENT COMPOUND
- - - PROPOSED DISCHARGE LINE
- + 0.0 REFERENCE POINT
- ⊗ PROPOSED INFILTRATION WELL



MARATHON OIL COMPANY	MID-CONTINENT REGION
<b>INDIAN BASIN GAS PLANT</b> EDDY COUNTY, NEW MEXICO	
<b>REMEDATION PROJECT FIGURE 1. SHALLOW ZONE</b>	
ORIGINAL SCALE: 1" = 750'	DATE: 4/78
AUTHOR: T PRICE	REVISED
DRAFTED BY: SB	PROJECT
FILE LOC: 80MENA44BAP OPR	

R 23 E

R 24 E

T  
21  
S

## PHASE 1

- EXISTING RECOVERY WELL
- PROPOSED RECOVERY WELL
- EXISTING MONITOR WELL
- PROPOSED SUPPLY WELL
- ⊗ PROPOSED INFILTRATION WELL



ROW

- + 0,0 REFERENCE POINT
- ⊗ TREATMENT COMPOUND



MARATHON OIL COMPANY	MID-CONTINENT REGION
<b>INDIAN BASIN GAS PLANT</b> EDDY COUNTY, NEW MEXICO	
<b>REMEDATION PROJECT FIGURE 2. LOWER QUEEN</b>	
ORIGINAL SCALE 1" = 400'	DATE 2/78
AUTHOR T.P.R.	REVISED 3/78
DRAFTED BY SB	PROJECT
FILE LOC. @MENA22 RUP OPER	

**APPENDIX A**

**LABORATORY ANALYSIS OF HYDROCARBON-CONTAMINATED  
GROUNDWATER EFFLUENT**

(previously submitted in original modification document dated 1-15-96)

## **APPENDIX B**

### **LABORATORY ANALYSIS OF TREATED WATER EFFLUENT**

(previously submitted in original modification document dated 1-15-96)

**APPENDIX C**  
**WELL COMPLETION DIAGRAMS**

(previously submitted in original modification document dated 1-15-96)

STATE OF  
NEW MEXICO

OIL  
CONSERVATION  
DIVISION



MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone

☐ Personal

Time

10:00AM

Date

4-8-96

Originating Party

MARK ASKLEY

Other Parties

BOB MENZIE

Place

INDIAN BOSTON GW-21

Discussion

BOB WANTS TO AMEND THE MODIFICATION

Conclusions or Agreements

HE WILL SUBMIT A LETTER WITH AMENDMENTS

Signature

Signed

Mark Askley



**Marathon  
Oil Company**

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

January 15, 1996

Mr. Roger C. Anderson  
Environmental Bureau Chief  
Oil Conservation Division  
2040 Pacheco St.  
Santa Fe, New Mexico 87501

RE: Indian Basin Gas Plant  
Groundwater Discharge Plan (GW-21) Modification

Dear Mr. Anderson:

Attached are three copies of a modification to the Indian Basin Gas Plant Groundwater Discharge Plan (GW-21) for your review and approval. The discharge plan modification is necessary to permit the addition of a treated groundwater injection system. This document is submitted by Marathon Oil Company on behalf of the Indian Basin Gas Plant owners. In addition, a check for the \$50 filing fee is enclosed. If you have any questions concerning the discharge plan, please call me.

Sincerely,

Robert J. Menzie, Jr.  
Advanced Environmental Representative

File: 556-01

**RECEIVED**  
JAN 19 1996  
Environmental Bureau  
Oil Conservation Division

**MARATHON OIL COMPANY  
INDIAN BASIN GAS PLANT  
GROUNDWATER DISCHARGE PLAN (GW-21) MODIFICATION**

Submitted on behalf of the working interest owners to  
State of New Mexico  
Energy, Minerals and Natural Resources Department  
Oil Conservation Division



## **INTRODUCTION**

This Groundwater Discharge Plan modification is to address the addition of a treated groundwater injection system at the Indian Basin Gas Plant which includes up to two Lower Queen injection wells (IW-1 and IW-2), up to two Shallow zone injection wells (MW-45 and MW-51), an underground groundwater collection pipeline to the water treatment compound, an underground treated groundwater discharge pipeline to the two Lower Queen injection wells, an aboveground treated water discharge pipeline to MW-45, and an underground pipeline conveying treated water to MW-51. This document is an amendment to the existing Groundwater Discharge Plan document dated November 26, 1994, as approved.

## **TYPE OF OPERATION**

A discharge system to collect and treat hydrocarbon-contaminated groundwater and inject (discharge) the treated water into wells completed within the Lower Queen and Shallow alluvial aquifers.

## **OPERATOR/LEGALLY RESPONSIBLE PARTY & LOCAL REPRESENTATIVE**

No change from approved Groundwater Discharge Plan dated November 26, 1994.

## **LOCATION OF FACILITY**

Figures 1 & 2 are maps showing the locations of the various components of the injection system. The two Lower Queen injection wells (IW-1 and IW-2) are located on Bureau of Land Management (BLM) property in the southeast 1/4 of Section 23, Township 21S, Range 23E, in Eddy County, New Mexico. Shallow zone injection wells MW-45 and MW-51, the aboveground treated water discharge pipeline to MW-45, and the underground pipeline conveying treated water to MW-51 are located on Marathon's Indian Basin Gas Plant property in the northeast 1/4 of Section 23, Township 21S, Range 23E. The underground gathering pipeline conveying hydrocarbon-contaminated groundwater to the water treatment compound is located on both BLM and the Indian Basin Gas Plant property in Sections 23, 24, and 25, Township 21S, Range 23E. The treated groundwater discharge underground pipeline to the two Lower Queen injection wells is located on both BLM and Indian Basin Gas Plant property in Section 23, Township 21S, Range 23E.

## **LANDOWNER**

The landowner of the Indian Basin Gas Plant property has not changed from the approved Groundwater Discharge Plan dated November 26, 1994; however, two underground pipelines and the two Lower Queen injection wells are located on BLM property.

## **FACILITY DESCRIPTION**

Figures 1 & 2 show the specific facilities associated with the treatment of hydrocarbon-contaminated groundwater and injection into the Shallow zone and Lower Queen aquifers. The treatment compound facilities will include all underground gathering pipeline, up to two air strippers, and activated carbon vessels. The injection system will consist of two underground discharge pipelines, an aboveground discharge pipeline, two Shallow zone injection wells, and two Lower Queen injection wells.

## **SOURCES AND QUANTITIES OF EFFLUENTS & WASTE SOLIDS**

### Effluents

The two effluents of the injection system are: 1) hydrocarbon-contaminated groundwater; and, 2) treated water cleaned to New Mexico Water Quality Control Commission (WQCC) standards described in the WQCC Regulations in Section 3-103. The quantity of hydrocarbon-contaminated groundwater gathered in the underground pipeline will be approximately 6857 bbl/day or 200 gpm. The quantity of treated water injected into the Lower Queen aquifer via the two injection wells will range from 0 to 200 gpm. The quantity of treated water injected into the Shallow zone aquifer via the two injection wells will range from 0 to 50 gpm. The water that is not injected into either aquifer will be used as plant process water or diverted to one of the Class II disposal wells as described in the approved Groundwater Discharge Plan.

### Waste Solid

The waste solid generated from the injection system is spent activated carbon contained within the vessels. This waste will be recycled by a carbon regeneration service company. Regenerated carbon will be used to replace the spent carbon. If disposal of spent activated carbon is required, appropriate analytical tests will be performed to properly characterize the waste for disposal.

## **EFFLUENT AND SOLID WASTE QUALITY CHARACTERISTICS**

### Effluent

Appendix A is an October 1995 laboratory report containing analyses of the hydrocarbon-contaminated groundwater gathered in the underground pipeline going into the air stripper (stripper inlet) and of treated water exiting the air stripper (stripper outlet). Appendix B contains an April 1995 laboratory analysis report of the treated groundwater from a sample collected at the

outlet of the air stripper and provides full suite analysis of parameters contained in the WQCC groundwater standards.

#### Waste

No laboratory analysis is available for spent activated carbon because the system has not been constructed yet. Under current plans, spent activated carbon will be recycled via a regeneration service. Analysis will be performed when required to characterize for disposal. The laboratory report will be kept on file at the gas plant.

### **TRANSFER AND STORAGE OF PROCESS FLUIDS AND EFFLUENTS**

Transfer of hydrocarbon-contaminated groundwater is by an underground gathering pipeline. Transfer of treated water is by both aboveground and underground pipelines. Storage of hydrocarbon-contaminated groundwater prior to treatment by air stripping and activated carbon is in aboveground steel tanks as described in the approved Groundwater Discharge Plan. Figure 2 is a generalized flow schematic of the gathering, storage, treatment, and discharge (injection) system.

Discharges of effluents can occur throughout the system. Discharges from the air stripper, storage tanks, or carbon vessels at the treatment compound are within an unlined secondary containment. Containment is afforded by an earthen berm that is capable of containing 133% of the storage tank volume.

#### Underground Pipelines

The injection system includes two underground pipelines. The pipelines will be hydrostatically tested after initial construction; integrity will be demonstrated by maintaining 5 psi above normal operating pressure for a duration of four hours. For polyethylene lines, integrity will be verified by visual inspection of pressured line. Results of the pressure tests will be kept on file at the gas plant.

### **EFFLUENT DISPOSAL**

Hydrocarbon-contaminated groundwater will be treated to WQCC standards at the treatment compound by the air stripper/activated carbon system. Treated water will then be injected into the Lower Queen and/or Shallow zone aquifers as previously described. Up to 200 gpm of treated water will be injected into the Lower Queen aquifer through wells IW-1 and IW-2. Up to 50 gpm of treated water into the Shallow zone aquifer via wells MW-45 and MW-51. The proposed well construction diagrams for IW-1 and IW-2 and the well completion diagrams for wells MW-45 and MW-51 are included in Appendix C. Construction of these wells will confine the injection (recharge) of treated water to the zone of completion.

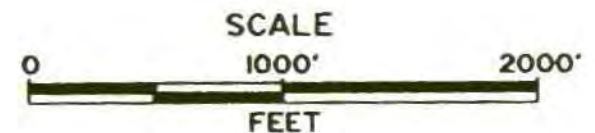
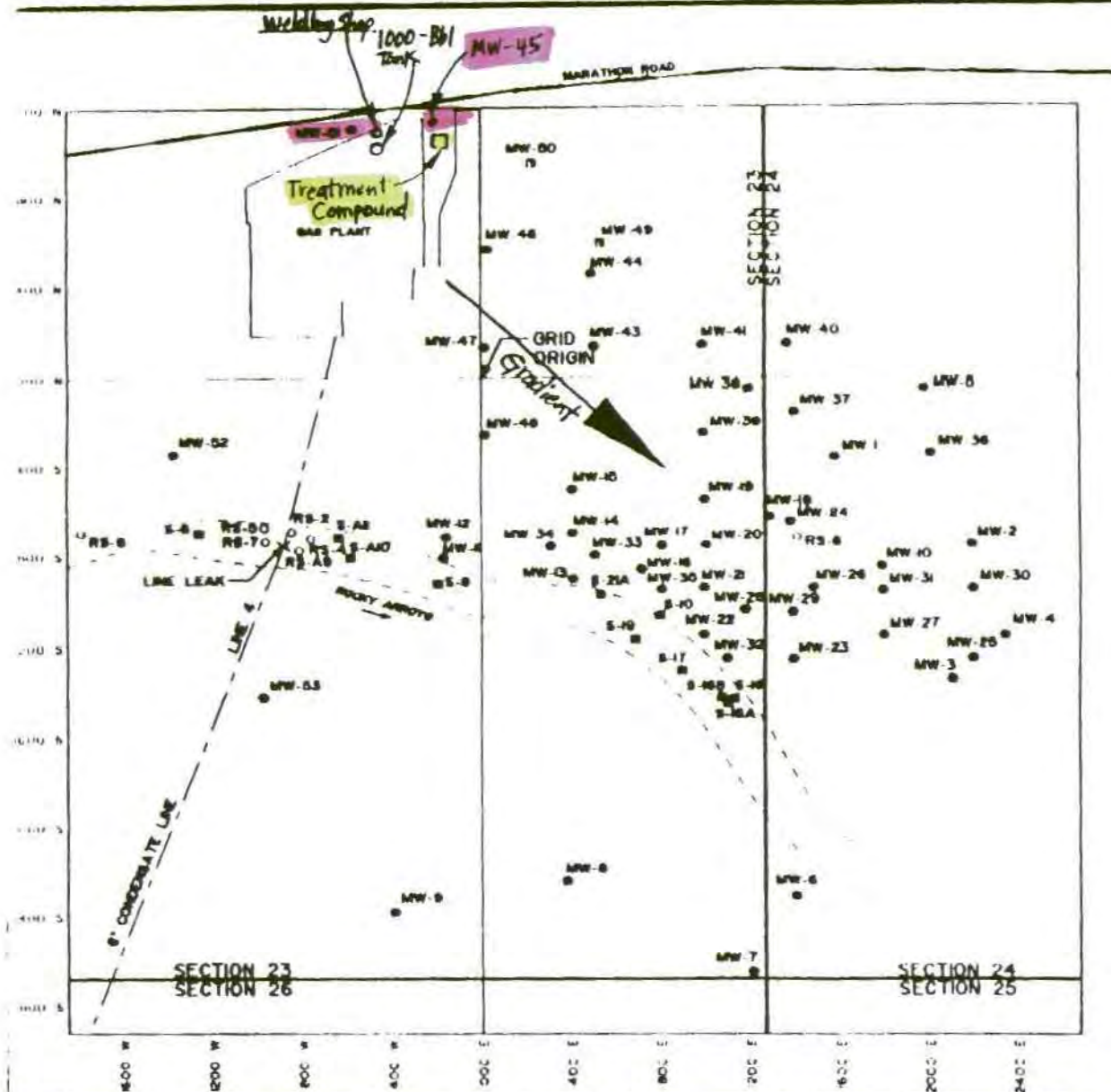
Overflow of treated water from injection wells will be prevented by installation of a high level shut-off mechanism at 10 feet below the top of the wellhead casing. This will prevent treated water from flowing out of the casing and onto the ground.

Monitoring of the treated water effluent will be conducted on a monthly basis to ensure that treatment to WQCC groundwater standards is being accomplished by the air stripper and activated carbon. Water samples will be collected at the outlet of the last treatment equipment (i.e., the air stripper or the activated carbon vessel) prior to the treated water entering the discharge pipelines that convey the treated water to the injection wells. The water samples will be analyzed for benzene, ethylbenzene, toluene, and total xylenes by Environmental Protection Agency Method 8020. Monthly laboratory reports of treated water samples will be kept on file at the gas plant. If the laboratory report indicates that WQCC groundwater standards have been exceeded, the OCD will be notified.

#### **INSPECTION, MAINTENANCE AND REPORTING**

Inspections of the underground pipeline right-of-way will be conducted to search for moist soils or staining that may indicate a potential pipeline leak. In addition, flow meters will be placed on either end of the pipeline for daily comparison purposes to detect potential pipeline leaks. An apparent leak will be investigated immediately. A confirmed leak of contaminated water will be reported to the OCD according to WQCC Regulations.

# INDIAN BASIN GAS PLANT ARTESIA, NEW MEXICO



## LEGEND

- MW-# SHALLOW ALLUVIAL GROUNDWATER MONITORING WELL
- RS-# 4 INCH PVC RECOVERY SUMP
- S-# 24 INCH GALVANIZED RECOVERY SUMP

Figure 1		MARATHON OIL COMPANY	
Location		INDIAN BASIN GAS PLANT	
Shallow zone Base		DATE	PREPARED BY
		CHECKED BY	DRAFTED BY
		PROJECT NO.	FIGURE NO.

# EXPLANATION

◆ MONITOR WELL

- - - CONDENSATE LINE

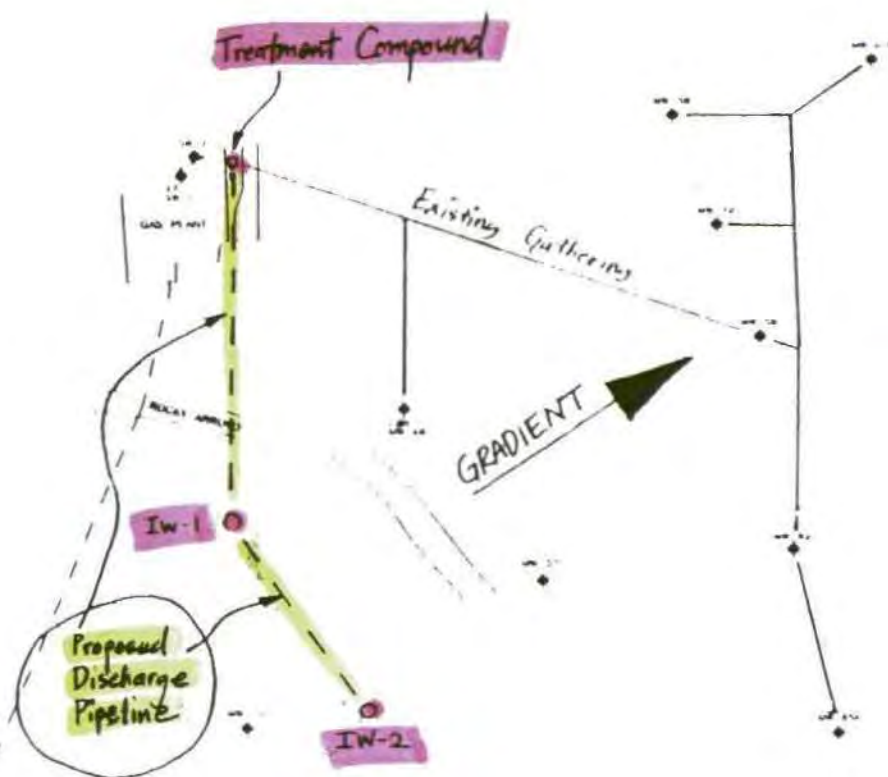


0 1000 2000  
APPROX. SCALE IN FEET

**MARATHON OIL COMPANY**  
INDIAN BASIN GAS PLANT SITE  
INDIAN BASIN, NEW MEXICO  
02335V112

DRAWN BY: Dacre Bush DATE: 05-11-84  
DRAFTED BY: DEN HOLMES DATE: 05-20-84  
CHECKED BY: DATE:

Figure 2



**APPENDIX A**

**LABORATORY ANALYSIS OF HYDROCARBON-CONTAMINATED  
GROUNDWATER EFFLUENT**



Analytical**Technologies**, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107  
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. 510345

October 26, 1995

Marathon Oil Company  
P.O. Box 552  
Midland, TX 79702

Project Name/Number: IB REMEDIATION 44999

Attention: Bob Menzie

On 10/13/95, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 325.3 analyses were performed by Analytical Technologies, Inc., 11 East Olive Road, Pensacola, FL.

All other analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Kimberly D. McNeill  
Project Manager

H. Mitchell Rubenstein, Ph.D.  
Laboratory Manager

MR:jt

Enclosure





Analytical Technologies, Inc.

CLIENT : MARATHON OIL CO.

DATE RECEIVED : 10/13/95

PROJECT # : 44999

PROJECT NAME : IB REMEDIATION

REPORT DATE : 10/26/95

ATI ID: 510345

	ATI ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	510345-01	SW-1	AQUEOUS	10/12/95
02	NA	STRIPPER INLET	AQUEOUS	10/12/95
03	NA	STRIPPER OUTLET	AQUEOUS	10/12/95
04	510345-04	LYMAN	AQUEOUS	10/12/95
05	510345-05	ARROYO	AQUEOUS	10/12/95
06	510345-06	BIEBBLE	AQUEOUS	10/12/95
07	NA	TRIP BLANK	AQUEOUS	10/05/95

---TOTALS---

<u>MATRIX</u>	<u>#SAMPLES</u>
AQUEOUS	7

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 510280  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 510345  
Project Name: MARATHON OIL  
Project Location: INDIAN BASIN REMEDIATION-MO  
Test: Group of Single Wetchem  
QcLevel: II

Parameter:	Unit:	Result:	R.L:	Batch:	Q:
Client ID: 510345-01			Lab ID: 001		
CHLORIDE (325.3)	MG/L	24	1	CIW040	
Comments:					
Client ID: 510345-04			Lab ID: 002		
CHLORIDE (325.3)	MG/L	12	2	CIW040	#
Comments:					
Client ID: 510345-05			Lab ID: 003		
CHLORIDE (325.3)	MG/L	14	2	CIW040	#
Comments:					
Client ID: 510345-06			Lab ID: 004		
CHLORIDE (325.3)	MG/L	13	2	CIW040	#
Comments:					



Analytical**Technologies**, Inc.

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 510280  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 510345  
Project Name: MARATHON OIL  
Project Location: INDIAN BASIN REMEDIATION-MO  
Test: Group of Single Wetchem

Client ID:	Lab Matrix: ID:	Date/Time Sampled:	Date Received:
510345-01	001 WATER	12-OCT-95 0958	14-OCT-95
510345-04	002 WATER	12-OCT-95 1015	14-OCT-95
510345-05	003 WATER	12-OCT-95 1025	14-OCT-95
510345-06	004 WATER	12-OCT-95 1035	14-OCT-95



Analytical**Technologies**, Inc.

"Method Report Summary"

Accession Number: 510280  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 510345  
Project Name: MARATHON OIL  
Project Location: INDIAN BASIN REMEDIATION-MO  
Test: Group of Single Wetchem

Client Sample Id:	Parameter:	Unit:	Result:
510345-01	CHLORIDE (325.3)	MG/L	24
510345-04	CHLORIDE (325.3)	MG/L	12
510345-05	CHLORIDE (325.3)	MG/L	14
510345-06	CHLORIDE (325.3)	MG/L	13



Analytical**Technologies**, Inc.

"WetChem Quality Control Report"

Parameter:	CHLORIDE
Batch Id:	CIW040
Blank Result:	<1
Anal. Method:	325.3
Prep. Method:	N/A
Analysis Date:	24-OCT-95
Prep. Date:	24-OCT-95

Sample Duplication

Sample Dup:	510279-13
Rept Limit:	<1

Sample Result:	9.31
Dup Result:	9.41
Sample RPD:	1
Max RPD:	6
Dry Weight%	N/A

Matrix Spike

Sample Spiked:	510279-13
Rept Limit:	<1
Sample Result:	9.31
Spiked Result:	59.5
Spike Added:	55.0
% Recovery:	91
% Rec Limits:	89-110
Dry Weight%	N/A

ICV

ICV Result:	94.9
True Result:	100.0
% Recovery:	95
% Rec Limits:	90-110

LCS

LCS Result:	
True Result:	
% Recovery:	
% Rec Limits:	



----- Common Footnotes Wet Chem -----

N/A = NOT APPLICABLE.  
N/S = NOT SUBMITTED.  
N/C = SAMPLE AND DUPLICATE RESULTS ARE AT OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RPD IS "NOT CALCULABLE" AND NO CONTROL LIMITS APPLY.  
ND = NOT DETECTED ABOVE REPORTING LIMIT.  
DISS. OR D = DISSOLVED  
T & D = TOTAL AND DISSOLVED  
R = REACTIVE  
T = TOTAL  
G = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE RESULT IS AT OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "IN CONTROL".  
Q = THE ANALYTICAL (POST-DIGESTION) SPIKE IS REPORTED DUE TO THE MATRIX (PRE-DIGESTION) SPIKE BEING OUTSIDE ACCEPTANCE LIMITS.  
# = ELEVATED REPORTING LIMIT DUE TO INSUFFICIENT SAMPLE.  
+ = ELEVATED REPORTING LIMIT DUE TO DILUTION INTO CALIBRATION RANGE.  
\* = ELEVATED REPORTING LIMIT DUE TO MATRIX INTERFERENCE.  
@ = ADJUSTED REPORTING LIMIT DUE TO SAMPLE MATRIX (DILUTION PRIOR TO PREPARATION).  
P = ANALYTICAL (POST-DIGESTION) SPIKE  
I = DUPLICATE INJECTION  
& = AUTOMATED  
F = SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.  
N/C+ = NOT CALCULABLE  
N/C\* = NOT CALCULABLE; SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.  
H = SAMPLE AND/OR DUPLICATE IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL".  
A = SAMPLE AND DUPLICATE RESULTS ARE "OUT OF CONTROL".  
Z = THE SAMPLE RESULT FOR THE SPIKE IS BELOW REPORTING LIMIT. HOWEVER, THIS RESULT IS REPORTED FOR ACCURATE QC CALCULATIONS.  
NH= SAMPLE AND / OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE RESULTS EXCEED THE ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL" SAMPLE IS NON-HOMOGENOUS.  
(\*) = DETECTION LIMITS RAISED DUE TO CLP METHOD NOT REQUIRING A CONCENTRATION STEP FOR CN.  
(CA) = SEE CORRECTIVE ACTIONS FORM.

SW-846, 3RD EDITION, SEPTEMBER 1986 AND REVISION 1, JULY 1992.  
EPA 600/4-79-020, REVISED MARCH 1983.  
STANDARD METHODS, 17TH ED., 1989  
NIOSH MANUAL OF ANALYTICAL METHODS, 3RD EDITION.  
ANNUAL BOOK OF ASTM STANDARDS, VOLUME 11.01, 1991.

1. COLIFORM. COLIFORM PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE LOGARITHM OF COLONIES PER 100 MLS OF SAMPLE ON DUPLICATE PLATES.
2. PH. PH PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND THE DUPLICATE ANALYSIS.
3. FLASHPOINT. FLASHPOINT PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE ANALYSIS. IF FLASHPOINT IS LESS THAN 25 DEGREES CELSIUS, THE DETECTION LIMIT BECOMES THE INITIAL STARTING TEMPERATURE.

RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION).

RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.

DPH = DOLLY P. HWANG	SG = SCOTT GRESHAM	RB = REBECCA BROWN
TT = TONY TINEO	NSB = NANCY S. BUTLER	FB = FREDDIE BROWN
MM = MARY MOLONEY	CF = CHRISTINE FOSTER	HN = HONG NGUYEN
GJ = GARY JACOBS		



Analytical **Technologies, Inc.**

### GAS CHROMATOGRAPHY RESULTS

TEST : BTEX (EPA 8020)  
CLIENT : MARATHON OIL CO. ATI I.D.: 510345  
PROJECT # : 44999  
PROJECT NAME : IB REMEDIATION

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	SW-1	AQUEOUS	10/12/95	NA	10/13/95	1
02	STRIPPER INLET	AQUEOUS	10/12/95	NA	10/13/95	10
03	STRIPPER OUTLET	AQUEOUS	10/12/95	NA	10/13/95	1
PARAMETER			UNITS	01	02	03
BENZENE			UG/L	<0.5	92	2.8
TOLUENE			UG/L	<0.5	6.2	7.1
ETHYLBENZENE			UG/L	0.6	110	4.1
TOTAL XYLENES			UG/L	1.2	220	20
SURROGATE:						
BROMOFLUOROBENZENE (%)				101	82	79



Analytical**Technologies**, Inc.

# GAS CHROMATOGRAPHY RESULTS

TEST : BTEX (EPA 8020)  
CLIENT : MARATHON OIL CO. ATI I.D.: 510345  
PROJECT # : 44999  
PROJECT NAME : IB REMEDIATION

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	LYMAN	AQUEOUS	10/12/95	NA	10/13/95	1
05	ARROYO	AQUEOUS	10/12/95	NA	10/13/95	1
06	BIEBBLE	AQUEOUS	10/12/95	NA	10/13/95	1
PARAMETER			UNITS	04	05	06
BENZENE			UG/L	<0.5	<0.5	<0.5
TOLUENE			UG/L	<0.5	<0.5	<0.5
ETHYLBENZENE			UG/L	<0.5	<0.5	<0.5
TOTAL XYLENES			UG/L	1.6	1.2	<0.5

## SURROGATE:

BROMOFLUOROBENZENE (%)	98	99	101
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Analytical Technologies, Inc.

# GAS CHROMATOGRAPHY RESULTS

TEST : BTEX (EPA 8020)  
CLIENT : MARATHON OIL CO. ATI I.D.: 510345  
PROJECT # : 44999  
PROJECT NAME : IB REMEDIATION

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
07	TRIP BLANK	AQUEOUS	10/05/95	NA	10/13/95	1
PARAMETER		UNITS		07		
BENZENE		UG/L		<0.5		
TOLUENE		UG/L		<0.5		
ETHYLBENZENE		UG/L		<0.5		
TOTAL XYLENES		UG/L		<0.5		

SURROGATE:

BROMOFLUOROBENZENE (%) 99



Analytical**Technologies**, Inc.

## GAS CHROMATOGRAPHY RESULTS

### REAGENT BLANK

TEST	: BTEX (EPA 8020)	ATI I.D.	: 510345
BLANK I.D.	: 101395	MATRIX	: AQUEOUS
CLIENT	: MARATHON OIL CO.	DATE EXTRACTED	: NA
PROJECT #	: 44999	DATE ANALYZED	: 10/13/95
PROJECT NAME	: IB REMEDIATION	DILUTION FACTOR	: 1

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<0.5

#### SURROGATE:

BROMOFLUOROBENZENE (%)	102
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Analytical**Technologies**, Inc.

## GAS CHROMATOGRAPHY RESULTS

### REAGENT BLANK

TEST	: BTEX (EPA 8020)	ATI I.D.	: 510345
BLANK I.D.	: 101395B	MATRIX	: AQUEOUS
CLIENT	: MARATHON OIL CO.	DATE EXTRACTED	: NA
PROJECT #	: 44999	DATE ANALYZED	: 10/13/95
PROJECT NAME	: IB REMEDIATION	DILUTION FACTOR	: 1

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<0.5

#### SURROGATE:

BROMOFLUOROBENZENE (%)	98
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Analytical**Technologies**, Inc.

GAS CHROMATOGRAPHY - QUALITY CONTROL

MSMSD

TEST : BTEX (EPA 8020)  
MSMSD # : 51034501 ATI I.D. : 510345  
CLIENT : MARATHON OIL CO. DATE EXTRACTED : NA  
PROJECT # : 44999 DATE ANALYZED : 10/13/95  
PROJECT NAME : IB REMEDIATION SAMPLE MATRIX : AQUEOUS  
REF. I.D. : 51034501 UNITS : UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD
BENZENE	<0.5	10	12	120	10	100	18
TOLUENE	<0.5	10	10	100	10	100	0
ETHYLBENZENE	0.6	10	10	94	10	94	0
TOTAL XYLENES	1.2	30	30	96	31	99	3

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



Analytical Technologies, Inc., Albuquerque, NM  
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

# CHAIN OF CUSTODY

DATE: 10-12-95 PAGE 1 OF 1

ATI LAB I.D.

510345

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: BOB MENZIE

COMPANY: MARATHON Oil Co  
ADDRESS: P.O. Box 552  
MIDLAND TX 79702  
PHONE: 915 687-8312  
FAX: 915 687-8305

BILL TO:  
COMPANY:  
ADDRESS: SAME AS ABOVE

## ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
SW-1	10/24/95	9:58	water	-01
Stripper Inlet		10:05		-02
Stripper Outlet		10:07		-03
Lyman		10:15		-04
Arroyo		10:25		-05
Biebble		10:35		-06
Trip Blank	10/5	-	AQ	-07

Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal	The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)	NUMBER OF CONTAINERS
			✓																3
			✓																2
			✓																2
			✓	✓															3
			✓	✓															3
			✓	✓															3
			X																1

## PROJECT INFORMATION

PROJ. NO: 44999	NO. CONTAINERS	APR 17
PROJ. NAME: EB Remediation	CUSTODY SEALS	Y/N/NA
P.O. NO:	RECEIVED INTACT	Y
SHIPPED VIA:	RECEIVED COLD	Y

## PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

## SAMPLED & RELINQUISHED BY: 1.

Signature: Rodriguez Aguilera 11/08  
Printed Name: Rodriguez Aguilera 10-12-95  
Company: Marathon 915 687-8312

## RELINQUISHED BY: 2.

Signature: Kevin Cook 0825  
Printed Name: Kevin Cook 10/13/95  
Company: GTI

## RELINQUISHED BY: 3.

Signature: \_\_\_\_\_ Time: \_\_\_\_\_  
Printed Name: \_\_\_\_\_ Date: \_\_\_\_\_  
Company: \_\_\_\_\_

## RECEIVED BY: 1.

Signature: Kevin Cook 11/08  
Printed Name: Kevin Cook 10-12-95  
Company: GTI (915) 687-8312

## RECEIVED BY: 2.

Signature: \_\_\_\_\_ Time: \_\_\_\_\_  
Printed Name: \_\_\_\_\_ Date: \_\_\_\_\_  
Company: \_\_\_\_\_

## RECEIVED BY: (LAB) 3.

Signature: Andrew Walker 0820  
Printed Name: Andrew Walker 10/13  
Company: Analytical Technologies, Inc.



## Chain of Custody

DATE 10/13 PAGE 1 OF 1

NETWORK PROJECT MANAGER: <u>Kim McNeill</u> <u>LETITIA KRAKOWSKI</u>					ANALYSIS REQUEST																					
COMPANY: <b>Analytical Technologies, Inc.</b> ADDRESS: 2709-D Pan American Freeway, NE Albuquerque, NM 87107					TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	632/632 MOD	619/619 MOD	610/8310	Chloride	8240 (TCLP 1311) ZHE	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)	NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O <sub>2</sub> , CO <sub>2</sub> , METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
CLIENT PROJECT MANAGER: <u>Kim McNeill</u>																										
SAMPLE ID	DATE	TIME	MATRIX	LAB ID																						
510345-01	10/12	0958	AQ	1																						
-04	↓	1015	↓	2																						
-05	↓	1025	↓	3																						
-06	↓	1035	↓	4																						

PROJECT INFORMATION		SAMPLE RECEIPT		SAMPLES SENT TO:		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.	
PROJECT NUMBER: <u>510345</u>		TOTAL NUMBER OF CONTAINERS		SAN DIEGO		Signature: <u>Andrew P. R...</u> Time: <u>1700</u>		Signature: _____ Time: _____	
PROJECT NAME: <u>Indian Basin Remediation</u>		CHAIN OF CUSTODY SEALS		FT. COLLINS		Printed Name: _____ Date: <u>10/13</u>		Printed Name: _____ Date: _____	
QC LEVEL: <u>STD</u> IV		INTACT?		RENTON		Analytical Technologies, Inc.		Company: _____	
QC REQUIRED: MS MSD BLANK		RECEIVED GOOD COND. COLD		PENSACOLA		Albuquerque		RECEIVED BY: (LAB) 1.	
TAT: <u>STANDARD</u> RUSH!		LAB NUMBER <u>510280</u>		PORTLAND		Signature: <u>R. Elsp...</u> Time: <u>0930</u>		Signature: _____ Time: _____	
DUE DATE: <u>10/25</u>				PHOENIX		Printed Name: <u>R. ELSPERMAN</u> Date: <u>10/14/13</u>		Printed Name: _____ Date: _____	
RUSH SURCHARGE: <u>no</u>				FIBERQUANT		Company: <u>ATI-FL</u>		Company: _____	
CLIENT DISCOUNT: <u>000%</u>									

**APPENDIX B**

**LABORATORY ANALYSIS OF TREATED WATER EFFLUENT**



Analytical**Technologies**, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107  
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. 503327

April 18, 1995

Marathon Oil Company  
P.O. Box 552  
Midland, TX 79702-0552

Project Name/Number: IB INJECTION INDIAN BASIN (44999)

Attention: Bob Menzie

On 03/10/95, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

This report is being reissued in part to include Radiochemistry/Uranium results. It is now complete.

Please note additional case narrative for Radium 226/228 included in this report.

Due to laboratory error, the EPA recommended hold for Nitrate analyses was missed. Total Nitrate/Nitrite analysis was performed and the results are included in this report. We apologize for any inconvenience. There is no charge for this analysis.

Radiochemistry and Uranium analyses were performed by Analytical Technologies, Inc., 225 Commerce Drive, Fort Collins, CO.

EPA Method 8010/8020 and 504.1 analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.





Analytical Technologies, Inc.

All other analyses were performed by Analytical Technologies, Inc., 11 East Olive Road, Pensacola, FL.

This report is being reissued in part to correct typographical error.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D.  
Project Manager

H. Mitchell Rubenstein, Ph.D.  
Laboratory Manager

MR:jt

Enclosure



Analytical Technologies, Inc.

CLIENT : MARATHON OIL CO.  
PROJECT # : INDIAN BASIN (44999)  
PROJECT NAME : IB INJECTION

DATE RECEIVED : 03/10/95  
REPORT DATE : 03/24/95

ATI ID: 503327

	ATI PENSACOLA ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	503327-01	S-OUT	AQUEOUS	03/09/95
02	503327-02	TRIP BLANK	AQUEOUS	02/28/95

---TOTALS---

<u>MATRIX</u>	<u>#SAMPLES</u>
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 503475  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 503327  
Project Name: MARATHON OIL  
Project Location: IB INJECTION  
Test: Group of Single Wetchem  
Matrix: WATER  
QC Level: II

Lab ID: 001  
Client Sample Id: 503327-01

Sample Date/Time: 09-MAR-95 1530  
Received Date: 11-MAR-95

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
CHLORIDE (325.2)	MG/L	40	2		CKW08A	TT
CYANIDE, TOTAL (335.2)	MG/L	ND	0.005		CNW015	MM
FLUORIDE (340.2)	MG/L	0.8	0.2		FLW020	DPH
NITRITE-NITRATE, NITROGEN (353.2)	MG/L	ND	0.1		N3W16A	BF
PHENOLS, TOTAL (420.1)	MG/L	ND	0.006	#	PEW009	MM
SULFATE (375.4)	MG/L	360	100	+	SEW020	DBH
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	730	5		TDW014	NB

Comments:



Analytical**Technologies**, Inc.

"Method Report Summary"

Accession Number: 503475  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 503327  
Project Name: MARATHON OIL  
Project Location: IB INJECTION  
Test: Group of Single Wetchem

Client Sample Id:	Parameter:	Unit:	Result:
503327-01	CHLORIDE (325.2)	MG/L	40
	FLUORIDE (340.2)	MG/L	0.8
	SULFATE (375.4)	MG/L	360
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	730



## "WetChem Quality Control Report"

Parameter:	CHLORIDE	CYANIDE	FLUORIDE	NO2NO3	PHENOL	SULFATE
Batch Id:	CKW08A	CNW015	FLW020	N3W16A	PEW009	SEW020
Blank Result:	<2	<0.005	<0.2	<0.1	<0.005	<10
Anal. Method:	325.2	335.2	340.2	353.2	420.1	375.4
Prep. Method:	N/A	N/A	N/A	N/A	N/A	N/A
Analysis Date:	20-MAR-95	21-MAR-95	17-MAR-95	17-MAR-95	21-MAR-95	20-MAR-95
Prep. Date:	20-MAR-95	21-MAR-95	17-MAR-95	17-MAR-95	16-MAR-95	20-MAR-95

## Sample Duplication

Sample Dup:	503475-1	503475-1	503336-1	503495-6	N/A	503334-1
Rept Limit:	<2	<0.005	<0.2	<0.1	N/A	<10
Sample Result:	40.1	<0.005	<0.2	0.35		26.9
Dup Result:	38.5	<0.005	<0.2	0.36		26.5
Sample RPD:	4	N/C	N/C	0.01G		0.4G
Max RPD:	13	0.005	0.2	0.1		10
Dry Weight%	N/A	N/A	N/A	N/A		N/A

## Matrix Spike

Sample Spiked:	503475-1	503475-1	503336-1	503495-6	503475-1	503335-4
Rept Limit:	<2	<0.005	<0.2	<0.1	<0.006#	<10
Sample Result:	40.1	<0.005	<0.2	0.35	<0.006	10.8
Spiked Result:	58.7	0.082	0.906	1.38	0.026	31.2
Spike Added:	20	0.100	0.800	1.0	0.022	20
% Recovery:	93	82	113	103	118	102
% Rec Limits:	89-110	63-114	70-129	85-118	59-151	51-151
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A

## ICV

ICV Result:	56	0.041	1.10	1.94	0.038	20.5
True Result:	55	0.045	1.20	2.00	0.040	20
% Recovery:	102	91	92	97	95	103
% Rec Limits:	90-110	90-110	90-110	90-110	90-110	90-110

## LCS

LCS Result:						
True Result:						
% Recovery:						
% Rec Limits:						



Analytical Technologies, Inc.

"WetChem Quality Control Report"

Parameter:	TDS
Batch Id:	TDW014
Blank Result:	<5
Anal. Method:	160.1
Prep. Method:	N/A
Analysis Date:	16-MAR-95
Prep. Date:	16-MAR-95

Sample Duplication

Sample Dup:	503475-1
Rept Limit:	<5

Sample Result:	733
Dup Result:	728
Sample RPD:	1
Max RPD:	16
Dry Weight%	N/A

Matrix Spike

Sample Spiked:	N/A
Rept Limit:	N/A
Sample Result:	
Spiked Result:	
Spike Added:	
% Recovery:	
% Rec Limits:	
Dry Weight%	

ICV

ICV Result:	
True Result:	
% Recovery:	
% Rec Limits:	

LCS

LCS Result:	265
True Result:	293
% Recovery:	90
% Rec Limits:	66-122



Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 503475  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 503327  
Project Name: MARATHON OIL  
Project Location: IB INJECTION  
Test: Group of Single Metals  
Matrix: WATER  
QC Level: II

Lab Id: 001  
Client Sample Id: 503327-01

Sample Date/Time: 09-MAR-95 1530  
Received Date: 11-MAR-95

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
SILVER (200.7)	MG/L	ND	0.01		A0W060	JRR
ALUMINUM (200.7)	MG/L	ND	0.06		L0W060	JRR
ARSENIC (206.2)	MG/L	ND	0.005		R2W087	CD
BORON (200.7)	MG/L	ND	0.09		O0W060	JRR
BARIUM (200.7)	MG/L	0.10	0.01		B0W060	JRR
CADMIUM (213.2)	MG/L	ND	0.0005		C2W087	SL
COBALT (200.7)	MG/L	ND	0.01		T0W060	JRR
CHROMIUM (200.7)	MG/L	ND	0.01		H0W060	JRR
COPPER (200.7)	MG/L	ND	0.01		F0W060	JRR
IRON (200.7)	MG/L	0.61	0.02		N0W060	JRR
MERCURY (245.1)	MG/L	ND	0.0002		M2W037	SL
MANGANESE (200.7)	MG/L	0.27	0.01		G0W060	JRR
MOLYBDENUM (200.7)	MG/L	ND	0.01		D0W060	JRR
NICKEL (200.7)	MG/L	ND	0.02		E0W060	JRR
LEAD (239.2)	MG/L	ND	0.003		P2W087	CD
SELENIUM (270.2)	MG/L	ND	0.005		S2W087	SL
ZINC (200.7)	MG/L	ND	0.02		50W060	JRR

Comments:



Analytical**Technologies**, Inc.

"Method Report Summary"

Accession Number: 503475  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 503327  
Project Name: MARATHON OIL  
Project Location: IB INJECTION  
Test: Group of Single Metals

Client Sample Id:	Parameter:	Unit:	Result:
503327-01	BARIUM (200.7)	MG/L	0.10
	IRON (200.7)	MG/L	0.61
	MANGANESE (200.7)	MG/L	0.27





Analytical Technologies, Inc.

## "Metals Quality Control Report"

Parameter:	SILVER	ALUMINUM	ARSENIC	BORON	BARIUM	CADMIUM
Batch Id:	A0W060	LOW060	R2W087	O0W060	B0W060	C2W087
Blank Result:	<0.01	<0.06	<0.005	<0.09	<0.01	<0.0005
Anal. Method:	200.7	200.7	206.2	200.7	200.7	213.2
Prep. Method:	EPA 600	EPA 600	EPA 600	EPA 600	EPA 600	EPA 600
Analysis Date:	15-MAR-95	15-MAR-95	21-MAR-95	15-MAR-95	15-MAR-95	15-MAR-95
Prep. Date:	15-MAR-95	15-MAR-95	15-MAR-95	15-MAR-95	15-MAR-95	15-MAR-95

## Sample Duplication

Sample Dup:	503514-1	503514-1	503457-22	503514-1	503514-1	503457-22
Rept Limit:	<0.01	<0.06	<0.10+	<0.09	<0.01	<0.0005
Sample Result:	2.0	22	0.76	3.8	2.3	0.0049
Dup Result:	1.9	22	0.77	3.8	2.3	0.0050
Sample RPD:	5	0	1	0	0	2
Max RPD:	20	20	20	20	20	20
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A

## Matrix Spike

Sample Spiked:	503514-1	503514-1	503457-22	503514-1	503514-1	503457-22
Rept Limit:	<0.01	<0.06	<0.10+	<0.09	<0.01	<0.0005
Sample Result:	<0.01	20	0.73	1.9	0.43	<0.0005
Spiked Result:	2.0	22	0.76	3.8	2.3	0.0049
Spike Added:	2.0	2.0F	0.040F	2.0	2.0	0.0050
% Recovery:	100	100	75	95	94	98
% Rec Limits:	75-125	75-125	75-125	75-125	75-125	75-125
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A

## ICV

ICV Result:	5.0	5.3	0.039	5.1	5.1	0.0020
True Result:	5.0	5.0	0.040	5.0	5.0	0.0020
% Recovery:	100	106	98	102	102	100
% Rec Limits:	90-110	90-110	90-110	90-110	90-110	90-110

## LCS

LCS Result:	2.1	2.1	0.037	2.0	2.0	0.0048
True Result:	2.0	2.0	0.040	2.0	2.0	0.0050
% Recovery:	105	105	93	100	100	96
% Rec Limits:	80-120	80-120	80-120	80-120	80-120	80-120



Analytical Technologies, Inc.

"Metals Quality Control Report"

Parameter:	COBALT	CHROMIUM	COPPER	IRON	MERCURY	MANGANESE
Batch Id:	TOW060	HOW060	POW060	NOW060	M2W037	GOW060
Blank Result:	<0.01	<0.01	<0.01	<0.02	<0.0002	<0.01
Anal. Method:	200.7	200.7	200.7	200.7	245.1	200.7
Prep. Method:	EPA 600	EPA 600	EPA 600	EPA 600	245.1	EPA 600
Analysis Date:	15-MAR-95	15-MAR-95	15-MAR-95	15-MAR-95	16-MAR-95	15-MAR-95
Prep. Date:	15-MAR-95	15-MAR-95	15-MAR-95	15-MAR-95	16-MAR-95	15-MAR-95

Sample Duplication

Sample Dup:	503514-1	503514-1	503514-1	503514-1	503580-1	503514-1
Rept Limit:	<0.01	<0.01	<0.01	<0.02	<0.0002	<0.01
Sample Result:	1.9	2.0	2.0	48	0.0046	5.6
Dup Result:	1.9	2.0	2.0	47	0.0047	5.5
Sample RPD:	0	0	0	2	2	2
Max RPD:	20	20	20	20	20	20
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A

Matrix Spike

Sample Spiked:	503514-1	503514-1	503514-1	503514-1	503580-1	503514-1
Rept Limit:	<0.01	<0.01	<0.01	<0.02	<0.0002	<0.01
Sample Result:	0.05	0.15	0.07	45	<0.0002	3.6
Spiked Result:	1.9	2.0	2.0	48	0.0046	5.6
Spike Added:	2.0	2.0	2.0	2.0F	0.0050	2.0
% Recovery:	93	93	97	150	92	100
% Rec Limits:	75-125	75-125	75-125	75-125	75-125	75-125
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A

ICV

ICV Result:	5.1	5.2	5.0	5.3	0.0041	5.1
True Result:	5.0	5.0	5.0	5.0	0.0040	5.0
% Recovery:	102	104	100	106	103	102
% Rec Limits:	90-110	90-110	90-110	90-110	80-120	90-110

LCS

LCS Result:	2.1	2.1	2.0	2.1	0.0046	2.1
True Result:	2.0	2.0	2.0	2.0	0.0050	2.0
% Recovery:	105	105	100	105	92	105
% Rec Limits:	80-120	80-120	80-120	80-120	80-120	80-120



Analytical Technologies, Inc.

"Metals Quality Control Report"

Parameter:	MOLYBDENUM	NICKEL	LEAD	SELENIUM	ZINC
Batch Id:	DOW060	EOW060	P2W087	S2W087	50W060
Blank Result:	<0.01	<0.02	<0.003	<0.005	<0.02
Anal. Method:	200.7	200.7	239.2	270.2	200.7
Prep. Method:	EPA 600	EPA 600	EPA 600	EPA 600	EPA 600
Analysis Date:	15-MAR-95	15-MAR-95	20-MAR-95	17-MAR-95	15-MAR-95
Prep. Date:	15-MAR-95	15-MAR-95	15-MAR-95	15-MAR-95	15-MAR-95

Sample Duplication

Sample Dup:	503514-1	503514-1	503457-22	503457-22	503514-1
Rept Limit:	<0.01	<0.02	<0.003	<0.005	<0.02
Sample Result:	1.9	2.1	0.020	0.037	76
Dup Result:	1.9	2.1	0.020	0.036	75
Sample RPD:	0	0	0	3	1
Max RPD:	20	20	20	20	20
Dry Weight%	N/A	N/A	N/A	N/A	N/A

Matrix Spike

Sample Spiked:	503514-1	503514-1	503457-22	503457-22	503514-1
Rept Limit:	<0.01	<0.02	<0.003	<0.005	<0.02
Sample Result:	0.01	0.28	<0.003	<0.005	72
Spiked Result:	1.9	2.1	0.020	0.037	76
Spike Added:	2.0	2.0	0.020	0.040	2.0F
% Recovery:	95	91	100	93	200
% Rec Limits:	75-125	75-125	75-125	75-125	75-125
Dry Weight%	N/A	N/A	N/A	N/A	N/A

ICV

ICV Result:	4.9	5.1	0.039	0.021	5.2
True Result:	5.0	5.0	0.040	0.020	5.0
% Recovery:	98	102	98	105	104
% Rec Limits:	90-110	90-110	90-110	90-110	90-110

LCS

LCS Result:	2.1	2.1	0.020	0.040	2.1
True Result:	2.0	2.0	0.020	0.040	2.0
% Recovery:	105	105	100	100	105
% Rec Limits:	80-120	80-120	80-120	80-120	80-120



Analytical Technologies, Inc.

# GAS CHROMATOGRAPHY RESULTS

TEST : ETHYLENE DIBROMIDE (EPA METHOD 504.1)  
CLIENT : MARATHON OIL CO. ATI I.D.: 503327  
PROJECT # : INDIAN BASIN (44999)  
PROJECT NAME : IB INJECTION

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	S-OUT	AQUEOUS	03/09/95	03/13/95	03/14/95	1
PARAMETER		UNITS	01			
ETHYLENE DIBROMIDE		UG/L	<0.01			

## SURROGATE:

1,4-DICHLOROBENZENE (%) 109



Analytical Technologies, Inc.

## GAS CHROMATOGRAPHY RESULTS

### REAGENT BLANK

TEST	: ETHYLENE DIBROMIDE (EPA METHOD 504.1)		
BLANK I.D.	: 031395	ATI I.D.	: 503327
CLIENT	: MARATHON OIL CO.	MATRIX	: AQUEOUS
PROJECT #	: INDIAN BASIN (44999)	DATE EXTRACTED	: 03/13/95
PROJECT NAME	: IB INJECTION	DATE ANALYZED	: 03/13/95
		DILUTION FACTOR	: 1

PARAMETER	UNITS	
ETHYLENE DIBROMIDE	UG/L	<0.01

#### SURROGATE:

1,4-DICHLOROBENZENE (%)	114
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Analytical Technologies, Inc.

# GAS CHROMATOGRAPHY - QUALITY CONTROL

## MSMSD

TEST : ETHYLENE DIBROMIDE (EPA METHOD 504.1)  
MSMSD # : 031395 ATI I.D. : 503327  
CLIENT : MARATHON OIL CO. DATE EXTRACTED : 03/13/95  
PROJECT # : INDIAN BASIN (44999) DATE ANALYZED : 03/13/95  
PROJECT NAME : IB INJECTION SAMPLE MATRIX : AQUEOUS  
REF. I.D. : 031395 UNITS : UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD
ETHYLENE DIBROMIDE	<0.01	0.25	0.29	116	0.27	108	7

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

# GAS CHROMATOGRAPHY RESULTS



Analytical Technologies, Inc.

TEST : PURGEABLE HALOCARBONS/AROMATICS (EPA 8010/8020)  
 CLIENT : MARATHON OIL CO. ATI I.D.: 503327  
 PROJECT # : INDIAN BASIN (44999)  
 PROJECT NAME : IB INJECTION

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	S-OUT	AQUEOUS	03/09/95	NA	03/13/95	1
02	TRIP BLANK	AQUEOUS	02/28/95	NA	03/13/95	1

PARAMETER	UNITS	01	02
BENZENE	UG/L	<0.5	<0.5
BROMODICHLOROMETHANE	UG/L	<0.2	<0.2
BROMOFORM	UG/L	<0.5	<0.5
BROMOMETHANE	UG/L	<1.0	<1.0
CARBON TETRACHLORIDE	UG/L	<0.2	<0.2
CHLOROBENZENE	UG/L	<0.5	<0.5
CHLOROETHANE	UG/L	<0.5	<0.5
CHLOROFORM	UG/L	<0.5	<0.5
CHLOROMETHANE	UG/L	<1.0	<1.0
DIBROMOCHLOROMETHANE	UG/L	<0.2	<0.2
1,2-DIBROMOETHANE (EDB)	UG/L	<0.2	<0.2
1,2-DICHLOROBENZENE	UG/L	<0.5	<0.5
1,3-DICHLOROBENZENE	UG/L	<0.5	<0.5
1,4-DICHLOROBENZENE	UG/L	<0.5	<0.5
1,1-DICHLOROETHANE	UG/L	<0.2	<0.2
1,2-DICHLOROETHANE (EDC)	UG/L	<0.5	<0.5
1,1-DICHLOROETHENE	UG/L	<0.2	<0.2
CIS-1,2-DICHLOROETHENE	UG/L	<0.2	<0.2
TRANS-1,2-DICHLOROETHENE	UG/L	<1.0	<1.0
1,2-DICHLOROPROPANE	UG/L	<0.2	<0.2
CIS-1,3-DICHLOROPROPENE	UG/L	<0.2	<0.2
TRANS-1,3-DICHLOROPROPENE	UG/L	<0.2	<0.2
ETHYLBENZENE	UG/L	<0.5	<0.5
METHYL-t-BUTYL ETHER	UG/L	<2.5	<2.5
METHYLENE CHLORIDE	UG/L	<2.0	<2.0
1,1,2,2-TETRACHLOROETHANE	UG/L	<0.2	<0.2
TETRACHLOROETHENE	UG/L	<0.5	<0.5
TOLUENE	UG/L	0.5	<0.5
1,1,1-TRICHLOROETHANE	UG/L	<1.0	<1.0
1,1,2-TRICHLOROETHANE	UG/L	<0.2	<0.2
TRICHLOROETHENE	UG/L	<0.2	<0.2
TRICHLOROFLUOROMETHANE	UG/L	<0.2	<0.2
VINYL CHLORIDE	UG/L	<0.5	<0.5
TOTAL XYLENES	UG/L	<0.5	<0.5

## SURROGATES:

BROMOCHLOROMETHANE (%)	100	102
TRIFLUOROTOLUENE (%)	94	95



Analytical Technologies, Inc.

# GAS CHROMATOGRAPHY RESULTS - QUALITY CONTROL

## REAGENT BLANK

TEST	: EPA 8010/8020	ATI I.D.	: 503327
BLANK I.D.	: 031395	MATRIX	: AQUEOUS
CLIENT	: MARATHON OIL CO.	DATE EXTRACTED	: NA
PROJECT #	: INDIAN BASIN (44999)	DATE ANALYZED	: 03/13/95
PROJECT NAME	: IB INJECTION	DIL. FACTOR	: 1

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
BROMODICHLOROMETHANE	UG/L	<0.2
BROMOFORM	UG/L	<0.5
BROMOMETHANE	UG/L	<1.0
CARBON TETRACHLORIDE	UG/L	<0.2
CHLOROBENZENE	UG/L	<0.5
CHLOROETHANE	UG/L	<0.5
CHLOROFORM	UG/L	<0.5
CHLOROMETHANE	UG/L	<1.0
DIBROMOCHLOROMETHANE	UG/L	<0.2
1,2-DIBROMOETHANE (EDB)	UG/L	<0.2
1,2-DICHLOROBENZENE	UG/L	<0.5
1,3-DICHLOROBENZENE	UG/L	<0.5
1,4-DICHLOROBENZENE	UG/L	<0.5
1,1-DICHLOROETHANE	UG/L	<0.2
1,2-DICHLOROETHANE (EDC)	UG/L	<0.5
1,1-DICHLOROETHENE	UG/L	<0.2
CIS-1,2-DICHLOROETHENE	UG/L	<0.2
TRANS-1,2-DICHLOROETHENE	UG/L	<1.0
1,2-DICHLOROPROPANE	UG/L	<0.2
CIS-1,3-DICHLOROPROPENE	UG/L	<0.2
TRANS-1,3-DICHLOROPROPENE	UG/L	<0.2
ETHYLBENZENE	UG/L	<0.5
METHYL-t-BUTYL ETHER	UG/L	<2.5
METHYLENE CHLORIDE	UG/L	<2.0
1,1,2,2-TETRACHLOROETHANE	UG/L	<0.2
TETRACHLOROETHENE	UG/L	<0.2
TOLUENE	UG/L	<0.5
1,1,1-TRICHLOROETHANE	UG/L	<1.0
1,1,2-TRICHLOROETHANE	UG/L	<0.2
TRICHLOROETHENE	UG/L	<0.2
TRICHLOROFLUOROMETHANE	UG/L	<0.2
VINYL CHLORIDE	UG/L	<0.5
TOTAL XYLENES	UG/L	<0.5

### SURROGATES:

BROMOCHLOROMETHANE (%)	105
TRIFLUOROTOLUENE (%)	101





Analytical Technologies, Inc.

## GAS CHROMATOGRAPHY - QUALITY CONTROL

### MSMSD

TEST : PURGEABLE HALOCARBONS/AROMATICS (EPA 8010/8020)  
MSMSD # : 50332701 ATI I.D. : 503327  
CLIENT : MARATHON OIL CO. DATE EXTRACTED : NA  
PROJECT # : INDIAN BASIN (44999) DATE ANALYZED : 03/13/95  
PROJECT NAME : IB INJECTION SAMPLE MATRIX : AQUEOUS  
REF. I.D. : 50332701 UNITS : UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD
BENZENE	<0.5	10	10	100	10	100	0
CHLOROBENZENE	<0.5	10	12	120	11	110	9
1,1-DICHLOROETHENE	<0.2	10	8.4	84	8.9	89	6
TOLUENE	<0.5	10	11	110	11	110	0
TRICHLOROETHENE	<0.2	10	11	110	12	120	9

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 503475  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 503327  
Project Name: MARATHON OIL  
Project Location: IB INJECTION  
Test: POLYNUCLEAR AROMATICS BY 8310  
Analysis Method: 8310 / SW 846, 3rd Edition, September 1986 and Revision 1, July 1992  
Extraction Method: 3510/SW-846, 3rd Edition, September 1986 and Revision 1, July 1992  
Matrix: WATER  
QC Level: II

Lab Id: 001 Sample Date/Time: 09-MAR-95 1530  
Client Sample Id: 503327-01 Received Date: 11-MAR-95  
Batch: PAW081 Extraction Date: 15-MAR-95  
Blank: A Dry Weight %: N/A Analysis Date: 17-MAR-95

Parameter:	Units:	Results:	Rpt Lmts:	Q:
ACENAPHTHENE	UG/L	ND	1	
ACENAPHTHYLENE	UG/L	ND	1	
ANTHRACENE	UG/L	ND	1	
BENZO(a)ANTHRACENE	UG/L	ND	1	
BENZO(a)PYRENE	UG/L	ND	1	
BENZO(b)FLUORANTHENE	UG/L	ND	1	
BENZO(g,h,i)PERYLENE	UG/L	ND	1	
BENZO(k)FLUORANTHENE	UG/L	ND	1	
CHRYSENE	UG/L	ND	1	
DIBENZO(a,h)ANTHRACENE	UG/L	ND	1	
FLUORANTHENE	UG/L	ND	1	
FLUORENE	UG/L	ND	1	
INDENO(1,2,3-cd)PYRENE	UG/L	ND	1	
NAPHTHALENE	UG/L	ND	1	
PHENANTHRENE	UG/L	ND	1	
PYRENE	UG/L	ND	1	
1-METHYLNAPHTHALENE	UG/L	ND	1	
2-METHYLNAPHTHALENE	UG/L	ND	1	
2-CHLOROANTHRACENE	%REC/SURR	67	24-128	
ANALYST	INITIALS	TLH		

Comments:



Analytical Technologies, Inc.

"QC Report"

Title: Water Blank  
Batch: PAW081  
Analysis Method: 8310 / SW 846, 3rd Edition, September 1986 and Revision 1, July 1992  
Extraction Method: 3510/SW-846, 3rd Edition, September 1986 and Revision 1, July 1992

Blank Id: A Date Analyzed: 16-MAR-95 Date Extracted: 15-MAR-95

Parameters:	Units:	Results:	Reporting Limits:
ACENAPHTHENE	UG/L	ND	1
ACENAPHTHYLENE	UG/L	ND	1
ANTHRACENE	UG/L	ND	1
BENZO(a)ANTHRACENE	UG/L	ND	1
BENZO(a)PYRENE	UG/L	ND	1
BENZO(b)FLUORANTHENE	UG/L	ND	1
BENZO(g,h,i)PERYLENE	UG/L	ND	1
BENZO(k)FLUORANTHENE	UG/L	ND	1
CHRYSENE	UG/L	ND	1
DIBENZO(a,h)ANTHRACENE	UG/L	ND	1
FLUORANTHENE	UG/L	ND	1
FLUORENE	UG/L	ND	1
INDENO(1,2,3-cd)PYRENE	UG/L	ND	1
NAPHTHALENE	UG/L	ND	1
PHENANTHRENE	UG/L	ND	1
PYRENE	UG/L	ND	1
1-METHYLNAPHTHALENE	UG/L	ND	1
2-METHYLNAPHTHALENE	UG/L	ND	1
2-CHLOROANTHRACENE	%REC/SURR	47	24-128
ANALYST	INITIALS	TLH	

Comments:



Analytical Technologies, Inc.

"QC Report"

Title: Water Reagent  
Batch: PAW081  
Analysis Method: 8310 / SW 846, 3rd Edition, September 1986 and Revision 1, July 1992  
Extraction Method: 3510/SW-846, 3rd Edition, September 1986 and Revision 1, July 1992

RS Date Analyzed: 16-MAR-95  
RSD Date Analyzed: 16-MAR-95

RS Date Extracted: 15-MAR-95  
RSD Date Extracted: 15-MAR-95

Parameters:	Spike Added	Sample Conc	RS Conc	RS %Rec	RSD Conc	RSD %Rec	RPD	Rec Lmts
ACENAPHTHYLENE	80.0	<1	64	80	59	74	8	52-102
BENZO(k) FLUORANTHENE	4.0	<1	4.2	105	4.0	100	5	66-131
CHRYSENE	4.0	<1	4.3	108	4.0	100	8	69-122
PHENANTHRENE	4.0	<1	4.0	100	3.6	90	11	70-111
PYRENE	4.0	<1	3.5	88	3.1	78	12	76-112
Surrogates:								
2-CHLOROANTHRACENE				97		88		24-128

Comments:

Notes:

N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT  
UG/L = PARTS PER BILLION. < = LESS THAN REPORTING LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.  
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE  
PROGRAM AND REFERENCED METHOD.



Analytical Technologies, Inc.

"QC Report"

Title: Water Matrix  
Batch: PAW081  
Analysis Method: 8310 / SW 846, 3rd Edition, September 1986 and Revision 1, July 1992  
Extraction Method: 3510/SW-846, 3rd Edition, September 1986 and Revision 1, July 1992

Dry Weight %: N/A  
Sample Spiked: 503475-1  
MS Date Analyzed: 17-MAR-95  
MSD Date Analyzed: 17-MAR-95  
MS Date Extracted: 15-MAR-95  
MSD Date Extracted: 15-MAR-95

Parameters:	Spike Added	Sample Conc	MS Conc	MS %Rec	MSD Conc	MSD %Rec	RPD	Rec Lmts
ACENAPHTHYLENE	80.0	<1	57	71	58	73	3	45 3-139
BENZO(k) FLUORANTHENE	4.0	<1	3.8	95	3.8	95	0	29 32-150
CHRYSENE	4.0	<1	4.1	103	3.8	95	8	26 26-178
PHENANTHRENE	4.0	<1	3.2	80	3.1	78	3	37 31-154
PYRENE	4.0	<1	3.5	88	2.9	73	19	25 25-140

Surrogates:  
2-CHLOROANTHRACENE 66 61 24-128

Comments:

Notes:

N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT  
UG/L = PARTS PER BILLION. < = LESS THAN REPORTING LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.  
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.



Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 503475  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 503327  
Project Name: MARATHON OIL  
Project Location: IB INJECTION  
Test: PCB  
Analysis Method: 8080 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.  
Extraction Method: 3510 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.  
Matrix: WATER  
QC Level: II

Lab Id: 001 Sample Date/Time: 09-MAR-95 1530  
Client Sample Id: 503327-01 Received Date: 11-MAR-95

Batch: PCW055 Extraction Date: 15-MAR-95  
Blank: A Dry Weight %: N/A Analysis Date: 21-MAR-95

Parameter:	Units:	Results:	Rpt Lmts:	Q:
AROCLOR-1016	UG/L	ND	1	
AROCLOR-1221	UG/L	ND	1	
AROCLOR-1232	UG/L	ND	1	
AROCLOR-1242	UG/L	ND	1	
AROCLOR-1248	UG/L	ND	1	
AROCLOR-1254	UG/L	ND	1	
AROCLOR-1260	UG/L	ND	1	
DCB	%REC/SURR	92	22-147	
TCMX	%REC/SURR	78	14-134	
ANALYST	INITIALS	KK		

Comments:



Analytical Technologies, Inc.

"QC Report"

Title: Water Blank  
Batch: PCW055  
Analysis Method: 8080 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.  
Extraction Method: 3510 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.

---

Blank Id: A      Date Analyzed: 20-MAR-95      Date Extracted: 15-MAR-95

Parameters:	Units:	Results:	Reporting Limits:
AROCLOR-1016	UG/L	ND	1
AROCLOR-1221	UG/L	ND	1
AROCLOR-1232	UG/L	ND	1
AROCLOR-1242	UG/L	ND	1
AROCLOR-1248	UG/L	ND	1
AROCLOR-1254	UG/L	ND	1
AROCLOR-1260	UG/L	ND	1
DCB	%REC/SURR	110	22-147
TCMX	%REC/SURR	91	14-134
ANALYST	INITIALS	KK	

Comments:



Analytical Technologies, Inc.

"QC Report"

Title: Water Reagent  
Batch: PCW055  
Analysis Method: 8080 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.  
Extraction Method: 3510 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.

RS Date Analyzed: 20-MAR-95  
RSD Date Analyzed: 20-MAR-95

RS Date Extracted: 15-MAR-95  
RSD Date Extracted: 15-MAR-95

Parameters:	Spike Added	Sample Conc	RS Conc	RS %Rec	RSD Conc	RSD %Rec	RPD	Rec Lmts
PCB - 1016	10.0	<1	9.6	96	9.5	95	1	50-114
PCB - 1260	10.0	<1	10	100	11	110	10	8-127
Surrogates:								
DCB				106		108		22-147
TCMX				88		88		14-134

Comments:

Notes:

N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT  
UG/L = PARTS PER BILLION. < = LESS THAN REPORTING LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.  
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE  
PROGRAM AND REFERENCED METHOD.





Analytical Technologies, Inc.

"QC Report"

Title: Water Matrix  
Batch: PCW055  
Analysis Method: 8080 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.  
Extraction Method: 3510 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.

Dry Weight %: N/A  
Sample Spiked: 503475-1  
MS Date Analyzed: 21-MAR-95  
MSD Date Analyzed: 21-MAR-95  
MS Date Extracted: 15-MAR-95  
MSD Date Extracted: 15-MAR-95

Parameters:	Spike Added	Sample Conc	MS Conc	MS %Rec	MSD Conc	MSD %Rec	RPD	RPD Lmts	Rec Lmts
PCB - 1016	20	<1	17	85	17	85	0	30	50-114
PCB - 1260	20	<1	18	90	18	90	0	30	8-127

Surrogates:

DCB				85		88			22-147
TCMX				74		75			14-134

Comments:

Notes:

N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT  
UG/L = PARTS PER BILLION. < = LESS THAN REPORTING LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.  
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.



## Chain of Custody

503475

DATE 3/10/15 PAGE 1 OF 1

[illegible]

PROJECT INFORMATION		SAMPLE RECEIPT		SAMPLES SENT TO:	RELINQUISHED BY: 1.		RELINQUISHED BY: 2.	
PROJECT NUMBER: 503327	TOTAL NUMBER OF CONTAINERS				SAN DIEGO	Signature: <i>[Signature]</i>	Time: 1730	Signature:
PROJECT NAME: mo	CHAIN OF CUSTODY SEALS			FT. COLLINS	Printed Name: <i>[Signature]</i>	Date: 3/10/95	Printed Name:	Date:
QC LEVEL: (STD.) IV	INTACT?			RENTON	Company: Analytical Technologies, Inc.		Company:	
QC REQUIRED: MS MSD BLANK	RECEIVED GOOD COND/COLD			PENSACOLA	Albuquerque			
TAT: (STANDARD) RUSH	LAB NUMBER			PORTLAND				
				PHOENIX	RECEIVED BY: (LAB) 1.		RECEIVED BY: (LAB) 2.	
					Signature:	Time:	Signature:	Time:
				FIREQUANT	Printed Name:	Date:	Printed Name:	Date:
					Company:		Company:	
DUE DATE: 3/24								
RUSH SURCHARGE: 0								
CLIENT DISCOUNT: 10 %								

LW# 1316

ATT-PNS

----- Common Footnotes Wet Chem -----

N/A = NOT APPLICABLE.  
N/S = NOT SUBMITTED.  
N/C = SAMPLE AND DUPLICATE RESULTS ARE AT OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RPD IS "NOT CALCULABLE" AND NO CONTROL LIMITS APPLY.  
ND = NOT DETECTED ABOVE REPORTING LIMIT.  
DISS. OR D = DISSOLVED  
T & D = TOTAL AND DISSOLVED  
R = REACTIVE  
T = TOTAL  
G = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE RESULT IS AT OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "IN CONTROL".  
Q = THE ANALYTICAL (POST-DIGESTION) SPIKE IS REPORTED DUE TO THE MATRIX (PRE-DIGESTION) SPIKE BEING OUTSIDE ACCEPTANCE LIMITS.  
# = ELEVATED REPORTING LIMIT DUE TO INSUFFICIENT SAMPLE.  
+ = ELEVATED REPORTING LIMIT DUE TO DILUTION INTO CALIBRATION RANGE.  
\* = ELEVATED REPORTING LIMIT DUE TO MATRIX INTERFERENCE.  
@ = ADJUSTED REPORTING LIMIT DUE TO SAMPLE MATRIX (DILUTION PRIOR TO PREPARATION).  
P = ANALYTICAL (POST-DIGESTION) SPIKE  
I = DUPLICATE INJECTION  
& = AUTOMATED  
F = SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.  
N/C+ = NOT CALCULABLE  
N/C\* = NOT CALCULABLE; SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.  
H = SAMPLE AND/OR DUPLICATE IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL".  
A = SAMPLE AND DUPLICATE RESULTS ARE "OUT OF CONTROL".  
Z = THE SAMPLE RESULT FOR THE SPIKE IS BELOW REPORTING LIMIT. HOWEVER, THIS RESULT IS REPORTED FOR ACCURATE QC CALCULATIONS.  
NH= SAMPLE AND / OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE RESULTS EXCEED THE ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL" SAMPLE IS NON-HOMOGENOUS.  
(\* ) = DETECTION LIMITS RAISED DUE TO CLP METHOD NOT REQUIRING A CONCENTRATION STEP FOR CN.  
(CA) = SEE CORRECTIVE ACTIONS FORM.

SW-846, 3RD EDITION, SEPTEMBER 1986 AND REVISION 1, JULY 1992.

EPA 600/4-79-020, REVISED MARCH 1983.

STANDARD METHODS, 17TH ED., 1989

NIOSH MANUAL OF ANALYTICAL METHODS, 3RD EDITION.

ANNUAL BOOK OF ASTM STANDARDS, VOLUME 11.01, 1991.

1. COLIFORM. COLIFORM PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE LOGARITHM OF COLONIES PER 100 MLS OF SAMPLE ON DUPLICATE PLATES.
2. PH. PH PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND THE DUPLICATE ANALYSIS.
3. FLASHPOINT. FLASHPOINT PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE ANALYSIS. IF FLASHPOINT IS LESS THAN 25 DEGREES CELSIUS, THE DETECTION LIMIT BECOMES THE INITIAL STARTING TEMPERATURE.

RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION).

RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.

DPH = DOLLY P. HWANG	RB = REBECCA BROWN
DBH = DONALD B. HAND	BF = BLANCA FACH
TT = TONY TINEO	NB = NANCY L. BRASCH
JHS = JOSEPH SAUNDERS	MM = MARY MOLONEY
NSB = NANCY S. BUTLER	CF = CHRISTINE FOSTER

----- Common Footnotes Metals -----

N/A = NOT APPLICABLE.  
N/S = NOT SUBMITTED.  
N/C = SAMPLE AND DUPLICATE RESULTS ARE AT OR BELOW ATI REPORTING LIMIT;  
THEREFORE, THE RPD IS "NOT CALCULABLE" AND NO CONTROL LIMITS APPLY.  
N/D = NOT DETECTED.  
DISS. OR D = DISSOLVED  
T & D = TOTAL AND DISSOLVED  
R = REACTIVE  
T = TOTAL  
G = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND  
THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE RESULT IS AT  
OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "IN CONTROL".  
Q = THE ANALYTICAL (POST-DIGESTION) SPIKE IS REPORTED DUE TO PERCENT RECOVERY  
BEING OUTSIDE ACCEPTANCE LIMITS ON THE MATRIX (PRE-DIGESTION) SPIKE.  
# = ELEVATED REPORTING LIMIT DUE TO INSUFFICIENT SAMPLE.  
+ = ELEVATED REPORTING LIMIT DUE TO DILUTION INTO CALIBRATION RANGE.  
\* = ELEVATED REPORTING LIMIT DUE TO MATRIX INTERFERENCE. (DILUTION PRIOR  
TO ANALYSIS)  
@ = ADJUSTED REPORTING LIMIT DUE TO SAMPLE MATRIX. (DILUTION PRIOR TO  
DIGESTION)  
P = ANALYTICAL (POST DIGESTION) SPIKE.  
I = DUPLICATE INJECTION.  
& = AUTOMATED  
F = SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.  
N/C+ = NOT CALCULABLE  
N/C\* = NOT CALCULABLE; SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.  
H = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE  
ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI REPORTING  
LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL".  
A = SAMPLE AND DUPLICATE RESULTS ARE "OUT OF CONTROL".  
Z = THE SAMPLE RESULT FOR THE SPIKE IS BELOW THE REPORTING LIMIT. HOWEVER,  
THIS RESULT IS REPORTED FOR ACCURATE QC CALCULATIONS.  
NH= SAMPLE AND / OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT  
AND THE ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI  
REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL".  
SAMPLE IS NON-HOMOGENEOUS.  
J = (FLORIDA DEP 'J' FLAG) - MATRIX SPIKE AND POST SPIKE RECOVERY IS OUT OF  
THE ACCEPTABLE RANGE. SEE OUT OF CONTROL EVENTS FORM.  
S = METHOD OF STANDARD ADDITIONS (MSA) WAS PERFORMED ON THIS SAMPLE.

FROM ANALYSIS REPORT:

RL= REPORTING LIMIT BASED ON METHOD DETECTION LIMIT STUDIES.  
Q= QUALIFIER (FOOTNOTE)

FROM QUALITY CONTROL REPORT:

RPD= RELATIVE PERCENT DEVIATION.  
RPT LIMIT= REPORTING LIMIT BASED ON METHOD DETECTION LIMIT STUDIES.

NOTE: THE UNITS REPORTED ON THE QUALITY CONTROL REPORT ARE REPORTED ON AN AS  
RUN BASIS.

SW-846, 3rd Edition, September 1986 and Revision 1, July 1992.  
EPA 600/4-79-020, Revised March 1983.  
NIOSH Manual of Analytical Methods, 3rd Edition.

JP = JAY PEREZ  
GJ = GARY JACOBS  
JLH = JAMES L. HERED  
CD = CHRISTY DRAPER

JRR = JOHN R. ROWE  
JR = JOHN REED  
SL = STEPHANIE LOWRY

Common notation for Organic reporting

N/S = NOT SUBMITTED  
N/A = NOT APPLICABLE  
D = DILUTED OUT  
UG = MICROGRAMS  
UG/L = PARTS PER BILLION.  
UG/KG = PARTS PER BILLION.  
MG/M3 = MILLIGRAM PER CUBIC METER.  
PPMV = PART PER MILLION BY VOLUME.  
MG/KG = PARTS PER MILLION.  
MG/L = PARTS PER MILLION.  
< = LESS THAN DETECTION LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS

SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

ORGANIC SOILS ARE REPORTED ON A DRYWEIGHT BASIS.

ND = NOT DETECTED ABOVE REPORTING LIMIT.

RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.

RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION)

ATI/GC/FID

ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH FLAME IONIZATION DETECTOR (FID).

ATI/GC/FIX

ATI GAS CHROMATOGRAPHIC METHOD FOR ANALYSIS OF FIXED GASES EMPLOYING DIRECT INJECTION ON COLUMN WITH THERMAL CONDUCTIVITY DETECTOR (TCD) AND FLAME IONIZATION DETECTOR (FID).

ATI/GC/FPD

ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH FLAME PHOTOMETRIC DETECTOR (FPD) IN SULFUR-SPECIFIC MODE.

ATI/GC/PID

ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH PHOTOIONIZATION DETECTOR (PID).

ATI/GC/TCD

ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH THERMAL CONDUCTIVITY DETECTOR (TCD).

LJT = LISA THOMASON  
DGH = DARREL HALSELL  
TLH = TARA HELTON  
KW = KAREN WADSWORTH  
MV = MONIQUE VERHEYDEN  
SW = STEVE WILHITE  
JMP = JACKIE PRICE  
SJF = STEVE FILOROMO  
PL = PAUL LESCHENSKY  
RW = ROBERT WOLFE  
BV = BEN VAUGHN  
KS = KENDALL SMITH  
NC = NICOLE CALL  
LKD = LEIGH DUVALL

Common notation for Organic reporting

N/S = NOT SUBMITTED  
N/A = NOT APPLICABLE  
D = DILUTED OUT  
UG/L = PARTS PER BILLION.  
UG/KG = PARTS PER BILLION.  
MG/KG = PARTS PER MILLION.  
MG/L = PARTS PER MILLION.  
< = LESS THAN DETECTION LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.  
J = THE REPORTED VALUE IS EITHER LESS THAN THE REPORTING LIMIT BUT  
GREATER THAN ZERO, OR QUANTITATED AS A TIC; THEREFORE, IT IS  
ESTIMATED.  
JJ = THE REPORTED VALUE IS ESTIMATED DUE TO MATRIX INTERFERENCE.  
ND = NOT DETECTED ABOVE REPORTING LIMIT.  
RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.  
RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION)

SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM  
AND REFERENCED METHOD.

ORGANIC SOILS ARE REPORTED ON A DRY WEIGHT BASIS.

RP = ROBERT PEREZ  
KK = KERRY KUST  
RW = ROBERT WOLFE  
FC = FRANKIE COLEMAN



Analytical**Technologies**, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107  
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. 503327

April 12, 1995

Marathon Oil Company  
P.O. Box 552  
Midland, TX 79702-0552

Project Name/Number: IB INJECTION INDIAN BASIN (44999)

Attention: Bob Menzie

On 03/10/95, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

This report is being reissued in part to include Radiochemistry/Uranium results. It is now complete.

Please note additional case narrative for Radium 226/228 included in this report.

Due to laboratory error, the EPA recommended hold for Nitrate analyses was missed. Total Nitrate/Nitrite analysis was performed and the results are included in this report. We apologize for any inconvenience. There is no charge for this analysis.

Radiochemistry and Uranium analyses were performed by Analytical Technologies, Inc., 225 Commerce Drive, Fort Collins, CO.

EPA Method 8010/8010 and 504.1 analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.



All other analyses were performed by Analytical Technologies, Inc., 11 East Olive Road, Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.



Letitia Krakowski, Ph.D.  
Project Manager



H. Mitchell Rubenstein, Ph.D.  
Laboratory Manager

MR:jt

Enclosure

CLIENT : MARATHON OIL CO.  
PROJECT # : INDIAN BASIN (44999)  
PROJECT NAME : IB INJECTION

DATE RECEIVED : 03/10/95  
REPORT DATE : 03/24/95

ATI ID: 503327

	ATI PENSACOLA ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	503327-01	S-OUT	AQUEOUS	03/09/95
02	503327-02	TRIP BLANK	AQUEOUS	02/28/95

---TOTALS---

<u>MATRIX</u>	<u>#SAMPLES</u>
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

**TOTAL URANIUM ANALYSIS RESULTS SUMMARY**  
By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc.

Date Collected: 03/09/95

Client Name: ATI-NM

Date Analyzed : 03/15/95

Client Project ID: MO -- 503327

Sample Matrix : Water

Lab Sample ID Series: 95-03-083

Client Sample ID	Lab Sample ID	Total Uranium (ug/L )
S-Out	03-083-01	0.61 ± 0.08
Duplicate	03-083-D1	0.65 ± 0.09

Reported Uncertainties are the Estimated Total Propagated Uncertainties ( $2\sigma$ ).  
See ATI SOP 743FC for details of TPU determinations.

Remarks:

Sample 95-03-083-D1 is a duplicate of 95-03-083-01.



Analytical Technologies, Inc.

**TOTAL URANIUM ANALYSIS RESULTS SUMMARY**  
By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc.

Date Collected: 03/15/95

Client Name: ATI-NM

Date Analyzed : 03/15/95

Client Project ID: MO -- 503327

Sample Matrix : Water

Lab Sample ID Series: 95-03-020

Client Sample ID	Lab Sample ID	Total Uranium (ug/L )
Blank	03-020-B1	0.00 ± 0.05

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ).  
See ATI SOP 743FC for details of TPU determinations.

**Remarks:**

Blank for work orders 95-03-020 and 95-03-083.



Analytical Technologies, Inc.

# TOTAL URANIUM BLANK SPIKE RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc.

Date Collected: 03/15/95

Client Name: ATI-NM

Date Analyzed : 03/15/95

Client Project ID: MO -- 503327

Sample Matrix : Water

Lab Sample ID Series: 95-03-020

Lab Sample ID	Spike Conc. (ug/L )	Rep't Conc. (ug/L )
95-03-020-S1	12.5 ± 1.9	12.6 ± 2.4

Reported Uncertainties are the Estimated Total Propagated Uncertainties ( $2\sigma$ ).  
See ATI SOP 743FC for details of TPU determinations.

ATI sets control limits for KPA Uranium measurements as follows:

Blank Spike Control Limits = Known ( $\mu$ )  $\pm$  0.15 \*  $\mu$ .

Matrix Spike Control Limits = Known ( $\mu$ ) + Native Concentration  
 $\pm$  0.25 \* ( $\mu$  + Native Concentration).

ATI uses these control limits for all KPA Uranium measurements

Acceptance Range for spike samples is the known value  $\pm$  the  
control limits stated above. The reported value, without the  
uncertainty, should be compared to that range.

Remarks:

Blank spike for work orders 95-03-020 and 95-03-083.



Analytical Technologies, Inc.

# TOTAL URANIUM MATRIX SPIKE RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc.

Date Collected: 03/09/95

Client Name: ATI-NM

Date Analyzed : 03/15/95

Client Project ID: MO -- 503327

Sample Matrix : Water

Lab Sample ID Series: 95-03-083

Lab Sample ID	Known Conc. (ug/L )	Rep't Conc. (ug/L )
95-03-083-M1	0.81 ± 0.20	0.79 ± 0.19

Reported Uncertainties are the Estimated Total Propagated Uncertainties ( $2\sigma$ ).  
See ATI SOP 743FC for details of TPU determinations.

ATI sets control limits for KPA Uranium measurements as follows:

Blank Spike Control Limits = Known ( $\mu$ )  $\pm$  0.15 \*  $\mu$ .

Matrix Spike Control Limits = Known ( $\mu$ ) + Native Concentration  
 $\pm$  0.25 \* ( $\mu$  + Native Concentration).

ATI uses these control limits for all KPA Uranium measurements

Acceptance Range for spike samples is the known value  $\pm$  the  
control limits stated above. The reported value, without the  
uncertainty, should be compared to that range.

Remarks:

Sample 95-03-083-M1 is a matrix spike of 95-03-083-01.



Analytical **Technologies**, Inc.

Narrative Comments for Work Order 95-03-083

<sup>226/228</sup> Ra by Gamma Spectroscopy in Water

04/10/95

Work Order 95-03-083 was received on 03/11/95 and scheduled for gamma spectroscopy. The gamma analysis was completed on 04/01/95.

Sample 95-03-088-S1 failed ATI control limits slightly high due to an unusually low chemical yield. All other quality control requirements passed including another blank spike and a blank.

Reported results are believed not to be affected by the low blank spike recovery. Sufficient sample is not available for re-extraction, however; if additional sample is provided, it will be re-analyzed at no extra charge.

John Mitchell

Radiochemistry Instrument Technician



Analytical **Technologies**, Inc.

# GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 03/09/95 12:00

Client Name: ATI-NM

Date Analyzed: 03/31/95 00:58

Lab Sample ID: 95-03-083-01

Sample Matrix: Water

Client Sample ID: S-OUT

Radium Recovery: 0.930

Bi/Pb-214 ingrowth for Ra-226 determination: 15.8 days

Nuclide	Activity ( pCi/Liter )	% Uncertainty
Pb-214	0.460 ± 0.682	148
Ra-226	0.460 ± 0.682	148
Bi-214	< 0.730	BDL
Ra-228	< 1.00	BDL

Reported Uncertainties are the Estimated Total Propagated Uncertainty ( $2\sigma$ ).  
See ATI SOP 743FC for details of the TPU determination.

BDL = Below Detection Limit; see method for DL determination





Analytical **Technologies**, Inc.

# GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.      Date Collected: 03/15/95 12:00

Client Name: ATI-NM      Date Analyzed: 03/31/95 02:18

Lab Sample ID: 95-03-088-B1      Sample Matrix: Water

Client Sample ID: Blank      Radium Recovery: 0.894

Bi/Pb-214 ingrowth for Ra-226 determination: 15.9 days

Nuclide	Activity ( pCi/Liter )	% Uncertainty
Ra-226	0.840 ± 0.546	65.1
Pb-214	0.840 ± 0.546	65.1
Bi-214	< 0.620	BDL
Ra-228	< 0.890	BDL

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ).  
See ATI SOP 743FC for details of the TPU determination.

BDL = Below Detection Limit; see method for DL determination

Remarks: Blank for work orders 95-03-088 and 95-03-083.



Analytical Technologies, Inc.

# RADIUM 226 and RADIUM 228 BLANK SPIKE RESULTS

Method 901.1 (Modified)/KAHN et al (1990)

Lab Name: Analytical Technologies, Inc.

Date Collected: 03-15-95

Client Name: ATI-NM

Date Analyzed : 03-31-95

Client Project ID : MO -- 503327

Sample Matrix : Water

Lab Workorder Number : 95-03-088

Units : liter

Lab Sample ID	Radium 226 Known Value	Radium 226 Rep't Value	Radium 228 Known Value	Radium 228 Rep't Value
95-03-088-S1	14.8 ± 3.85	19.5 ± 2.33	14.9 ± 6.41	21.0 ± 2.42

Reported Uncertainties are the Estimated Total Propagated Uncertainties ( $2\sigma$ ).  
See ATI SOP 743FC for details of TPU determinations.

The U.S. EPA sets control limits for Ra-226 measurements as follows :  
Control Limits = Known ( $\mu$ )  $\pm$  0.26 \*  $\mu$ , for  $\mu$  > 0.1 pCi/l

The U.S. EPA sets control limits for Ra-228 measurements as follows :  
Control Limits = Known ( $\mu$ )  $\pm$  0.43 \*  $\mu$ , for  $\mu$  > 0.1 pCi/l

ATI uses these control limits for all Ra-226/228 measurements.

Acceptance Range for blank spike samples is the known value  $\pm$  the  
control limits stated above. The reported value, without the  
uncertainty, should be compared to that range.

Remarks:

Blank spike for work orders 95-03-088 and 95-03-083.



Analytical **Technologies**, Inc.

**RADIUM 226 and RADIUM 228 BLANK SPIKE RESULTS**

Method 901.1 (Modified)/KAHN et al (1990)

Lab Name: Analytical Technologies, Inc.

Date Collected: 03-15-95

Client Name: ATI-NM

Date Analyzed : 04-01-95

Client Project ID : MO -- 503327

Sample Matrix : Water

Lab Workorder Number : 95-03-088

Units : liter

Lab Sample ID	Radium 226 Known Value	Radium 226 Rep't Value	Radium 228 Known Value	Radium 228 Rep't Value
95-03-088-S2	14.8 ± 3.85	16.6 ± 2.11	14.9 ± 6.41	19.4 ± 2.40

Reported Uncertainties are the Estimated Total Propagated Uncertainties ( $2\sigma$ ).  
See ATI SOP 743FC for details of TPU determinations.

The U.S. EPA sets control limits for Ra-226 measurements as follows :  
Control Limits = Known ( $\mu$ )  $\pm$  0.26 \*  $\mu$ , for  $\mu$  > 0.1 pCi/l

The U.S. EPA sets control limits for Ra-228 measurements as follows :  
Control Limits = Known ( $\mu$ )  $\pm$  0.43 \*  $\mu$ , for  $\mu$  > 0.1 pCi/l

ATI uses these control limits for all Ra-226/228 measurements.

Acceptance Range for blank spike samples is the known value  $\pm$  the control limits stated above. The reported value, without the uncertainty, should be compared to that range.

**Remarks:**

Blank spike for work orders 95-03-088 and 95-03-083.  
Sample 95-03-088-S2 is a blank spike duplicate.





**Chain of Custody** 95-03-183

DATE 3/10/95 PAGE 1 OF 1

[illegible]

PROJECT INFORMATION		SAMPLE RECEIPT		SAMPLES SENT TO:		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.	
PROJECT NUMBER: 503327	TOTAL NUMBER OF CONTAINERS: 2	SAN DIEGO		Signature:	Time:	Signature:	Time:		
PROJECT NAME: MD	CHAIN OF CUSTODY SEALS: NP	FT. COLLINS	X	Printed Name:	Date:	Printed Name:	Date:		
QC LEVEL: STD. IV	INTACT?: NP	RENTON		Printed Name:	Date:	Printed Name:	Date:		
QC REQUIRED: MS MSD BLANK	RECEIVED GOOD COND. COLD: Y	PENSACOLA		Analytical Technologies, Inc.		Company:			
TAT: STANDARD RUSH!	LAB NUMBER:	PORTLAND		Albuquerque		Company:			
		PHOENIX		RECEIVED BY: (LAB) 1.		RECEIVED BY: (LAB) 2.			
		FIBERQUANT		Signature:	Time:	Signature:	Time:		
				Printed Name:	Date:	Printed Name:	Date:		
				Company:		Company:			
DUE DATE: 3/24, 4/7 <sup>24hrs</sup>									
RUSH SURCHARGE: 0									
CLIENT DISCOUNT: 10 %									

**APPENDIX C**  
**WELL COMPLETION DIAGRAMS**

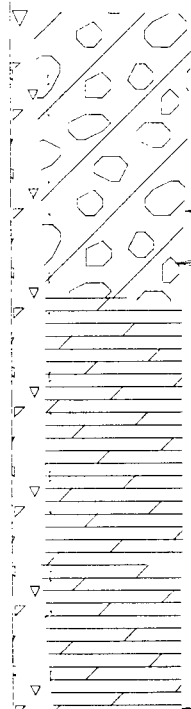
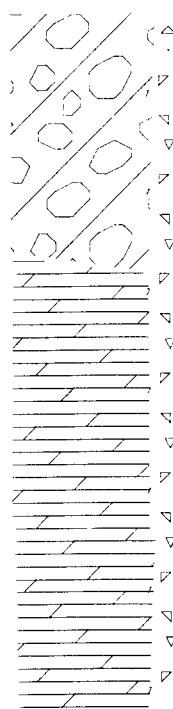
Marathon Oil Company

Planned Infiltration Wells IW-1 and IW-2

2.5 Foot Stickup

Ground Level Approximately 3800'

Cemented  
Casing



Approximately 30 Feet  
Cobbles Will Be Present

Approximately 70 Feet

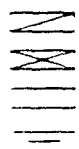
11" Open Hole

175' Estimated Piezometric Surface

Estimated TD 195'

# WELL COMPLETION RECORD

GEOL. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3806.6					<p>VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM 3808.68 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX 2" PVC RISER SODIUM BENTONITE PELLETS 3" - 20 SILICA SAND PACK 2" SLOT PVC SCREEN SLURRY</p>
	0	SILT, 7.5 YR 6/4, LIGHT BROWN, LOOSE, SOFT, DRY	ML		1 CC		
	2.7	CLAYEY SILT, 7.5 YR 5/4, BROWN, NON-PLASTIC, DRY, FRIABLE, CALICHE NODULES, 15% CLAY, 10% CALICHE, 75% SILT	ML		2 NS		
	5				3 NS		
	9.1	SANDSTONE, 2.5 YR 8/4, PALE YELLOW, MODERATELY HARD, SLIGHTLY CEMENTED, FINE GRAINED, SILTY			4 NS		
	11.1	COLOR CHANGES TO 2.5 YR 8/2, LIGHT OLIVE BROWN WITH INCREASED MOISTURE			5 NR		
	15	2.5 YR 4/4, OLIVE BROWN AND 2.5 YR 8/2, LIGHT OLIVE BROWN AT 17.5, CEMENTED, HARD AT 18.1, WEAK AT 19.5	SV		6 NS		
	17.5				7 NR		
	19.5				8 NS		
	21.5				9 NR		
	23.5				10 NS		
	25.5				11 NR		
	27.5				12 NS		
	29.5				13 NR		
	31.5				14 NS		
	33.5				15 NR		
	35	ADDER REFUSAL AT 34.5			16 NS		



SPLIT-SPoon SAMPLER  
 STANDARD PENETRATION TEST  
 UNDISTURBED SAMPLE  
 WATER TABLE (24 HOURS)  
 WATER TABLE (TIME OF BORING)  
 LABORATORY TEST LOCATION  
 PENETROMETER (TONS/SQ FT)  
 NR NO RECOVERY  
 NS NOT SAMPLED  
 SC GRAB COMPOSITE

**ROBERTS/SCHORNICK**  
 & ASSOCIATES, INC.  
 100 W. 10TH ST., SUITE 100  
 OMAHA, NE 68102

JOB NAME/NUMBER **MW-45 (BH-68)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED **5.2.91**

DRILLING METHOD **HSA**

DRILLED BY **W-B**

LOGGED BY **JMS**

THEFTED BY **B.E.**





NOTICE OF PUBLICATION  
STATE OF NEW MEXICO

RECEIVED

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

JAN 30 1996  
1303  
USFWS - NMESO

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge plan modification application has been submitted to the Director of the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

(GW-021) - Marathon Oil Company, Robert Menzie, Jr., Production Environmental Representative, P.O. Box 552, Midland, Texas, 79702-0552 has submitted an application for modification of its previously approved discharge plan for its Indian Basin Gas Plant located in the NE/4 of Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. Hydrocarbon-contaminated ground water from Marathon's ground water remediation project will be collected and treated to New Mexico Water Quality Control Commission standards by an air stripper/activated carbon system. The treated water will then be injected into the Lower Queen and/or the Shallow zone aquifer. The injection system will consist of two underground discharge pipelines, an above ground discharge pipeline, two Shallow zone injection wells, and two Lower Queen injection wells. The Lower Queen injection wells are located in the SE/4 of Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. The Shallow zone injection wells are located in the NE/4 of Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico. The quantity of treated water injected into the Lower Queen aquifer will range from 0 to 200 gallons per minute. The quantity of treated water injected into the Shallow aquifer will range from 0 to 50 gallons per minute. Total dissolved solids concentration of the treated water is approximately 730 mg/l. Ground water most likely to be affected by any accidental discharge is at a depth of approximately 240 feet and has a total dissolved solids content of approximately 550 mg/l. The discharge plan addresses how discharge quality, spills, leaks, and other accidental discharges to the surface will be managed.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge plan application may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling on any proposed discharge plan or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted to him and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed plan based on information available. If a public hearing is held, the director will approve or disapprove the proposed plan based on information in the plan and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 23rd day of January **NO EFFECT FINDING**

The described action will have no effect on listed species, wetlands, or other important wildlife resources.

Date February 13, 1996

Consultation # GW960CD-1

Approved by

SEAL U.S. FISH and WILDLIFE SERVICE

NEW MEXICO ECOLOGICAL SERVICES FIELD OFFICE

ALBUQUERQUE, NEW MEXICO

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY, Director

STATE OF NEW MEXICO  
ENERGY, MINERALS, AND NATURAL RES.

**CARLSBAD CURRENT-ARGUS**

620 South Main • P.O. Box 1629  
Carlsbad, New Mexico 88220  
(505) 887-5501

**CLASSIFIED ADVERTISING INVOICE**

START DATE	2/4/96	STOP DATE	2/4/96
NO. INSERTIONS	1	NO. LINES	143
CLASSIFICATION	100	AD NO.	162345

AMOUNT DUE

\$ 63.92

IF PAID AFTER

\$

YOUR AD READ:

*Thank You*

RETURN POSTAGE GUARANTEED

STATE OF NEW MEXICO  
ENERGY, MINERALS AND  
NATURAL RESOURCES DEPT.  
ATTN: SALLY E MARTINEZ  
2040 S PACHECO  
SANTE FE NM 87505

PLEASE RETURN WITH YOUR REMITTANCE

AD#: 162345  
STOP DAY: 2/4/96  
AMOUNT DUE: 63.92

No.

100

# Affidavit of Publication

Nº 18035

State of New Mexico,  
County of Eddy, ss.

Amy McKay,  
being first duly sworn, on oath says:

That she is Business Manager  
of the Carlsbad Current-Argus, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the state wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

February 4, 1996  
\_\_\_\_\_, 19\_\_\_\_  
\_\_\_\_\_, 19\_\_\_\_  
\_\_\_\_\_, 19\_\_\_\_  
\_\_\_\_\_, 19\_\_\_\_  
\_\_\_\_\_, 19\_\_\_\_

That the cost of publication is \$ 63.92,  
and that payment thereof has been made and will  
be assessed as court costs.

Amy McKay

Subscribed and sworn to before me this

5<sup>th</sup> day of February, 1996

Anna Crump

My commission expires 08/01/98  
Notary Public

## Legals

February 4, 1996

### NOTICE OF PUBLICATION STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge plan modification application has been submitted to the Director of the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

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quality, spills, leaks, and other accidental discharges to the surface will be managed.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge plan application may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling on any proposed discharge plan or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted to him and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be

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If no public hearing is held, the Director will approve or disapprove the proposed plan based on information available. If a public hearing is held, the director will approve or disapprove the proposed plan based on information in the plan and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 23rd day of January 1996.

STATE OF NEW MEXICO  
OIL CONSERVATION  
DIVISION  
WILLIAM J. LEMAY, Director

SEAL

# The Santa Fe New Mexican

Since 1849. We Read You.

NM OIL CONSERVATION  
ATTN: SALLY MARTINEZ  
P O BOX 6429  
SANTA FE, NM 87505-6429

AD NUMBER: 464509

ACCOUNT: 56689

LEGAL NO: 59005

P.O. #: 96-199-002997

220 LINES once at \$ 88.00

Affidavits: 5.25

Tax: 5.83

Total: \$ 99.08

## NOTICE OF PUBLICATION

### STATE OF NEW MEXICO

Energy, Minerals and  
Natural Resources  
Department  
Oil Conservation Division

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GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 23rd of January, 1996.

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY, Director  
Legal #59005  
Pub. February 2, 1996

## AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO  
COUNTY OF SANTA FE

I, BETSY PERNER being first duly sworn declare and say that I am Legal Advertising Representative of THE SANTA FE NEW MEXICAN, a daily news paper published in the English language, and having a general circulation in the Counties of Santa Fe and Los Alamos, State of New Mexico and being a Newspaper duly qualified to publish legal notices and advertisements under the provisions of Chapter 167 on Session Laws of 1937; that the publication # 59005 a copy of which is hereto attached was published in said newspaper once each week for one consecutive week(s) and that the notice was published in the newspaper proper and not in any supplement; the first publication being on the 2 day of February 1996 and that the undersigned has personal knowledge of the matter and things set forth in this affidavit.

/S/

Betsy Perner  
LEGAL ADVERTISEMENT REPRESENTATIVE

Subscribed and sworn to before me on this 2 day of February A.D., 1996



OFFICIAL SEAL

Candace C. Ruiz

NOTARY PUBLIC - STATE OF NEW MEXICO

My Commission Expires: 9/24/99

Candace C. Ruiz

• P.O. Box 2048 • Santa Fe, New Mexico 87501

• 983-3303 • (FAX) 505-984-1785

OK  
MA  
2-7-96

State of New Mexico  
**ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT**  
Santa Fe, New Mexico 87505



January 29, 1996

**CARLSBAD CURRENT ARGUS**  
**P. O. Box 1629**  
**Carlsbad, New Mexico 88221**

**RE: NOTICE OF PUBLICATION**

**ATTN: ADVERTISING MANAGER**

Dear Sir/Madam:

Please publish the attached notice one time immediately on receipt of this request. Please proofread carefully, as any error in a land description or in a key word or phrase can invalidate the entire notice.

Immediately upon completion of publication, please send the following to this office:

1. Publisher's affidavit in duplicate.
2. Statement of cost (also in duplicate.)
2. CERTIFIED invoices for prompt payment.

We should have these immediately after publication in order that the legal notice will be available for the hearing which it advertises, and also so that there will be no delay in your receiving payment.

Please publish the notice no later than February 5, 1996., 1995.

Sincerely,

  
Sally E. Martinez  
Administrative Secretary

Attachment

**VILLAGRA BUILDING - 408 Galisteo**  
Forestry and Resources Conservation Division  
P.O. Box 1948 87504-1948  
827-5830  
Park and Recreation Division  
P.O. Box 1147 87504-1147  
827-7465

**2040 South Pacheco**  
Office of the Secretary  
827-5950  
Administrative Services  
827-5925  
Energy Conservation & Management  
827-5900  
Mining and Minerals  
827-5970  
Oil Conservation  
827-7131

January 29, 1996

NEW MEXICAN  
202 E. Marcy  
Santa Fe, New Mexico 87501

RE: NOTICE OF PUBLICATION

PO #96-199-002997

**ATTN: BETSY PERNER**

Dear Sir/Madam:

Please publish the attached notice<sup>s</sup> one time. Please proofread carefully, as any error in a land description or in a key word or phrase can invalidate the entire notice.

Immediately upon completion of publication, please send the following to this office:

1. Publisher's affidavit.
2. Invoices for prompt payment.

We should have these immediately after publication in order that the legal notice will be available for the hearing which it advertises, and also so that there will be no delay in your receiving payment.

Please publish the notice on Friday, February 2, 1996, 1995.

Sincerely,

  
Sally E. Martinez  
Administrative Secretary

Attachment



**NOTICE OF PUBLICATION**  
**STATE OF NEW MEXICO**  
**ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT**  
**OIL CONSERVATION DIVISION**

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GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 23rd day of January 1996.

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

  
WILLIAM J. LEMAY, Director

S E A L

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

  
WILLIAM J. LEMAY, Director

S E A L

Check No	Check Date	Bank No	Vendor No	<b>Marathon Oil Company</b> 539 South Main Street Findlay, Ohio 45840				Direct Inquiries to: ACCOUNTS PAYABLE DEPARTMENT Midland, Texas PHONE: 915-682-1626	
	01/12/96	3723	N03075						
Loc	Mo	Yr	Sub	P.O. Number	Invoice Number	Invoice Date	Remit Comment	Discount Amt	Invoice/Pay Amt
0574	01	P01	15003041		262606A	01/11/96	FILING FEE FOR DISCHARGE PLAN TOTAL REMITTANCE: <i>Indian Basin</i> <i>GW-21</i>	0.00	50.00 50.00

(FOLD ON PERFORATION BELOW AND DETACH CHECK STUB BEFORE DEPOSITING)

**THE BACK OF THIS DOCUMENT CONTAINS AN ARTIFICIAL WATERMARK HOLD AT AN ANGLE TO VIEW**

## OIL CONSERVATION DIVISION

November 1, 1995

**CERTIFIED MAIL****RETURN RECEIPT NO. Z-765-962-889**

Mr. Robert J. Menzie, Jr.  
Marathon Oil Company  
P. O. Box 552  
Midland, Texas 79702-0552

**RE: Discharge Plan GW-21  
Cooling Tower Sludge Characterization and Disposal  
Indian Basin Gas Plant  
Eddy County, New Mexico**

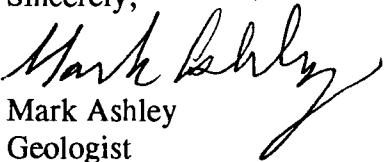
Dear Mr. Menzie:

The New Mexico Oil Conservation Division (OCD) has reviewed Marathon's request dated September 6, 1995 for disposal of nonexempt cooling tower bottom sludge at the Indian Basin Gas Plant landfarm. The request included sample results which indicated the sludge to be nonhazardous. Based on the sample results, Marathon's disposal request is approved.

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

If you have any questions, please feel free to call me at (505) 827-7155.

Sincerely,

  
Mark Ashley  
Geologist

xc: OCD Artesia Office



**Marathon  
Oil Company**

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

September 6, 1995

Mr. Mark W. Ashley  
State of New Mexico, Oil Conservation Division  
2040 Pacheco St.  
Santa Fe, New Mexico 87505

RE: Indian Basin Gas Plant  
Groundwater Discharge Plan GW-21  
Cooling Tower sludge characterization and disposal

Dear Mr. Ashley:

Per Mr. Roger Anderson's request, this letter is intended to clarify my August 22, 1995 letter regarding the characterization and disposal of nonexempt cooling tower bottom sludge at the Indian Basin Gas Plant. The laboratory report that was attached to my August 22, 1995 letter reported total metals analysis results. Therefore, to characterize the metal results as hazardous or nonhazardous, the Environmental Protection Agency allows a determination to be made by dividing the total metal concentration by 20 to compare with the Toxicity Characteristic Leaching Procedure (TCLP) regulatory limit for that metal. If the result is less than the TCLP regulatory limit for that metal (after dividing by 20), then the metal concentration is considered nonhazardous. Of the RCRA metals, all were characterized as nonhazardous.

As mentioned in the August 22, 1995 letter, the sludge was also analyzed for volatile organic compounds (VOC) using the TCLP. The results indicate the sludge is nonhazardous for VOC.

Marathon intends to remove the cooling tower sludge using a vacuum truck and/ or other equipment. Marathon is proposing to mix the sludge with exempt nonhazardous hydrocarbon-contaminated soil to be treated in the gas plant landfarm. Please approve this request for disposal of the sludge into the landfarm and notify me as soon as possible. If you have any questions, please contact me at (915) 687-8312.

Sincerely,

Robert J. Menzie, Jr.  
Production Environmental Representative

File 528-05



**Marathon  
Oil Company**

OIL CONSERVATION DIVISION  
RECEIVED

P. O. Box 1324  
Artesia, New Mexico 88210  
Telephone (505) 457-2621

195 OCT 10 AM 8 52

September 6, 1995

Mr. Roger Anderson  
Environmental Bureau Chief  
New Mexico Energy, Minerals and Natural Resources Department  
Oil Conservation Division  
2040 S. Pacheco  
Santa Fe, New Mexico 87505

Dear Mr. Anderson:

In response to your letter dated August 16, 1995 regarding inspection ports between the inner and outer vessels on the glycol skimmer, Marathon submits the attached diagram. The ports shown were installed earlier this year by Plant personnel. The two ports are three and four inches in diameter and are located 180° apart. They allow for inspection of the secondary containment and also for removal of any liquids.

Please call if you have any questions pertaining to our actions.

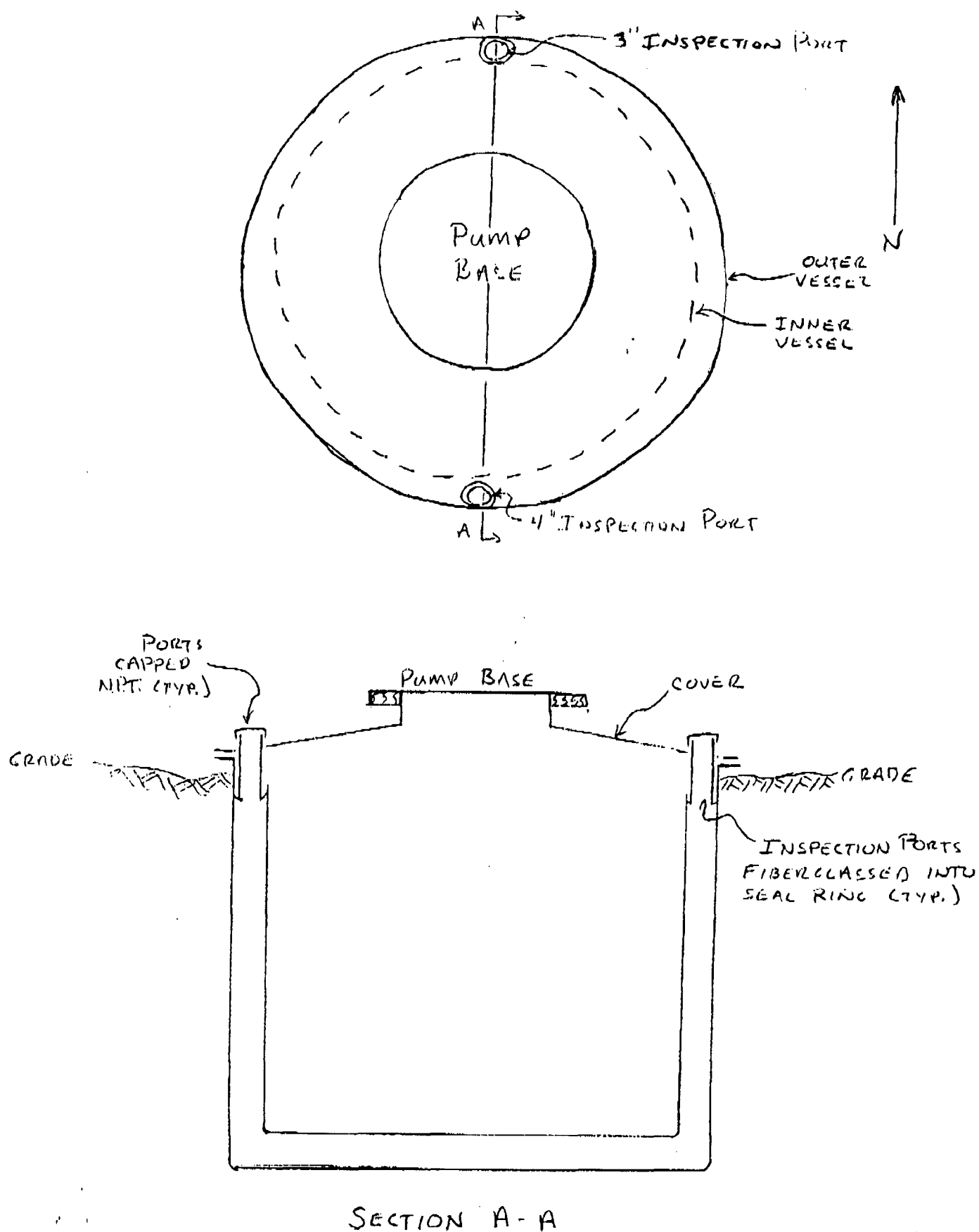
Sincerely,

A handwritten signature in cursive script that reads 'Noel R. Garza'.

(Noel R. Garza  
Plant Superintendent

Attachment

xc: R. J. Menzie





STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION



**Marathon  
Oil Company**

8 52 P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

August 22, 1995

Mr. Mark W. Ashley  
State of New Mexico, Oil Conservation Division  
2040 Pacheco St.  
Santa Fe, New Mexico 87501

RE: Indian Basin Gas Plant  
Groundwater Discharge Plan GW-21  
Cooling Tower bottoms (sludge) characterization and disposal

Dear Mr. Ashley:

Attached are the laboratory analysis results for cooling tower sludge samples collected on July 21, 1995 at Marathon's Indian Basin Gas Plant. The sludge was analyzed for volatile organic compounds (VOC) using the Toxicity Characteristic Leaching Procedure in addition to the SW-846 target analyte metals list (20 metals) and arsenic, lead, and selenium. The results indicate the nonexempt waste stream is nonhazardous for VOC and metals. Process knowledge was used to eliminate the need for other laboratory tests (e.g., semi-volatile organic compounds, polychlorinated biphenyls, herbicides, pesticides, polyaromatic hydrocarbons, radium, uranium, phenol, etc.).

Marathon intends to remove the cooling tower sludge using a vacuum truck and/ or other equipment. Marathon is proposing to mix the sludge with hydrocarbon-contaminated soil to be treated in the gas plant landfarm. Please approve this workplan and notify me as soon as possible. If you have any questions, please contact me at (915) 687-8312.

Sincerely,

A handwritten signature in cursive script that reads "Robert J. Menzie, Jr.".

Robert J. Menzie, Jr.  
Production Environmental Representative

Attachment

c: C. K. Curlee  
N. R. Garza

File 528-05



Analytical**Technologies**, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107  
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. 507391

August 17, 1995

Marathon Oil Company  
P.O. Box 552  
Midland, TX 79702-0552

Project Name/Number: IBGP COOLING TOWER

Attention: Bob Menzie

On **07/24/95**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

All analyses were performed by Analytical Technologies, Inc., 11 East Olive Road, Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Kimberly D. McNeill  
Project Manager

H. Mitchell Rubenstein, Ph.D.  
Laboratory Manager

MR:jt

Enclosure



Analytical Technologies, Inc.

CLIENT : MARATHON OIL COMPANY DATE RECEIVED : 07/24/95  
PROJECT # : (NONE)  
PROJECT NAME : IBGP COOLING TOWER REPORT DATE : 08/17/95

ATI ID: 507391

	ATI ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	507391-01	COOLING TOWER	AQUEOUS	07/21/95
02	507391-02	TRIP BLANK	AQUEOUS	07/14/95

---TOTALS---

<u>MATRIX</u>	<u>#SAMPLES</u>
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 507484  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 507391  
Project Name: MARATHON OIL  
Project Location: IBGP COOLING TOWER  
Test: TARGET ANALYTE LIST (SW-846)  
Matrix: AQUEOUS SLUDGE  
QC Level: II

Lab Id: 001  
Client Sample Id: 507391-01

Sample Date/Time: 21-JUL-95 1158  
Received Date: 25-JUL-95

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
SILVER (6010)	MG/L	ND	0.25	@*	A6W169	JMP
ALUMINUM (6010)	MG/L	500	1.5	@*	L6W169	JMP
BARIUM (6010)	MG/L	<u>120</u>	0.25	@+	B6W169	JMP
BERYLLIUM (6010)	MG/L	ND	0.02	@	Y6W169	JMP
CALCIUM (6010)	MG/L	24000	50	@+	I6W169	JMP
CADMIUM (6010)	MG/L	ND	0.12	@*	C6W169	JMP
COBALT (6010)	MG/L	1.2	0.05	@	T6W169	JMP
CHROMIUM (6010)	MG/L	<u>16</u>	0.05	@	H6W169	JMP
COPPER (6010)	MG/L	50	0.05	@	F6W169	JMP
IRON (6010)	MG/L	5500	1	@+	N6W169	JMP
MERCURY (7470)	MG/L	0.019	0.002	@	M7WC88	GU
POTASSIUM (6010)	MG/L	160	10	@	X6W169	JMP
MAGNESIUM (6010)	MG/L	3200	5	@+	J6W169	JMP
MANGANESE (6010)	MG/L	320	0.25	@+	G6W169	JMP
SODIUM (6010)	MG/L	5200	5	@+	I6W169	JMP
NICKEL (6010)	MG/L	7.0	0.5	@*	E6W169	JMP
ANTIMONY (6010)	MG/L	ND	1.5	@*	36W169	JMP
THALLIUM (6010)	MG/L	ND	2.5	@*	46W169	JMP
VANADIUM (6010)	MG/L	10	0.05	@	V6W169	JMP
ZINC (6010)	MG/L	70	0.1	@	S6W169	JMP

Comments:



Analytical Technologies, Inc.

"Method Report Summary"

Accession Number: 507484  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 507391  
Project Name: MARATHON OIL  
Project Location: IBGP COOLING TOWER  
Test: TARGET ANALYTE LIST (SW-846)

Client Sample Id:	Parameter:	Unit:	Result:
507391-01	ALUMINUM (6010)	MG/L	500
	BARIUM (6010)	MG/L	120
	CALCIUM (6010)	MG/L	24000
	COBALT (6010)	MG/L	1.2
	CHROMIUM (6010)	MG/L	16
	COPPER (6010)	MG/L	50
	IRON (6010)	MG/L	5500
	MERCURY (7470)	MG/L	0.019
	POTASSIUM (6010)	MG/L	160
	MAGNESIUM (6010)	MG/L	3200
	MANGANESE (6010)	MG/L	320
	SODIUM (6010)	MG/L	5200
	NICKEL (6010)	MG/L	7.0
	VANADIUM (6010)	MG/L	10
	ZINC (6010)	MG/L	70



Analytical Technologies, Inc.

## "Metals Quality Control Report"

Parameter:	SILVER	ALUMINUM	BARIUM	BERYLLIUM	CALCIUM	CADMIUM
Batch Id:	A6W169	L6W169	B6W169	Y6W169	I6W169	C6W169
Blank Result:	<0.01	<0.06	<0.01	<0.004	<1	<0.005
Anal. Method:	6010	6010	6010	6010	6010	6010
Prep. Method:	3010	3010	3010	3010	3010	3010
Analysis Date:	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95
Prep. Date:	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95

## Sample Duplication

Sample Dup:	507521-1	507521-1	507521-1	507521-1	507521-1	507521-1
Rept Limit:	<0.01	<0.06	<0.01	<0.004	<1	<0.005
Sample Result:	2.0	2.3	2.0	2.0	32	2.0
Dup Result:	2.0	2.3	2.0	2.0	32	2.0
Sample RPD:	0	0	0	0	0	0
Max RPD:	20	20	20	20	20	20
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A

## Matrix Spike

Sample Spiked:	507521-1	507521-1	507521-1	507521-1	507521-1	507521-1
Rept Limit:	<0.01	<0.06	<0.01	<0.004	<1	<0.005
Sample Result:	<0.01	0.38	0.02	<0.004	12	<0.005
Spiked Result:	2.0	2.3	2.0	2.0	32	2.0
Spike Added:	2.0	2.0	2.0	2.0	20	2.0
% Recovery:	100	96	99	100	100	100
% Rec Limits:	75-125	75-125	75-125	75-125	75-125	75-125
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A

## ICV

ICV Result:	4.8	5.1	4.8	5.0	9.9	4.8
True Result:	5.0	5.0	5.0	5.0	10	5.0
% Recovery:	96	102	96	100	99	96
% Rec Limits:	90-110	90-110	90-110	90-110	90-110	90-110

## ICS

ICS Result:	2.0	2.0	2.0	2.0	20	2.0
True Result:	2.0	2.0	2.0	2.0	20	2.0
% Recovery:	100	100	100	100	100	100
% Rec Limits:	80-120	80-120	80-120	80-120	80-120	80-120



Analytical Technologies, Inc.

## "Metals Quality Control Report"

Parameter:	COBALT	CHROMIUM	COPPER	IRON	MERCURY	POTASSIUM
Batch Id:	T6W169	H6W169	F6W169	N6W169	M7W088	X6W169
Blank Result:	<0.01	<0.01	<0.01	<0.02	<0.0002	<2
Anal. Method:	6010	6010	6010	6010	7470	6010
Prep. Method:	3010	3010	3010	3010	7470	3010
Analysis Date:	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95	05-AUG-95	02-AUG-95
Prep. Date:	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95	05-AUG-95	02-AUG-95

## Sample Duplication

Sample Dup:	507521-1	507521-1	507521-1	507521-1	507521-1	507521-1
Rept Limit:	<0.01	<0.01	<0.01	<0.02	<0.0002	<2
Sample Result:	2.0	2.0	2.0	12	0.0053	27
Dup Result:	2.0	2.0	2.0	12	0.0054	27
Sample RPD:	0	0	0	0	2	0
Max RPD:	20	20	20	20	20	20
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A

## Matrix Spike

Sample Spiked:	507521-1	507521-1	507521-1	507521-1	507521-1	507521-1
Rept Limit:	<0.01	<0.01	<0.01	<0.02	<0.0002	<2
Sample Result:	<0.01	<0.01	<0.01	10	<0.0002	7
Spiked Result:	2.0	2.0	2.0	12	0.0053	27
Spike Added:	2.0	2.0	2.0	2.0F	0.0050	20
% Recovery:	100	100	100	100	106	100
% Rec Limits:	75-125	75-125	75-125	75-125	75-125	75-125
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A

## ICV

ICV Result:	4.9	4.9	4.8	5.2	0.0042	48
True Result:	5.0	5.0	5.0	5.0	0.0040	50
% Recovery:	98	98	96	104	106	96
% Rec Limits:	90-110	90-110	90-110	90-110	90-120	90-110

## LCS

LCS Result:	2.0	2.0	2.0	2.0	0.0052	20
True Result:	2.0	2.0	2.0	2.0	0.0050	20
% Recovery:	100	100	100	100	104	100
% Rec Limits:	90-120	90-120	90-120	90-120	90-120	90-120



Analytical Technologies, Inc.

## "Metals Quality Control Report"

Parameter:	MAGNESIUM	MANGANESE	SODIUM	NICKEL	ANTIMONY	THALLIUM
Batch Id:	J6W169	G6W169	16W169	E6W169	36W169	46W169
Blank Result:	<0.2	<0.01	<0.2	<0.02	<0.06	<0.1
Anal. Method:	6010	6010	6010	6010	6010	6010
Prep. Method:	3010	3010	3010	3010	3010	3010
Analysis Date:	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95
Prep. Date:	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95	02-AUG-95

## Sample Duplication

Sample Dup:	507521-1	507521-1	507521-1	507521-1	507521-1	507521-1
Rept Limit:	<0.2	<0.01	<0.2	<0.02	<0.06	<0.1
Sample Result:	36	2.2	120	2.0	1.9	1.9
Dup Result:	36	2.2	120	2.0	2.0	1.9
Sample RPD:	0	0	0	0	5	0
Max RPD:	20	20	20	20	20	20
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A

## Matrix Spike

Sample Spiked:	507521-1	507521-1	507521-1	507521-1	507521-1	507521-1
Rept Limit:	<0.2	<0.01	<0.2	<0.02	<0.06	<0.1
Sample Result:	16	0.27	95	<0.02	<0.06	<0.1
Spiked Result:	36	2.2	120	2.0	1.9	1.9
Spike Added:	20	2.0	20F	2.0	2.0	2.0
% Recovery:	100	97	125	100	95	95
% Rec Limits:	75-125	75-125	75-125	75-125	75-125	75-125
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A

## ICV

ICV Result:	5.1	5.0	10	4.9	5.2	4.8
True Result:	5.0	5.0	10	5.0	5.0	5.0
% Recovery:	102	100	100	98	104	96
% Rec Limits:	90-110	90-110	90-110	90-110	90-110	90-110

## LCS

LCS Result:	20	2.0	23	2.0	2.0	2.0
True Result:	20	2.0	20	2.0	2.0	2.0
% Recovery:	100	100	115	100	100	100
% Rec Limits:	90-120	90-120	90-120	90-120	90-120	90-120





Analytical Technologies, Inc.

"Metals Quality Control Report"

Parameter:	VANADIUM	ZINC
Batch Id:	V5W169	56W169
Blank Result:	<0.01	<0.02
Anal. Method:	6010	6010
Prep. Method:	3010	3010
Analysis Date:	02-AUG-95	02-AUG-95
Prep. Date:	02-AUG-95	02-AUG-95

Sample Duplication

Sample Dup:	507521-1	507521-1
Rept Limit:	<0.01	<0.02
Sample Result:	2.0	2.0
Dup Result:	2.0	2.0
Sample RPD:	0	0
Max RPD:	20	20
Dry Weight%	N/A	N/A

Matrix Spike

Sample Spiked:	507521-1	507521-1
Rept Limit:	<0.01	<0.02
Sample Result:	<0.01	0.02
Spiked Result:	2.0	2.0
Spike Added:	2.0	2.0
% Recovery:	100	99
% Rec Limits:	75-125	75-125
Dry Weight%	N/A	N/A

ICV

ICV Result:	4.8	5.0
True Result:	5.0	5.0
% Recovery:	96	100
% Rec Limits:	90-110	90-110

LCS

LCS Result:	2.0	2.0
True Result:	2.0	2.0
% Recovery:	100	100
% Rec Limits:	80-120	80-120



A6W169	ANALYST: JMP
A6W169	The results reported under "Sample Duplication" are the MS/MSD.
L6W169	ANALYST: JMP
L6W169	The results reported under "Sample Duplication" are the MS/MSD.
B6W169	ANALYST: JMP
B6W169	The results reported under "Sample Duplication" are the MS/MSD.
Y6W169	ANALYST: JMP
Y6W169	The results reported under "Sample Duplication" are the MS/MSD.
I6W169	ANALYST: JMP
I6W169	The results reported under "Sample Duplication" are the MS/MSD.
C6W169	ANALYST: JMP
C6W169	The results reported under "Sample Duplication" are the MS/MSD.
T6W169	ANALYST: JMP
T6W169	The results reported under "Sample Duplication" are the MS/MSD.
H6W169	ANALYST: JMP
H6W169	The results reported under "Sample Duplication" are the MS/MSD.
F6W169	ANALYST: JMP
F6W169	The results reported under "Sample Duplication" are the MS/MSD.
N6W169	ANALYST: JMP
N6W169	The results reported under "Sample Duplication" are the MS/MSD.
M7W088	ANALYST: GJ
M7W088	The results reported under "Sample Duplication" are the MS/MSD.
X6W169	ANALYST: JMP
X6W169	The results reported under "Sample Duplication" are the MS/MSD.
J6W169	ANALYST: JMP
J6W169	The results reported under "Sample Duplication" are the MS/MSD.
G6W169	ANALYST: JMP
G6W169	The results reported under "Sample Duplication" are the MS/MSD.
L6W169	ANALYST: JMP
L6W169	The results reported under "Sample Duplication" are the MS/MSD.
E6W169	ANALYST: JMP
E6W169	The results reported under "Sample Duplication" are the MS/MSD.
B6W169	ANALYST: JMP
B6W169	The results reported under "Sample Duplication" are the MS/MSD.
36W169	ANALYST: JMP
36W169	The results reported under "Sample Duplication" are the MS/MSD.
46W169	ANALYST: JMP
46W169	The results reported under "Sample Duplication" are the MS/MSD.
V6W169	ANALYST: JMP
V6W169	The results reported under "Sample Duplication" are the MS/MSD.
S6W169	ANALYST: JMP
S6W169	The results reported under "Sample Duplication" are the MS/MSD.



----- Common Footnotes Metals -----

N/A = NOT APPLICABLE.  
N/S = NOT SUBMITTED.  
N/C = SAMPLE AND DUPLICATE RESULTS ARE AT OR BELOW ATI REPORTING LIMIT;  
THEREFORE, THE RPD IS "NOT CALCULABLE" AND NO CONTROL LIMITS APPLY.  
N/D = NOT DETECTED.  
DISS. OR D = DISSOLVED  
T & D = TOTAL AND DISSOLVED  
R = REACTIVE  
T = TOTAL  
G = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND  
THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE RESULT IS AT  
OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "IN CONTROL".  
Q = THE ANALYTICAL (POST-DIGESTION) SPIKE IS REPORTED DUE TO PERCENT RECOVERY  
BEING OUTSIDE ACCEPTANCE LIMITS ON THE MATRIX (PRE-DIGESTION) SPIKE.  
# = ELEVATED REPORTING LIMIT DUE TO INSUFFICIENT SAMPLE.  
+ = ELEVATED REPORTING LIMIT DUE TO DILUTION INTO CALIBRATION RANGE.  
\* = ELEVATED REPORTING LIMIT DUE TO MATRIX INTERFERENCE. (DILUTION PRIOR  
TO ANALYSIS)  
@ = ADJUSTED REPORTING LIMIT DUE TO SAMPLE MATRIX. (DILUTION PRIOR TO  
DIGESTION)  
P = ANALYTICAL (POST DIGESTION) SPIKE.  
I = DUPLICATE INJECTION.  
& = AUTOMATED  
F = SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.  
N/C- = NOT CALCULABLE  
N/C\* = NOT CALCULABLE; SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.  
H = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE  
ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI REPORTING  
LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL".  
A = SAMPLE AND DUPLICATE RESULTS ARE "OUT OF CONTROL".  
Z = THE SAMPLE RESULT FOR THE SPIKE IS BELOW THE REPORTING LIMIT. HOWEVER,  
THIS RESULT IS REPORTED FOR ACCURATE QC CALCULATIONS.  
NH= SAMPLE AND / OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT  
AND THE ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI  
REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL".  
SAMPLE IS NON-HOMOGENEOUS.  
J = (FLORIDA DEP 'C' FLAG) - MATRIX SPIKE AND POST SPIKE RECOVERY IS OUT OF  
THE ACCEPTABLE RANGE. SEE OUT OF CONTROL EVENTS FORM.  
S = METHOD OF STANDARD ADDITIONS (MSA) WAS PERFORMED ON THIS SAMPLE.

FROM ANALYSIS REPORT:

RL= REPORTING LIMIT BASED ON METHOD DETECTION LIMIT STUDIES.

Q= QUALIFIER (FOOTNOTE

FROM QUALITY CONTROL REPORT:

RPD= RELATIVE PERCENT DEVIATION.

RPT LIMIT= REPORTING LIMIT BASED ON METHOD DETECTION LIMIT STUDIES.

NOTE: THE UNITS REPORTED ON THE QUALITY CONTROL REPORT ARE REPORTED ON AN AS  
RUN BASIS.

SW-846, 3rd Edition, September 1986 and Revision 1, July 1992.

EPA 600/4-79-020, Revised March 1983.

NIOSH Manual of Analytical Methods, 3rd Edition.

GJ = GARY JACOBS  
JLH = JAMES L. HERED

JR = JOHN REED  
JMP = JACQUELINE M. PRICE



Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 507484  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 507391  
Project Name: MARATHON OIL  
Project Location: IBGP COOLING TOWER  
Test: Group of Single Metals  
Matrix: AQUEOUS SLUDGE  
QC Level: II

Lab Id: 001  
Client Sample Id: 507391-01

Sample Date/Time: 21-JUL-95 1158  
Received Date: 25-JUL-95

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
ARSENIC (6010)	MG/L	<u>10</u> 5	0.25	@	R6W169	JMP
LEAD (6010)	MG/L	2.2	1.2	@*	P6W169	JMP
SELENIUM (6010)	MG/L	ND	5	@*	S6W169	JMP

Comments:



Analytical **Technologies**, Inc.

"Method Report Summary"

Accession Number: 507484  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 507391  
Project Name: MARATHON OIL  
Project Location: IBGP COOLING TOWER  
Test: Group of Single Metals

Client Sample Id:	Parameter:	Unit:	Result:
507391-01	ARSENIC (6010)	MG/L	<u>10</u>
	LEAD (6010)	MG/L	2.2



Analytical Technologies, Inc.

"Metals Quality Control Report"

Parameter:	ARSENIC	LEAD	SELENIUM
Batch Id:	R6W169	P6W169	S6W169
Blank Result:	<0.05	<0.05	<0.1
Anal. Method:	6010	6010	6010
Prep. Method:	3010	3010	3010
Analysis Date:	02-AUG-95	02-AUG-95	02-AUG-95
Prep. Date:	02-AUG-95	02-AUG-95	02-AUG-95

Sample Duplication

Sample Dup:	507521-1	507521-1	507521-1
Rept Limit:	<0.05	<0.05	<0.1
Sample Result:	2.0	1.9	2.0
Dup Result:	2.0	2.0	2.0
Sample RPD:	0	5	0
Max RPD:	20	20	20
Dry Weight%	N/A	N/A	N/A

Matrix Spike

Sample Spiked:	507521-1	507521-1	507521-1
Rept Limit:	<0.05	<0.05	<0.1
Sample Result:	<0.05	<0.05	<0.1
Spiked Result:	2.0	1.9	2.0
Spike Added:	2.0	2.0	2.0
% Recovery:	100	95	100
% Rec Limits:	75-125	75-125	75-125
Dry Weight%	N/A	N/A	N/A

ICV

ICV Result:	5.0	4.9	4.8
True Result:	5.0	5.0	5.0
% Recovery:	100	98	96
% Rec Limits:	90-110	90-110	90-110

LCS

LCS Result:	2.0	2.0	2.0
True Result:	2.0	2.0	2.0
% Recovery:	100	100	100
% Rec Limits:	90-120	90-120	90-120



Analytical**Technologies**, Inc.

"Quality Control Comments"

Batch Id:                      Comments:

---

R6W169	ANALYST: JMP
R6W169	The results reported under "Sample Duplication" are the MS/MSD.
P6W169	ANALYST: JMP
P6W169	The results reported under "Sample Duplication" are the MS/MSD.
S6W169	ANALYST: JMP
S6W169	The results reported under "Sample Duplication" are the MS/MSD.



----- Common Footnotes Metals -----

N/A = NOT APPLICABLE.  
N/S = NOT SUBMITTED.  
N/C = SAMPLE AND DUPLICATE RESULTS ARE AT OR BELOW ATI REPORTING LIMIT;  
THEREFORE, THE RPD IS "NOT CALCULABLE" AND NO CONTROL LIMITS APPLY.  
N/D = NOT DETECTED.  
DISS. OR D = DISSOLVED  
T & D = TOTAL AND DISSOLVED  
R = REACTIVE  
T = TOTAL  
G = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND  
THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE RESULT IS AT  
OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "IN CONTROL".  
Q = THE ANALYTICAL (POST-DIGESTION) SPIKE IS REPORTED DUE TO PERCENT RECOVERY  
BEING OUTSIDE ACCEPTANCE LIMITS ON THE MATRIX (PRE-DIGESTION) SPIKE.  
# = ELEVATED REPORTING LIMIT DUE TO INSUFFICIENT SAMPLE.  
+ = ELEVATED REPORTING LIMIT DUE TO DILUTION INTO CALIBRATION RANGE.  
\* = ELEVATED REPORTING LIMIT DUE TO MATRIX INTERFERENCE. (DILUTION PRIOR  
TO ANALYSIS)  
@ = ADJUSTED REPORTING LIMIT DUE TO SAMPLE MATRIX. (DILUTION PRIOR TO  
DIGESTION)  
P = ANALYTICAL (POST DIGESTION) SPIKE.  
I = DUPLICATE INJECTION.  
& = AUTOMATED  
F = SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.  
N/C+ = NOT CALCULABLE  
N/C\* = NOT CALCULABLE; SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.  
H = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE  
ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI REPORTING  
LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL".  
A = SAMPLE AND DUPLICATE RESULTS ARE "OUT OF CONTROL".  
Z = THE SAMPLE RESULT FOR THE SPIKE IS BELOW THE REPORTING LIMIT. HOWEVER,  
THIS RESULT IS REPORTED FOR ACCURATE QC CALCULATIONS.  
NH= SAMPLE AND / OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT  
AND THE ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI  
REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL".  
SAMPLE IS NON-HOMOGENEOUS.  
J = (FLORIDA DEP 'J' FLAG) - MATRIX SPIKE AND POST SPIKE RECOVERY IS OUT OF  
THE ACCEPTABLE RANGE. SEE OUT OF CONTROL EVENTS FORM.  
S = METHOD OF STANDARD ADDITIONS (MSA) WAS PERFORMED ON THIS SAMPLE.

FROM ANALYSIS REPORT:

RL= REPORTING LIMIT BASED ON METHOD DETECTION LIMIT STUDIES.

Q= QUALIFIER FOOTNOTE

FROM QUALITY CONTROL REPORT:

RPD= RELATIVE PERCENT DEVIATION.

RPT LIMIT= REPORTING LIMIT BASED ON METHOD DETECTION LIMIT STUDIES.

NOTE: THE UNITS REPORTED ON THE QUALITY CONTROL REPORT ARE REPORTED ON AN AS  
RUN BASIS.

SW-846, 3rd Edition, September 1986 and Revision 1, July 1992.

EPA 600/4-79-020, Revised March 1983.

NIOSH Manual of Analytical Methods, 3rd Edition.

GJ = GARY JACOBS  
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Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 507484  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 507391  
Project Name: MARATHON OIL  
Project Location: IBGP COOLING TOWER  
Test: TCLP VOLATILES (8240)  
Analysis Method: 8240 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992  
Extraction Method: 1311 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.  
Matrix: AQUEOUS SLUDGE  
QC Level: II

Lab Id: 001 Sample Date/Time: 21-JUL-95 1158  
Client Sample Id: 507391-01 Received Date: 25-JUL-95  
Batch: BUW058 Extraction Date: 27-JUL-95  
Blank: C Dry Weight %: N/A Analysis Date: 02-AUG-95

Parameter:	Units:	Results:	Rpt Lmts:	Q:
BENZENE	MG/L	0.002	0.001	
CARBON TETRACHLORIDE	MG/L	ND	0.002	
CHLOROBENZENE	MG/L	ND	0.001	
CHLOROFORM	MG/L	ND	0.002	
1,4-DICHLOROBENZENE	MG/L	ND	0.002	
1,2-DICHLOROETHANE	MG/L	ND	0.002	
1,1 DICHLOROETHYLENE	MG/L	ND	0.002	
METHYL ETHYL KETONE	MG/L	0.003	0.010	
TETRACHLOROETHYLENE	MG/L	ND	0.002	
TRICHLOROETHYLENE	MG/L	ND	0.001	
VINYL CHLORIDE	MG/L	ND	0.001	
BROMOFLUOROBENZENE	%REC/SURR	93	85-115	
1,2-DICHLOROETHANE-D4	%REC/SURR	95	76-114	
TOLUENE-D8	%REC/SURR	97	83-110	
ANALYST	INITIALS	PL		

Comments:



Analytical**Technologies**, Inc.

"Method Report Summary"

Accession Number: 507484  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 507391  
Project Name: MARATHON OIL  
Project Location: IBGP COOLING TOWER  
Test: TCLP VOLATILES (8240)

---

Client Sample Id:	Parameter:	Unit:	Result:
507391-01	BENZENE	MG/L	0.002
	METHYL ETHYL KETONE	MG/L	0.023



Analytical Technologies, Inc.

"QC Report"

Title: Water Blank  
Batch: BUW058  
Analysis Method: 8240 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992  
Extraction Method: 1311 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.

Blank Id: C Date Analyzed: 02-AUG-95 Date Extracted: 27-JUL-95

Parameters:	Units:	Results:	Reporting Limits:
ACETONE	UG/L	ND	10
ACETONITRILE	UG/L	ND	100
ACROLEIN	UG/L	ND	100
ACRYLONITRILE	UG/L	ND	100
ALLYL CHLORIDE	UG/L	ND	100
BENZENE	UG/L	ND	1
BIS(CHLOROMETHYL) ETHER	UG/L	ND	5
BROMODICHLOROMETHANE	UG/L	ND	1
BROMOFORM	UG/L	ND	2
BROMOMETHANE	UG/L	ND	1
CARBON DISULFIDE	UG/L	ND	1
CARBON TETRACHLORIDE	UG/L	ND	2
CHLOROBENZENE	UG/L	ND	1
CHLOROETHANE	UG/L	ND	1
2-CHLOROETHYL VINYL ETHER	UG/L	ND	5
CHLOROFORM	UG/L	ND	2
CHLOROMETHANE	UG/L	ND	2
CHLOROPRENE	UG/L	ND	5
DIBROMOCHLOROMETHANE	UG/L	ND	1
DIBROMOMETHANE	UG/L	ND	5
1,2-DIBROMO-3-CHLOROPROPANE	UG/L	ND	5
DICHLORODIFLUOROMETHANE	UG/L	ND	5
1,1-DICHLOROETHANE	UG/L	ND	1
1,2-DICHLOROETHANE	UG/L	ND	2
1,1-DICHLOROETHENE	UG/L	ND	1
1,2-DICHLOROETHENE (TOTAL)	UG/L	ND	2
1,2-DICHLOROPROPANE	UG/L	ND	2
CIS-1,3-DICHLOROPROPENE	UG/L	ND	1
TRANS-1,3-DICHLOROPROPENE	UG/L	ND	1
TRANS-1,4-DICHLORO-2-BUTENE	UG/L	ND	5
1,4-DIOXANE	UG/L	ND	10
ETHYLBENZENE	UG/L	ND	1
ETHYL METHACRYLATE	UG/L	ND	5
2-HEXANONE (MEK)	UG/L	ND	3
IODOETHANE	UG/L	ND	5
ISOBUTYL ALCOHOL	UG/L	ND	10
METHACRYLONITRILE	UG/L	ND	5
METHYLENE CHLORIDE	UG/L	ND	3
METHYL ETHYL KETONE	UG/L	ND	3
METHYL METHACRYLATE	UG/L	ND	5
4-METHYL-2-PENTANONE (MIBK)	UG/L	ND	3
PROPIONITRILE	UG/L	ND	5
STYRENE	UG/L	ND	2
TETRACHLOROETHENE	UG/L	ND	1
1,1,1,2-TETRACHLOROETHANE	UG/L	ND	2
1,1,2,2-TETRACHLOROETHANE	UG/L	ND	2



Analytical Technologies, Inc.

"QC Report"

Title: Water Blank  
Batch: BUW058  
Analysis Method: 8240 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992  
Extraction Method: 1311 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.

Parameters:	Units:	Results:	Reporting Limits:
TOLUENE	UG/L	ND	5
1,1,1-TRICHLOROETHANE	UG/L	ND	5
1,1,2-TRICHLOROETHANE	UG/L	ND	2
TRICHLOROETHENE	UG/L	ND	1
TRICHLOROFLUOROMETHANE	UG/L	ND	1
1,2,3 TRICHLOROPROPANE	UG/L	ND	5
VINYL ACETATE	UG/L	ND	2
VINYL CHLORIDE	UG/L	ND	1
XYLENES (TOTAL)	UG/L	ND	2
BROMOFLUOROBENZENE	%REC/SURR	98	86-115
1,2-DICHLOROETHANE-D4	%REC/SURR	94	76-114
TOLUENE-D8	%REC/SURR	95	88-110
ANALYST	INITIALS	LL	

Comments:



Analytical Technologies, Inc.

"QC Report"

Title: Water Reagent  
Batch: BUW058  
Analysis Method: 8240 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992  
Extraction Method: 1311 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.

RS Date Analyzed: 01-AUG-95  
RSD Date Analyzed: 02-AUG-95

RS Date Extracted: N/A  
RSD Date Extracted: N/A

Parameters:	Spike Added	Sample Conc	RS Conc	RS %Rec	RSD Conc	RSD %Rec	RPD	Rec Lmts	Rec Lmts
1,1-DICHLOROETHENE	50	<1	52	104	51	102	2	12	81-113
TRICHLOROETHENE	50	<1	47	94	48	96	2	15	90-113
BENZENE	50	<1	43	86	43	86	0	15	84-113
TOLUENE	50	<5	45	90	48	96	6	11	90-113
CHLOROBENZENE	50	<1	45	90	47	94	4	15	87-113
Surrogates:									
1,2-DICHLOROETHANE-D4				95		95			76-114
TOLUENE-D8				93		97			83-111
BROMOFLUOROBENZENE				94		99			86-113

Comments:

Notes:

N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT  
UG/L = PARTS PER BILLION. < = LESS THAN REPORTING LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.  
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE  
PROGRAM AND REFERENCED METHOD.



Analytical Technologies, Inc.

"QC Report"

Title: Water Matrix  
Batch: BUW058  
Analysis Method: 8240 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992  
Extraction Method: 1311 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.

Dry Weight %: N/A  
Sample Spiked: 507484-1

MS Date Analyzed: 05-AUG-95  
MSD Date Analyzed: 05-AUG-95

MS Date Extracted: N/A  
MSD Date Extracted: N/A

Parameters:	Spike Added	Sample Conc	MS Conc	MS %Rec	MSD Conc	MSD %Rec	RPD	RPD Lmts	Rec Lmts
1,1-DICHLOROETHENE	50	<1	51	102	50	100	2	12	78-119
TRICHLOROETHENE	50	<1	49	98	49	98	0	15	90-116
BENZENE	50	<1	48	96	49	98	2	10	84-118
TOLUENE	50	<5	55	110	54	108	2	11	84-129
CHLOROBENZENE	50	<1	48	96	49	98	2	15	87-117

Surrogates:	MS %Rec	MSD %Rec	Rec Lmts
1,2-DICHLOROETHANE-D4	95	97	76-114
TOLUENE-D8	87*	84*	89-110
BROMOFLUOROBENZENE	97	101	86-115

Comments:

\* MATRIX SPIKE/MATRIX SPIKE DUPLICATE HAD RECOVERY(S), RPD'S AND/OR SURROGATE(S) OUTSIDE ACCEPTANCE LIMITS DUE TO MATRIX INTERFERENCE. SEE REAGENT SPIKE/REAGENT SPIKE DUPLICATE DATA.

Notes:

N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT  
UG/L = PARTS PER BILLION. < = LESS THAN REPORTING LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.  
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.



Analytical Technologies, Inc.

Common notation for Organic reporting

N/S = NOT SUBMITTED  
N/A = NOT APPLICABLE  
D = DILUTED OUT  
UG/L = PARTS PER BILLION.  
UG/KG = PARTS PER BILLION.  
MG/KG = PARTS PER MILLION.  
MG/L = PARTS PER MILLION.  
MG/M3 = MILLIGRAMS PER CUBIC METER.  
NG = NANOGRAMS.  
UG = MICROGRAMS.  
PPBV = PARTS PER BILLION/VOLUME.  
< = LESS THAN DETECTION LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS  
J = THE REPORTED VALUE IS EITHER LESS THAN THE REPORTING LIMIT BUT  
GREATER THAN ZERO, OR QUANTITATED AS A TIC; THEREFORE, IT IS  
ESTIMATED.  
JJ = REPORTED VALUE IS ESTIMATED DUE TO MATRIX INTERFERENCE.  
ND = NOT DETECTED ABOVE REPORT LIMIT.  
RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.  
RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION)

SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE  
PROGRAM AND REFERENCED METHOD.

ORGANIC SOILS ARE REPORTED ON A DRY WEIGHT BASIS.

DUE TO THE NATURE OF THE SAMPLE MATRIX, MATRIX SPIKE/MATRIX SPIKE  
DUPLICATE ANALYSIS CANNOT BE PERFORMED FOR AIR ANALYSIS.

LP = LEVERNE PETERSON	RW = RITA WINGO
DWB = DAVID BOWERS	LD = LARRY DILMORE
DB = DENNIS BESON	DC = DAVID CELESTIAL
LL = LANCE LARSON	RB = RAFAEL BARRAZA
JA = JENNIFER ALEXANDER	PL = PAUL LESCHENSKY



Analytical Technologies, Inc.

"QC Report"

Title: Water Blank  
Batch: BUW055  
Analysis Method: 8240 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992  
Extraction Method: N/A

Blank Id: B Date Analyzed: 28-JUL-95 Date Extracted: N/A

Parameters:	Units:	Results:	Reporting Limits:
ACETONE	UG/L	ND	10
ACETONITRILE	UG/L	ND	100
ACROLEIN	UG/L	ND	100
ACRYLONITRILE	UG/L	ND	100
ALLYL CHLORIDE	UG/L	ND	100
BENZENE	UG/L	ND	1
BIS (CHLOROMETHYL) ETHER	UG/L	ND	5
BROMODICHLOROMETHANE	UG/L	ND	1
BROMOFORM	UG/L	ND	2
BROMOMETHANE	UG/L	ND	1
CARBON DISULFIDE	UG/L	ND	1
CARBON TETRACHLORIDE	UG/L	ND	2
CHLOROBENZENE	UG/L	ND	1
CHLOROETHANE	UG/L	ND	1
2-CHLOROETHYL VINYL ETHER	UG/L	ND	5
CHLOROFORM	UG/L	ND	2
CHLOROMETHANE	UG/L	ND	2
CHLOROPRENE	UG/L	ND	5
DIBROMOCHLOROMETHANE	UG/L	ND	1
DIBROMOMETHANE	UG/L	ND	5
1,2-DIBROMO-3-CHLOROPROPANE	UG/L	ND	5
DICHLORODIFLUOROMETHANE	UG/L	ND	5
1,1-DICHLOROETHANE	UG/L	ND	1
1,2-DICHLOROETHANE	UG/L	ND	2
1,1-DICHLOROETHENE	UG/L	ND	1
1,2-DICHLOROETHENE (TOTAL)	UG/L	ND	2
1,2-DICHLOROPROPANE	UG/L	ND	2
CIS-1,3-DICHLOROPROPENE	UG/L	ND	1
TRANS-1,3-DICHLOROPROPENE	UG/L	ND	1
TRANS-1,4-DICHLORO-2-BUTENE	UG/L	ND	5
1,4-DIOXANE	UG/L	ND	10
ETHYLBENZENE	UG/L	ND	1
ETHYL METHACRYLATE	UG/L	ND	5
2-HEXANONE (MBK)	UG/L	ND	3
IODOETHANE	UG/L	ND	5
ISOBUTYL ALCOHOL	UG/L	ND	10
METHACRYLONITRILE	UG/L	ND	5
METHYLENE CHLORIDE	UG/L	ND	3
METHYL ETHYL KETONE	UG/L	ND	3
METHYL METHACRYLATE	UG/L	ND	5
4-METHYL-2-PENTANONE (MIBK)	UG/L	ND	3
PROPIONITRILE	UG/L	ND	5
STYRENE	UG/L	ND	2
TETRACHLOROETHENE	UG/L	ND	1
1,1,1,2-TETRACHLOROETHANE	UG/L	ND	2
1,1,2,2-TETRACHLOROETHANE	UG/L	ND	2





Analytical Technologies, Inc.

"QC Report"

Title: Water Blank  
Batch: BUW055  
Analysis Method: 8240 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992  
Extraction Method: N/A

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Parameters:	Units:	Results:	Reporting Limits:
TOLUENE	UG/L	ND	5
1,1,1-TRICHLOROETHANE	UG/L	ND	5
1,1,2-TRICHLOROETHANE	UG/L	ND	2
TRICHLOROETHENE	UG/L	ND	1
TRICHLOROFLUOROMETHANE	UG/L	ND	1
1,2,3 TRICHLOROPROPANE	UG/L	ND	5
VINYL ACETATE	UG/L	ND	2
VINYL CHLORIDE	UG/L	ND	1
XYLENES (TOTAL)	UG/L	ND	2
BROMOFLUOROBENZENE	%REC/SURR	96	86-115
1,2-DICHLOROETHANE-D4	%REC/SURR	98	76-114
TOLUENE-D8	%REC/SURR	98	88-110
ANALYST	INITIALS	DWB	

Comments:



Analytical Technologies, Inc.

"QC Report"

Title: Water Reagent  
Batch: BUW055  
Analysis Method: 8240 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992  
Extraction Method: N/A

RS Date Analyzed: 27-JUL-95  
RSD Date Analyzed: 27-JUL-95

RS Date Extracted: N/A  
RSD Date Extracted: N/A

Parameters:	Spike Added	Sample Conc	RS Conc	RS %Rec	RSD Conc	RSD %Rec	RPD	Rec Lmts
1,1-DICHLOROETHENE	50	<1	55	110	57	114	4	81-115
TRICHLOROETHENE	50	<1	50	100	50	100	0	90-115
BENZENE	50	<1	48	96	48	96	0	84-115
TOLUENE	50	<5	53	106	53	106	0	90-115
CHLOROBENZENE	50	<1	48	96	48	96	0	87-115
Surrogates:								
1,2-DICHLOROETHANE-D4				94		93		76-114
TOLUENE-D8				102		102		88-115
BROMOFLUOROBENZENE				93		94		86-115

Comments:

Notes:

N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT  
UG/L = PARTS PER BILLION. < = LESS THAN REPORTING LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.  
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE  
PROGRAM AND REFERENCED METHOD.



Analytical Technologies, Inc.

"QC Report"

Title: Water Matrix  
Batch: BUW055  
Analysis Method: 8240 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992  
Extraction Method: N/A

Dry Weight %: N/A  
Sample Spiked: 507493-1

MS Date Analyzed: 27-JUL-95  
MSD Date Analyzed: 27-JUL-95

MS Date Extracted: N/A  
MSD Date Extracted: N/A

Parameters:	Spike Added	Sample Conc	MS Conc	MS %Rec	MSD Conc	MSD %Rec	RPD	Rec Lmts	Rec Lmts
1,1-DICHLOROETHENE	50	<1	59	118	58	116	2	12	78-119
TRICHLOROETHENE	50	<1	50	100	53	106	6	15	90-116
BENZENE	50	<1	46	92	46	92	0	10	84-118
TOLUENE	50	<5	49	98	52	104	6	11	84-129
CHLOROBENZENE	50	<1	48	96	50	100	4	15	87-117

Surrogates:	MS %Rec	MSD %Rec	Rec Lmts
1,2-DICHLOROETHANE-D4	84	84	76-114
TOLUENE-D8	94	99	83-110
BROMOFLUOROBENZENE	89	90	86-115

Comments:

Notes:

N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT  
UG/L = PARTS PER BILLION. < = LESS THAN REPORTING LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.  
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.



Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 507484  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 507391  
Project Name: MARATHON OIL  
Project Location: IBGP COOLING TOWER  
Test: VOLATILES (8240)  
Analysis Method: 8240 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992  
Extraction Method: N/A  
Matrix: WATER  
QC Level: II

Lab Id: 002  
Client Sample Id: 507391-02  
Sample Date/Time: 14-JUL-95 N/S  
Received Date: 25-JUL-95  
Batch: BUW055  
Blank: B  
Dry Weight %: N/A  
Extraction Date: N/A  
Analysis Date: 28-JUL-95

Parameter:	Units:	Results:	Rpt Lmts:	Q:
ACETONE	UG/L	ND	10	
ACROLEIN	UG/L	ND	100	
ACRYLONITRILE	UG/L	ND	100	
BENZENE	UG/L	ND	1	
BROMODICHLOROMETHANE	UG/L	ND	1	
BROMOFORM	UG/L	ND	2	
BROMOMETHANE	UG/L	ND	1	
2-BUTANONE (MEK)	UG/L	ND	3	
CARBON DISULFIDE	UG/L	ND	1	
CARBON TETRACHLORIDE	UG/L	ND	2	
CHLOROBENZENE	UG/L	ND	1	
CHLOROETHANE	UG/L	ND	1	
2-CHLOROETHYL VINYL ETHER	UG/L	ND	5	
CHLOROFORM	UG/L	ND	2	
CHLOROMETHANE	UG/L	ND	2	
CHLORODIBROMOMETHANE	UG/L	ND	5	
DIBROMOMETHANE	UG/L	ND	5	
DICHLORODIFLUOROMETHANE	UG/L	ND	5	
1,1-DICHLOROETHANE	UG/L	ND	1	
1,2-DICHLOROETHANE	UG/L	ND	2	
1,1-DICHLOROETHENE	UG/L	ND	1	
TOTAL 1,2-DICHLOROETHYLENE	UG/L	ND	5	
1,2-DICHLOROPROPANE	UG/L	ND	2	
CIS-1,3-DICHLOROPROPENE	UG/L	ND	1	
TRANS-1,3-DICHLOROPROPENE	UG/L	ND	1	
1,4-DICHLORO-2-BUTENE	UG/L	ND	5	
ETHYL BENZENE	UG/L	ND	1	
ETHYL METHACRYLATE	UG/L	ND	5	
2-HEXANONE	UG/L	ND	3	
IODOMETHANE	UG/L	ND	5	
METHYLENE CHLORIDE	UG/L	ND	3	
4-METHYL-2-PENTANONE	UG/L	ND	3	
STYRENE	UG/L	ND	2	
1,1,2,2-TETRACHLOROETHANE	UG/L	ND	2	
TETRACHLOROETHENE	UG/L	ND	1	
TOLUENE	UG/L	ND	5	
1,1,1-TRICHLOROETHANE	UG/L	ND	5	
1,1,2-TRICHLOROETHANE	UG/L	ND	2	
TRICHLOROETHENE	UG/L	ND	1	
TRICHLOROFLUOROMETHANE	UG/L	ND	1	



Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 507484  
Client: ANALYTICAL TECHNOLOGIES, INC.  
Project Number: 507391  
Project Name: MARATHON OIL  
Project Location: IBGP COOLING TOWER  
Test: VOLATILES (8240)  
Analysis Method: 8240 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992  
Extraction Method: N/A  
Matrix: WATER  
QC Level: II

Lab Id: 002  
Client Sample Id: 507391-02  
Sample Date/Time: 14-JUL-95 N/S  
Received Date: 25-JUL-95

Parameter:	Units:	Results:	Rpt Lmts:	Q:
1,2,3 TRICHLOROPROPANE	UG/L	ND	5	
VINYL ACETATE	UG/L	ND	2	
VINYL CHLORIDE	UG/L	ND	1	
TOTAL XYLENES	UG/L	ND	2	
BROMOFLUOROBENZENE	%REC/SURR	87	86-115	
1,2-DICHLOROETHANE-D4	%REC/SURR	82	76-114	
TOLUENE-D8	%REC/SURR	91	88-110	
ANALYST	INITIALS	DWB		

Comments:



Analytical **Technologies**, Inc.

Common notation for Organic reporting

N/S = NOT SUBMITTED  
N/A = NOT APPLICABLE  
D = DILUTED OUT  
UG/L = PARTS PER BILLION.  
UG/KG = PARTS PER BILLION.  
MG/KG = PARTS PER MILLION.  
MG/L = PARTS PER MILLION.  
MG/M3 = MILLIGRAMS PER CUBIC METER.  
NG = NANOGRAMS.  
UG = MICROGRAMS.  
PPBV = PARTS PER BILLION/VOLUME.  
< = LESS THAN DETECTION LIMIT.  
\* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS  
J = THE REPORTED VALUE IS EITHER LESS THAN THE REPORTING LIMIT BUT  
GREATER THAN ZERO, OR QUANTITATED AS A TIC; THEREFORE, IT IS  
ESTIMATED.  
JJ = REPORTED VALUE IS ESTIMATED DUE TO MATRIX INTERFERENCE.  
ND = NOT DETECTED ABOVE REPORT LIMIT.  
RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.  
RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION)

SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE  
PROGRAM AND REFERENCED METHOD.

ORGANIC SOILS ARE REPORTED ON A DRY WEIGHT BASIS.

DUE TO THE NATURE OF THE SAMPLE MATRIX, MATRIX SPIKE/MATRIX SPIKE  
DUPLICATE ANALYSIS CANNOT BE PERFORMED FOR AIR ANALYSIS.

LP = LEVERNE PETERSON	RW = RITA WINGO
DWB = DAVID BOWERS	LD = LARRY DILMORE
DB = DENNIS BESON	BC = DAVID CELESTIAL
LL = LANCE LARSON	RB = RAFAEL BARRAZA
JA = JENNIFER ALEXANDER	

# Chain of Custody

DATE 7/24 PAGE 1 OF 1

[illegible]

PROJECT INFORMATION		SAMPLE RECEIPT		SAMPLES SENT TO:	RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
PROJECT NUMBER: 507391	TOTAL NUMBER OF CONTAINERS: 3	PROJECT NAME: IB6P Cooling Tower	CHAIN OF CUSTODY SEALS: X	SAN DIEGO	Signature: Andrew Parker Time: 1710	Signature: Time:
QC LEVEL: (STD) IV	INTACT? X	QC REQUIRED: MS MSD BLANK	RECEIVED GOOD COND / COLD X	FT COLLINS	Printed Name: Date	Printed Name: Date
TAT: STANDARD RUSH!	LAB NUMBER: 507434			RENTON	Signature: Andrew Parker Date: 7/24	Company:
				PENSACOLA	Analytical Technologies, Inc. Albuquerque	RECEIVED BY: (LAB) 1.
				PORTLAND	Signature: Time:	Signature: Time:
				PHOENIX	Printed Name: Date: 7/25/95	Printed Name: Date:
				FIBERGLASS	Company: A.T.I.	Company:
DUE DATE: 8/7		RUSH SURCHARGE:				
CLIENT DISCOUNT: 10 %						



DATE: 7-21-95 PAGE 1 OF

507391

PROJECT MANAGER: Bob Menzie

COMPANY: Marathon Oil Company  
ADDRESS: 125 W. Missouri St  
Midland, TX 79701  
PHONE: 915-687-8312  
FAX: 915-687-8337

BILL TO: \_\_\_\_\_  
COMPANY: \_\_\_\_\_ same  
ADDRESS: \_\_\_\_\_

## ANALYSIS REQUEST

01	Petroleum Hydrocarbons (418.1)
02	(MOD 8015) Gas/Diesel
	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)
	BTXE/MTBE (8020)
✓	TCLP Vol. 8240
✓	23 THC metals
	Chlorinated Hydrocarbons (601/8010)
	Aromatic Hydrocarbons (602/8020)
	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.
	Pesticides/PCB (608/8080)
	Herbicides (615/8150)
	Base/Neutral/Acid Compounds GC/MS (625/8270)
	Volatile Organics GC/MS (624/8240)
	Polynuclear Aromatics (610/8310)
	SDWA Primary Standards - Arizona
	SDWA Secondary Standards - Arizona
	SDWA Primary Standards - Federal
	SDWA Secondary Standards - Federal
	The 13 Priority Pollutant Metals
	RCRA Metals by Total Digestion
	RCRA Metals by TCLP (1311)

## PROJECT INFORMATION

## SAMPLE RECEIPT

PROJ. NO.:	NO. CONTAINERS	3
PROJ. NAME: IBGP Cooling Tower	CUSTODY SEALS	⑤ / N / NA
P.O. NO.:	RECEIVED INTACT	Y
SHIPPED VIA:	RECEIVED COLD	Y

**PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS**



(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

SAMPLED & RELINQUISHED BY: 1. RELINQUISHED BY: 2. RELINQUISHED BY: 3.

Signature: <i>A. H. H. H.</i>	Time: <i>4:12 pm</i>	Signature: <i>Charles Madden</i>	Time: <i>0930</i>	Signature: _____	Time: _____
Printed Name: <i>RT Mentie</i>	Date: <i>7-21-95</i>	Printed Name: <i>Charles Madden</i>	Date: <i>7-24-95</i>	Printed Name: _____	Date: _____
Company: <i>Marathon</i>	Phone: <i>915-687-8312</i>	Company: <i>GTI</i>		Company: _____	

## RECEIVED BY: 1. RECEIVED BY: 2. RECEIVED BY: (LAB) 3.

Signature: 	Time: 4:12 pm	Signature:	Time:	Signature: 	Time: 0933
Printed Name: Charles Bladwell	Date: 7-21-95	Printed Name:	Date:	Printed Name: Andrew Parker	Date: 7/24
Company: GTE		Company:		Analytical Technologies, Inc.	



**NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT**  
**OIL CONSERVATION DIVISION**

August 16, 1995

**CERTIFIED MAIL**  
**RETURN RECEIPT NO. Z 765 962 755**

Mr. Noel Garza  
Marathon Oil Company  
P.O. Box 1324  
Artesia, New Mexico 88211


**RE: GLYCOL SKIMMER  
DISCHARGE PLAN GW-21  
MARATHON OIL COMPANY  
INDIAN BASIN GAS PLANT**

Dear Mr. Garza:

On November 30, 1994 you received, via certified mail, a letter from the New Mexico Oil Conservation Division (OCD) stating that the glycol skimmer was lacking an inspection port between the inner and outer vessels as required by the discharge plan. As of this date, the OCD has not received a plan by which Marathon proposes to install the above mentioned port. Please provide a proposal plan by September 16, 1995.

If you have any questions on this matter, please feel free to contact Mark Ashley at (505) 827-7155.

Sincerely,

  
Roger Anderson  
Environmental Bureau Chief

xc: Robert J. Menzie, Jr., Marathon Oil Company, Midland, Texas



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

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

June 15, 1995

**Certified Mail**

**Return Receipt No. Z-765-962-729**

Mr. Robert J. Menzie, Jr.  
Marathon Oil Company  
P. O. Box 552  
Midland, Texas 79702-0552

**RE: Discharge Plan GW-21  
Surface Impoundment Construction  
Indian Basin Gas Plant  
Eddy County, New Mexico**

Dear Mr. Menzie:

The New Mexico Oil Conservation Division (OCD) has reviewed the Marathon Oil Company May 24, 1995 surface impoundment construction letter for treated water from the remediation project. Based on the information provided, and pursuant to the "Engineering Design Guidelines for Construction of Waste Storage/Disposal Ponds" of the OCD Environmental Regulations the OCD has the following comments and requests for additional information:

- 1) The OCD construction guidelines require synthetic liners to be of at least 30 mil thickness. The proposed 10 mil synthetic liner does not meet the OCD construction guideline requirements.

Synthetic liners are also required to meet manufacturing specifications as outlined in the OCD construction guidelines. No specifications were received.

- 2) No information was received regarding the slope and top width of the levees. The OCD construction guidelines require inside slopes no steeper than 2:1, outside slopes no steeper than 3:1 and a top width of at least eighteen inches (18").
- 3) From the information received, there does not appear to be any leak detection or a secondary liner. The OCD construction guidelines require both.

Mr. Robert J. Menzie, Jr.  
June 15, 1995  
Page 2

Submission of the above mentioned information will allow the OCD to complete a review of your request. If you have any questions regarding this matter, please feel free to contact Mark Ashley at (505) 827-7155.

Sincerely,

by  Deputy Director

William J. LeMay  
Director

WJL/mwa

xc: N. R. Garza, Indian Basin Gas Plant  
Tim Gum OCD, Artesia Office  
Ray Smith OCD, Artesia Office

## **Mark Ashley**

---

**From:** Tim Gumm  
**Date sent:** Thursday, June 15, 1995 8:02AM  
**To:** Mark Ashley  
**Subject:** Registered: Tim Gumm

### **Your message**

**To:** Tim Gumm  
**Subject:** review of letters  
**Date:** Wednesday, June 14, 1995 7:37PM  
**was accessed on**  
**Date:** Thursday, June 15, 1995 8:02AM

OIL CONSERVATION DIVISION

RECEIVED



**Marathon  
Oil Company**

1995 MAY 30 AM 8:52

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

May 24, 1995

Mr. Roger C. Anderson  
Environmental Bureau Chief  
Oil Conservation Division  
2040 Pacheco St.  
Santa Fe, New Mexico 87501

RE: Indian Basin Gas Plant, Groundwater Discharge Plan GW-21

Dear Mr. Anderson:

Pursuant to Section 3-107.C of the Water Quality Control Commission Regulations, Marathon is notifying your office of the construction of a surface impoundment to store treated water from the remediation project. The treated water will be used for drilling operations in the Indian Basin Field. The impoundment will be located near the southeast corner of the plant between the condensate loading rack and the overhead bullet condensate storage tanks.

The impoundment will be constructed of seam-welded, 10-mil plastic liner laid over earthen floor and berms. The approximate dimensions of the impoundment excluding the berms will be 100-feet wide by 100-feet long by 6-feet deep which will enable the storage of approximately 10,000 barrels of treated water. Treated water will be conveyed from the outlet of the air stripper at the treatment compound to the impoundment via a 6-inch polyethylene underground pipeline.

Marathon plans to begin construction of the impoundment on Tuesday, May 30, 1995. Please approve the proposed construction specifications and fax your response letter to me (915-687-8337) at your earliest convenience. Thank you. Please call if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Robert J. Menzie, Jr.".

Robert J. Menzie, Jr.  
Production Environmental Representative

c: C. K. Curlee  
N. R. Garza  
L. J. Oswald  
R. F. Unger

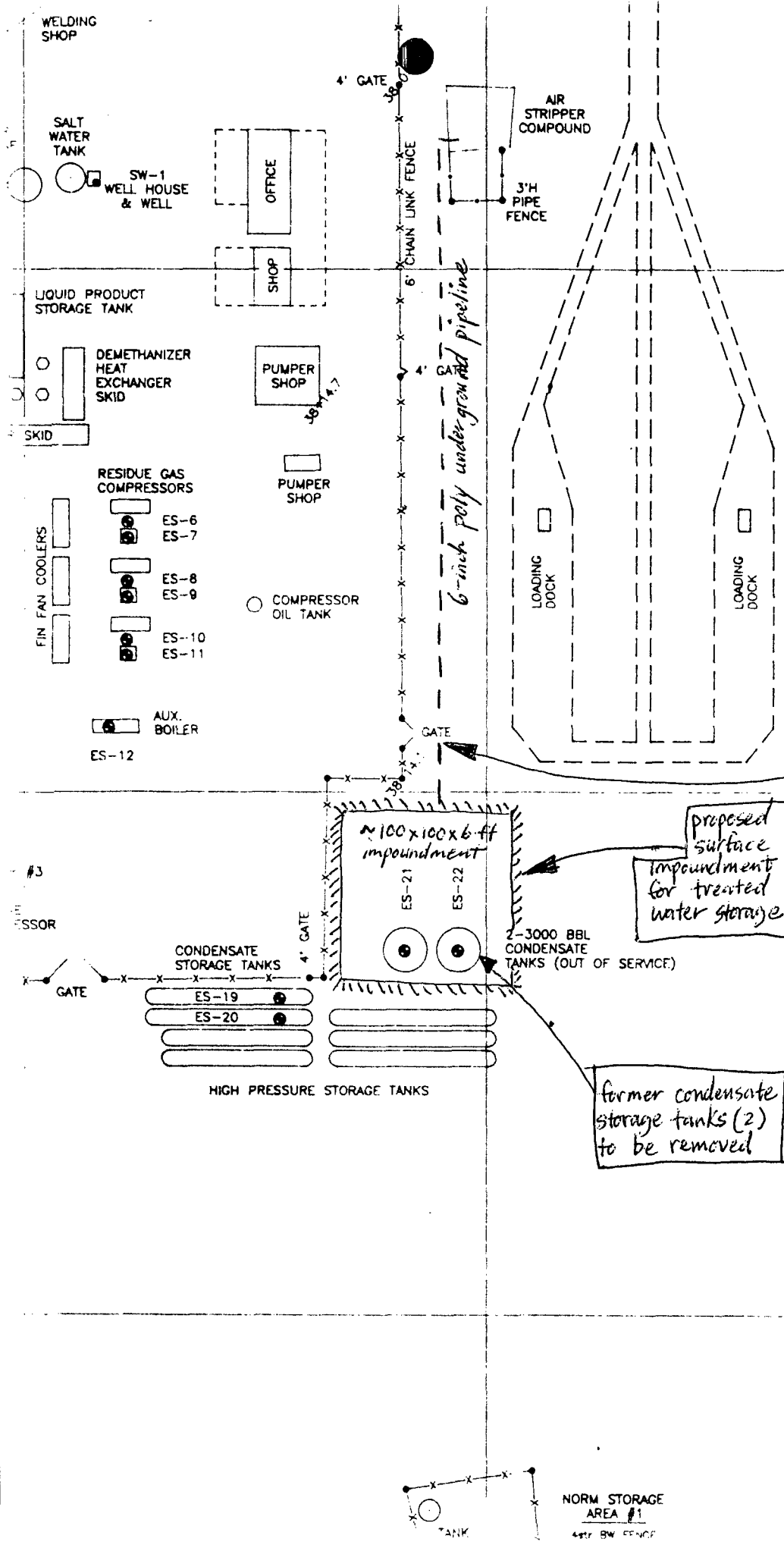
File 524-03 (1994)

ES-  
ES-  
ES-  
ES-  
ES-

1320.08'

S. 00°04'58" E.

Figure 2  
from GWDP-  
Oct. 1994



underground pipeline

proposed surface impoundment for treated water storage

former condensate storage tanks (2) to be removed

NORM STORAGE  
AREA #1  
4' BW FENCE

OIL CONSERVATION DIVISION  
RECEIVED

Mid-Continent Region  
Production United States



**Marathon  
Oil Company**

'95 MAY 15 AM 8 52

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

May 11, 1995

Mr. Roger C. Anderson  
Environmental Bureau Chief  
Oil Conservation Division  
2040 Pacheco St.  
Santa Fe, New Mexico 87501

RE: Indian Basin Gas Plant  
Groundwater Discharge Plan GW-21

Dear Mr. Anderson:

Pursuant to Michael Stogner's (Oil Conservation Division) letter to Marathon Oil Company dated January 3, 1995 and to Section 3-107.C of the Water Quality Control Commission Regulations, Marathon is notifying your office of an increase in the volume of produced water being disposed as part of the plant's commingled effluent into two permitted Class II injection wells. Table 1 of Marathon Oil Company's Groundwater Discharge Plan (GW-21) dated October 31, 1994 indicates a 2000 barrel-per-day average volume for Effluent No. 1, Commingled Effluent (injection). The current average volume for Effluent No. 1 is 3300 barrels per day.

This increase in the volume of produced water is a result of increased production to the plant. No facility expansion or process modification has been required to manage this additional production increase. The additional produced water should not significantly affect the water quality of the commingled effluent. Please call if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Robert J. Menzie, Jr.".

Robert J. Menzie, Jr.  
Production Environmental Representative

c: C. K. Curlee  
N. R. Garza  
L. J. Oswald  
R. F. Unger

File 524-03 (1994)



**Marathon  
Oil Company**

P.O. Box 552  
Midland, TX 79702-0552  
Telephone 915/682-1626

November 10, 1994

Mr. Roger C. Anderson  
State of New Mexico, Oil Conservation Division  
2040 South Pacheco Street  
Santa Fe, New Mexico 87505

RE: INDIAN BASIN GAS PLANT  
GROUNDWATER DISCHARGE PLAN (GW-21)  
INTEGRITY TEST OF INLET COMPRESSOR SUMP

Dear Mr. Anderson:

Marathon is notifying your office that a five-hour integrity test of the new inlet compressor sump will be conducted on Monday, November 14, 1994 beginning at approximately 9:00 am MST. Mark W. Ashley in the Oil Conservation Division district office in Artesia, New Mexico was verbally notified today and requested the November 14 test date. The new double-walled, fiberglass, inlet compressor sump was installed on November 8, 1994.

If you have any questions, please contact me at (915) 687-8312.

Sincerely,

Robert J. Menzie, Jr.  
Production Environmental Representative

xc: M. W. Ashley, OCD-Artesia  
C. K. Curlee  
B. L. Ogden  
L. J. Oswald  
C. M. Schweser, IBGP





**Marathon  
Oil Company**

OIL CONSERVATION DIVISION

RECEIVED

P.O. Box 1324  
Artesia, NM 88211-1324  
Telephone 505/457-4621

JAN 17 1995 8 52 AM

January 12, 1995

Mr. Mark Ashley  
New Mexico- Oil Conservation Division  
2040 South Pacheco  
Santa Fe, New Mexico 87501

RE: Underground Pipeline Integrity Testing

Dear Mr. Ashley:

Marathon is providing notice of four separate five-hour integrity tests as scheduled in Table 5 of Marathon's Groundwater Discharge Plan (GW-21) dated October 31, 1994. The following underground pipelines will be tested at three pounds per square inch (psi) greater than operating pressure for a five-hour period:

1. Horizontal H. P. Inlet Scrubber Closed Drain;
2. Amine Load Line to Storage Tanks;
3. Glycol Load Line to Storage Tanks; and,
4. Inlet Gas Separators' Dump Valves to Inlet Condensate Line.

The four tests will be conducted concurrently beginning at approximately 8:30 am on Wednesday, January 18, 1995. During the test, pressure readings will be documented on a pressure test log. The logs will be filed in the gas plant office. If you have any questions, please call me or C. Mike Schweser at the gas plant.

Sincerely,

A handwritten signature in cursive script that reads "Robert J. Menzie, Jr.".

Robert J. Menzie, Jr.  
Production Environmental Representative

xc: Ray Smith, OCD District Office-Artesia

Production Operations, United States

**Marathon  
Oil Company**P.O. Box 1324  
Artesia, NM 86211-1324  
Telephone 505/457-2621

January 12, 1995

Mr. Mark Ashley  
New Mexico- Oil Conservation Division  
2040 South Pacheco  
Santa Fe, New Mexico 87501

RE: Underground Pipeline Integrity Testing

Dear Mr. Ashley:

Marathon is providing notice of four separate five-hour integrity tests as scheduled in Table 5 of Marathon's Groundwater Discharge Plan (GW-21) dated October 31, 1994. The following underground pipelines will be tested at three pounds per square inch (psi) greater than operating pressure for a five-hour period:

1. Horizontal H. P. Inlet Scrubber Closed Drain;
2. Amine Load Line to Storage Tanks;
3. Glycol Load Line to Storage Tanks; and,
4. Inlet Gas Separators' Dump Valves to Inlet Condensate Line.

The four tests will be conducted concurrently beginning at approximately 8:30 am on Wednesday, January 18, 1995. During the test, pressure readings will be documented on a pressure test log. The logs will be filed in the gas plant office. If you have any questions, please call me or C. Mike Schweser at the gas plant.

Sincerely,

Robert J. Menzie, Jr.  
Production Environmental Representative

cc: Ray Smith, OCD District Office-Artesia



STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING  
GOVERNOR

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

January 3, 1995

**CERTIFIED MAIL**

**RETURN RECEIPT NO. Z-765-962-790**

Mr. R.F. Unger  
Marathon Oil Company  
P. O. Box 552  
Midland, Texas 79702-0552

**RE: Discharge Plan GW-21 Renewal  
Indian Basin Gas Plant  
Eddy County, New Mexico**

Dear Mr. Unger:

The discharge plan renewal GW-21 for the Marathon Oil Company Indian Basin Gas Plant located in the NE/4 of Section 23, Township 21 South, Range 23 East, NMPM, Eddy County, New Mexico, **is hereby approved** under the conditions contained in the enclosed attachment. The discharge plan consists of the renewal application dated October 31, 1994.

The discharge plan renewal was submitted pursuant to Section 3-106 of the New Mexico Water Quality Control Commission (WQCC) Regulations. It is renewed pursuant to Section 3-109.A. Please note Sections 3-109.E and 3-109.F. which provide for possible future amendments or modifications of the plan. Please be advised the approval of this plan does not relieve you of liability should your operation result in actual pollution of surface water, ground water, or the environment which may be actionable under other laws and/or regulations.

Please be advised that all exposed pits, including lined pits and open tanks (tanks exceeding 16 feet in diameter), shall be screened, netted, or otherwise rendered nonhazardous to wildlife including migratory birds.

Please note that Section 3-104 of the regulations require "When a facility has been approved,

Mr. R.F. Unger  
January 3, 1995  
Page 2

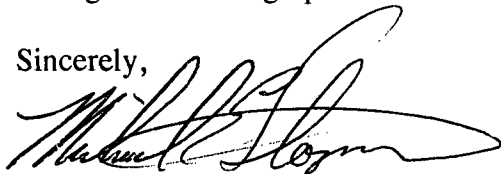
discharges must be consistent with the terms and conditions of the plan". Pursuant to Section 3-107.C. you are required to notify the Director of any facility expansion, production increase, or process modification that would result in any change in the discharge of water quality or volume.

Pursuant to Section 3-109.G.4., this plan is for a period of five (5) years. This approval will expire on November 26, 1999, and you should submit an application in ample time before this date. It should be noted that all gas processing plants and oil refineries in excess of twenty-five years old will be required to submit plans for, or the results of, an underground drainage testing program as a requirement for discharge plan renewal.

The discharge plan application for the Marathon Oil Company Indian Basin Gas Plant is subject to WQCC Regulation 3-114 discharge plan fee. Every billable facility submitting a discharge plan renewal will be assessed a fee equal to the filing fee of fifty (50) dollars plus one-half of the flat fee, or sixteen-hundred sixty-seven dollars and fifty cents (\$1667.50), for gas plants. The New Mexico Oil Conservation Division (OCD) received your fifty dollar filing fee and flat fee on November 15, 1994

On behalf of the staff of the OCD, I wish to thank you and your staff for your cooperation during this discharge plan review.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Stogner", written over a horizontal line.

Michael Stogner  
Acting Director

MS/mwa  
Attachment

xc: OCD Artesia Office  
N.R. Garza, Indian Basin Gas Plant

ATTACHMENT TO THE DISCHARGE PLAN GW-21 APPROVAL  
MARATHON OIL COMPANY  
INDIAN BASIN GAS PLANT  
DISCHARGE PLAN REQUIREMENTS  
(January 3, 1995)

1. Drum Storage: All drums will be stored on pad and curb type containment.
2. Sump Inspection: Any new sumps or below-grade tanks will incorporate leak detection in their designs.
3. Berms: All tanks that contain materials other than freshwater will be bermed to contain one and one-third (1-1/3) the capacity of the largest tank within the berm or one and one-third (1-1/3) the total capacity of all interconnected tanks.
4. Pressure Testing: All discharge plan facilities are required to pressure test all underground piping at the time of discharge plan renewal. All new underground piping shall be designed and installed to allow for isolation and pressure testing at 3 psi above normal operating pressure.
5. Spills: All spills and/or leaks will be reported to the OCD district office pursuant to WQCC Rule 1-203 and OCD Rule 116.
6. Pads: All Compressor pads will have lips or curb type containment installed to prevent contaminants from running onto the ground surface.

## FAX COVER SHEET

TO: Mark AshleyCOMPANY: OCDFAX NUMBER: 748-9720FROM: Timmy Klein

COMPANY: MARATHON OIL COMPANY - INDIAN BASIN GAS PLANT

NUMBER OF PAGES (INCLUDING COVER SHEET) 2

If you do not receive total number of pages, please call  
(505) 457-2212 as soon as possible.

Mark,

This is the drawing of the sump we  
are talking about putting the inspection port in.

Thanks  
Timmy