AMERICAN ENVIRONMENTAL NETWORK 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"FINAL REPORT FORMAT - SINGLE"

Accession: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: ACID & BASE EXTRACTABLES (8270)
Analysis Method: 8270/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.
Extraction Method: 3520/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.
Matrix: WATER
QC Level: I

Lab Id: 001
Client Sample Id: SW-03
Sample Date/Time: 24-JUN-98 1530
Received Date: 26-JUN-98

Parameter:	Units:	Results:	Rpt Lmts:	Q:
CHRYSENE	UG/L	ND	0.7	
DIBENZ(A,J)ACRIDINE	UG/L	ND	0.5	
DIBENZO (A,H) ANTHRACENE	UG/L	ND	0.3	
DIBENZOFURAN	UG/L	ND	0.4	
1,2-DICHLOROBENZENE	UG/L	ND	0.3	
1,3-DICHLOROBENZENE	UG/L	ND	0.3	
1,4-DICHLOROBENZENE	UG/L	ND	0.5	
3,3'-DICHLOROBENZIDINE	UG/L	ND	0.4	
DIETHYLPHTHALATE	UG/L	ND	0.4	
P-DIMETHYLAMINOAZOBENZENE	UG/L	ND	0.4	
7,12-DIMETHYLBENZ(A)ANTHRACENE	UG/L	ND	1.8	
A-,A-DIMETHYLPHENETHYLAMINE	UG/L	ND	0.1	
DIMETHYLPHTHALATE	UG/L	ND	0.4	
DI-N-BUTYLPHTHALATE	UG/L	ND	0.4	
2,4-DINITROTOLUENE	UG/L	ND	0.5	
2,6-DINITROTOLUENE	UG/L	ND	0.5	
DI-N-OCTYLPHTHALATE	UG/L	ND	0.7	
DIPHENYLAMINE	UG/L	ND	0.5	
1,2-DIPHENYLHYDRAZINE	UG/L	ND	0.3	
FLUORANTHENE	UG/L	ND	0.5	
FLUORENE	UG/L	ND	0.6	
HEXACHLOROBENZENE	UG/L	ND	0.5	
HEXACHLOROBUTADIENE	UG/L	ND	0.5	
HEXACHLOROCYCLOPENTADIENE	UG/L	ND	0.6	
HEXACHLOROETHANE	UG/L	ND	0.6	
INDENO (1,2,3-CD) PYRENE	UG/L	ND	0.5	
ISOPHORONE	UG/L	ND	0.4	
3-METHYLCHOLANTHRENE	UG/L	ND	0.4	
2-METHYLNAPHTHALENE	UG/L	ND	0.5	
NAPHTHALENE	UG/L	ND	0.4	
1-NAPHTHYLAMINE	UG/L	ND	1.5	
2-NAPHTHYLAMINE	UG/L	ND	1.0	
2-NITROANILINE	UG/L	ND	0.4	
3-NITROANILINE	UG/L	ND	0.9	
4-NITROANILINE	UG/L	ND	0.8	
NITROBENZENE	UG/L	ND	0.5	
N-NITROSODIMETHYLAMINE	UG/L	ND	1.2	
N-NITROSODI-N-BUTYLAMINE	UG/L	ND	1.1	
N-NITROSODIETHYLAMINE	UG/L*	ND	10	
N-NITROSODIPHENYLAMINE	UG/L	ND	0.4	
N-NITROSO-DI-N-PROPYLAMINE	UG/L	ND	0.4	
N-NITROSOPIPERIDINE	UG/L	ND	0.8	
N-NITROSOPYRROLIDINE	UG/L*	ND	10	
PENTACHLOROBENZENE	UG/L	ND	0.4	
PENTACHLORONITROBENZENE (PCNB)	UG/L	ND	5.0	

"FINAL REPORT FORMAT - SINGLE"

Accession: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: ACID & BASE EXTRACTABLES (8270)
Analysis Method: 8270/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.
Extraction Method: 3520/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.
Matrix: WATER
QC Level: I

Lab Id: 001 Sample Date/Time: 24-JUN-98 1530
Client Sample Id: SW-03 Received Date: 26-JUN-98

Parameter:	Units:	Results:	Rpt Lmts:	Q:
PHENACETIN	UG/L	ND	0.4	
PHENANTHRENE	UG/L	ND	0.4	
2-PICOLINE	UG/L	ND	7.7	
PRONAMIDE	UG/L	ND	0.4	
PYRENE	UG/L	ND	0.5	
1,2,4,5-TETRACHLOROBENZENE	UG/L	ND	0.4	
1,2,4 TRICHLOROBENZENE	UG/L	ND	0.6	
2-FLUOROPHENOL	%REC/SURR	81	21-100	
PHENOL-D6	%REC/SURR	81	10-100	
2,4,6-TRIBROMOPHENOL	%REC/SURR	81	10-123	
2-FLUOROBIPHENYL	%REC/SURR	92	43-116	
NITROBENZENE-D5	%REC/SURR	93	35-114	
TERPHENYL-D14	%REC/SURR	111	33-124	
ANALYST	INITIALS	RW		

Comments:

AMERICAN ENVIRONMENTAL NETWORK 11 East Olive Rd Pensacola, FL 32514 (850) 474-1001

Data Qualifiers for Final Report

AEN-Pensacola Inorganic/Organic

@	Adjusted reporting limit due to sample matrix (dilution prior to digestion and/or analysis)
+	Elevated reporting limit due to dilution into calibration range
*	Elevated reporting limit due to matrix interference (dilution prior to digestion and/or analysis)
#	Elevated reporting limit due to insufficient sample size
D	Diluted out
J5	The reported value is quantitated as a TIC; therefore, it is estimated
ND = Not Detected	N/S = Not Submitted N/A = Not Applicable

Florida Projects Inorganic/Organic

Y1	Improper preservation, no preservative present in sample upon receipt
Y2	Improper preservation, incorrect preservative present in sample upon receipt
Y3	Improper preservation, sample temperature exceeded EPA temperature limits of 2-6°C upon receipt
Y (FL description)	The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
Q	Sample held beyond the accepted holding time
I	The reported value is < Laboratory RL and > laboratory MDL
U1	The reported value is ≤ Laboratory MDL (value for sample result is reported as the MDL)
U (FL description)	Indicates the compound was analyzed for but not detected.
T	The reported value is < Laboratory MDL (value shall not be used for statistical analysis)
V	The analyte was detected in both the sample and the associated method blank.
J1	Surrogate recovery limits have been exceeded
J2	The sample matrix interfered with the ability to make any accurate determinations
J3	The reported value failed to meet the established quality control criteria for either precision or accuracy
J (FL description)	Estimated value; not accurate.

AFCEE Projects (under QAPP) and All Other (AEN-PN) Projects/Sites for Inorganic/Organic Parameters

J4	(For positive results) Temperature limits exceeded (≤2°C or ≥ 6°C)
J (AFCEE description)	The analyte was positively identified, the quantitation is an estimation
R1	(For nondetects) Temperature limits exceeded (≤2°C or ≥ 6°C)
R2	Improper preservation, no preservative present in sample upon receipt
R3	Improper preservation, incorrect preservative present in sample upon receipt
R4	Holding time exceeded
R5	Collection requirements not met, improper container used for sample
R (AFCEE description)	The data are unusable due to deficiencies in the ability to analyze the sample and meet QC criteria
F	< RL and > laboratory MDL
F (AFCEE description)	The analyte was positively identified but the associated numerical value is below the AFCEE or lab RL
U2	≤ Laboratory MDL (value for result will be the MDL, never below the MDL)
U (AFCEE description)	The analyte was analyzed for but not detected. The associated numerical value is at or below the MDL
B (AFCEE description)	The analyte was found in the associated blank, as well as in the sample

ICR Projects Inorganic/Organic

A	Acceptable
R6	Rejected

Examples: ICR Flags

R6 = Laboratory extracted the sample but the refrigerator malfunctioned so the extract became warm and client was notified

R6 = Sample arrived in laboratory in good condition; however, the laboratory did not analyze it within EPA's established holding time limit.

CLP and CLP-like Projects

Refer to referenced CLP Statement of Work (SOW) for explanation of data qualifiers

IDL = Laboratory Instrument Detection Limit

MDL = Laboratory Method Detection Limit

RL = Reporting Limit (AFCEE RLs are listed in the AFCEE QAPP)

CLP CRDL = CLP Contract Required Detection Limit (these limits are listed in the EPA CLP Statement of Work or SOW)

CLP CRQL = CLP Contract Required Quantitation Limit (these limits are listed in the EPA CLP Statement of Work or SOW)

Any time a sample arrives at the laboratory improperly preserved (at improper pH or temperature) or after holding time has expired or prepared or analyzed after holding time, client must be notified in writing (i.e. case narrative).

AEN-Pensacola uses the most current promulgated methods contained in the reference manuals.

AMERICAN ENVIRONMENTAL NETWORK 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

Quality Control Report

Analysis: MARATHON WET CHEMISTRY INORGANICS

Accession:	806387
Client:	AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number:	806422
Project Name:	IBRP
Project Location:	MARATHON OIL COMPANY, MIDLAND, TX
Department:	WET CHEM

Committed To *Your* Success

Severn Trent Laboratories
120 Southcenter Court, Suite 300
Morrisville NC 27560

Tel: (919) 460-8505
Fax: (919) 469-2646

July 29, 1998

American Environmental Network
Attn: Dr. Mitch Rubenstein
2709D PanAmerican Freeway NE
Albuquerque, NM 87107

Dear Dr. Rubenstein:

Please find enclosed the radiological results of four (4) water samples. This report contains sections addressing the following information at a minimum:

- case narrative
- sample summary
- analytical results (forms I thru VII), key, and COC's if applicable

[redacted]

Copies of this radiological report and supporting data are maintained in our files for a minimum of three years unless special arrangements have been made. Except where specifically indicated, all radiological testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (919) 460-8505 for any additional information. Thank you for utilizing our services. We hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Sincerely,

Ross W. Williams

Ross W. Williams, Ph.D.
Manager, Radiological Laboratory
STL-North Carolina

RWW/mevl

Committed To *Your* Success

CASE NARRATIVE
Client: American Environmental Network - NM
Client Project ID: 104332.03
STL-NC Order Number: 98-06-502
STL-NC Project Number: 2399-021

Four (4) water samples were received on June 29, 1998, in good condition with the chain-of-custody intact.

The samples were analyzed for Ra-226 and Ra-228.

A method blank was analyzed with each batch, and the activities of the blanks were equal to or less than the acceptance criteria of less than three times the MDL.

A blank spike sample was analyzed with each batch, and the recoveries were within the 80-120% acceptance criteria.

A matrix spike analysis was made with each batch also. The matrix spike recoveries were within the acceptance criteria of 80-120% for water samples.

A duplicate sample was analyzed for each batch. The duplicate analyses were within our acceptance criteria of a Duplicate Error Ratio (DER) of less than 1.5. The DER is defined as follows:

$$DER = \frac{|S-D|}{(2\sigma_s + 2\sigma_d)}$$

Where: S = Original Sample Value
D = Duplicate Value
$2\sigma_s$ = Original Sample Uncertainty
$2\sigma_d$ = Duplicate Sample Uncertainty

Ross W. Williams, Ph.D.
Manager, Radiological Laboratory
7/29/98

Environmental Survey

Cover Page

Radiological Data Analysis Package

07/28/98
120 Southcenter Ct., Suite 300
Morrisville, NC 27560
Phone (919) 460-8505
Fax (919) 469-2646

Project Number: 2399-021

NC - 806422

Client Sample ID	Lab ID
SW-03	9806502-01
MW-83	9806502-02
MW-82	9806502-03
MW-65A	9806502-04

Comments: ______________________________

Release of the data contained in this package has been authorized by the laboratory manager or the manager's designee, as verified by the following signature.

Ross W. Williams 7/29/98
Manager, Radiological Laboratory Date

STL

Project Number: 2399-021

Severn Trent Laboratories

Radiological Analysis Results

NC - 806422

07/28/98

Form 1

Client Sample ID	Lab ID	Sample Type	Batch Number	Matrix	Radionuclide	Result	Uncertainty	Q	Units	Analysis Date	Sample Size	MDA
SW-03	9806502-01	Reg	98070007	Water	Ra-226	0.23	0.16		pCi/L	07/27/98	0.5000	0.16
SW-03	9806502-01	Reg	98070009	Water	Ra-228	2.83	1.04		pCi/L	07/15/98	1.0000	2.08
MW-83	9806502-02	Reg	98070007	Water	Ra-226	0.25	0.14		pCi/L	07/27/98	0.5000	0.15
MW-83	9806502-02	Reg	98070009	Water	Ra-228	0.89	0.87		pCi/L	07/15/98	1.0000	1.93
MW-82	9806502-03	Reg	98070007	Water	Ra-226	0.30	0.09		pCi/L	07/27/98	0.5000	0.07
MW-82	9806502-03	Reg	98070009	Water	Ra-228	-4.38	0.72		pCi/L	07/15/98	1.0000	2.46
MW-65A	9806502-04	Reg	98070007	Water	Ra-226	0.67	0.17		pCi/L	07/27/98	0.5000	0.14
MW-65A	9806502-04	Reg	98070009	Water	Ra-228	0.71	0.98		pCi/L	07/16/98	1.0000	2.25

Key shall be attached

Comments: _____

_____

_____

Form I

Client Sample ID	Lab ID	Sample Type	Batch Number	Matrix	Radionuclide	Result	Uncertainty	Q	Units	Analysis Date	Sample Size	MDA
MW-59	9806412-01	Reg	98070007	Water	Ra-226	1.36	0.22		pCi/L	07/24/98	0.5000	0.09
MW-59	9806412-01	Reg	98070009	Water	Ra-228	1.42	1.14		pCi/L	07/15/98	1.0000	2.55
MW-74	9806412-02	Reg	98070007	Water	Ra-226	1.20	0.20		pCi/L	07/24/98	0.5000	0.06
MW-74	9806412-02	Reg	98070009	Water	Ra-228	16.96	3.62		pCi/L	07/15/98	1.0000	5.89
MW-67	9806412-03	Reg	98070007	Water	Ra-226	1.09	0.26		pCi/L	07/24/98	0.5000	0.15
MW-67	9806412-03	Reg	98070009	Water	Ra-228	1.89	0.76		pCi/L	07/15/98	1.0000	1.45
SW-02	9806412-04	Reg	98070007	Water	Ra-226	-0.87	0.16		pCi/L	07/27/98	0.5000	0.26
SW-02	9806412-04	Reg	98070009	Water	Ra-228	0.35	0.79		pCi/L	07/15/98	1.0000	1.86

Key shall be attached

Comments: _____

_____

_____

MDA mode

STL

Environmental Survey

Cover Page

Radiological Data Analysis Package

07/28/98

120 Southcenter Ct., Suite 300
Morrisville, NC 27560

Phone (919) 460-8505
Fax (919) 469-2646

Project Number: 2399-019

NC - 806421

Client Sample ID	Lab ID
MW-59	9806412-01
MW-74	9806412-02
MW-67	9806412-03
SW-02	9806412-04

Comments: _____

Release of the data contained in this package has been authorized by the laboratory manager or the manager's designee, as verified by the following signature.

Rosa W. Williams
Manager, Radiological Laboratory

7/29/98
Date

STL
Committed To *Your* Success

CASE NARRATIVE
Client: American Environmental Network - NM
Client Project ID: 104332.03
STL-NC Order Number: 98-06-412
STL-NC Project Number: 2399-019

Four (4) water samples were received on June 26, 1998, in good condition with the chain-of-custody intact.

The samples were analyzed for Ra-226 and Ra-228.

A method blank was analyzed with each batch, and the activities of the blanks were equal to or less than the acceptance criteria of less than three times the MDL.

A blank spike sample was analyzed with each batch, and the recoveries were within the 80-120% acceptance criteria.

A matrix spike analysis was made with each batch also. The matrix spike recoveries were within the acceptance criteria of 80-120% for water samples.

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Where: S = Original Sample Value
D = Duplicate Value
$2\sigma_s$ = Original Sample Uncertainty
$2\sigma_d$ = Duplicate Sample Uncertainty

Ross W. Williams, Ph.D.
Manager, Radiological Laboratory
7/29/98

Committed To *Your* Success

Severn Trent Laboratories
120 Southcenter Court, Suite 300
Morrisville NC 27560

Tel: (919) 460-8505
Fax: (919) 469-2646

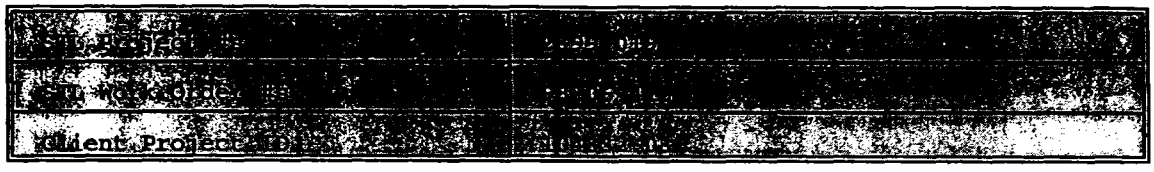
July 29, 1998

American Environmental Network
Attn: Dr. Mitch Rubenstein
2709D PanAmerican Freeway NE
Albuquerque, NM 87107

Dear Dr. Rubenstein:

Please find enclosed the radiological results of four (4) water samples. This report contains sections addressing the following information at a minimum:

- case narrative
- sample summary
- analytical results (forms I thru VII), key, and COC's if applicable



Copies of this radiological report and supporting data are maintained in our files for a minimum of three years unless special arrangements have been made. Except where specifically indicated, all radiological testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (919) 460-8505 for any additional information. Thank you for utilizing our services. We hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Sincerely,

Ross W. Williams

Ross W. Williams, Ph.D.
Manager, Radiological Laboratory
STL-North Carolina

RWW/mevl

CLIENT	: MARATHON OIL COMPANY	AEN I.D.	: 806421
PROJECT #	: 104332.03	DATE RECEIVED	: 6/27/98
PROJECT NAME	: IBRP	REPORT DATE	: 7/28/98

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-59	AQUEOUS	6/24/98
02	MW-74	AQUEOUS	6/24/98
03	MW-67	AQUEOUS	6/24/98
04	SW-02	AQUEOUS	6/24/98
05	TRIP BLANK	AQUEOUS	6/17/98

AEN I.D. 806421

July 30, 1998

MARATHON OIL COMPANY
P.O. BOX 552
MIDLAND, TX 79702-0552

Project Name IBRP
Project Number 104332.03

Attention: PAUL PEACOCK

On 6/27/98 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.

This report is being reissued in part to include the radiochemistry results. This report was originally dated 7/28/98. Radiochemistry was performed by STL, Morrisville, NC.

EPA methods 504.1, 8021 and 8260 were performed by American Environmental Network (NM) Inc., Albuquerque, NM.

Uranium was performed by North Creek Analytical, Portland, OR.

All other parameters were performed by STL, 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.
General Manager

MR: mt

Enclosure

"FINAL REPORT FORMAT - SINGLE"

Accession:	806387
Client:	AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number:	806422
Project Name:	IBRP
Project Location:	MARATHON OIL COMPANY, MIDLAND, TX
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:	I

Lab Id:	002	Sample Date/Time:	25-JUN-98 0945
Client Sample Id:	MW-83	Received Date:	26-JUN-98
Batch: PAW149		Extraction Date:	30-JUN-98
Blank: A	Dry Weight %: N/A	Analysis Date:	02-JUL-98

Parameter:	Units:	Results:	Rpt Lmts:	Q:
BENZO(a)PYRENE	UG/L	ND	0.1	
1-METHYLNAPHTHALENE	UG/L	50	0.3	
2-CHLOROANTHRACENE	%REC/SURR	59	28-138	
ANALYST	INITIALS	HAH		

Comments:

SEVERN TRENT LABORATORIES 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"FINAL REPORT FORMAT - SINGLE"

Accession:	806387
Client:	AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number:	806422
Project Name:	IBRP
Project Location:	MARATHON OIL COMPANY, MIDLAND, TX
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:	I

Lab Id:	001		Sample Date/Time:	24-JUN-98 1530
Client Sample Id:	SW-03		Received Date:	26-JUN-98
Batch: PAW149			Extraction Date:	30-JUN-98
Blank: A	Dry Weight %:	N/A	Analysis Date:	02-JUL-98

Parameter:	Units:	Results:	Rpt Lmts:	Q:
BENZO(a)PYRENE	UG/L	ND	0.1	
1-METHYLNAPHTHALENE	UG/L	ND	0.3	
2-CHLOROANTHRACENE	%REC/SURR	68	28-138	
ANALYST	INITIALS	HAH		

Comments:

SEVERN TRENT LABORATORIES 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"FINAL REPORT FORMAT - SINGLE"

Accession: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: PESTICIDES (8080)
Analysis Method: 8080 / Test Methods for Evaluating Solid Waste, SW-846, 3rd ed.
Extraction Method: 3510 / 3660 / Test Methods for Evaluating Solid Waste, SW-846, 3rd ed.
Matrix: WATER
QC Level: II

Lab Id: 002 Sample Date/Time: 25-JUN-98 0945
Client Sample Id: MW-83 Received Date: 26-JUN-98

Batch: PSW045 Extraction Date: 30-JUN-98
Blank: A Dry Weight %: N/A Analysis Date: 11-JUL-98

Parameter:	Units:	Results:	Rpt Lmts:	Q:
ALDRIN	UG/L	ND	0.02	
ALPHA-BHC	UG/L	ND	0.02	
BETA-BHC	UG/L	0.18	0.02	I
DELTA-BHC	UG/L	0.04	0.02	
GAMMA-BHC (LINDANE)	UG/L	0.22	0.02	I
4,4'-DDD	UG/L	ND	0.02	
4,4'-DDE	UG/L	ND	0.02	
4,4'-DDT	UG/L	ND	0.02	
DIELDRIN	UG/L	ND	0.02	
ENDOSULFAN I	UG/L	ND	0.02	
ENDOSULFAN II	UG/L	ND	0.02	
ENDOSULFAN SULFATE	UG/L	ND	0.02	
ENDRIN	UG/L	ND	0.02	
ENDRIN ALDEHYDE	UG/L	ND	0.02	
HEPTACHLOR	UG/L	ND	0.02	
HEPTACHLOR EPOXIDE	UG/L	ND	0.02	
METHOXYCHLOR	UG/L	ND	0.02	
CHLORDANE	UG/L	ND	0.01	
TOXAPHENE	UG/L	ND	0.12	
PCB-1016	UG/L	ND	0.04	
PCB-1221	UG/L	ND	0.04	
PCB-1232	UG/L	ND	0.04	
PCB-1242	UG/L	ND	0.04	
PCB-1248	UG/L	ND	0.04	
PCB-1254	UG/L	ND	0.04	
PCB-1260	UG/L	ND	0.04	
TCMX	%REC/SURR	76	43-101	
DCB	%REC/SURR	84	17-135	
ANALYST	INITIALS	RP		

Comments:
I = DUAL-COLUMN RPD > 40%

SEVERN TRENT LABORATORIES 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"FINAL REPORT FORMAT - SINGLE"

Accession: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: PESTICIDES (8080)
Analysis Method: 8080 / Test Methods for Evaluating Solid Waste, SW-846, 3rd ed.
Extraction Method: 3510 / 3660 / Test Methods for Evaluating Solid Waste, SW-846, 3rd ed.
Matrix: WATER
QC Level: II

Lab Id: 001 Sample Date/Time: 24-JUN-98 1530
Client Sample Id: SW-03 Received Date: 26-JUN-98

Batch: PSW045 Extraction Date: 30-JUN-98
Blank: A Dry Weight %: N/A Analysis Date: 11-JUL-98

Parameter:	Units:	Results:	Rpt Lmts:	Q:
ALDRIN	UG/L	ND	0.02	
ALPHA-BHC	UG/L	ND	0.02	
BETA-BHC	UG/L	ND	0.02	
DELTA-BHC	UG/L	ND	0.02	
GAMMA-BHC (LINDANE)	UG/L	ND	0.02	
4,4'-DDD	UG/L	ND	0.02	
4,4'-DDE	UG/L	ND	0.02	
4,4'-DDT	UG/L	ND	0.02	
DIELDRIN	UG/L	ND	0.02	
ENDOSULFAN I	UG/L	ND	0.02	
ENDOSULFAN II	UG/L	ND	0.02	
ENDOSULFAN SULFATE	UG/L	ND	0.02	
ENDRIN	UG/L	ND	0.02	
ENDRIN ALDEHYDE	UG/L	ND	0.02	
HEPTACHLOR	UG/L	ND	0.02	
HEPTACHLOR EPOXIDE	UG/L	ND	0.02	
METHOXYCHLOR	UG/L	ND	0.02	
CHLORDANE	UG/L	ND	0.01	
TOXAPHENE	UG/L	ND	0.12	
PCB-1016	UG/L	ND	0.04	
PCB-1221	UG/L	ND	0.04	
PCB-1232	UG/L	ND	0.04	
PCB-1242	UG/L	ND	0.04	
PCB-1248	UG/L	ND	0.04	
PCB-1254	UG/L	ND	0.04	
PCB-1260	UG/L	ND	0.04	
TCMX	%REC/SURR	75	43-101	
DCB	%REC/SURR	92	17-135	
ANALYST	INITIALS	RP		

Comments:

SEVERN TRENT LABORATORIES 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

Analysis Report

Analysis: PESTICIDES (8080)

Accession:	806387
Client:	AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number:	806422
Project Name:	IBRP
Project Location:	MARATHON OIL COMPANY, MIDLAND, TX
Department:	PESTICIDES

"Method Report Summary"

Accession Number: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: MARATHON METALS - OPTIMA

Client Sample Id:	Parameter:	Unit:	Result:
SW-03	ARSENIC (6010A)	MG/L	0.0022
	BARIUM (6010A)	MG/L	0.044
	BORON (6010A)	MG/L	0.11
	CADMIUM (6010A)	MG/L	0.0003
	COBALT (6010A)	MG/L	0.0004
	CHROMIUM (6010A)	MG/L	0.0010
	IRON (6010A)	MG/L	0.015
	MANGANESE (6010A)	MG/L	0.0015
	MOLYBDENUM (6010A)	MG/L	0.0024
	ZINC (6010A)	MG/L	0.048
MW-83	ARSENIC (6010A)	MG/L	0.024
	BARIUM (6010A)	MG/L	0.11
	BORON (6010A)	MG/L	0.083
	CADMIUM (6010A)	MG/L	0.0002
	COBALT (6010A)	MG/L	0.0013
	CHROMIUM (6010A)	MG/L	0.0026
	NICKEL (6010A)	MG/L	0.0047
	IRON (6010A)	MG/L	0.81
	MANGANESE (6010A)	MG/L	0.54
	MOLYBDENUM (6010A)	MG/L	0.0045
MW-82	ARSENIC (6010A)	MG/L	0.010
	BARIUM (6010A)	MG/L	0.063
	BORON (6010A)	MG/L	0.11
	CADMIUM (6010A)	MG/L	0.0002
	COBALT (6010A)	MG/L	0.0009
	CHROMIUM (6010A)	MG/L	0.0009
	NICKEL (6010A)	MG/L	0.0027
	IRON (6010A)	MG/L	0.44
	MANGANESE (6010A)	MG/L	0.18
	MOLYBDENUM (6010A)	MG/L	0.0040
MW-65A	SILVER (6010A)	MG/L	BD
	ARSENIC (6010A)	MG/L	0.0087
	BARIUM (6010A)	MG/L	0.095
	BORON (6010A)	MG/L	0.066
	CADMIUM (6010A)	MG/L	0.0002
	COBALT (6010A)	MG/L	0.0052
	CHROMIUM (6010A)	MG/L	0.0008
	NICKEL (6010A)	MG/L	0.024
	IRON (6010A)	MG/L	0.59
	MANGANESE (6010A)	MG/L	0.44
	MOLYBDENUM (6010A)	MG/L	0.0049
	ZINC (6010A)	MG/L	0.030

SEVERN TRENT LABORATORIES 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: MARATHON METALS - OPTIMA

Client Id:	Lab Id:	Matrix:	Date/Time Sampled:	Date Received:
SW-03	001	WATER	24-JUN-98 1530	26-JUN-98
MW-83	002	WATER	25-JUN-98 0945	26-JUN-98
MW-82	003	WATER	25-JUN-98 1150	26-JUN-98
MW-65A	004	WATER	25-JUN-98 1430	26-JUN-98

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: MARATHON METALS - OPTIMA
QcLevel: II

Parameter:	Unit:	Result:	R.L:	Batch:	Q:
Client ID: MW-82			Lab ID:003		
SILVER (6010A)	MG/L	ND	0.0007	AYW176	
ALUMINUM (6010A)	MG/L	ND	0.026	LYW176	
ARSENIC (6010A)	MG/L	0.010	0.0018	RYW176	
BARIUM (6010A)	MG/L	0.063	0.0002	BYW176	
BORON (6010A)	MG/L	0.11	0.0057	OYW176	
CADMIUM (6010A)	MG/L	0.0002	0.0002	CYW176	
COBALT (6010A)	MG/L	0.0009	0.0003	TYW176	
CHROMIUM (6010A)	MG/L	0.0009	0.0008	HYW176	
COPPER (6010A)	MG/L	ND	0.0018	FYW176	
MERCURY (7470A)	MG/L	ND	0.0001	M7W083	
NICKEL (6010A)	MG/L	0.0027	0.0009	EYW176	
IRON (6010A)	MG/L	0.44	0.013	NYW176	
LEAD (6010A)	MG/L	ND	0.0022	PYW176	
MANGANESE (6010A)	MG/L	0.18	0.0002	GYW176	
MOLYBDENUM (6010A)	MG/L	0.0040	0.0003	DYW176	
ZINC (6010A)	MG/L	ND	0.014	5YW176	

Comments:

Parameter:	Unit:	Result:	R.L:	Batch:	Q:
Client ID: MW-65A			Lab ID:004		
SILVER (6010A)	MG/L	BD	0.0007	AYW176	
ALUMINUM (6010A)	MG/L	ND	0.026	LYW176	
ARSENIC (6010A)	MG/L	0.0087	0.0018	RYW176	
BARIUM (6010A)	MG/L	0.095	0.0002	BYW176	
BORON (6010A)	MG/L	0.066	0.0057	OYW176	
CADMIUM (6010A)	MG/L	0.0002	0.0002	CYW176	
COBALT (6010A)	MG/L	0.0052	0.0003	TYW176	
CHROMIUM (6010A)	MG/L	0.0008	0.0008	HYW176	
COPPER (6010A)	MG/L	ND	0.0018	FYW176	
MERCURY (7470A)	MG/L	ND	0.0001	M7W083	
NICKEL (6010A)	MG/L	0.024	0.0009	EYW176	
IRON (6010A)	MG/L	0.59	0.013	NYW176	
LEAD (6010A)	MG/L	ND	0.0022	PYW176	
MANGANESE (6010A)	MG/L	0.44	0.0002	GYW176	
MOLYBDENUM (6010A)	MG/L	0.0049	0.0003	DYW176	
ZINC (6010A)	MG/L	0.030	0.014	5YW176	

Comments:

SEVERN TRENT LABORATORIES 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: MARATHON METALS - OPTIMA
QcLevel: II

Parameter:	Unit:	Result:	R.L:	Batch:	Q:
Client ID: SW-03			Lab ID:001		
SILVER (6010A)	MG/L	ND	0.0007	AYW176	
ALUMINUM (6010A)	MG/L	ND	0.026	LYW176	
ARSENIC (6010A)	MG/L	0.0022	0.0018	RYW176	
BARIUM (6010A)	MG/L	0.044	0.0002	BYW176	
BORON (6010A)	MG/L	0.11	0.0057	OYW176	
CADMIUM (6010A)	MG/L	0.0003	0.0002	CYW176	
COBALT (6010A)	MG/L	0.0004	0.0003	TYW176	
CHROMIUM (6010A)	MG/L	0.0010	0.0008	HYW176	
COPPER (6010A)	MG/L	ND	0.0018	FYW176	
MERCURY (7470A)	MG/L	ND	0.0001	M7W083	
NICKEL (6010A)	MG/L	ND	0.0009	EYW176	
IRON (6010A)	MG/L	0.015	0.013	NYW176	
LEAD (6010A)	MG/L	ND	0.0022	PYW176	
MANGANESE (6010A)	MG/L	0.0015	0.0002	GYW176	
MOLYBDENUM (6010A)	MG/L	0.0024	0.0003	DYW176	
ZINC (6010A)	MG/L	0.048	0.014	5YW176	
Comments:					
Client ID: MW-83			Lab ID:002		
SILVER (6010A)	MG/L	ND	0.0007	AYW176	
ALUMINUM (6010A)	MG/L	ND	0.026	LYW176	
ARSENIC (6010A)	MG/L	0.024	0.0018	RYW176	
BARIUM (6010A)	MG/L	0.11	0.0002	BYW176	
BORON (6010A)	MG/L	0.083	0.0057	OYW176	
CADMIUM (6010A)	MG/L	0.0002	0.0002	CYW176	
COBALT (6010A)	MG/L	0.0013	0.0003	TYW176	
CHROMIUM (6010A)	MG/L	0.0026	0.0008	HYW176	
COPPER (6010A)	MG/L	ND	0.0018	FYW176	
MERCURY (7470A)	MG/L	ND	0.0001	M7W083	
NICKEL (6010A)	MG/L	0.0047	0.0009	EYW176	
IRON (6010A)	MG/L	0.81	0.013	NYW176	
LEAD (6010A)	MG/L	ND	0.0022	PYW176	
MANGANESE (6010A)	MG/L	0.54	0.0002	GYW176	
MOLYBDENUM (6010A)	MG/L	0.0045	0.0003	DYW176	
ZINC (6010A)	MG/L	ND	0.014	5YW176	
Comments:					

SEVERN TRENT LABORATORIES 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

Analysis Report

Analysis: MARATHON METALS - OPTIMA

Accession:	806387
Client:	AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number:	806422
Project Name:	IBRP
Project Location:	MARATHON OIL COMPANY, MIDLAND, TX
Department:	METALS

SEVERN TRENT LABORATORIES 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: Group of Single Metals

Client Id:	Lab Id:	Matrix:	Date/Time Sampled:	Date Received:
SW-03	001	WATER	24-JUN-98 1530	26-JUN-98
MW-83	002	WATER	25-JUN-98 0945	26-JUN-98
MW-82	003	WATER	25-JUN-98 1150	26-JUN-98
MW-65A	004	WATER	25-JUN-98 1430	26-JUN-98

SEVERN TRENT LABORATORIES 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: Group of Single Metals
QcLevel: II

Parameter:	Unit:	Result:	R.L:	Batch:	Q:
Client ID: SW-03			Lab ID:001		
SELENIUM (7740)	MG/L	ND	0.005	S7W092	
Comments:					
Client ID: MW-83			Lab ID:002		
SELENIUM (7740)	MG/L	ND	0.005	S7W092	
Comments:					
Client ID: MW-82			Lab ID:003		
SELENIUM (7740)	MG/L	ND	0.005	S7W092	
Comments:					
Client ID: MW-65A			Lab ID:004		
SELENIUM (7740)	MG/L	ND	0.005	S7W092	
Comments:					

SEVERN TRENT LABORATORIES 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

Analysis Report

Analysis: Group of Single Metals

Accession:	**806387**
Client:	**AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.**
Project Number:	**806422**
Project Name:	**IBRP**
Project Location:	**MARATHON OIL COMPANY, MIDLAND, TX**
Department:	**METALS**

"Method Report Summary"

Accession Number: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: MARATHON WET CHEMISTRY INORGANICS

Client Sample Id:	Parameter:	Unit:	Result:
SW-03	CHLORIDE (4500-CL B)	MG/L	9
	FLUORIDE (340.2/4500-F C)	MG/L	0.7
	NITRITE-NITRATE, NITROGEN (353.2)	MG/L	5.9
	NITRATE, NITROGEN (353.2-354.1)	MG/L	5.9
	PH (150.1)	UNITS	7.5
	SULFATE (375.4)	MG/L	110
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	410
MW-83	CHLORIDE (4500-CL B)	MG/L	49
	FLUORIDE (340.2/4500-F C)	MG/L	0.7
	PH (150.1)	UNITS	7.2
	SULFATE (375.4)	MG/L	270
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	640
MW-82	CHLORIDE (4500-CL B)	MG/L	72
	FLUORIDE (340.2/4500-F C)	MG/L	0.7
	NITRITE-NITRATE, NITROGEN (353.2)	MG/L	0.14
	NITRATE, NITROGEN (353.2-354.1)	MG/L	0.14
	PH (150.1)	UNITS	7.1
	PHENOLS, TOTAL (420.1)	MG/L	0.006
	SULFATE (375.4)	MG/L	390
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	730
MW-65A	CHLORIDE (4500-CL B)	MG/L	24
	FLUORIDE (340.2/4500-F C)	MG/L	0.7
	PH (150.1)	UNITS	7.2
	PHENOLS, TOTAL (420.1)	MG/L	0.005
	SULFATE (375.4)	MG/L	250
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	550

AMERICAN ENVIRONMENTAL NETWORK 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: MARATHON WET CHEMISTRY INORGANICS

Client ID:	Lab ID:	Matrix:	Date/Time Sampled:	Date Received:
SW-03	001	WATER	24-JUN-98 1530	26-JUN-98
MW-83	002	WATER	25-JUN-98 0945	26-JUN-98
MW-82	003	WATER	25-JUN-98 1150	26-JUN-98
MW-65A	004	WATER	25-JUN-98 1430	26-JUN-98

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: MARATHON WET CHEMISTRY INORGANICS
QcLevel: II

Parameter:	Unit:	Result:	R.L:	Batch:	Q:
Client ID: MW-82			Lab ID: 003		
CHLORIDE (4500-CL B)	MG/L	72	1	CIW072	
CYANIDE, TOTAL (335.2)	MG/L	ND	0.005	CNW039	
FLUORIDE (340.2/4500-F C)	MG/L	0.7	0.2	FLW028	
NITRITE, NITROGEN (354.1)	MG/L	ND	0.1	N2W095	
NITRITE-NITRATE, NITROGEN (353.2)	MG/L	0.14	0.1	N3W49A	
NITRATE, NITROGEN (353.2-354.1)	MG/L	0.14	0.1	NONE	
PH (150.1)	UNITS	7.1	NA	PHW136	R4
PHENOLS, TOTAL (420.1)	MG/L	0.006	0.005	PEW027	
SULFATE (375.4)	MG/L	390	130	SEW081	+
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	730	5	TDW039	

Comments:

Parameter:	Unit:	Result:	R.L:	Batch:	Q:
Client ID: MW-65A			Lab ID: 004		
CHLORIDE (4500-CL B)	MG/L	24	1	CIW072	
CYANIDE, TOTAL (335.2)	MG/L	ND	0.005	CNW039	
FLUORIDE (340.2/4500-F C)	MG/L	0.7	0.2	FLW028	
NITRITE, NITROGEN (354.1)	MG/L	ND	0.1	N2W095	
NITRITE-NITRATE, NITROGEN (353.2)	MG/L	ND	0.1	N3W49A	
NITRATE, NITROGEN (353.2-354.1)	MG/L	ND	0.1	NONE	
PH (150.1)	UNITS	7.2	NA	PHW136	R4
PHENOLS, TOTAL (420.1)	MG/L	0.005	0.005	PEW027	
SULFATE (375.4)	MG/L	250	130	SEW081	+
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	550	5	TDW039	

Comments:

AMERICAN ENVIRONMENTAL NETWORK 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 806387
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 806422
Project Name: IBRP
Project Location: MARATHON OIL COMPANY, MIDLAND, TX
Test: MARATHON WET CHEMISTRY INORGANICS
QcLevel: II

Parameter:	Unit:	Result:	R.L:	Batch:	Q:
Client ID: SW-03			**Lab ID: 001**		
CHLORIDE (4500-CL B)	MG/L	9	1	CIW071	
CYANIDE, TOTAL (335.2)	MG/L	ND	0.005	CNW039	
FLUORIDE (340.2/4500-F C)	MG/L	0.7	0.2	FLW028	
NITRITE, NITROGEN (354.1)	MG/L	ND	0.1	N2W095	
NITRITE-NITRATE, NITROGEN (353.2)	MG/L	5.9	0.2	N3W49A	+
NITRATE, NITROGEN (353.2-354.1)	MG/L	5.9	0.1	NONE	
PH (150.1)	UNITS	7.5	NA	PHW135	R4
PHENOLS, TOTAL (420.1)	MG/L	ND	0.005	PEW027	
SULFATE (375.4)	MG/L	110	50	SEW081	+
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	410	5	TDW039	

Comments:

Client ID: MW-83			**Lab ID: 002**		
CHLORIDE (4500-CL B)	MG/L	49	1	CIW072	
CYANIDE, TOTAL (335.2)	MG/L	ND	0.005	CNW039	
FLUORIDE (340.2/4500-F C)	MG/L	0.7	0.2	FLW028	
NITRITE, NITROGEN (354.1)	MG/L	ND	0.1	N2W095	
NITRITE-NITRATE, NITROGEN (353.2)	MG/L	ND	0.1	N3W49A	
NITRATE, NITROGEN (353.2-354.1)	MG/L	ND	0.1	NONE	
PH (150.1)	UNITS	7.2	NA	PHW136	R4
PHENOLS, TOTAL (420.1)	MG/L	ND	0.005	PEW027	
SULFATE (375.4)	MG/L	270	130	SEW081	+
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	640	5	TDW039	

Comments:

AMERICAN ENVIRONMENTAL NETWORK 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

Analysis Report

Analysis: MARATHON WET CHEMISTRY INORGANICS

Accession:	806387
Client:	AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number:	806422
Project Name:	IBRP
Project Location:	MARATHON OIL COMPANY, MIDLAND, TX
Department:	WET CHEM

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL ▪ (425) 420-9200 ▪ FAX 420-9210
SPOKANE ▪ (509) 924-9200 ▪ FAX 924-9290
PORTLAND ▪ (503) 906-9200 ▪ FAX 906-9210

American Environmental Network	Project:	Marathon Oil	Sampled: 6/24/98 to 6/25/98
2709-D Pan American Freeway,NE	Project Number:	104332.03	Received: 6/29/98
Albuquerque, NM 87107	Project Manager:	Kimberly McNeill	Reported: 7/21/98 17:26

Total Metals per EPA 6000/7000 Series Methods
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
SW-03			P806561-01				Water	
Uranium	0780334	7/14/98	7/20/98	EPA 6020	0.00100	0.00160	mg/l	
MW-83			P806561-02				Water	
Uranium	0780334	7/14/98	7/20/98	EPA 6020	0.00100	0.00160	mg/l	
MW-82			P806561-03				Water	
Uranium	0780334	7/14/98	7/20/98	EPA 6020	0.00100	0.00140	mg/l	
MW-65A			P806561-04				Water	
Uranium	0780334	7/14/98	7/20/98	EPA 6020	0.00100	ND	mg/l	

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL ▪ (425) 420-9200 ▪ FAX 420-9210
SPOKANE ▪ (509) 924-9200 ▪ FAX 924-9290
PORTLAND ▪ (503) 906-9200 ▪ FAX 906-9210

American Environmental Network	Project:	Marathon Oil	Sampled:	6/24/98 to 6/25/98
2709-D Pan American Freeway,NE	Project Number:	104332.03	Received:	6/29/98
Albuquerque, NM 87107	Project Manager:	Kimberly McNeill	Reported:	7/21/98 17:26

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
SW-03	P806561-01	Water	6/24/98
MW-83	P806561-02	Water	6/25/98
MW-82	P806561-03	Water	6/25/98
MW-65A	P806561-04	Water	6/25/98

North Creek Analytical, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety

Lisa Domenighini, Project Manager

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: MARATHON OIL COMPANY	AEN I.D. :	806422
PROJECT #	: 104332.03	DATE RECEIVED :	6/27/98
PROJECT NAME	: IBRP		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
806422-02	SW-83	AQUEOUS	6/25/98	N/A	06/30/98	10

PARAMETER	DET. LIMIT		UNITS
Dichlorodifluoromethane	1.0	< 10	ug/L
Chloromethane	1.0	< 10	ug/L
Vinyl Chloride	1.0	< 10	ug/L
Bromomethane	1.0	< 10	ug/L
Chloroethane	1.0	< 10	ug/L
Trichlorofluoromethane	1.0	< 10	ug/L
Acetone	10	< 100	ug/L
Acrolein	5.0	< 50	ug/L
1,1-Dichloroethene	1.0	< 10	ug/L
Iodomethane	1.0	< 10	ug/L
Methylene Chloride	1.0	< 10	ug/L
Acrylonitrile	5.0	< 50	ug/L
cis-1,2-Dichloroethene	1.0	< 10	ug/L
Methyl-t-butyl Ether	1.0	< 10	ug/L
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	< 10	ug/L
1,1-Dichloroethane	1.0	< 10	ug/L
trans-1,2-Dichloroethene	1.0	< 10	ug/L
2-Butanone	10	< 100	ug/L
Carbon Disulfide	1.0	< 10	ug/L
Bromochloromethane	1.0	< 10	ug/L
Chloroform	1.0	< 10	ug/L
2,2-Dichloropropane	1.0	< 10	ug/L
1,2-Dichloroethane	1.0	< 10	ug/L
Vinyl Acetate	1.0	< 10	ug/L
1,1,1-Trichloroethane	1.0	< 10	ug/L
1,1-Dichloropropene	1.0	< 10	ug/L
Carbon Tetrachloride	1.0	< 10	ug/L
Benzene	1.0	< 10	ug/L
1,2-Dichloropropane	1.0	< 10	ug/L
Trichloroethene	1.0	< 10	ug/L
Bromodichloromethane	1.0	< 10	ug/L
2-Chloroethyl Vinyl Ether	10	< 100	ug/L
cis-1,3-Dichloropropene	1.0	< 10	ug/L
trans-1,3-Dichloropropene	1.0	< 10	ug/L
1,1,2-Trichloroethane	1.0	< 10	ug/L
1,3-Dichloropropane	1.0	< 10	ug/L
Dibromomethane	1.0	< 10	ug/L
Toluene	1.0	< 10	ug/L
1,2-Dibromoethane	1.0	< 10	ug/L
4-Methyl-2-Pentanone	10	< 100	ug/L
2-Hexanone	10	< 100	ug/L
Dibromochloromethane	1.0	< 10	ug/L
Tetrachloroethene	1.0	< 10	ug/L
Chlorobenzene	1.0	< 10	ug/L
Ethylbenzene	1.0	16	ug/L

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: MARATHON OIL COMPANY	AEN I.D. :	806422
PROJECT #	: 104332.03	DATE RECEIVED :	6/27/98
PROJECT NAME	: IBRP		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
806422-01	SW-03	AQUEOUS	6/24/98	N/A	06/30/98	1

PARAMETER	DET. LIMIT		UNITS
o-Xylene	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
Naphthalene	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	101
	(80 - 120)
Toluene-d8	95
	(88 - 110)
Bromofluorobenzene	98
	(86 - 115)

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: MARATHON OIL COMPANY	AEN I.D. :	806422
PROJECT #	: 104332.03	DATE RECEIVED :	6/27/98
PROJECT NAME	: IBRP		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
806422-01	SW-03	AQUEOUS	6/24/98	N/A	06/30/98	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
m&p Xylenes	1.0	< 1.0	ug/L

GAS CHROMOTOGRAPHY QUALITY CONTROL

MSMSD

TEST	: PURGEABLE HALOCARBONS / AROMATICS (EPA 8021)		
MSMSD #	: 806422-01	AEN I.D.	: 806422
CLIENT	: MARATHON OIL COMPANY	DATE EXTRACTED	: N/A
PROJECT #	: 104332.03	DATE ANALYZED	: 6/30/98
PROJECT NAME	: IBRP	SAMPLE MATRIX	: AQUEOUS
		UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
1,1-DICHLOROETHENE	<0.2	10.0	6.3	63	7.5	75	17	(44 - 99)	20
TRICHLOROETHENE	<0.3	10.0	10.6	106	9.9	99	7	(89 - 127)	20
CHLOROBENZENE	<0.5	10.0	10.3	103	9.6	96	7	(87 - 124)	20

CHEMIST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

GAS CHROMOTOGRAPHY RESULTS

TEST : PURGEABLE HALOCARBONS / AROMATICS (EPA 8021)
CLIENT : MARATHON OIL COMPANY AEN I.D.: 806422
PROJECT # : 104332.03
PROJECT NAME : IBRP

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	MW-65A	AQUEOUS	6/25/98	NA	7/1/98	5

PARAMETER	DET. LIMIT	UNITS	04
TETRACHLOROETHENE	0.5	UG/L	< 2.5
VINYL CHLORIDE	0.5	UG/L	< 2.5
SURROGATE:			
BROMOCHLOROMETHANE (%)			106
SURROGATE LIMITS	(73 - 117)		

CHEMIST NOTES:
N/A

GAS CHROMOTOGRAPHY RESULTS

TEST : PURGEABLE HALOCARBONS / AROMATICS (EPA 8021)
CLIENT : MARATHON OIL COMPANY AEN I.D.: 806422
PROJECT # : 104332.03
PROJECT NAME : IBRP

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	SW-03	AQUEOUS	6/24/98	NA	6/30/98	1
02	MW-83	AQUEOUS	6/25/98	NA	6/30/98	5
03	MW-82	AQUEOUS	6/25/98	NA	7/1/98	5

PARAMETER	DET. LIMIT	UNITS	01	02	03
TETRACHLOROETHENE	0.5	UG/L	< 0.5	< 2.5	< 2.5
VINYL CHLORIDE	0.5	UG/L	< 0.5	< 2.5	< 2.5
SURROGATE:					
BROMOCHLOROMETHANE (%)			102	102	99
SURROGATE LIMITS	(73 - 117)				

CHEMIST NOTES:
N/A

GAS CHROMOTOGRAPHY RESULTS

TEST : ETHYLENE DIBROMIDE (EPA 504.1)
CLIENT : MARATHON OIL COMPANY AEN I.D.: 806422
PROJECT # : 104332.03
PROJECT NAME : IBRP

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	MW-65A	AQUEOUS	6/25/98	7/2/98	7/2/98	1

PARAMETER	DET. LIMIT	UNITS	04
ETHYLENE DIBROMIDE	0.01	UG/L	< 0.01

SURROGATE:
1,4-DICHLOROBENZENE 79
SURROGATE LIMITS (75 - 141)

CHEMIST NOTES:
N/A

GAS CHROMOTOGRAPHY RESULTS

TEST : ETHYLENE DIBROMIDE (EPA 504.1)
CLIENT : MARATHON OIL COMPANY AEN I.D.: 806422
PROJECT # : 104332.03
PROJECT NAME : IBRP

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	SW-03	AQUEOUS	6/24/98	7/2/98	7/2/98	1
02	MW-83	AQUEOUS	6/25/98	7/2/98	7/2/98	1
03	MW-82	AQUEOUS	6/25/98	7/2/98	7/2/98	1

PARAMETER	DET. LIMIT	UNITS	01	02	03
ETHYLENE DIBROMIDE	0.01	UG/L	< 0.01	< 0.01	< 0.01
SURROGATE:					
1,4-DICHLOROBENZENE			81	81	76
SURROGATE LIMITS	(75 - 141)				

CHEMIST NOTES:
N/A

CLIENT	: MARATHON OIL COMPANY	AEN I.D.	: 806422
PROJECT #	: 104332.03	DATE RECEIVED	: 6/27/98
PROJECT NAME	: IBRP	REPORT DATE	: 7/28/98

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SW-03	AQUEOUS	6/24/98
02	MW-83	AQUEOUS	6/25/98
03	MW-82	AQUEOUS	6/25/98
04	MW-65A	AQUEOUS	6/25/98
05	TRIP BLANK	AQUEOUS	6/17/98

AEN I.D. 806422

July 28, 1998

MARATHON OIL COMPANY
P.O. BOX 552
MIDLAND, TX 79702-0552

Project Name IBRP
Project Number 104332.03

Attention: PAUL PEACOCK

On 6/27/98 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.

Radiochemistry results (Ra 226/228) will follow in a separate report.

EPA methods 504.1, 8021 and 8260 were performed by American Environmental Network (NM) Inc., Albuquerque, NM.

Uranium was performed by North Creek Analytical, Portland, OR.

All other parameters were performed by STL, 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.
General Manager

MR: mt

Enclosure

ANALYTICAL REPORT

Kim McNeill
Pinnacle Laboratories
2709-D Pan American Fwy NE
Albuquerque, NM 87107

10/22/1998
Job No.: 98.02005

Project Name: 810048 / MOC
Date Received: 10/14/1998

Sample Number	Sample Description
106520	810048-27 (MW-82)

PARAMETERS	METHODS	RESULTS	REPORT LIMIT	UNITS	DATE ANALYZED	FLAG
Magnesium, ICP	6010	51	0.05	mg/L	10/20/1998	
Potassium, ICP	6010	2.1	0.2	mg/L	10/19/1998	
Sodium, ICP	6010	44	4.0	mg/L	10/20/1998	DIL,Q

Sample Number	Sample Description
106521	810048-28 (MW-68)

PARAMETERS	METHODS	RESULTS	REPORT LIMIT	UNITS	DATE ANALYZED	FLAG
Alkalinity, Bicarb.(CaCO3)	SM 2320 B	300	5.0	mg/L	10/15/1998	
Alkalinity, Carb. (CaCO3)	SM 2320 B	ND	5.0	mg/L	10/15/1998	
Alkalinity, Total (CaCO3)	310.1	300	5.0	mg/L	10/15/1998	
Chloride	EPA 300.0	2.8	0.5	mg/L	10/16/1998	
ICP/AA Digestion - Water	ICP	-			10/16/1998	
Calcium, ICP	6010	84	0.05	mg/L	10/20/1998	
Magnesium, ICP	6010	34	0.05	mg/L	10/20/1998	
Potassium, ICP	6010	2.3	0.2	mg/L	10/19/1998	
Sodium, ICP	6010	14	0.2	mg/L	10/20/1998	

A sample result of ND indicates the parameter was Not Detected at the reporting limit.

ANALYTICAL REPORT

Kim McNeill
Pinnacle Laboratories
2709-D Pan American Fwy NE
Albuquerque, NM 87107

10/22/1998
Job No.: 98.02005

Project Name: 810048 / MOC
Date Received: 10/14/1998

Sample Number: 106520
Sample Description: 810048-27 (MW-82)

PARAMETERS	METHODS	RESULTS	REPORT LIMIT	UNITS	DATE ANALYZED	FLAG
Magnesium, ICP	6010	51	0.05	mg/L	10/20/1998	
Potassium, ICP	6010	2.1	0.2	mg/L	10/19/1998	
Sodium, ICP	6010	44	4.0	mg/L	10/20/1998	DIL,Q

Sample Number: 106521
Sample Description: 810048-28 (MW-68)

PARAMETERS	METHODS	RESULTS	REPORT LIMIT	UNITS	DATE ANALYZED	FLAG
Alkalinity, Bicarb.(CaCO3)	SM 2320 B	300	5.0	mg/L	10/15/1998	
Alkalinity, Carb. (CaCO3)	SM 2320 B	ND	5.0	mg/L	10/15/1998	
Alkalinity, Total (CaCO3)	310.1	300	5.0	mg/L	10/15/1998	
Chloride	EPA 300.0	2.8	0.5	mg/L	10/16/1998	
ICP/AA Digestion - Water	ICP	-			10/16/1998	
Calcium, ICP	6010	84	0.05	mg/L	10/20/1998	
Magnesium, ICP	6010	34	0.05	mg/L	10/20/1998	
Potassium, ICP	6010	2.3	0.2	mg/L	10/19/1998	
Sodium, ICP	6010	14	0.2	mg/L	10/20/1998	

A sample result of ND indicates the parameter was Not Detected at the reporting limit.

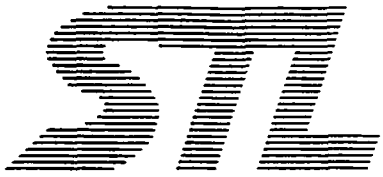
WORK ORDER

Lab

Work Order #	98-06-504	# of Samples	6	Recieved Date	06/30/98	American Environ. Network
Client #	2399	# of Tests	12	Load Date	06/30/98	2709D PanAmerican Freeway NE
Project	2399-022	Report Level	2	Due Date	07/17/98	Albuquerque, NM 87107
Amount	123.25	Quote #		Export Date	/ /	Mitch Rubenstein
Comment						

Lab ID	Sample #	Status	Matrix	Test	Cust ID	Collected
9806504-01	01A1	Open	Water	Ra-226	MW-57	06/25/98
9806504-01	01A2	Open	Water	Ra-228	MW-57	06/25/98
9806504-02	02A1	Open	Water	Ra-226	Rocky Arroyo	06/26/98
9806504-02	02A2	Open	Water	Ra-228	Rocky Arroyo	06/26/98
9806504-03	03A1	Open	Water	Ra-226	MW-94	06/26/98
9806504-03	03A2	Open	Water	Ra-228	MW-94	06/26/98
9806504-04	04A1	Open	Water	Ra-226	MW-68	06/26/98
9806504-04	04A2	Open	Water	Ra-228	MW-68	06/26/98
9806504-05	05A1	Open	Water	Ra-226	MW-86	06/26/98
9806504-05	05A2	Open	Water	Ra-228	MW-86	06/26/98
9806504-06	06A1	Open	Water	Ra-226	MW-62	06/26/98
9806504-06	06A2	Open	Water	Ra-228	MW-62	06/26/98

pH Checked
All Samples pH <2
Initials: ds Date: 7-1-98



Committed To *Your* Success

REPORT FORM KEY

Severn Trent Laboratories
120 Southcenter Court, Suite 300
Morrisville NC 27560

Tel: (919) 460-8505
Fax: (919) 469-2646

Instrument ID:

#1 - Gas Proportional Counter
#2 - High Purity Germanium Detectors (HPGe)
#3 - Alpha Spectrometry Counter
#4 - Liquid Scintillation Counter
#5 - Lucas Cell Counter
#6 - Sodium Iodide Detector

Sample Type:

REG - Regular Sample
DUP - Duplicate Sample
MS - Matrix Spike
BS - Blank Spike
MB - Method Blank

Units:

pCi/L - Picocuries per Liter
pCi/g - Picocuries per Gram
pCi/ml - Picocuries per Milliliter
pCi/mg - Picocuries per Milligram
pCi/F - Picocuries per Air Filter

Radionuclides:

H-3	Tritium	C-14	Carbon-14
Cl-36	Chlorine-36	K-40	Potassium-40
Co-60	Cobalt-60	Sr-89	Strontium-89
Sr-90	Strontium-90	Tc-99	Technetium-99
Cs-137	Cesium-137	Tl-208	Thallium-208
Pb-210	Lead-210	Pb-212	Lead-212
Pb-214	Lead-214	Bi-214	Bismuth-214
Ra-226	Radium-226	Ac-228	Actinium-228
Ra-228	Radium-228	Th-234	Thorium-234
Th-227	Thorium-227	Th-232/230/228	Isotopic Thorium
U-234/235/238	Isotopic Uranium	Pu-238	Plutonium-238
Pu-239/240	Plutonium-239&240	Am-241	Americium-241
Np-237	Neptunium-237		

STL | Project Number: 2399-022

Matrix Spike Results Summary | NC 806424 | 07/30/98

Form VI

Client Sample ID	Lab ID	Batch Number	Spike	SSR	Sample Result	Spike Added	Percent Recovery	Q	Units	Analysis Date	Inst ID
LYMAN	9806507-01	98070008	Ra-226	157.69	0.25	145.40	108.28 %		pCi/L	07/27/98	5
LYMAN	9806507-01	98070010	Ra-228	106.44	3.25	87.75	117.60 %		pCi/L	07/20/98	1

Key shall be attached
Comments: _____

MDA mode

Form VII

Client Sample ID	Lab ID	Batch Number	Radionuclide	Sample Result	Uncertainty	Dup. Result	Dup. Uncertainty	CER	Q	Units
SW-01	9806507-06	98070008	Ra-226	0.17	0.09	0.26	0.14	0.39		pCi/L
SW-01	9806507-06	98070010	Ra-228	-1.28	0.73	-1.49	0.63	0.15		pCi/L

Key shall be attached

Comments: _____

_____

_____

MDA mode

STL

Project Number: 2399-022

Blank Spike Results Summary

NC 806424

07/30/98

Form V

Client Sample ID	Batch Number	Matrix	Radionuclide	Spike	Result	Spike Value	Percent Recovery	Q	Units	Analysis Date	Method Number
Blank Spike	98070008	Water	Ra-226	Ra-226	166.82	145.40	114.73%		pCi/L	07/20/98	RAS01900
Blank Spike	98070010	Water	Ra-228	Ra-228	88.99	87.75	101.41%		pCi/L	07/17/98	RAS08500

Key shall be attached

Comments: _____

_____

_____

MDA mode

STL

Project Number: 2399-022

Severn Tren oratories

Chemical Recovery

NC 806424

07/30/98

Form IV

Client Sample ID	Lab ID	Sample Type	Batch Number	Radionuclide	Chemical Tracer	Tracer Result	Tracer Added	Percent Recovery	Q	Tracer Units	Analysis Date	Inst ID
MW-57	9806504-01	Reg	98070008	Ra-226	Ba-133	1174.00	1258.00	93.32 %		pCi	07/27/98	5
MW-57	9806504-01	Reg	98070010	Ra-228	Ba-133	1128.00	1258.00	89.67 %		pCi	07/17/98	1
Rocky Arroyo	9806504-02	Reg	98070008	Ra-226	Ba-133	1199.00	1240.00	96.69 %		pCi	07/28/98	5
Rocky Arroyo	9806504-02	Reg	98070010	Ra-228	Ba-133	1050.00	1240.00	84.68 %		pCi	07/17/98	1
MW-94	9806504-03	Reg	98070008	Ra-226	Ba-133	1183.00	1258.00	94.04 %		pCi	07/28/98	5
MW-94	9806504-03	Reg	98070010	Ra-228	Ba-133	1067.00	1258.00	84.82 %		pCi	07/17/98	1
MW-68	9806504-04	Reg	98070008	Ra-226	Ba-133	1232.00	1240.00	99.35 %		pCi	07/28/98	5
MW-68	9806504-04	Reg	98070010	Ra-228	Ba-133	1119.00	1240.00	90.24 %		pCi	07/17/98	1
MW-86	9806504-05	Reg	98070008	Ra-226	Ba-133	1103.00	1258.00	87.68 %		pCi	07/28/98	5
MW-86	9806504-05	Reg	98070010	Ra-228	Ba-133	974.30	1258.00	77.45 %		pCi	07/20/98	1
MW-62	9806504-06	Reg	98070008	Ra-226	Ba-133	1194.00	1240.00	96.29 %		pCi	07/28/98	5
MW-62	9806504-06	Reg	98070010	Ra-228	Ba-133	1109.00	1240.00	89.44 %		pCi	07/20/98	1
Blank Spike	N/A	BS	98070008	Ra-226	Ba-133	1291.00	1309.00	98.62 %		pCi	07/20/98	5
Blank Spike	N/A	BS	98070010	Ra-228	Ba-133	1223.00	1258.00	97.22 %		pCi	07/17/98	1
SW-01	9806507-06	Dup	98070008	Ra-226	Ba-133	1155.00	1258.00	91.81 %		pCi	07/27/98	5
SW-01	9806507-06	Dup	98070010	Ra-228	Ba-133	1067.00	1258.00	84.82 %		pCi	07/17/98	1
Method Blank	N/A	MB	98070008	Ra-226	Ba-133	1276.00	1309.00	97.48 %		pCi	07/20/98	5
Method Blank	N/A	MB	98070010	Ra-228	Ba-133	1152.00	1240.00	92.90 %		pCi	07/17/98	1
LYMAN	9806507-01	MS	98070008	Ra-226	Ba-133	1185.00	1240.00	95.56 %		pCi	07/27/98	5
LYMAN	9806507-01	MS	98070010	Ra-228	Ba-133	928.30	1240.00	74.86 %		pCi	07/20/98	1

Key shall be attached

Comments:

MDA mode

Method Blank Summary

NC 806424

07/30/98

Form III

Client Sample ID	Batch Number	Matrix	Radionuclide	Result	Uncertainty	Q	Units	Analysis Date	Sample Size	Method Number	Inst ID
Method Blank	98070008	Water	Ra-226	0.04	0.10		pCi/L	07/20/98	0.5000	RAS01900	5
Method Blank	98070010	Water	Ra-228	0.93	0.94		pCi/L	07/17/98	1.0000	RAS08500	1

Key shall be attached

Comments: _____

MDA mc

Form II

Client Sample ID	Lab ID	Sample Type	Batch Number	Matrix	Radionuclide	Result	Uncertainty	Units	Analysis Date	Sample Size	MDA	Inst ID
Blank Spike	N/A	BS	98070008	Water	Ra-226	166.82	1.88	pCi/L	07/20/98	0.5000	0.13	5
Blank Spike	N/A	BS	98070010	Water	Ra-228	88.99	3.18	pCi/L	07/17/98	1.0000	1.49	1
SW-01	9806507-06	Dup	98070008	Water	Ra-226	0.26	0.14	pCi/L	07/27/98	0.5000	0.14	5
SW-01	9806507-06	Dup	98070010	Water	Ra-228	-1.49	0.63	pCi/L	07/17/98	1.0000	1.86	1
Method Blank	N/A	MB	98070008	Water	Ra-226	0.04	0.10	pCi/L	07/20/98	0.5000	0.15	5
Method Blank	N/A	MB	98070010	Water	Ra-228	0.93	0.94	pCi/L	07/17/98	1.0000	2.14	1
LYMAN	9806507-01	MS	98070008	Water	Ra-226	157.69	2.00	pCi/L	07/27/98	0.5000	0.14	5
LYMAN	9806507-01	MS	98070010	Water	Ra-228	106.44	3.83	pCi/L	07/20/98	1.0000	1.85	1

Key shall be attached
Comments: _____

MDA mode

STL

Project Number: 2399-022

Severn Trent Laboratories

Radiological Analysis Results

NC 806424

07/30/98

Form I

Client Sample ID	Lab ID	Sample Type	Batch Number	Matrix	Radionuclide	Result	Uncertainty	Q	Units	Analysis Date	Sample Size	MDA
MW-57	9806504-01	Reg	98070008	Water	Ra-226	0.52	0.15		pCi/L	07/27/98	0.5000	0.11
MW-57	9806504-01	Reg	98070010	Water	Ra-228	2.54	0.88		pCi/L	07/17/98	1.0000	1.67
Rocky Arroyo	9806504-02	Reg	98070008	Water	Ra-226	0.25	0.09		pCi/L	07/28/98	0.5000	0.08
Rocky Arroyo	9806504-02	Reg	98070010	Water	Ra-228	2.57	0.93		pCi/L	07/17/98	1.0000	1.80
MW-94	9806504-03	Reg	98070008	Water	Ra-226	0.30	0.17		pCi/L	07/28/98	0.5000	0.17
MW-94	9806504-03	Reg	98070010	Water	Ra-228	4.52	1.04		pCi/L	07/17/98	1.0000	1.74
MW-68	9806504-04	Reg	98070008	Water	Ra-226	0.30	0.09		pCi/L	07/28/98	0.5000	0.07
MW-68	9806504-04	Reg	98070010	Water	Ra-228	3.35	0.96		pCi/L	07/17/98	1.0000	1.75
MW-86	9806504-05	Reg	98070008	Water	Ra-226	1.75	0.20		pCi/L	07/28/98	0.5000	0.09
MW-86	9806504-05	Reg	98070010	Water	Ra-228	0.82	1.05		pCi/L	07/20/98	1.0000	2.40
MW-62	9806504-06	Reg	98070008	Water	Ra-226	0.91	0.14		pCi/L	07/28/98	0.5000	0.06
MW-62	9806504-06	Reg	98070010	Water	Ra-228	2.80	0.84		pCi/L	07/20/98	1.0000	1.52

Key shall be attached

Comments: _____

_____

_____

MDA mode

STL

Environmental Survey

Cover Page

Radiological Data Analysis Package

07/30/98

120 Southcenter Ct., Suite 300
Morrisville, NC 27560

Phone (919) 460-8505
Fax (919) 469-2646

NC 806424

Project Number: 2399-022

Client Sample ID	Lab ID
MW-57	9806504-01
Rocky Arroyo	9806504-02
MW-94	9806504-03
MW-68	9806504-04
MW-86	9806504-05
MW-62	9806504-06

Comments: _____

Release of the data contained in this package has been authorized by the laboratory manager or the manager's designee, as verified by the following signature.

Ron W. Williams
Manager, Radiological Laboratory

7/30/98
Date

Committed To *Your* Success

CASE NARRATIVE
Client: American Environmental Network - NM
Client Project ID: 104332.03
STL-NC Order Number: 98-06-504
STL-NC Project Number: 2399-022

Six (6) water samples were received on June 30, 1998, in good condition with the chain-of-custody intact.

The samples were analyzed for Ra-226 and Ra-228.

A method blank was analyzed with each batch, and the activities of the blanks were equal to or less than the acceptance criteria of less than three times the MDL.

A blank spike sample was analyzed with each batch, and the recoveries were within the 80-120% acceptance criteria.

A matrix spike analysis was made with each batch also. The matrix spike recoveries were within the acceptance criteria of 80-120% for water samples.

A duplicate sample was analyzed for each batch. The duplicate analyses were within our acceptance criteria of a Duplicate Error Ratio (DER) of less than 1.5. The DER is defined as follows:

$$DER = \frac{|S-D|}{(2\sigma_s + 2\sigma_d)}$$

Where: S = Original Sample Value
D = Duplicate Value
$2\sigma_s$ = Original Sample Uncertainty
$2\sigma_d$ = Duplicate Sample Uncertainty

Ross W. Williams, Ph.D.
Manager, Radiological Laboratory
7/30/98

Committed To *Your* Success

July 30, 1998

Severn Trent Laboratories
120 Southcenter Court, Suite 300
Morrisville NC 27560

Tel: (919) 460-8505
Fax: (919) 469-2646

American Environmental Network
Attn: Dr. Mitch Rubenstein
2709D PanAmerican Freeway NE
Albuquerque, NM 87107

Dear Dr. Rubenstein:

Please find enclosed the radiological results of six (6) water samples. This report contains sections addressing the following information at a minimum:

- case narrative
- sample summary
- analytical results (forms I thru VII), key, and COC's if applicable

STL Project ID	[illegible]
STL Work Order ID	[illegible]
Client Project ID	[illegible]

Copies of this radiological report and supporting data are maintained in our files for a minimum of three years unless special arrangements have been made. Except where specifically indicated, all radiological testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (919) 460-8505 for any additional information. Thank you for utilizing our services. We hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Sincerely,

Ross W. Williams

Ross W. Williams, Ph.D.
Manager, Radiological Laboratory
STL-North Carolina

RWW/mevl

CLIENT	: MARATHON OIL COMPANY	AEN I.D.	: 806424
PROJECT #	: 104332.03	DATE RECEIVED	: 6/27/98
PROJECT NAME	: IBRP	REPORT DATE	: 7/28/98

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-57	AQUEOUS	6/25/98
02	ROCKY ARROYO	AQUEOUS	6/26/98
03	MW-94	AQUEOUS	6/26/98
04	MW-68	AQUEOUS	6/26/98
05	MW-86	AQUEOUS	6/26/98
06	MW-62	AQUEOUS	6/26/98
07	TRIP BLANK	AQUEOUS	6/11/98

AEN I.D. 806424

July 31, 1998

MARATHON OIL COMPANY
P.O. BOX 552
MIDLAND, TX 79702-0552

Project Name IBRP
Project Number 104332.03

Attention: PAUL PEACOCK

On 6/27/98 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.

This report is being reissued in part to include the radiochemistry results. This report was originally dated 7/28/98. Radiochemistry was performed by STL, Morrisville, NC.

EPA methods 504.1, 8021 and 8260 were performed by American Environmental Network (NM) Inc., Albuquerque, NM.

Uranium was performed by North Creek Analytical, Portland, OR.

All other parameters were performed by STL, 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.
General Manager

MR: mt

Enclosure

AGI WELL NO. 1 SWD
Proposed Injection Well
Attachments to Form C-108
(Part XI)

The following water analyses are for fresh water wells drilled in the Indian Basin Field as a part of the Indian Basin Groundwater Remediation Project. The wells of interest and their locations are as follows:

Well Name	Location Description
SW-001	NE ¼, SW ¼, NE ¼, of Section 23, T-21-S, R-23-E
SW-002	NE ¼, SW ¼, NE ¼, of Section 23, T-21-S, R-23-E
SW-003	SE ¼, SE ¼, NW ¼, of Section 22, T-21-S, R-23-E
MW-068	SE ¼, SE ¼, SE ¼, SE ¼, of Section 23, T-21-S, R-23-E
MW-086	NW ¼, SW ¼, NW ¼, of Section 24, T-21-S, R-23-E
MW-110	NE ¼, SW ¼, NE ¼, of Section 23, T-21-S, R-23-E

Fresh Water Well

HALLIBURTON

WATER ANALYSIS REPORT
HOBBS NEW MEXICO

COMPANY Glenn's Water Well Service

REPORT W-903
DATE 9-10-97
DISTRICT Hobbs

SUBMITTED BY Daughter-in-law Mtn. Place

WELL	As listed	DEPTH	N/C	FORMATION	N/C
COUNTY	N/C	FIELD	N/C	SOURCE	N/C
SAMPLE	#1 Lowe Drlg		#2 Mountain Place		
RESISTIVITY	14.20 @ 72 °F		12.43 @ 72 °F		@ °F
SPECIFIC GR.	1.000		1.002		
pH	7.1		7.0		
CALCIUM	250 mpl		10 mpl		mpl
MAGNESIUM	100 mpl		30 mpl		mpl
CHLORIDE	450 mpl		350 mpl		mpl
SULFATES	200 mpl		140 mpl		mpl
BICARBONATES	400 mpl		320 mpl		mpl
SOLUBLE IRON	nil mpl		n.f mpl		mpl
Sodium					
Total Dis. Solids					
Total Hardness					
OIL GRAVITY	@ °F		@ °F		@ °F

Soft Naturally

REMARKS Taste like distilled Water

Resitivity measured in: Ohm/m2/m

ANALYST: R. Bowyer Holden

#1 LOWE DRLG well is located in SW¼, NW¼, NW¼, of Section 23, T-21-S, R-23-E

AGI Well No. 1
Proposed Injection Well
Attachment to C-108
(Part VIII)

Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the goelogic name and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solid concentrations of 10,000 mg/L or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

Injection Zone

Geological Name: Devonian

Lithology: Limestone

Thickness: ± 1,000 feet

Depth: 10,300 feet to top of Devonian

Drinking Water - Overlying

Geological Name: Grayburg
Depth to Bottom: ±181' to 217' (Section 22 & 23 – 9 to 17 ppm, Cond 627-722 M-Mhos).

Aquifer w/dissolved solids concentration less than 10,000 mg/L:

Geological Name: Paddock
Depth to bottom: ± 2,800' (Section 23 - 3600 ppm, 1.009 specific gravity)

Above data is based on Geological data obtained from Ken Fresquez, Geologist, of the State Engineer's Office in Roswell, NM

Drinking Water - Underlying

NONE

Committed To *Your* Success

LABORATORY TEST RESULTS

Job Number: 912816 Date: 11/16/99

CUSTOMER: Marathon Oil Company PROJECT: INDIAN BASIN GAS PLT ATTN: Mr. Paul Peacock

Customer Sample ID: COMINGLED GAS PLT WASTE EFFLUENT
Date Sampled.....: 11/08/1999
Time Sampled.....: 10:00
Sample Matrix.....: Aqueous

Laboratory Sample ID: 912816-1
Date Received.....: 11/09/1999
Time Received.....: 15:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
	Dibenzo(a,h)anthracene	ND	0.10	ug/L	11/16/99	rm
	Fluoranthene	ND	1.0	ug/L	11/16/99	rm
	Fluorene	ND	1.0	ug/L	11/16/99	rm
	Indeno(1,2,3-cd)pyrene	ND	0.10	ug/L	11/16/99	rm
	Naphthalene	<5.0	5.0	ug/L	11/16/99	rm
	Phenanthrene	ND	1.0	ug/L	11/16/99	rm
	Pyrene	ND	1.0	ug/L	11/16/99	rm
EPA 8260B	Volatile Organic Compounds					
	Vinyl chloride	ND	500	ug/L	11/15/99	weh
	1,1-Dichloroethene	ND	200	ug/L	11/15/99	weh
	Methylene chloride	ND	200	ug/L	11/15/99	weh
	Benzene	4300	200	ug/L	11/15/99	weh
	Carbon tetrachloride	ND	200	ug/L	11/15/99	weh
	Chloroform	ND	200	ug/L	11/15/99	weh
	1,2-Dibromoethane (EDB)	ND	200	ug/L	11/15/99	weh
	1,1-Dichloroethane	ND	200	ug/L	11/15/99	weh
	1,2-Dichloroethane	ND	200	ug/L	11/15/99	weh
	Ethylbenzene	700	200	ug/L	11/15/99	weh
	1,1,2,2-Tetrachloroethane	ND	200	ug/L	11/15/99	weh
	Tetrachloroethene	ND	200	ug/L	11/15/99	weh
	Toluene	13000	200	ug/L	11/15/99	weh
	1,1,1-Trichloroethane	ND	200	ug/L	11/15/99	weh
	1,1,2-Trichloroethane	ND	200	ug/L	11/15/99	weh
	Trichloroethene	ND	200	ug/L	11/15/99	weh
	Xylenes (total)	7000	500	ug/L	11/15/99	weh

Committed To *Your* Success

LABORATORY TEST RESULTS

Job Number: 912816 Date: 11/16/99

CUSTOMER: Marathon Oil Company PROJECT: INDIAN BASIN GAS PLT ATTN: Mr. Paul Peacock

Customer Sample ID: COMINGLED GAS PLT WASTE EFFLUENT
Date Sampled.....: 11/08/1999
Time Sampled.....: 10:00
Sample Matrix.....: Aqueous

Laboratory Sample ID: 912816-1
Date Received.....: 11/09/1999
Time Received.....: 15:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 160.1	Solids, Total Dissolved (TDS)	21000	10	mg/L	11/10/99	lam
EPA 300.0	Chloride	6600	1000	mg/L	11/10/99	kso
EPA 300.0	Fluoride (F)	<50	50	mg/L	11/10/99	kso
EPA 300.0	Nitrogen, Nitrate as N (NO3-N)	<1.0	1.0	mg/L	11/10/99	kso
EPA 300.0	Sulfate (SO4)	1460	100	mg/L	11/10/99	kso
EPA 420.2	Phenol, Total Recoverable	0.18	0.05	mg/L	11/11/99	dmw
SM 4500 CN	Cyanide, Total	0.08	0.05	mg/L	11/15/99	jdb
EPA 3010	Acid Digestion, Metals (ICP)	Complete			11/10/99	amw
EPA 7470	Mercury (Hg)	<0.001	0.001	mg/L	11/11/99	pal
EPA 3510	Separatory Funnel Liq/Liq Extraction	Complete			11/12/99	bjl
EPA 6010B	Metals Analysis (ICAP)					
	Aluminum (Al)	<0.1	0.1	mg/L	11/11/99	pal
	Arsenic (As)	<0.02	0.02	mg/L	11/10/99	amw
	Barium (Ba)	0.06	0.01	mg/L	11/10/99	chh
	Boron (B)	1.67	0.05	mg/L	11/11/99	pal
	Cadmium (Cd)	<0.005	0.005	mg/L	11/10/99	chh
	Chromium (Cr)	0.01	0.01	mg/L	11/10/99	chh
	Cobalt (Co)	<0.03	0.03	mg/L	11/10/99	chh
	Copper (Cu)	0.02	0.01	mg/L	11/10/99	chh
	Iron (Fe)	6.83	0.05	mg/L	11/10/99	chh
	Lead (Pb)	<0.05	0.05	mg/L	11/10/99	chh
	Manganese (Mn)	0.23	0.01	mg/L	11/10/99	chh
	Molybdenum (Mo)	<0.05	0.05	mg/L	11/10/99	chh
	Nickel (Ni)	0.03	0.01	mg/L	11/10/99	chh
	Selenium (Se)	<0.02	0.02	mg/L	11/10/99	amw
	Silver (Ag)	<0.01	0.01	mg/L	11/10/99	amw
	Zinc (Zn)	0.21	0.01	mg/L	11/10/99	chh
EPA 8310	Polynuclear Aromatic Hydrocarbons-HPLC					
	Acenaphthene	ND	5.0	ug/L	11/16/99	rm
	Acenaphthylene	ND	5.0	ug/L	11/16/99	rm
	Anthracene	ND	1.0	ug/L	11/16/99	rm
	Benzo(b)fluoranthene	ND	0.10	ug/L	11/16/99	rm
	Benzo(k)fluoranthene	ND	0.10	ug/L	11/16/99	rm
	Benzo(a)anthracene	ND	0.10	ug/L	11/16/99	rm
	Benzo(a)pyrene	ND	0.10	ug/L	11/16/99	rm
	Benzo(ghi)perylene	ND	0.10	ug/L	11/16/99	rm
	Chrysene	ND	1.0	ug/L	11/16/99	rm

AGI Well No. 1
Proposed Injection Well
Attachment to C-108
(Part VII)

Proposed Operations

1. ***Proposed average and maximum daily rate and volume of fluids to be injected.***

   Fluid: Produced Water

   Average Rate: 30,000 BWPD and 3,000 MSCF Acid Gas per Day

   Maximum Rate: 40,000 BWPD and 5,000 MSCF Acid Gas per Day

2. ***Whether the system is open or closed.***

   The proposed disposal system will be a closed system.

3. ***Proposed average and maximum injection pressure.***

   Average Pressure: 1500 psi

   Maximum Pressure: 2020 psi

4. ***Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water.***

   The sources of the injection fluid will be produced water from offsetting leases and waste water and acid gas from the Indian Basin Gas Plant.

   Formations: Upper Penn
   Morrow

   See attached water analysis for each of the above zones. Also attached is an analysis of the plant waste water. The acid gas stream will be approximately 50% H_2S and 50% CO_2.

AGI Well No. 1
Proposed Injection Well
Attachment to C-108
(Part VII)

Proposed Operations Continued

5. ***If injection is for disposal purpose into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.***

Marathon Oil Company ran a DST on North Indian Basin Well No. 1 (Section 9, T-21-S, R-23-E, Eddy County New Mexico) in 1963. The DST tested the interval 10,009 ft to 10,100 ft. Based on the DST, the following analysis was reported:

Specific Gravity	1.109
pH	6.8
Resistivity	.285 @ 94° F
Chlorides (Cl)	11,000
Sulfates (SO_4)	1,500
Alkalinity (HCO_3)	610
Calcium (Ca)	1,080
Magnesium (Mg)	775
Iron (Fe)	20
Sodium (Na)	5,359
Sulfides (H_2S)	Negligible

MITCHELL ANALYTICAL LABORATORY

2638 Faudree
Odessa, Texas 79765-8538
561-5579

Morrow

Water Analysis

Company.... Nalco/Exxon Energy Chemicals
Well # .... BONE FLATS 12-5
Lease..... MARATHON
Location... Sec. 12, T-21-S, R-23-E
Date Run... 10/13/1997
Lab Ref #.. 97-OCT-N00768

Sample Temp... 70.0
Date Sampled.. 10/10/1997
Sampled by.... Mark Hermann
Employee # ... 27-011
Analyzed by... DANIEL

Eddy County, NM

		Mg/L	Eq. Wt.	MEq/L
Dissolved Gasses				
Hydrogen Sulfide	(H2S)	0.00	16.00	0.00
Carbon Dioxide	(CO2)	0.00	22.00	0.00
Dissolved Oxygen	(O2)	0.00	8.00	0.00
Cations				
Calcium	(Ca++)	1,125.60	20.10	56.00
Magnesium	(Mg++)	170.80	12.20	14.00
Sodium	(Na+)	22,472.93	23.00	977.08
Barium	(Ba++)	<.50	68.70	0.00
Manganese	(Mn++)	0.00	27.50	0.00
Anions				
Hydroxyl	(OH-)	0.00	17.00	0.00
Carbonate	(CO3=)	0.00	30.00	0.00
Bicarbonate	(HCO3-)	268.84	61.10	4.40
Sulfate	(SO4=)	9.00	48.80	0.18
Chloride	(Cl-)	37,040.70	35.50	1,043.40
Total Iron	(Fe)	16.75	18.60	0.90
Total Dissolved Solids		61,104.62		
Total Hardness As CaCO3		3,500.00		
Conductivity MICROMHOS/CM		95,000		

pH 6.650 Specific Gravity 60/60 F. 1.042

CaSO4 Solubility @ 80 F. 68.63 MEq/L, CaSO4 scale is not likely

CaCO3 Scale Index	
70.0	-0.706
80.0	-0.586
90.0	-0.386
100.0	-0.386
110.0	-0.126
120.0	-0.126
130.0	0.234
140.0	0.234
150.0	0.564

Nalco/Exxon Energy Chemicals

MITCHELL ANALYTICAL LABORATORY

2638 Faudree
Odessa, Texas 79765-8538
561-5579

Water Analysis

Upper Penn

Company.... Nalco/Exxon Energy Chemicals
Well # .... IHSC #7
Lease..... MARATHON
Location... Sec. 36, T-20-S, R-24-E
Date Run... 10/13/1997
Lab Ref #.. 97-OCT-N00769

Sample Temp... 70.0
Date Sampled.. 10/13/1997
Sampled by.... Mark Hermann
Employee # ... 27-011
Analyzed by... DANIEL

Eddy County, NM

Dissolved Gasses

		Mg/L	Eq. Wt.	MEq/L
Hydrogen Sulfide	(H2S)	340.00	16.08	21.15
Carbon Dioxide	(CO2)	0.00	22.00	0.00
Dissovled Oxygen	(O2)	0.00	8.00	0.00

Cations

Calcium	(Ca++)	341.70	20.10	17.00
Magnesium	(Mg++)	85.40	12.20	7.00
Sodium	(Na+)	3,714.25	23.00	161.49
Barium	(Ba++)	< .50	68.70	0.00
Manganese	(Mn++)	0.00	27.50	0.00

Anions

Hydroxyl	(OH-)	0.00	17.00	0.00
Carbonate	(CO3=)	12.00	30.00	0.40
Bicarbonate	(HCO3-)	928.72	61.10	15.20
Sulfate	(SO4=)	1,750.00	48.80	35.86
Chloride	(Cl-)	4,004.40	35.50	112.84

Total Iron	(Fe)	0.40	18.60	0.02
Total Dissolved Solids		11,176.87		
Total Hardness As CaCO3		1,200.00		
Conductivity MICROMHOS/CM		13,500		

pH 7.600 Specific Gravity 60/60 F. 1.008

CaSO4 Solubility @ 80 F. 40.28 MEq/L, CaSO4 scale is not likely

CaCO3 Scale Index

70.0	0.930
80.0	1.060
90.0	1.280
100.0	1.280
110.0	1.520
120.0	1.520
130.0	1.790
140.0	1.790
150.0	2.020

Submit to Appropriate
District Office
State Lease – 6 copies
Fee Lease – 5 copies
DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

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

Form C-105
Revised 1-1-89

WELL API NO. 30-015-00037

5. Indicate Type of Lease STATE ☐ FEE ☐

6. State Oil & Gas Lease No. NM-0384628

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

1a. Type of Well: OIL WELL ☐ GAS WELL ☐ DRY ☐ OTHER Salt Water Disposal

b. Type of Completion: NEW WELL ☐ WORK OVER ☐ DEEPEN ☒ PLUG BACK ☐ DIFF RESVR ☐ OTHER

7. Lease Name or Unit Agreement Name: Indian Basin Gas Com

2. Name of Operator: Marathon Oil Company

8. Well No. 1

3. Address of Operator: P.O. Box 552, Midland, TX 79702

9. Pool name or Wildcat: Devonian

4. Well Location
Unit Letter E : 1980 Feet From The North Line and 660 Feet From The West Line

Section 23 Township 21-S Range 23-E NMPM Eddy County

10. Date Spudded | 11. Date T.D. Reached | 12. Date Compl. (Ready to Prod.) | 13. Elevations (DF & RKB, RT, GR, etc.) | 14. Elev. Casinghead
See original completion report for this information.

15. Total Depth: 10438' | 16. Plug Back T.D. | 17. If Multiple Compl. How Many Zones? | 18. Intervals Drilled By | Rotary Tools | Cable Tools

19. Producing Interval(s), of this completion - Top, Bottom, Name: Injecting 10100' - 10438' Devonian

20. Was Directional Survey Made

21. Type Electric and Other Logs Run: GR/CCL from 7100' - 7630'

22. Was Well Cored

23. **CASING RECORD** (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
See original completion report.					

24. **LINER RECORD**

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

25. **TUBING RECORD**

SIZE	DEPTH SET	PACKER SET
2 3/8"		9965'

26. Perforation record (interval, size, and number)
6574'-6768', .4" shot, 308 holes
9039'-9263'-see original completion report

27. ACID, SHOT, FRACTURE, CEMENT, SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
6574'-6768'	Squeeze w/750sx cement
9039'-9263'	Squeeze w/300sx cement
10100'-10438'	Acid w/4000 gals 15% NEFE

28. **PRODUCTION**

Date First Production	Production Method (Flowing, gas lift, pumping - Size and type pump)	Well Status (Prod. or Shut-in)

Date of Test	Hours Tested	Choke Size	Prod'n For Test Period	Oil - Bbl.	Gas - MCF	Water - Bbl.	Gas - Oil Ratio

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate	Oil - Bbl.	Gas - MCF	Water - Bbl.	Oil Gravity - API - (Corr.)

29. Disposition of Gas (Sold, used for fuel, vented, etc.)

Test Witnessed By

30. List Attachments

31. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief

Signature Carl A. Bagwell Printed Name Carl A. Bagwell Title Eng. Technician Date 1/10/92

INSTRUCTIONS

This form is to be filed with the appropriate District Office of the Division not later than 20 days after the completion of any newly-drilled or deepened well. It shall be accompanied by one copy of all electrical and radio-activity logs run on the well and a summary of all special tests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, true vertical depths shall also be reported. For multiple completions, Items 25 through 29 shall be reported for each zone. The form is to be filed in quintuplicate except on state land, where six copies are required. See Rule 1105.

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

Southeastern New Mexico		Northwestern New Mexico	
T. Anhy	T. Canyon	T. Ojo Alamo	T. Penn. "B"
T. Salt	T. Strawn	T. Kirtland-Fruitland	T. Penn. "C"
B. Salt	T. Atoka	T. Pictured Cliffs	T. Penn. "D"
T. Yates	T. Miss	T. Cliff House	T. Leadville
T. 7 Rivers	T. Devonian	T. Menefee	T. Madison
T. Queen	T. Silurian	T. Point Lookout	T. Elbert
T. Grayburg	T. Montoya	T. Mancos	T. McCracken
T. San Andres	T. Simpson	T. Gallup	T. Ignacio Otzte
T. Glorieta	T. McKee	Base Greenhorn	T. Granite
T. Paddock	T. Ellenburger	T. Dakota	T.
T. Blinebry	T. Gr. Wash	T. Morrison	T.
T. Tubb	T. Delaware Sand	T. Todilto	T.
T. Drinkard	T. Bone Springs	T. Entrada	T.
T. Abo	T.	T. Wingate	T.
T. Wolfcamp	T.	T. Chinle	T.
T. Penn	T.	T. Permain	T.
T. Cisco (Bough C)	T.	T. Penn "A"	T.

OIL OR GAS SANDS OR ZONES

No. 1, from.....to..... No. 3, from.....to.....

No. 2, from.....to..... No. 4, from.....to.....

IMPORTANT WATER SANDS

Include data on rate of water inflow and elevation to which water rose in hole.

No. 1, from.....to.....feet.....

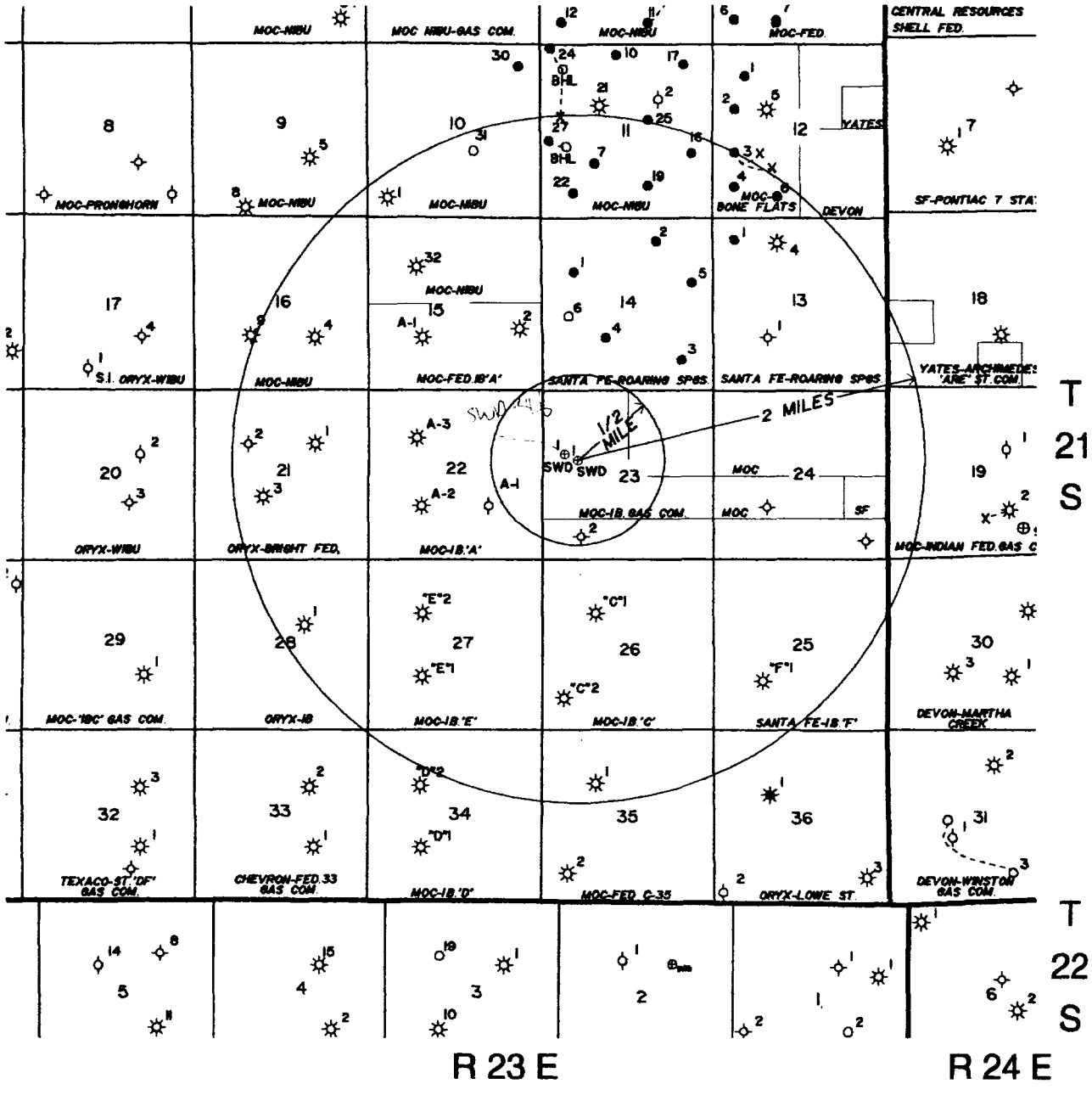
No. 2, from.....to.....feet.....

No. 3, from.....to.....feet.....

LITHOLOGY RECORD (Attach additional sheet if necessary)

From	To	Thickness in Feet	Lithology	From	To	Thickness in Feet	Lithology

AGI WELL NO. 1
Proposed Injection Well
Attachments to Form C-108
(Part V)



MARATHON OIL COMPANY
MID-CONTINENT REGION

INDIAN BASIN FIELD AREA

EDDY COUNTY, NEW MEXICO

Form 3160-3
(July 1992)

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

FORM APPROVED
OMB NO. 1004-0136
Expires: February 28, 1995

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR DEEPEN

5. LEASE DESIGNATION AND SERIAL NO.

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: N/A

1a. TYPE OF WORK: DRILL [X] DEEPEN [ ]

b. TYPE OF WELL: OIL WELL [ ] GAS WELL [ ] OTHER X SWD Well SINGLE ZONE [X] MULTIPLE ZONE [ ]

7. UNIT AGREEMENT NAME: Indian Basin Unit

8. FARM OR LEASE NAME, WELL NO.: A.G.I. # 1

2. NAME OF OPERATOR: Marathon Oil Company

9. API WELL NO.:

3. ADDRESS AND TELEPHONE NO.: P.O. Box 552 Midland, TX 79702 1-800-351-1417

10. FIELD AND POOL, OR WILDCAT: Indian Basin Field/ Devonian

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: 2139' FNL & 1061 FWL
At proposed prod. zone: 2139' FNL & 1061 FWL

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 23, T-21-S, R-23-E

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 15 Miles N.W. of Carlsbad

12. COUNTY OR PARISH: Eddy

13. STATE: N.M.

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any)	16. NO. OF ACRES IN LEASE	17. NO. OF ACRES ASSIGNED TO THIS WELL
1061'	640	640
18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.	**19. PROPOSED DEPTH**	**20. ROTARY OR CABLE TOOLS**
* 431'	11,000	Rotary

21. ELEVATIONS (Show whether DF,RT, GR, etc.): 3834' G.L.

22. APPROX. DATE WORK WILL START*: ASAP

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	GRADE, SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
14.75	10-3/4" K-55	40.50#	1200'	1050 sks.to surface
9.875	7-5/8"k-55& L-80	26.40# & 29.70#	10350	2220 Sks

Propose To drill A Devonian SWD well to Replace our Indian Basin Gas Com.#1

* Distance from the Indian Basin Gas Com # 1 Located @ 1980'FNL & 660' FWL to A.G.I. # 1 Well is 431'

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24. SIGNED Jerry Fletcher TITLE Engineer Tech. DATE 7-20-00

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

Application approval 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.

CONDITIONS OF APPROVAL, IF ANY:

APPROVED BY _____ TITLE _____ DATE _____

*See Instructions On Reverse Side

Title 18 U.S.C. Section 1001, makes 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.

AGI Well No. 1 SWD
Proposed Injection Well
Attachment to Form C-108
(Part VI)

Wells within area of review which penetrate the proposed injection zone:

Indian Basin Gas Com Well No. 1 SWD SWD-476

This well was originally drilled as a producing well, was converted to a disposal well and was recompleted in the Devonian zone on December 6, 1991.

TD is 10,438

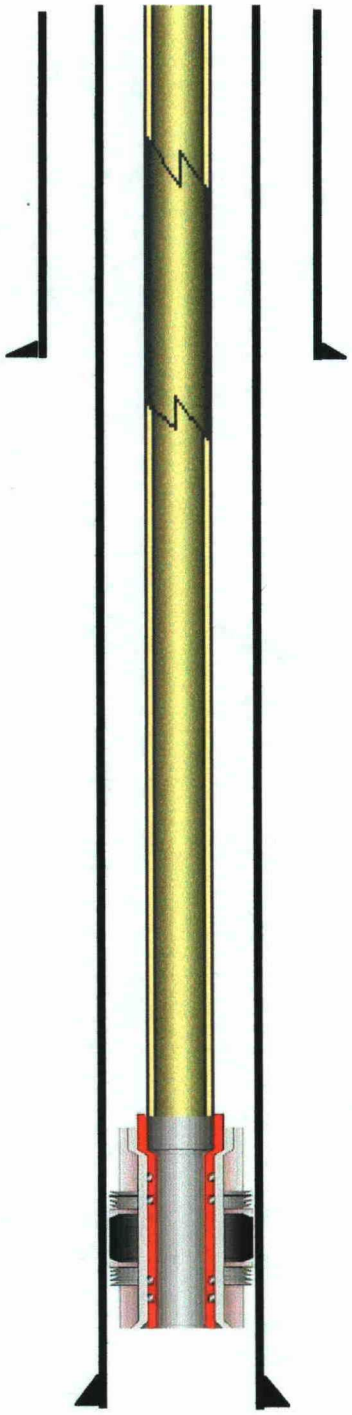
Disposal Zone is Devonian, 10,100' - 10,438' Open Hole.

See attached well completion report for the Devonian recompletion and the wellbore diagram of the original completion. (There isn't a legible copy of the original completion report in this office.)

9 5/8" @ 2250' w/1000 sxs CIRC

7' @ 10100' w/1350 sxs TOC @ 6070' TS

AGI WELL NO. 1 SWD
Proposed Injection Well
Attachments to Form C-108
(Part III)



10-3/4" K-55 set @ 1200'
cmt to surface w/1050 sx

5-1/2" L-80 coated tubing
Set @ 10,300'

Arrow Model B Permanent
Packer, Set @ 10,300'

7-5/8" L-80 set @ 10,350'
cmt to surface w/2220 sx

AGI Well No. 1
Proposed Injection Well
Attachments to C-108

Part III

Well Data

See attached proposed completion for AGI Well No. 1 SWD. Also attached is a copy of the Application for Permit to Drill (Form 3160-3) for this well.

Part V

Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

See attached map.

Part VI

Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging details.

See attached data.

Part VII

Attach data on proposed operation

See attachment.

Part VIII

See attachment.

Part IX

Describe the proposed stimulation program, if any.

The proposed injection well will be completed open hole. The proposed open hole interval will be stimulated using 15% HCl acid (30,000 gallons).

Part X

Attach appropriate logging and test data on the well.

The appropriate forms, along with an inclination survey and logs will be filed on this well when it is completed.

Part XI

Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

See attachment.

Part XII

Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

Marathon Oil Company, as Operator of the proposed injection well, has reviewed and examined available geologic and engineering data and finds no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

Ken W. Tatarzyn
Indian Basin Asset Team Manager

Part XIII

Proof of Notice

See attachments.

AGI Well No. 1 SWD
Proposed Injection Well
Attachments to C-108
(Part III)

Proposed Completion for:

AGI No. 1 SWD
UL "E", 2138' FNL, 1060' FWL
Sec. 23, T-21-S, R-23-E
Eddy County, New Mexico

14.75" hole to 1200'. Set 10.75" casing cemented to surface w/1050 sacks.

9.875" hole to 10,350'. Set 7-5/8" casing cemented to surface w/2220 sacks.

6.625" open hole 10,350' - 11,000'.

5.5" L-80, coated tubing set at 10,300'.

Arrow Model "B" Permanent Packer set @ 10,300'

Proposed injection zone: Devonian

Injection Interval: 10,350' - 11,000' open hole

This well will be drilled for the purpose of injection/disposal of produced water from offsetting leases and plant waste water and acid gas from the Indian Basin Gas Plant.

The next higher oil or gas zone is the Morrow at a depth of 8945'.

There are no zones lower than the Devonian that have ever been produced in this area.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-1
Revised 10-1-81

SWD 8/14/00

JUL 28

784

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☒ yes ☐ no

II. Operator: Marathon Oil Company

Address: P. O. Box 552, Midland, TX 79702

Contact party: Ginny Larke Phone: 915-682-1626

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? ☐ yes ☒ no
If yes, give the Division order number authorizing the project _____.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

• VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

•VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

• X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

• XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification

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

Name: K. W. Tatarzyn Title Asset Team Manager

Signature: K. W. Tatarzyn Date: 7-26-00

• If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office.

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(3) the formation name and depth with expected maximum injection rates and pressures; and

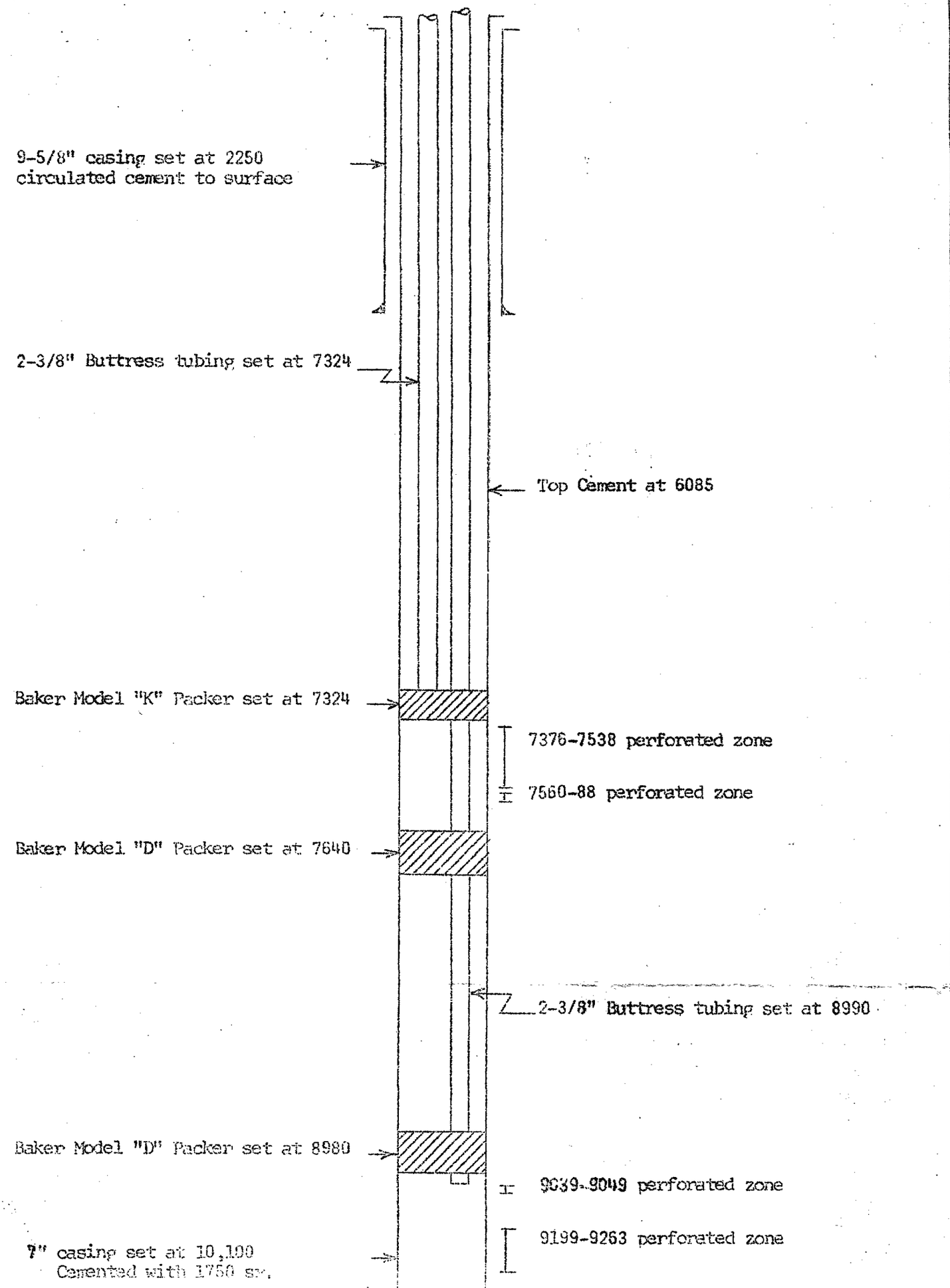
(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

DIAGRAMMATIC SKETCH
OF
DUAL COMPLETION
Ralph Lowe
Indian Basin No. 1
Wildcat
E23-21S-23E
Eddy County, New Mexico

ILLEGIBLE



AMERICAN ENVIRONMENTAL NETWORK 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"FINAL REPORT FORMAT - SINGLE"

Accession:	806387
Client:	AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number:	806422
Project Name:	IBRP
Project Location:	MARATHON OIL COMPANY, MIDLAND, TX
Test:	ACID & BASE EXTRACTABLES (8270)
Analysis Method:	8270/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.
Extraction Method:	3520/Test Methods for Evaluating Solid and Haz Waste, SW-846, 3rd Ed.
Matrix:	WATER
QC Level:	I

Lab Id:	001		Sample Date/Time:	24-JUN-98 1530
Client Sample Id:	SW-03		Received Date:	26-JUN-98
Batch: ALW079			Extraction Date:	28-JUN-98
Blank: A	Dry Weight %:	N/A	Analysis Date:	05-JUL-98

Parameter:	Units:	Results:	Rpt Lmts:	Q:
BENZOIC ACID	UG/L	ND	1.7	
4-CHLORO-3-METHYLPHENOL	UG/L	ND	0.4	
2-CHLOROPHENOL	UG/L	ND	0.5	
2,4-DICHLOROPHENOL	UG/L	ND	3.9	
2,6-DICHLOROPHENOL	UG/L	ND	0.1	
2,4-DIMETHYLPHENOL	UG/L	ND	0.5	
4,6-DINITRO-2-METHYLPHENOL	UG/L	ND	1.6	
2,4-DINITROPHENOL	UG/L	ND	3.3	
2-METHYLPHENOL	UG/L	ND	0.3	
4-METHYLPHENOL	UG/L	ND	0.5	
2-NITROPHENOL	UG/L	ND	0.4	
4-NITROPHENOL	UG/L	ND	0.7	
PENTACHLOROPHENOL	UG/L	ND	0.7	
PHENOL	UG/L	ND	0.5	
2,3,4,6-TETRACHLOROPHENOL	UG/L	ND	0.6	
2,4,5-TRICHLOROPHENOL	UG/L	ND	3.0	
2,4,6-TRICHLOROPHENOL	UG/L	ND	0.3	
ACENAPHTHENE	UG/L	ND	0.4	
ACENAPHTHYLENE	UG/L	ND	0.4	
ACETOPHENONE	UG/L	ND	0.4	
4-AMINOBIPHENYL	UG/L	ND	0.7	
ANILINE	UG/L	ND	0.5	
ANTHRACENE	UG/L	ND	0.4	
BENZIDINE	UG/L	ND	2.7	
BENZO (A) ANTHRACENE	UG/L	ND	0.5	
BENZO (A) PYRENE	UG/L	ND	0.2	
BENZO (B) FLUORANTHENE	UG/L	ND	0.5	
BENZO (G,H,I) PERYLENE	UG/L	ND	0.3	
BENZO (K) FLUORANTHENE	UG/L	ND	0.7	
BENZYL ALCOHOL	UG/L	ND	0.5	
BIS(2-CHLOROETHOXY)METHANE	UG/L	ND	0.4	
BIS(2-CHLOROETHYL)ETHER	UG/L	ND	0.5	
BIS(2-CHLOROISOPROPYL)ETHER	UG/L	ND	1.9	
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	ND	0.6	
4-BROMOPHENYL PHENYL ETHER	UG/L	ND	0.4	
BUTYLBENZYL PHTHALATE	UG/L	ND	0.5	
4-CHLOROANILINE	UG/L	ND	0.4	
1-CHLORONAPHTHALENE	UG/L	ND	0.6	
2-CHLORONAPHTHALENE	UG/L	ND	0.4	
4-CHLOROPHENYL PHENYL ETHER	UG/L	ND	0.5	

AMERICAN ENVIRONMENTAL NETWORK 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

Analysis Report

Analysis: ACID & BASE EXTRACTABLES (8270)

Accession:	806387
Client:	AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number:	806422
Project Name:	IBRP
Project Location:	MARATHON OIL COMPANY, MIDLAND, TX
Department:	ORGANIC/MS

WORK ORDER

Lab

Work Order #	98-06-412	# of Samples	4	Recieved Date	06/26/98	American Environ. Network
Client #	2399	# of Tests	8	Load Date	06/26/98	2709D PanAmerican Freeway NE
Project	2399-019	Report Level	2	Due Date	07/14/98	Albuquerque, NM 87107
Amount	123.25	Quote #		Export Date	/ /	Mitch Rubenstein
Comment						

Lab ID	Sample #	Status	Matrix	Test	Cust ID	Collected
9806412-01	01A1	Open	Water	Ra-226	MW-59	06/24/98
9806412-01	01A2	Open	Water	Ra-228	MW-59	06/24/98
9806412-02	02A1	Open	Water	Ra-226	MW-74	06/24/98
9806412-02	02A2	Open	Water	Ra-228	MW-74	06/24/98
9806412-03	03A1	Open	Water	Ra-226	MW-67	06/24/98
9806412-03	03A2	Open	Water	Ra-228	MW-67	06/24/98
9806412-04	04A1	Open	Water	Ra-226	SW-02	06/24/98
9806412-04	04A2	Open	Water	Ra-228	SW-02	06/24/98

pH Checked
All Samples pH <2
Initials: RB Date: 6/29/98

Committed To *Your* Success

REPORT FORM KEY

Severn Trent Laboratories
120 Southcenter Court, Suite 300
Morrisville NC 27560

Tel: (919) 460-8505
Fax: (919) 469-2646

Instrument ID:

#1 - Gas Proportional Counter
#2 - High Purity Germanium Detectors (HPGe)
#3 - Alpha Spectrometry Counter
#4 - Liquid Scintillation Counter
#5 - Lucas Cell Counter
#6 - Sodium Iodide Detector

Sample Type:

REG - Regular Sample
DUP - Duplicate Sample
MS - Matrix Spike
BS - Blank Spike
MB - Method Blank

Units:

pCi/L - Picocuries per Liter
pCi/g - Picocuries per Gram
pCi/ml - Picocuries per Milliliter
pCi/mg - Picocuries per Milligram
pCi/F - Picocuries per Air Filter

Radionuclides:

H-3	Tritium	C-14	Carbon-14
Cl-36	Chlorine-36	K-40	Potassium-40
Co-60	Cobalt-60	Sr-89	Strontium-89
Sr-90	Strontium-90	Tc-99	Technetium-99
Cs-137	Cesium-137	Tl-208	Thallium-208
Pb-210	Lead-210	Pb-212	Lead-212
Pb-214	Lead-214	Bi-214	Bismuth-214
Ra-226	Radium-226	Ac-228	Actinium-228
Ra-228	Radium-228	Th-234	Thorium-234
Th-227	Thorium-227	Th-232/230/228	Isotopic Thorium
U-234/235/238	Isotopic Uranium	Pu-238	Plutonium-238
Pu-239/240	Plutonium-239&240	Am-241	Americium-241
Np-237	Neptunium-237		

STL

Severn Trent Laboratories

Project Number: 2399-019

Blank Spike Results Summary

NC - 806421

07/28/98

Form V

Client Sample ID	Batch Number	Matrix	Radionuclide	Spike	Result	Spike Value	Percent Recovery	Q	Units	Analysis Date	Method Number
Blank Spike	98070007	Water	Ra-226	Ra-226	136.19	145.40	93.67%		pCi/L	07/20/98	RAS01900
Blank Spike	98070009	Water	Ra-228	Ra-228	93.02	87.75	106.01%		pCi/L	07/10/98	RAS08500

Key shall be attached

Comments: _____

_____

_____

MDA mod

STL

Project Number: 2399-019

Severn Trent Laboratories

Chemical Recovery

NC - 806421

07/28/98

Form IV

Client Sample ID	Lab ID	Sample Type	Batch Number	Radionuclide	Chemical Tracer	Tracer Result	Tracer Added	Percent Recovery	Q	Tracer Units	Analysis Date	Inst ID
MW-59	9806412-01	Reg	98070007	Ra-226	Ba-133	1105.00	1240.00	89.11 %		pCi	07/24/98	5
MW-59	9806412-01	Reg	98070009	Ra-228	Ba-133	978.00	1309.00	74.71 %		pCi	07/15/98	1
MW-74	9806412-02	Reg	98070007	Ra-226	Ba-133	1050.00	1258.00	83.47 %		pCi	07/24/98	5
MW-74	9806412-02	Reg	98070009	Ra-228	Ba-133	298.40	1260.00	23.68 %		pCi	07/15/98	1
MW-67	9806412-03	Reg	98070007	Ra-226	Ba-133	1172.00	1240.00	94.52 %		pCi	07/24/98	5
MW-67	9806412-03	Reg	98070009	Ra-228	Ba-133	1091.00	1309.00	83.35 %		pCi	07/15/98	1
SW-02	9806412-04	Reg	98070007	Ra-226	Ba-133	1119.00	1240.00	90.24 %		pCi	07/27/98	5
SW-02	9806412-04	Reg	98070009	Ra-228	Ba-133	1027.00	1260.00	81.51 %		pCi	07/15/98	1
Blank Spike	N/A	BS	98070007	Ra-226	Ba-133	1234.00	1260.00	97.94 %		pCi	07/20/98	5
Blank Spike	N/A	BS	98070009	Ra-228	Ba-133	1020.00	1260.00	80.95 %		pCi	07/10/98	1
MW-54	9806501-01	Dup	98070007	Ra-226	Ba-133	994.00	1258.00	79.01 %		pCi	07/24/98	5
MW-54	9806501-01	Dup	98070009	Ra-228	Ba-133	1188.00	1309.00	90.76 %		pCi	07/15/98	1
Method Blank	N/A	MB	98070007	Ra-226	Ba-133	1244.00	1260.00	98.73 %		pCi	07/20/98	5
Method Blank	N/A	MB	98070009	Ra-228	Ba-133	1083.00	1309.00	82.73 %		pCi	07/10/98	1
MW-55	9806501-02	MS	98070007	Ra-226	Ba-133	1172.00	1258.00	93.16 %		pCi	07/24/98	5
MW-55	9806501-02	MS	98070009	Ra-228	Ba-133	1030.00	1260.00	81.75 %		pCi	07/15/98	1

Key shall be attached

Comments: _____

MDA mode

Form III

Client Sample ID	Batch Number	Matrix	Radionuclide	Result	Uncertainty	Q	Units	Analysis Date	Sample Size	Method Number	Inst ID
Method Blank	98070008	Water	Ra-226	0.04	0.10		pCi/L	07/20/98	0.5000	RAS01900	5
Method Blank	98070010	Water	Ra-228	0.93	0.94		pCi/L	07/17/98	1.0000	RAS08500	1

Key shall be attached

Comments: _____

STL

Project Number: 2399-024

Severn Trer. oratories

QA/QC Results Summary

NC 806426

07/30/98

Form II

Client Sample ID	Lab ID	Sample Type	Batch Number	Matrix	Radionuclide	Result	Uncertainty	Units	Analysis Date	Sample Size	MDA	Inst ID
Blank Spike	N/A	BS	98070008	Water	Ra-226	166.82	1.88	pCi/L	07/20/98	0.5000	0.13	5
Blank Spike	N/A	BS	98070010	Water	Ra-228	88.99	3.18	pCi/L	07/17/98	1.0000	1.49	1
SW-01	9806507-06	Dup	98070008	Water	Ra-226	0.26	0.14	pCi/L	07/27/98	0.5000	0.14	5
SW-01	9806507-06	Dup	98070010	Water	Ra-228	-1.49	0.63	pCi/L	07/17/98	1.0000	1.86	1
Method Blank	N/A	MB	98070008	Water	Ra-226	0.04	0.10	pCi/L	07/20/98	0.5000	0.15	5
Method Blank	N/A	MB	98070010	Water	Ra-228	0.93	0.94	pCi/L	07/17/98	1.0000	2.14	1
LYMAN	9806507-01	MS	98070008	Water	Ra-226	157.69	2.00	pCi/L	07/27/98	0.5000	0.14	5
LYMAN	9806507-01	MS	98070010	Water	Ra-228	106.44	3.83	pCi/L	07/20/98	1.0000	1.85	1

Key shall be attached

Comments: _____

MDA mode

STL

Project Number: 2399-024

Severn Trent Laboratories

Radiological Analysis Results

NC 806426

07/30/98

Form I

Client Sample ID	Lab ID	Sample Type	Batch Number	Matrix	Radionuclide	Result	Uncertainty	Q	Units	Analysis Date	Sample Size	MDA
LYMAN	9806507-01	Reg	98070008	Water	Ra-226	0.25	0.12		pCi/L	07/28/98	0.5000	0.10
LYMAN	9806507-01	Reg	98070010	Water	Ra-228	3.25	0.99		pCi/L	07/17/98	1.0000	1.90
MW-73	9806507-02	Reg	98070008	Water	Ra-226	7.26	0.67		pCi/L	07/28/98	0.5000	0.21
MW-73	9806507-02	Reg	98070010	Water	Ra-228	5.99	1.17		pCi/L	07/20/98	1.0000	1.89
MW-72	9806507-03	Reg	98070008	Water	Ra-226	0.70	0.17		pCi/L	07/28/98	0.5000	0.11
MW-72	9806507-03	Reg	98070010	Water	Ra-228	3.22	0.99		pCi/L	07/20/98	1.0000	1.91
MW-75	9806507-04	Reg	98070008	Water	Ra-226	1.28	0.26		pCi/L	07/28/98	0.5000	0.16
MW-75	9806507-04	Reg	98070010	Water	Ra-228	2.22	0.81		pCi/L	07/20/98	1.0000	1.54
MW-110	9806507-05	Reg	98070008	Water	Ra-226	0.76	0.18		pCi/L	07/29/98	0.5000	0.13
MW-110	9806507-05	Reg	98070010	Water	Ra-228	-2.68	0.70		pCi/L	07/20/98	1.0000	2.10
SW-01	9806507-06	Reg	98070008	Water	Ra-226	0.17	0.09		pCi/L	07/29/98	0.5000	0.09
SW-01	9806507-06	Reg	98070010	Water	Ra-228	-1.28	0.73		pCi/L	07/21/98	1.0000	1.98

Key shall be attached

Comments: _____

_____

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MDA mor

STL

Environmental Survey

Cover Page

Radiological Data Analysis Package

07/30/98

120 Southcenter Ct., Suite 300
Morrisville, NC 27560

Phone (919) 460-8505
Fax (919) 469-2646

Project Number: 2399-024

NC 806426

Client Sample ID	Lab ID
LYMAN	9806507-01
MW-73	9806507-02
MW-72	9806507-03
MW-75	9806507-04
MW-110	9806507-05
SW-01	9806507-06

Comments: _____

Release of the data contained in this package has been authorized by the laboratory manager or the manager's designee, as verified by the following signature.

Ross W. Williams
Manager, Radiological Laboratory

7/30/98
Date

Committed To *Your* Success

CASE NARRATIVE
Client: American Environmental Network - NM
Client Project ID: 104332.03
STL-NC Order Number: 98-06-507
STL-NC Project Number: 2399-024

Six (6) water samples were received on July 2, 1998, in good condition with the chain-of-custody intact. The samples were analyzed for Ra-226 and Ra-228.

A method blank was analyzed with each batch, and the activities of the blanks were equal to or less than the acceptance criteria of less than three times the MDL.

A blank spike sample was analyzed with each batch, and the recoveries were within the 80-120% acceptance criteria.

A matrix spike analysis was made with each batch also. The matrix spike recoveries were within the acceptance criteria of 80-120% for water samples.

A duplicate sample was analyzed for each batch. The duplicate analyses were within our acceptance criteria of a Duplicate Error Ratio (DER) of less than 1.5. The DER is defined as follows:

$$DER = \frac{|S-D|}{(2\sigma_s + 2\sigma_d)}$$

Where: S = Original Sample Value
D = Duplicate Value
$2\sigma_s$ = Original Sample Uncertainty
$2\sigma_d$ = Duplicate Sample Uncertainty

Ross W. Williams, Ph.D.
Manager, Radiological Laboratory
7/30/98

C:\NET2\WP\AEN-NM 2399-024.WPD

Committed To *Your* Success

Severn Trent Laboratories
120 Southcenter Court, Suite 300
Morrisville NC 27560

Tel: (919) 460-8505
Fax: (919) 469-2646

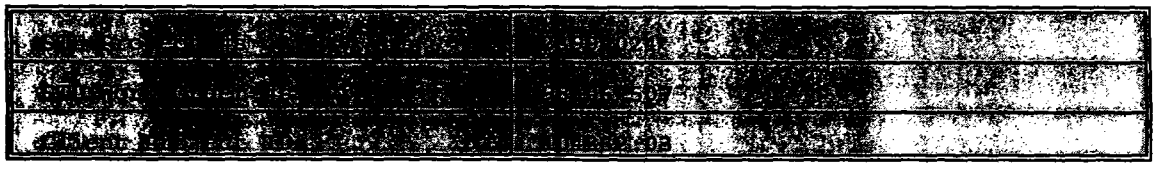
July 30, 1998

American Environmental Network
Attn: Dr. Mitch Rubenstein
2709D PanAmerican Freeway NE
Albuquerque, NM 87107

Dear Dr. Rubenstein:

Please find enclosed the radiological results of six (6) water samples. This report contains sections addressing the following information at a minimum:

- case narrative
- sample summary
- analytical results (forms I thru VII), key, and COC's if applicable



Copies of this radiological report and supporting data are maintained in our files for a minimum of three years unless special arrangements have been made. Except where specifically indicated, all radiological testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (919) 460-8505 for any additional information. Thank you for utilizing our services. We hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Sincerely,

Ross W. Williams

Ross W. Williams, Ph.D.
Manager, Radiological Laboratory
STL-North Carolina

RWW/mevl

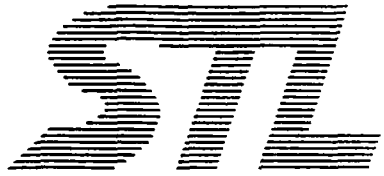
WORK ORDER

Lab

Work Order #	98-06-502	# of Samples	4	Recieved Date	06/29/98	American Environ. Network
Client #	2399	# of Tests	8	Load Date	06/29/98	2709D PanAmerican Freeway NE
Project	2399-021	Report Level	2	Due Date	07/16/98	Albuquerque, NM 87107
Amount	123.25	Quote #		Export Date	/ /	Mitch Rubenstein
Comment						

Lab ID	Sample #	Status	Matrix	Test	Cust ID	Collected
9806502-01	01A1	Open	Water	Ra-226	SW-03	06/24/98
9806502-01	01A2	Open	Water	Ra-228	SW-03	06/24/98
9806502-02	02A1	Open	Water	Ra-226	MW-83	06/24/98
9806502-02	02A2	Open	Water	Ra-228	MW-83	06/24/98
9806502-03	03A1	Open	Water	Ra-226	MW-82	06/24/98
9806502-03	03A2	Open	Water	Ra-228	MW-82	06/24/98
9806502-04	04A1	Open	Water	Ra-226	MW-65A	06/24/98
9806502-04	04A2	Open	Water	Ra-228	MW-65A	06/24/98

pH Checked
All Samples pH <2
Initials: sls **Date:** 6-29-98



Committed To *Your* Success

REPORT FORM KEY

Severn Trent Laboratories
120 Southcenter Court, Suite 300
Morrisville NC 27560

Tel: (919) 460-8505
Fax: (919) 469-2646

Instrument ID:

#1 - Gas Proportional Counter
#2 - High Purity Germanium Detectors (HPGe)
#3 - Alpha Spectrometry Counter
#4 - Liquid Scintillation Counter
#5 - Lucas Cell Counter
#6 - Sodium Iodide Detector

Sample Type:

REG - Regular Sample
DUP - Duplicate Sample
MS - Matrix Spike
BS - Blank Spike
MB - Method Blank

Units:

pCi/L - Picocuries per Liter
pCi/g - Picocuries per Gram
pCi/ml - Picocuries per Milliliter
pCi/mg - Picocuries per Milligram
pCi/F - Picocuries per Air Filter

Radionuclides:

H-3	Tritium	C-14	Carbon-14
Cl-36	Chlorine-36	K-40	Potassium-40
Co-60	Cobalt-60	Sr-89	Strontium-89
Sr-90	Strontium-90	Tc-99	Technetium-99
Cs-137	Cesium-137	Tl-208	Thallium-208
Pb-210	Lead-210	Pb-212	Lead-212
Pb-214	Lead-214	Bi-214	Bismuth-214
Ra-226	Radium-226	Ac-228	Actinium-228
Ra-228	Radium-228	Th-234	Thorium-234
Th-227	Thorium-227	Th-232/230/228	Isotopic Thorium
U-234/235/238	Isotopic Uranium	Pu-238	Plutonium-238
Pu-239/240	Plutonium-239&240	Am-241	Americium-241
Np-237	Neptunium-237		

STL

Severn Trent Laboratories

Project Number: 2399-021

Blank Spike Results Summary

NC - 806422

07/28/98

Form V

Client Sample ID	Batch Number	Matrix	Radionuclide	Spike	Result	Spike Value	Percent Recovery	Q	Units	Analysis Date	Method Number
Blank Spike	98070007	Water	Ra-226	Ra-226	136.19	145.40	93.67%		pCi/L	07/20/98	RAS01900
Blank Spike	98070009	Water	Ra-228	Ra-228	93.02	87.75	106.01%		pCi/L	07/10/98	RAS08500

Key shall be attached

Comments: _____

MDA met

STL | Project Number: 2399-021

Severn Trent Laboratories

Chemical Recovery

NC - 806422

07/28/98

Form IV

Client Sample ID	Lab ID	Sample Type	Batch Number	Radionuclide	Chemical Tracer	Tracer Result	Tracer Added	Percent Recovery	Q	Tracer Units	Analysis Date	Inst ID
SW-03	9806502-01	Reg	98070007	Ra-226	Ba-133	1022.00	1240.00	82.42 %		pCi	07/27/98	5
SW-03	9806502-01	Reg	98070009	Ra-228	Ba-133	1028.00	1260.00	81.59 %		pCi	07/15/98	1
MW-83	9806502-02	Reg	98070007	Ra-226	Ba-133	1199.00	1240.00	96.69 %		pCi	07/27/98	5
MW-83	9806502-02	Reg	98070009	Ra-228	Ba-133	839.80	1309.00	64.16 %		pCi	07/15/98	1
MW-82	9806502-03	Reg	98070007	Ra-226	Ba-133	1123.00	1258.00	89.27 %		pCi	07/27/98	5
MW-82	9806502-03	Reg	98070009	Ra-228	Ba-133	987.10	1260.00	78.34 %		pCi	07/15/98	1
MW-65A	9806502-04	Reg	98070007	Ra-226	Ba-133	1183.00	1258.00	94.04 %		pCi	07/27/98	5
MW-65A	9806502-04	Reg	98070009	Ra-228	Ba-133	1043.00	1309.00	79.68 %		pCi	07/16/98	1
Blank Spike	N/A	BS	98070007	Ra-226	Ba-133	1234.00	1260.00	97.94 %		pCi	07/20/98	5
Blank Spike	N/A	BS	98070009	Ra-228	Ba-133	1020.00	1260.00	80.95 %		pCi	07/10/98	1
MW-54	9806501-01	Dup	98070007	Ra-226	Ba-133	994.00	1258.00	79.01 %		pCi	07/24/98	5
MW-54	9806501-01	Dup	98070009	Ra-228	Ba-133	1188.00	1309.00	90.76 %		pCi	07/15/98	1
Method Blank	N/A	MB	98070007	Ra-226	Ba-133	1244.00	1260.00	98.73 %		pCi	07/20/98	5
Method Blank	N/A	MB	98070009	Ra-228	Ba-133	1083.00	1309.00	82.73 %		pCi	07/10/98	1
MW-55	9806501-02	MS	98070007	Ra-226	Ba-133	1172.00	1258.00	93.16 %		pCi	07/24/98	5
MW-55	9806501-02	MS	98070009	Ra-228	Ba-133	1030.00	1260.00	81.75 %		pCi	07/15/98	1

Key shall be attached

Comments: _____

MDA mode

P807052

American Environmental Network (NM) Inc.

CHAIN OF CUSTODY

DATE: 6/29-30/98 PAGE: ___ OF ___

AEN (NM) Accession #: [illegible]

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY

PROJECT MANAGER: Paul Peacock

COMPANY: Marathon Oil Company
ADDRESS: PO Box 552
Midland, TX 79702-0552
PHONE: (915) 687-8312
FAX: (915) 687-8305

BILL TO: same as above
COMPANY:
ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB NO.
Lyman	6/29/98	1530	Water	01
Lyman LC	↓	1530		02
mw-73	6/30/98	0815		03
mw-72		0915		04
mw-75		1030		05
mw-110		1140		06
sw-01		1330		07
sw-01 dup	↓	1330	↓	08
~~Trip Blank~~	~~6/11~~	~~1410~~	~~AQ~~	~~09~~

Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline)	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310)	General Chemistry:	Uranium		Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:		# OF CONTAINERS
																		X	X							1
																		X	X							1
																		X	X							1
																		X	X							1
																		X	X							1
																		X	X							1
																		X	X							1
																		X	X							1

PROJECT INFORMATION

PROJ. NO.: 104332.03
PROJ. NAME: IBRP
P.O. NO.:
SHIPPED VIA:

SAMPLE RECEIPT

NO. CONTAINERS: 8
CUSTODY SEALS: (Y) N/NA
RECEIVED INTACT: YES
BLUE ICE/ICE: 11°C

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) X

CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐

Lyman LC = Lab Control

Relinquished By:
Francine Torivio 17:00
Francine Torivio 7/1/98

On Ice

RELINQUISHED BY: 1

Signature: Kevin Cook Time: 1400
Printed Name: Kevin Cook Date: 6/30
Company: FMSI

RECEIVED BY: 1

Signature: Time: 1400
Printed Name: Chris Faith Date: 6/30
Company: AEN

RELINQUISHED BY: 2

Signature: Time: 1316
Printed Name: Chris Faith Date: 7/1
Company: AEN

RECEIVED BY: (LAB) 2

Signature: Francine Torivio Time: 1320
Printed Name: Francine Torivio Date: 7/1/98
Company: American Environmental Network (NM), Inc.

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL ▪ (425) 420-9200 ▪ FAX 420-9210
SPOKANE ▪ (509) 924-9200 ▪ FAX 924-9290
PORTLAND ▪ (503) 906-9200 ▪ FAX 906-9210

American Environmental Network	Project:	Marathon Oil	Sampled: 6/29/98 to 6/30/98
2709-D Pan American Freeway,NE	Project Number:	104332.03	Received: 7/2/98
Albuquerque, NM 87107	Project Manager:	Kimberly McNeill	Reported: 7/21/98 17:32

Notes and Definitions

#	Note
1	The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
2	Analyses are not controlled on RPD values from sample concentrations less than 5 times the reporting limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

North Creek Analytical, Inc.

Lisa Domenighini, Project Manager

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
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NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL • (425) 420-9200 • FAX 420-9210
SPOKANE • (509) 924-9200 • FAX 924-9290
PORTLAND • (503) 906-9200 • FAX 906-9210

American Environmental Network	Project:	Marathon Oil	Sampled: 6/29/98 to 6/30/98
2709-D Pan American Freeway,NE	Project Number:	104332.03	Received: 7/2/98
Albuquerque, NM 87107	Project Manager:	Kimberly McNeill	Reported: 7/21/98 17:32

Total Metals per EPA 6000/7000 Series Methods/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0780335	**Date Prepared: 7/14/98**					**Extraction Method: EPA 200/3005**				
Blank	**0780335-BLK1**									
Uranium	7/19/98			ND	mg/l	0.00100				
LCS	**0780335-BS1**									
Uranium	7/19/98	0.100		0.0712	mg/l	75.0-125	71.2			1
Duplicate	**0780335-DUP1**		**P807052-01**							
Uranium	7/19/98		0.00510	0.00220	mg/l			20.0	79.5	2
Matrix Spike	**0780335-MS1**		**P807052-01**							
Uranium	7/19/98	0.100	0.00510	0.0716	mg/l	70.0-130	66.5			1

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American Environmental Network	Project:	Marathon Oil	Sampled: 6/29/98 to 6/30/98
2709-D Pan American Freeway,NE	Project Number:	104332.03	Received: 7/2/98
Albuquerque, NM 87107	Project Manager:	Kimberly McNeill	Reported: 7/21/98 17:32

Total Metals per EPA 6000/7000 Series Methods
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
Lyman			P807052-01				Water	
Uranium	0780335	7/14/98	7/19/98	EPA 6020	0.00100	**0.00510**	mg/l	
LymanLC			P807052-02				Water	
Uranium	0780335	7/14/98	7/19/98	EPA 6020	0.00100	**0.00340**	mg/l	
MW-73			P807052-03				Water	
Uranium	0780335	7/14/98	7/19/98	EPA 6020	0.00100	**0.0201**	mg/l	
MW-72			P807052-04				Water	
Uranium	0780335	7/14/98	7/19/98	EPA 6020	0.00100	**0.00280**	mg/l	
MW-75			P807052-05				Water	
Uranium	0780335	7/14/98	7/19/98	EPA 6020	0.00100	**0.00160**	mg/l	
MW-110			P807052-06				Water	
Uranium	0780335	7/14/98	7/19/98	EPA 6020	0.00100	**0.00200**	mg/l	
SW-01			P807052-07				Water	
Uranium	0780335	7/14/98	7/19/98	EPA 6020	0.00100	**0.00150**	mg/l	
SW-01DP			P807052-08				Water	
Uranium	0780335	7/14/98	7/19/98	EPA 6020	0.00100	**0.00150**	mg/l	

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American Environmental Network	Project:	Marathon Oil	Sampled:	6/29/98 to 6/30 98
2709-D Pan American Freeway,NE	Project Number:	104332.03	Received:	7/2/98
Albuquerque, NM 87107	Project Manager:	Kimberly McNeill	Reported:	7/21/98 17:32

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
Lyman	P807052-01	Water	6/29/98
LymanLC	P807052-02	Water	6/29/98
MW-73	P807052-03	Water	6/30/98
MW-72	P807052-04	Water	6/30/98
MW-75	P807052-05	Water	6/30/98
MW-110	P807052-06	Water	6/30/98
SW-01	P807052-07	Water	6/30/98
SW-01DP	P807052-08	Water	6/30/98

Lisa Domenighini, Project Manager

Spike Recovery and RPD Summary Report - WATER

Method : C:\HPCHEM\1\METHODS\82600708.M (RTE Integrator)
Title : AEN New Mexico GC/MS
Last Update : Wed Jul 08 14:15:08 1998
Response via : Initial Calibration

Non-Spiked Sample: 07099817.D

	Spike Sample	Spike Duplicate Sample
File ID :	070998S3.D	070998S4.D
Sample :	806426-01 MS	806426-01 MSD
Acq Time:	9 Jul 98 9:29 pm	9 Jul 98 10:04 pm

Compound	Sample Conc	Spike Added	Spike Res	Dup Res	Spike %Rec	Dup %Rec	RPD	QC Limits RPD	QC Limits % Rec
1,1-Dichloroethene	0.0	50	43	42	86	84	2	14	61-145
Benzene	0.0	50	48	48	97	96	1	11	76-127
Trichloroethene	0.0	50	49	48	98	97	1	14	71-120
Toluene	0.0	50	48	47	96	94	2	13	76-125
Chlorobenzene	0.0	50	49	48	97	96	1	13	75-130

- Fails Limit Check

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: MARATHON OIL COMPANY	AEN I.D. :	806426
PROJECT #	: 104332.03	DATE RECEIVED :	7/1/98
PROJECT NAME	: IBRP		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
806426-08	SW-01 DP	AQUEOUS	6/30/98	N/A	07/10/98	1

PARAMETER	DET. LIMIT		UNITS
o-Xylene	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
Naphthalene	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	99
	(80 - 120)
Toluene-d8	97
	(88 - 110)
Bromofluorobenzene	99
	(86 - 115)

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: MARATHON OIL COMPANY	AEN I.D. :	806426
PROJECT #	: 104332.03	DATE RECEIVED :	7/1/98
PROJECT NAME	: IBRP		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
806426-08	SW-01 DP	AQUEOUS	6/30/98	N/A	07/10/98	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
m&p Xylenes	1.0	< 1.0	ug/L

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: MARATHON OIL COMPANY	AEN I.D. :	806426
PROJECT #	: 104332.03	DATE RECEIVED :	7/1/98
PROJECT NAME	: IBRP		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
806426-07	SW-01	AQUEOUS	6/30/98	N/A	07/10/98	1

PARAMETER	DET. LIMIT		UNITS
o-Xylene	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
Naphthalene	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	98	(80 - 120)
Toluene-d8	98	(88 - 110)
Bromofluorobenzene	100	(86 - 115)

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: MARATHON OIL COMPANY	AEN I.D. :	806426
PROJECT #	: 104332.03	DATE RECEIVED :	7/1/98
PROJECT NAME	: IBRP		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
806426-07	SW-01	AQUEOUS	6/30/98	N/A	07/10/98	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
m&p Xylenes	1.0	< 1.0	ug/L

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: MARATHON OIL COMPANY	AEN I.D. :	806426
PROJECT #	: 104332.03	DATE RECEIVED :	7/1/98
PROJECT NAME	: IBRP		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
806426-06	MW-110	AQUEOUS	6/30/98	N/A	07/10/98	10

PARAMETER	DET. LIMIT		UNITS
o-Xylene	1.0	< 10	ug/L
Styrene	1.0	< 10	ug/L
Bromoform	1.0	< 10	ug/L
1,1,2,2-Tetrachloroethane	1.0	< 10	ug/L
1,2,3-Trichloropropane	1.0	< 10	ug/L
Isopropyl Benzene	1.0	**36**	ug/L
Bromobenzene	1.0	< 10	ug/L
trans-1,4-Dichloro-2-Butene	1.0	< 10	ug/L
n-Propylbenzene	1.0	**51**	ug/L
2-Chlorotoluene	1.0	< 10	ug/L
4-Chlorotoluene	1.0	< 10	ug/L
1,3,5-Trimethylbenzene	1.0	**88**	ug/L
tert-Butylbenzene	1.0	< 10	ug/L
1,2,4-Trimethylbenzene	1.0	**440**	ug/L
sec-Butylbenzene	1.0	**13**	ug/L
1,3-Dichlorobenzene	1.0	< 10	ug/L
1,4-Dichlorobenzene	1.0	< 10	ug/L
p-Isopropyltoluene	1.0	**13**	ug/L
1,2-Dichlorobenzene	1.0	< 10	ug/L
n-Butylbenzene	1.0	**18**	ug/L
1,2-Dibromomo-3-chloropropane	1.0	< 10	ug/L
1,2,4-Trichlorobenzene	1.0	< 10	ug/L
Naphthalene	1.0	< 10	ug/L
Hexachlorobutadiene	1.0	< 10	ug/L
1,2,3-Trichlorobenzene	1.0	< 10	ug/L

SURROGATE % RECOVERY		
1,2-Dichloroethane-d4	97	(80 - 120)
Toluene-d8	97	(88 - 110)
Bromofluorobenzene	99	(86 - 115)

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: MARATHON OIL COMPANY	AEN I.D. :	806426
PROJECT #	: 104332.03	DATE RECEIVED :	7/1/98
PROJECT NAME	: IBRP		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
806426-06	MW-110	AQUEOUS	6/30/98	N/A	07/10/98	10

PARAMETER	DET. LIMIT		UNITS
Dichlorodifluoromethane	1.0	< 10	ug/L
Chloromethane	1.0	< 10	ug/L
Vinyl Chloride	1.0	< 10	ug/L
Bromomethane	1.0	< 10	ug/L
Chloroethane	1.0	< 10	ug/L
Trichlorofluoromethane	1.0	< 10	ug/L
Acetone	10	< 100	ug/L
Acrolein	5.0	< 50	ug/L
1,1-Dichloroethene	1.0	< 10	ug/L
Iodomethane	1.0	< 10	ug/L
Methylene Chloride	1.0	< 10	ug/L
Acrylonitrile	5.0	< 50	ug/L
cis-1,2-Dichloroethene	1.0	< 10	ug/L
Methyl-t-butyl Ether	1.0	< 10	ug/L
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	< 10	ug/L
1,1-Dichloroethane	1.0	< 10	ug/L
trans-1,2-Dichloroethene	1.0	< 10	ug/L
2-Butanone	10	< 100	ug/L
Carbon Disulfide	1.0	< 10	ug/L
Bromochloromethane	1.0	< 10	ug/L
Chloroform	1.0	< 10	ug/L
2,2-Dichloropropane	1.0	< 10	ug/L
1,2-Dichloroethane	1.0	< 10	ug/L
Vinyl Acetate	1.0	< 10	ug/L
1,1,1-Trichloroethane	1.0	< 10	ug/L
1,1-Dichloropropene	1.0	< 10	ug/L
Carbon Tetrachloride	1.0	< 10	ug/L
Benzene	1.0	170	ug/L
1,2-Dichloropropane	1.0	< 10	ug/L
Trichloroethene	1.0	< 10	ug/L
Bromodichloromethane	1.0	< 10	ug/L
2-Chloroethyl Vinyl Ether	10	< 100	ug/L
cis-1,3-Dichloropropene	1.0	< 10	ug/L
trans-1,3-Dichloropropene	1.0	< 10	ug/L
1,1,2-Trichloroethane	1.0	< 10	ug/L
1,3-Dichloropropane	1.0	< 10	ug/L
Dibromomethane	1.0	< 10	ug/L
Toluene	1.0	< 10	ug/L
1,2-Dibromoethane	1.0	< 10	ug/L
4-Methyl-2-Pentanone	10	< 100	ug/L
2-Hexanone	10	< 100	ug/L
Dibromochloromethane	1.0	< 10	ug/L
Tetrachloroethene	1.0	< 10	ug/L
Chlorobenzene	1.0	< 10	ug/L
Ethylbenzene	1.0	150	ug/L
1,1,1,2-Tetrachloroethane	1.0	< 10	ug/L
m&p Xylenes	1.0	160	ug/L

GAS CHROMOTOGRAPHY RESULTS

TEST : PURGEABLE HALOCARBONS / AROMATICS (EPA 8021)
CLIENT : MARATHON OIL COMPANY AEN I.D.: 806426
PROJECT # : 104332.03
PROJECT NAME : IBRP

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
07	SW-01	AQUEOUS	6/30/98	NA	7/7/98	1
08	SW-01DP	AQUEOUS	6/30/98	NA	7/7/98	1

PARAMETER	DET. LIMIT	UNITS	07	08
TETRACHLOROETHENE	0.5	UG/L	< 0.5	< 0.5
VINYL CHLORIDE	0.5	UG/L	< 0.5	< 0.5
SURROGATE:				
BROMOCHLOROMETHANE (%)			104	101
SURROGATE LIMITS	(73 - 117)			

CHEMIST NOTES:
N/A

GAS CHROMOTOGRAPHY RESULTS

TEST : PURGEABLE HALOCARBONS / AROMATICS (EPA 8021)
CLIENT : MARATHON OIL COMPANY AEN I.D.: 806426
PROJECT # : 104332.03
PROJECT NAME : IBRP

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	MW-72	AQUEOUS	6/30/98	NA	7/7/98	1
05	MW-75	AQUEOUS	6/30/98	NA	7/7/98	1
06	MW-110	AQUEOUS	6/30/98	NA	7/7/98	1

PARAMETER	DET. LIMIT	UNITS	04	05	06
TETRACHLOROETHENE	0.5	UG/L	< 0.5	< 0.5	< 0.5
VINYL CHLORIDE	0.5	UG/L	< 0.5	< 0.5	< 0.5
SURROGATE:					
BROMOCHLOROMETHANE (%)			96	99	97
SURROGATE LIMITS	(73 - 117)				

CHEMIST NOTES:
N/A

GAS CHROMOTOGRAPHY RESULTS
REAGENT BLANK

TEST	: ETHYLENE DIBROMIDE (EPA 504.1)		
BLANK I.D.	: 070298B	AEN I.D.	: 806426
CLIENT	: MARATHON OIL COMPANY	MATRIX	: AQUEOUS
PROJECT #	: 104332.03	DATE EXTRACTED	: 7/2/98
PROJECT NAME	: IBRP	DATE ANALYZED	: 7/3/98

PARAMETER	DET. LIMIT	UNITS	
ETHYLENE DIBROMIDE	0.01	UG/L	<0.01
SURROGATE:			
1,4-DICHLOROBENZENE			82
SURROGATE LIMITS	(78 - 140)		

CHEMIST NOTES:
N/A

GAS CHROMOTOGRAPHY RESULTS

TEST : ETHYLENE DIBROMIDE (EPA 504.1)
CLIENT : MARATHON OIL COMPANY AEN I.D.: 806426
PROJECT # : 104332.03
PROJECT NAME : IBRP

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
07	SW-01	AQUEOUS	6/30/98	7/2/98	7/3/98	1
08	SW-01DP	AQUEOUS	6/30/98	7/2/98	7/3/98	1

PARAMETER	DET. LIMIT	UNITS	07	08
ETHYLENE DIBROMIDE	0.01	UG/L	< 0.01	< 0.01
SURROGATE:				
1,4-DICHLOROBENZENE			91	85
SURROGATE LIMITS	(75 - 141)			

CHEMIST NOTES:

GAS CHROMOTOGRAPHY RESULTS

TEST : ETHYLENE DIBROMIDE (EPA 504.1)
CLIENT : MARATHON OIL COMPANY AEN I.D.: 806426
PROJECT # : 104332.03
PROJECT NAME : IBRP

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	MW-72	AQUEOUS	6/30/98	7/2/98	7/3/98	1
05	MW-75	AQUEOUS	6/30/98	7/2/98	7/3/98	1
06	MW-110	AQUEOUS	6/30/98	7/2/98	7/3/98	1

PARAMETER	DET. LIMIT	UNITS	04	05	06
ETHYLENE DIBROMIDE	0.01	UG/L	< 0.01	< 0.01	< 0.01
SURROGATE:					
1,4-DICHLOROBENZENE			77	81	82
SURROGATE LIMITS	(75 - 141)				

CHEMIST NOTES:
N/A

GAS CHROMOTOGRAPHY RESULTS

TEST : ETHYLENE DIBROMIDE (EPA 504.1)
CLIENT : MARATHON OIL COMPANY AEN I.D.: 806426
PROJECT # : 104332.03
PROJECT NAME : IBRP

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	LYMAN	AQUEOUS	6/29/98	7/2/98	7/3/98	1
02	LYMAN LC	AQUEOUS	6/29/98	7/2/98	7/3/98	1
03	MW-73	AQUEOUS	6/30/98	7/2/98	7/3/98	1

PARAMETER	DET. LIMIT	UNITS	01	02	03
ETHYLENE DIBROMIDE	0.01	UG/L	< 0.01	< 0.01	< 0.01
SURROGATE:					
1,4-DICHLOROBENZENE			86	85	86
SURROGATE LIMITS	(75 - 141)				

CHEMIST NOTES:
N/A

CLIENT	: MARATHON OIL COMPANY	AEN I.D.	: 806426
PROJECT #	: 104332.03	DATE RECEIVED	: 7/1/98
PROJECT NAME	: IBRP	REPORT DATE	: 7/28/98

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	LYMAN	AQUEOUS	6/29/98
02	LYMAN LC	AQUEOUS	6/29/98
03	MW-73	AQUEOUS	6/30/98
04	MW-72	AQUEOUS	6/30/98
05	MW-75	AQUEOUS	6/30/98
06	MW-110	AQUEOUS	6/30/98
07	SW-01	AQUEOUS	6/30/98
08	SW-01DP	AQUEOUS	6/30/98
09	TRIP BLANK	AQUEOUS	6/11/98

AEN I.D. 806426

July 28, 1998

MARATHON OIL COMPANY
P.O. BOX 552
MIDLAND, TX 79702-0552

Project Name IBRP
Project Number 104332.03

Attention: PAUL PEACOCK

On 7/1/98 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.

Radiochemistry results (Ra 226/228) will follow in a separate report.

EPA methods 504.1, 8021 and 8260 were performed by American Environmental Network (NM) Inc., Albuquerque, NM.

Uranium was performed by North Creek Analytical, Portland, OR.

All other parameters were performed by STL, 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.
General Manager

MR: mt

Enclosure

WORK ORDER

Lab

Work Order #	98-06-507	# of Samples	6	Recieved Date	07/02/98	American Environ. Network
Client #	2399	# of Tests	12	Load Date	07/02/98	2709D PanAmerican Freeway NE
Project	2399-024	Report Level	2	Due Date	07/16/98	Albuquerque, NM 87107
Amount	123.25	Quote #		Export Date	/ /	Mitch Rubenstein
Comment	Specific client QC					

Lab ID	Sample #	Status	Matrix	Test	Cust ID	Collected
9806507-01	01A1	Open	Water	Ra-226	LYMAN	06/29/98
9806507-01	01A2	Open	Water	Ra-228	LYMAN	06/29/98
9806507-02	02A1	Open	Water	Ra-226	MW-73	06/30/98
9806507-02	02A2	Open	Water	Ra-228	MW-73	06/30/98
9806507-03	03A1	Open	Water	Ra-226	MW-72	06/30/98
9806507-03	03A2	Open	Water	Ra-228	MW-72	06/30/98
9806507-04	04A1	Open	Water	Ra-226	MW-75	06/30/98
9806507-04	04A2	Open	Water	Ra-228	MW-75	06/30/98
9806507-05	05A1	Open	Water	Ra-226	MW-110	06/30/98
9806507-05	05A2	Open	Water	Ra-228	MW-110	06/30/98
9806507-06	06A1	Open	Water	Ra-226	SW-01	06/30/98
9806507-06	06A2	Open	Water	Ra-228	SW-01	06/30/98

(1) MS on 9806507-1 (Lyman)

(2) Dup on 9806507-6 (SW-01)

pH Checked
All Samples pH <2
Initials: GB Date: 7/6/98
not preserved on arrival

Committed To *Your* Success

REPORT FORM KEY

Severn Trent Laboratories
120 Southcenter Court, Suite 300
Morrisville NC 27560

Tel: (919) 460-8505
Fax: (919) 469-2646

Instrument ID:

#1 - Gas Proportional Counter
#2 - High Purity Germanium Detectors (HPGe)
#3 - Alpha Spectrometry Counter
#4 - Liquid Scintillation Counter
#5 - Lucas Cell Counter
#6 - Sodium Iodide Detector

Sample Type:

REG - Regular Sample
DUP - Duplicate Sample
MS - Matrix Spike
BS - Blank Spike
MB - Method Blank

Units:

pCi/L - Picocuries per Liter
pCi/g - Picocuries per Gram
pCi/ml - Picocuries per Milliliter
pCi/mg - Picocuries per Milligram
pCi/F - Picocuries per Air Filter

Radionuclides:

H-3	Tritium	C-14	Carbon-14
Cl-36	Chlorine-36	K-40	Potassium-40
Co-60	Cobalt-60	Sr-89	Strontium-89
Sr-90	Strontium-90	Tc-99	Technetium-99
Cs-137	Cesium-137	Tl-208	Thallium-208
Pb-210	Lead-210	Pb-212	Lead-212
Pb-214	Lead-214	Bi-214	Bismuth-214
Ra-226	Radium-226	Ac-228	Actinium-228
Ra-228	Radium-228	Th-234	Thorium-234
Th-227	Thorium-227	Th-232/230/228	Isotopic Thorium
U-234/235/238	Isotopic Uranium	Pu-238	Plutonium-238
Pu-239/240	Plutonium-239&240	Am-241	Americium-241
Np-237	Neptunium-237		

STL

Project Number: 2399-024

Severn Trent Laboratories

NC 806426

Duplicate Results

Form VII

Client Sample ID	Lab ID	Batch Number	Radionuclide	Sample Result	Uncertainty	Dup. Result	Dup. Uncertainty	DER	Q	Units
SW-01	9806507-06	98070008	Ra-226	0.17	0.09	0.26	0.14	0.39		pCi/L
SW-01	9806507-06	98070010	Ra-228	-1.28	0.73	-1.49	0.63	0.15		pCi/L

Key shall be attached

Comments:

MDA mr

Project Number: 2399-024

Severn Tren. ‿oratories

Matrix Spike Results Summary

NC 806426

07/30/98

Form VI

Client Sample ID	Lab ID	Batch Number	Spike	SSR	Sample Result	Spike Added	Percent Recovery	Q	Units	Analysis Date	Inst ID
LYMAN	9806507-01	98070008	Ra-226	157.69	0.25	145.40	108.28 %		pCi/L	07/27/98	5
LYMAN	9806507-01	98070010	Ra-228	106.44	3.25	87.75	117.60 %		pCi/L	07/20/98	1

Key shall be attached

Comments: ____________________

MDA mode

Severn Trent Laboratories

STL

Project Number: 2399-024

Blank Spike Results Summary

NC 806426

07/30/98

Form V

Client Sample ID	Batch Number	Matrix	Radionuclide	Spike	Result	Spike Value	Percent Recovery	Q	Units	Analysis Date	Method Number
Blank Spike	98070008	Water	Ra-226	Ra-226	166.82	145.40	114.73%		pCi/L	07/20/98	RAS01900
Blank Spike	98070010	Water	Ra-228	Ra-228	88.99	87.75	101.41%		pCi/L	07/17/98	RAS08500

Key shall be attached

Comments: _____

MDA mor

STL | Project Number: 2399-024

Severn Trent Laboratories

Chemical Recovery

NC 806426

07/30/98

Form IV

Client Sample ID	Lab ID	Sample Type	Batch Number	Radionuclide	Chemical Tracer	Tracer Result	Tracer Added	Percent Recovery	Q	Tracer Units	Analysis Date	Inst ID
LYMAN	9806507-01	Reg	98070008	Ra-226	Ba-133	1191.00	1240.00	96.05 %		pCi	07/28/98	5
LYMAN	9806507-01	Reg	98070010	Ra-228	Ba-133	1161.00	1240.00	93.63 %		pCi	07/17/98	1
MW-73	9806507-02	Reg	98070008	Ra-226	Ba-133	1075.00	1258.00	85.45 %		pCi	07/28/98	5
MW-73	9806507-02	Reg	98070010	Ra-228	Ba-133	987.40	1258.00	78.49 %		pCi	07/20/98	1
MW-72	9806507-03	Reg	98070008	Ra-226	Ba-133	1146.00	1240.00	92.42 %		pCi	07/28/98	5
MW-72	9806507-03	Reg	98070010	Ra-228	Ba-133	1079.00	1240.00	87.02 %		pCi	07/20/98	1
MW-75	9806507-04	Reg	98070008	Ra-226	Ba-133	1204.00	1258.00	95.71 %		pCi	07/28/98	5
MW-75	9806507-04	Reg	98070010	Ra-228	Ba-133	978.60	1258.00	77.79 %		pCi	07/20/98	1
MW-110	9806507-05	Reg	98070008	Ra-226	Ba-133	1202.00	1258.00	95.55 %		pCi	07/29/98	5
MW-110	9806507-05	Reg	98070010	Ra-228	Ba-133	1100.00	1240.00	88.71 %		pCi	07/20/98	1
SW-01	9806507-06	Reg	98070008	Ra-226	Ba-133	1068.00	1258.00	84.90 %		pCi	07/29/98	5
SW-01	9806507-06	Reg	98070010	Ra-228	Ba-133	1041.00	1258.00	82.75 %		pCi	07/21/98	1
Blank Spike	N/A	BS	98070008	Ra-226	Ba-133	1291.00	1309.00	98.62 %		pCi	07/20/98	5
Blank Spike	N/A	BS	98070010	Ra-228	Ba-133	1223.00	1258.00	97.22 %		pCi	07/17/98	1
SW-01	9806507-06	Dup	98070008	Ra-226	Ba-133	1155.00	1258.00	91.81 %		pCi	07/27/98	5
SW-01	9806507-06	Dup	98070010	Ra-228	Ba-133	1067.00	1258.00	84.82 %		pCi	07/17/98	1
Method Blank	N/A	MB	98070008	Ra-226	Ba-133	1276.00	1309.00	97.48 %		pCi	07/20/98	5
Method Blank	N/A	MB	98070010	Ra-228	Ba-133	1152.00	1240.00	92.90 %		pCi	07/17/98	1
LYMAN	9806507-01	MS	98070008	Ra-226	Ba-133	1185.00	1240.00	95.56 %		pCi	07/27/98	5
LYMAN	9806507-01	MS	98070010	Ra-228	Ba-133	928.30	1240.00	74.86 %		pCi	07/20/98	1

Key shall be attached

Comments:

MDA mode

Affidavit of Publication

№ 20777

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 thc 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:

July 21	2000
	2000
	2000
	2000
	2000
	2000

That the cost of publication is $ 25.96, and that payment thereof has been made and will be assessed as court costs.

Amy McKay

Subscribed and sworn to before me this 21 day of July, 2000

Lorraine Reporte

My commission expires 5/25/03

Notary Public

July 21, 2000

PROPOSED INJECTION WELL

Marathon Oil Company, as operator, proposes to drill and complete a well for salt water disposal service. The location of the well is 2138' FNL and 1060' FWL of, Section 23, Township 21 South, Range 23 East, Eddy County. New Mexico. The zone of injection will be the Devonian from 10,100 ft. to 10,700 ft. with a maximum expected injection rate of 20,000 bwpd and 5000 SCF of acid gas per day at a maximum expected infection pressure of 2,020 psig. Any interested party with an objection or request of hearing should notify the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, within 15 days of this notice. Any questions should be directed to Ken Tatarzyn of Marathon Oil Company at P.O. Box 552, Midland, Texas 79701 or telephone (915) 682-1626.

Mid-Continent Region
Production United States

Marathon Oil Company

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

July 27, 2000

Santa Fe Energy Resources
550 W. Texas, Suite 1330
Midland, Texas 79701

Offset Operator
AGI Well No. 1 SWD
Section 23, T-21-S, R-23-E
Eddy County, New Mexico

Re: Application for Authorization to Inject (C-108)

Gentlemen:

Marathon Oil Company is in the process of making application to the State of New Mexico, Energy and Minerals Department, Oil Conservation Division for authorization to dispose of produced water from offsetting leases, and plant waste water and acid gas from the Indian Basin Gas Plant, into a proposed well, the AGI Well No. 1. In accordance with the application process, Marathon is submitting the application to offset operators in the "area of review" of the proposed injection well. Objections must be filed with the Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501 within 15 days of the date of this letter.

Sincerely,

Ken W. Tatarzyn
Indian Basin Asset Team Manager

Enclosures

GL:m:\winword\AGI1OFFSET.doc

Mid-Continent Region
Production United States

Marathon Oil Company

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

July 27, 2000

Bureau of Land Management
2909 West Second Street
Roswell, New Mexico 88201

Surface Owner
AGI Well No. 1 SWD
Section 23, T-21-S, R-23-E
Eddy County, New Mexico

Re: Application for Authorization to Inject (C-108)

Gentlemen:

Marathon Oil Company is in the process of making application to the State of New Mexico, Energy and Minerals Department, Oil Conservation Division for authorization to drill a disposal well located 2138' FNL & 1060' FWL of Section 23, T-21-S, R-23-E, in Eddy County. In accordance with the application process, Marathon is submitting the application to the BLM as surface owner of the property on which the proposed disposal well will be drilled.

Sincerely,

Ken W. Tatarzyn
Indian Basin Asset Team Manager

Enclosures