

APPENDIX B

Water Analysis

Appendix B
Water Analyses from Entrada Formation
Jillson Federal SWD #1

The below table lists water analyses of samples retrieved from the Entrada formation during the completion of the Jillson Federal SWD #1. Sample analysis are attached.

Table I, Appendix B
Water Analyzes

Analysis	Sample #
1. Total Dissolved Solids	2283
2. Total Petroleum Hydrocarbons	2286
3. Aromatic Volatile Organics	2286
Benzene	
Toluene	
Ethyl benzene	
m,p-Xylene	
o-Xylene	
Total	
4. General Analysis	2286
Total Chloride	
Total Sulfate	
5. Silver Analysis	2286
6. Cadmium Analysis	2286
7. Copper Analysis	2286
8. Nickel Analysis	2286
9. Iron Analysis	2286
10. Chromium Analysis	2286
11. Lead Analysis	2286
12. Zinc Analysis	2286
13. Mercury Analysis	2286
14. Arsenic Analysis	2286

OFF: (505) 325-8786



LAB: (505) 325-5667

TOTAL DISSOLVED SOLIDS ANALYSIS

Attn: *Brian Alt*
Company: *Meridian Oil*
Address: *P.O. Box 4289*
City, State: *Farmington, NM 87499*

Date: *11/5/94*
Lab ID: *2283*
Sample No. *3864*
Job No. *4-1145*

Project Name: *Meridian Oil / Jillison #1*
Project Location: *Sample #18, 5,000' - SWB 294 Barrels*
Sampled by: *NR* Date: *11/3/94* Time: *16:36*
Analyzed by: *DLA* Date: *11/5/94*
Type of Sample: *Water*

Laboratory Analysis

Laboratory Identification	Sample Identification	Total Dissolved Solids
<i>3864-2283</i>	<i>Meridian Oil / Jillison #1</i> <i>Sample #18, 5,000' - SWB 294 Barrels</i>	<i>6,916 mg/L</i>

Method - *Standard Methods Method 2540 C. Total Dissolved Solids Dried at 180C*

Approved by:

Date:

[Signature]
11/6/94

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TOTAL PETROLEUM HYDROCARBONS

Attn: *Brain Ault*
Company: *Meridian Oil Inc.*
Address: *P.O. Box 4289*
City, State: *Farmington, NM 87499*

Date: *11/18/94*
Lab ID: *2286*
Sample No. *3899*
Job No. *4-1145*

Project Name: *Meridian Oil, Inc.*
Project Location: *Jilson Federal SWD #1 Formation Water*
Sampled by: *CG* Date: *11/8/94* Time: *10:50*
Analyzed by: *DC* Date: *11/18/94*
Type of Sample: *Water*

Laboratory Analysis

Laboratory Identification	Sample Identification	Total Petroleum Hydrocarbons
3899-2286	<i>Meridian Oil, Inc.</i> <i>Jilson Federal SWD #1 Formation Water</i>	12.4 mg/L

Method - EPA Method 418.1 Total Petroleum Hydrocarbons

Approved by: *[Signature]*
Date: *11/18/94*

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AROMATIC VOLATILE ORGANICS

Attn: *Brian Ault*
Company: *Meridian Oil Inc.*
Address: *P.O. Box 4289*
City, State: *Farmington, NM 87499*

Date: *11/18/94*
Lab ID: *2286*
Sample ID: *3899*
Job No. *2-1000*

Project Name: *Meridian Oil, Inc.*
Project Location: *Jillson Federal SWD #1 Formation Water*
Sampled by: *CG* Date: *11/8/94*
Analyzed by: *DLA* Date: *11/18/94*
Sample Matrix: *Water*

Time: *10:50***Aromatic Volatile Organics**

<i>Component</i>	<i>Measured Concentration ug/L</i>	<i>Detection Limit Concentration ug/L</i>
<i>Benzene</i>	<i>470</i>	<i>0.2</i>
<i>Toluene</i>	<i>424</i>	<i>0.2</i>
<i>Ethylbenzene</i>	<i>101</i>	<i>0.2</i>
<i>m,p-Xylene</i>	<i>281</i>	<i>0.2</i>
<i>o-Xylene</i>	<i>514</i>	<i>0.2</i>
	<i>TOTAL 1,790 ug/L</i>	

*ND - Not Detectable***Method** - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: *[Signature]*
Date: *11/18/94*

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GENERAL ANALYSIS

Attn: *Brian Ault*
Company: *Meridian Oil Inc.*
Address: *P.O. Box 4289*
City, State: *Farmington, NM 87499*

Date: *11/18/94*
Lab ID: *2286*
Sample No. *3899*
Job No. *4-1145*

Project Name: *Meridian Oil, Inc.*
Project Location: *Jilison Federal SWD #1 Formation Water*
Sampled by: *CG* Date: *11/8/94* Time: *10:50*
Analyzed by: *DC* Date: *11/18/94*
Type of Sample: *Water*

Laboratory Analysis

Laboratory Identification	Sample Identification	Total Chloride (Cl-)
<i>3899-2286</i>	<i>Meridian Oil, Inc. Jilison Federal SWD #1 Formation Water</i>	<i>160.0 mg/L</i>

Laboratory Identification	Sample Identification	Total Sulfate (SO4 2-)
<i>3899-2286</i>	<i>Meridian Oil, Inc. Jilison Federal SWD #1 Formation Water</i>	<i>1758 mg/L</i>

Method - *Standard Methods For the Examination of Water and Wastewater;*
Chloride: Ion Specific Electrode - Direct Measurement
Sulfate: 4500 - SO4 2- E. Turbidimetric Method

Approved by: *[Signature]*
Date: *11/18/94*

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SILVER ANALYSIS

Attn: *Brian Ault*
 Company: *Meridian Oil, Inc.*
 Address: *P.O. Box 4289*
 City, State: *Farmington, NM 87499*

Date: *11/22/94*
 Lab ID: *2286*
 Sample No. *3899*
 Job No. *4-1145*

Project Name: *Meridian Oil, Inc.*
 Project Location: *Jilison Federal SWD #1 Formation Water*
 Sampled by: *CG* Date: *11/8/94* Time: *10:50*
 Analyzed by: *DLA* Date: *11/19/94*
 Type of Sample: *Water*

Laboratory Analysis

Laboratory Identification	Sample Identification	Total Silver (Ag)
<i>3899-2286</i>	<i>Meridian Oil, Inc. Jilison Federal SWD #1 Formation Water</i>	<i><0.01 mg/L</i>

Quality Assurance Report**Quality Control Sample**

Laboratory Identification	True Value	Analyzed Value	Units	% Diff	Limit % Diff
<i>0336-QC</i>	<i>2.00</i>	<i>2.14</i>	<i>ppm</i>	<i>7</i>	<i>10</i>

Spike

Laboratory Identification	Analyzed Value	Matrix Spike	Spike Value	Units	Spike Recovery
<i>4018-2299</i>	<i>0.00</i>	<i>0.35</i>	<i>0.36</i>	<i>ppm</i>	<i>103%</i>

Method - *SW-846 EPA Method 7760A Silver (AA, Direct Aspiration)*

Approved by: *Da 6x*Date: *11/22/94*

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CADMIUM ANALYSIS

Attn: *Brian Ault*
Company: *Meridian Oil, Inc.*
Address: *P.O. Box 4289*
City, State: *Farmington, NM 87499*

Date: 11/22/94
Lab ID: 2286
Sample No. 3899
Job No. 4-1145

Project Name: *Meridian Oil, Inc.*
Project Location: *Jillson Federal SWD #1 Formation Water*
Sampled by: CG Date: 11/8/94 Time: 10:50
Analyzed by: DLA Date: 11/19/94
Type of Sample: *Water*

Laboratory Analysis

Laboratory Identification	Sample Identification	Total Cadmium (Cd)
3899-2286	<i>Meridian Oil, Inc.</i> <i>Jillson Federal SWD #1 Formation Water</i>	0.03 mg/L

Quality Assurance Report**Quality Control Sample**

Laboratory Identification	True Value	Analyzed Value	Units	% Diff	Limit % Diff
0336-QC	2.00	1.98	ppm	-1	10

Spike

Laboratory Identification	Analyzed Value	Matrix Spike	Spike Value	Units	Spike Recovery
4018-2299	0.03	0.25	0.29	ppm	104%

Method - SW-846 EPA Method 7130 Cadmium (AA, Direct Aspiration)

Approved by:
Date:

[Signature]
11/22/94

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COPPER ANALYSIS

Attn: *Brian Ault*
Company: *Meridian Oil, Inc.*
Address: *P.O. Box 4289*
City, State: *Farmington, NM 87499*

Date: *11/22/94*
Lab ID: *2286*
Sample No. *3899*
Job No. *4-1145*

Project Name: *Meridian Oil, Inc.*
Project Location: *Jillson Federal SWD #1 Formation Water*
Sampled by: *CG* Date: *11/8/94* Time: *10:50*
Analyzed by: *DLA* Date: *11/19/94*
Type of Sample: *Water*

Laboratory Analysis

Laboratory Identification	Sample Identification	Total Copper (Cu)
<i>3899-2286</i>	<i>Meridian Oil, Inc.</i> <i>Jillson Federal SWD #1 Formation Water</i>	<i>0.10 mg/L</i>

Quality Assurance Report**Quality Control Sample**

	<i>True</i>	<i>Analyzed</i>			<i>Limit</i>
<i>Laboratory Identification</i>	<i>Value</i>	<i>Value</i>	<i>Units</i>	<i>% Diff</i>	<i>% Diff</i>
<i>0336-QC</i>	<i>2.00</i>	<i>2.00</i>	<i>ppm</i>	<i>0</i>	<i>10</i>

Spike

	<i>Analyzed</i>	<i>Matrix</i>	<i>Spike</i>		<i>Spike</i>
<i>Laboratory Identification</i>	<i>Value</i>	<i>Spike</i>	<i>Value</i>	<i>Units</i>	<i>Recovery</i>
<i>4018-2299</i>	<i>0.10</i>	<i>1.00</i>	<i>1.10</i>	<i>ppm</i>	<i>100%</i>

Method - *SW-846 EPA Method 7210 Copper (AA, Direct Aspiration)*

Approved by:

Date:

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NICKEL ANALYSIS

Attn: *Brian Ault*
Company: *Meridian Oil, Inc.*
Address: *P.O. Box 4289*
City, State: *Farmington, NM 87499*

Date: *11/22/94*
Lab ID: *2286*
Sample No. *3899*
Job No. *4-1145*

Project Name: *Meridian Oil, Inc.*
Project Location: *Jillson Federal SWD #1 Formation Water*
Sampled by: *CG* Date: *11/8/94* Time: *10:50*
Analyzed by: *DLA* Date: *11/19/94*
Type of Sample: *Water*

Laboratory Analysis

Laboratory Identification	Sample Identification	Total Nickel (Ni)
<i>3899-2286</i>	<i>Meridian Oil, Inc. Jillson Federal SWD #1 Formation Water</i>	<i>0.30 mg/L</i>

Quality Assurance Report**Quality Control Sample**

Laboratory Identification	True Value	Analyzed Value	Units	% Diff	Limit % Diff
<i>0336-QC</i>	<i>2.00</i>	<i>2.00</i>	<i>ppm</i>	<i>0</i>	<i>10</i>

Spike

Laboratory Identification	Analyzed Value	Matrix Spike	Spike Value	Units	Spike Recovery
<i>4018-2299</i>	<i>0.10</i>	<i>1.00</i>	<i>1.10</i>	<i>ppm</i>	<i>100%</i>

Method - *SW-846 EPA Method 7520 Nickel (AA, Direct Aspiration)*

Approved by:
Date:

Jah
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IRON ANALYSIS

Attn: *Brian Ault*
Company: *Meridian Oil, Inc.*
Address: *P.O. Box 4289*
City, State: *Farmington, NM 87499*

Date: *11/22/94*
Lab ID: *2286*
Sample No. *3899*
Job No. *4-1145*

Project Name: *Meridian Oil, Inc.*
Project Location: *Jillson Federal SWD #1 Formation Water*
Sampled by: *CG* Date: *11/8/94* Time: *10:50*
Analyzed by: *DLA* Date: *11/19/94*
Type of Sample: *Water*

Laboratory Analysis

<i>Laboratory Identification</i>	<i>Sample Identification</i>	<i>Total Iron (Fe)</i>
<i>3899-2286</i>	<i>Meridian Oil, Inc.</i> <i>Jillson Federal SWD #1 Formation Water</i>	<i>43.00 mg/L</i>

Quality Assurance Report**Quality Control Sample**

<i>Laboratory Identification</i>	<i>True Value</i>	<i>Analyzed Value</i>	<i>Units</i>	<i>% Diff</i>	<i>Limit % Diff</i>
<i>0336-QC</i>	<i>2.00</i>	<i>2.00</i>	<i>ppm</i>	<i>0</i>	<i>10</i>

Spike

<i>Laboratory Identification</i>	<i>Analyzed Value</i>	<i>Matrix Spike</i>	<i>Spike Value</i>	<i>Units</i>	<i>Spike Recovery</i>
<i>4018-2299</i>	<i>2.55</i>	<i>1.00</i>	<i>3.70</i>	<i>ppm</i>	<i>115%</i>

Method - *SW-846 EPA Method 7380 Iron (AA, Direct Aspiration)*

Approved by: *Daly*Date: *11/22/94*

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CHROMIUM ANALYSIS

Attn: *Brian Ault*
Company: *Meridian Oil, Inc.*
Address: *P.O. Box 4289*
City, State: *Farmington, NM 87499*

Date: *11/22/94*
Lab ID: *2286*
Sample No. *3899*
Job No. *4-1145*

Project Name: *Meridian Oil, Inc.*
Project Location: *Jillson Federal SWD #1 Formation Water*
Sampled by: *CG* Date: *11/8/94* Time: *10:50*
Analyzed by: *DLA* Date: *11/19/94*
Type of Sample: *Water*

Laboratory Analysis

Laboratory Identification	Sample Identification	Total Chromium (Cr)
3899-2286	<i>Meridian Oil, Inc.</i> <i>Jillson Federal SWD #1 Formation Water</i>	<0.01 mg/L

Quality Assurance Report**Quality Control Sample**

Laboratory Identification	True Value	Analyzed Value	Units	% Diff	Limit % Diff
0336-QC	2.00	2.00	ppm	0	10

Spike

Laboratory Identification	Analyzed Value	Matrix Spike	Spike Value	Units	Spike Recovery
4018-2299	0.00	1.00	1.10	ppm	110%

Method - *SW-846 EPA Method 7190 Chromium (AA, Direct Aspiration)*

Approved by: *[Signature]*Date: *11/22/94*

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LEAD ANALYSIS

Attn: *Brian Ault*
Company: *Meridian Oil, Inc.*
Address: *P.O. Box 4289*
City, State: *Farmington, NM 87499*

Date: *11/22/94*
Lab ID: *2286*
Sample No. *3899*
Job No. *4-1145*

Project Name: *Meridian Oil, Inc.*
Project Location: *Jillson Federal SWD #1 Formation Water*
Sampled by: *CG* Date: *11/8/94* Time: *10:50*
Analyzed by: *DLA* Date: *11/19/94*
Type of Sample: *Water*

Laboratory Analysis

Laboratory Identification	Sample Identification	Total Lead (Pb)
3899-2286	<i>Meridian Oil, Inc.</i> <i>Jillson Federal SWD #1 Formation Water</i>	0.30 mg/L

Quality Assurance Report**Quality Control Sample**

Laboratory Identification	True Value	Analyzed Value	Units	% Diff	Limit % Diff
0336-QC	2.00	2.00	ppm	0	10

Spike

Laboratory Identification	Analyzed Value	Matrix Spike	Spike Value	Units	Spike Recovery
4018-2299	0.20	1.00	1.30	ppm	110%

Method - *SW-846 EPA Method 7420 Lead (AA, Direct Aspiration)*

Approved by: *DLA*
Date: *11/22/94*

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ZINC ANALYSIS

Attn: *Brian Ault*
 Company: *Meridian Oil, Inc.*
 Address: *P.O. Box 4289*
 City, State: *Farmington, NM 87499*

Date: 11/22/94
 Lab ID: 2286
 Sample No. 3899
 Job No. 4-1145

Project Name: *Meridian Oil, Inc.*
 Project Location: *Jilison Federal SWD #1 Formation Water*
 Sampled by: CG Date: 11/8/94 Time: 10:50
 Analyzed by: DLA Date: 11/19/94
 Type of Sample: *Water*

Laboratory Analysis

Laboratory Identification	Sample Identification	Total Zinc (Zn)
3899-2286	<i>Meridian Oil, Inc.</i> <i>Jilison Federal SWD #1 Formation Water</i>	1.46 mg/L

Quality Assurance Report**Quality Control Sample**

	True	Analyzed			Limit
Laboratory Identification	Value	Value	Units	% Diff	% Diff
0336-QC	1.00	1.00	ppm	0	10

Spike

	Analyzed	Matrix	Spike		Spike
Laboratory Identification	Value	Spike	Value	Units	Recovery
4018-2299	0.33	1.00	1.32	ppm	99%

Method - SW-846 EPA Method 7950 Zinc (AA, Direct Aspiration)

Approved by: *[Signature]*
 Date: 11/22/94

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OFF: (505) 325-8786

LAB: (505) 325-5667

MERCURY ANALYSIS

Attn: *Brian Ault*
Company: *Meridian Oil, Inc.*
Address: *P.O. Box 4289*
City, State: *Farmington, NM 87499*

Date: 11/22/94
Lab ID: 2286
Sample No. 3899
Job No. 4-1145

Project Name: *Meridian Oil, Inc.*
Project Location: *Jilson Federal SWD #1 Formation Water*
Sampled by: CG Date: 11/8/94 Time: 10:50
Analyzed by: DLA Date: 11/19/94
Type of Sample: *Water*

Laboratory Analysis

Laboratory Identification	Sample Identification	Total Mercury (Hg)
3899-2286	<i>Meridian Oil, Inc.</i> <i>Jilson Federal SWD #1 Formation Water</i>	<0.002 mg/L

Quality Assurance Report**Quality Control Sample**

Laboratory Identification	True Value	Analyzed Value	Units	% Diff	Limit % Diff
0336-QC	0.200	0.198	ppm	-1	10

Spike

Laboratory Identification	Analyzed Value	Matrix Spike	Spike Value	Units	Spike Recovery
4042-2378	0.000	0.200	0.204	ppm	102%

Method - SW-846 EPA Method 7470A Mercury in Liquid Waste (Manual Cold-Vapor Technique)

Approved by: *[Signature]*
Date: 11/22/94

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OFF: (505) 325-8786

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ARSENIC ANALYSIS

Attn: *Brian Ault*
 Company: *Meridian Oil, Inc.*
 Address: *P.O. Box 4289*
 City, State: *Farmington, NM 87499*

Date: *11/22/94*
 Lab ID: *2286*
 Sample No. *3899*
 Job No. *4-1145*

Project Name: *Meridian Oil, Inc.*
 Project Location: *Jillson Federal SWD #1 Formation Water*
 Sampled by: *CG* Date: *11/8/94* Time: *10:50*
 Analyzed by: *DLA* Date: *11/19/94*
 Type of Sample: *Water*

Laboratory Analysis

Laboratory Identification	Sample Identification	Total Arsenic (As)
<i>3899-2286</i>	<i>Meridian Oil, Inc. Jillson Federal SWD #1 Formation Water</i>	<i><0.01 mg/L</i>

Quality Assurance Report**Quality Control Sample**

Laboratory Identification	True Value	Analyzed Value	Units	% Diff	Limit % Diff
<i>0336-QC</i>	<i>1.50</i>	<i>1.30</i>	<i>ppm</i>	<i>-13</i>	<i>15</i>

Spike

Laboratory Identification	Analyzed Value	Matrix Spike	Spike Value	Units	Spike Recovery
<i>4018-2299</i>	<i>0.00</i>	<i>1.00</i>	<i>0.94</i>	<i>ppm</i>	<i>94%</i>

Method - *SW-846 EPA Method 7061A Arsenic (AA, Gaseous Hydride)*

Approved by: *[Signature]*Date: *11/22/94*

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OFF: (505) 325-8786



LAB: (505) 325-5667

QUALITY ASSURANCE REPORT for EPA Method 8020

Date Analyzed: 11/18/94

Internal QC No.: 0222-STD

Surrogate QC No.: 0223-STD

Reference Standard QC No.: 0300-STD

Method Blank

Analytes in Blank	Amount
Average Amount of All Analytes In Blank	<0.1 ppb

Calibration Check

Calibration Standards	Units of Measure	* True Value	Analyzed Value	% Diff	Limit
Benzene	ppb	20	21	3	15%
Toluene	ppb	20	19	5	15%
Ethylbenzene	ppb	20	20	0	15%
m,p-Xylene	ppb	40	44	9	15%
o-Xylene	ppb	20	19	5	15%

Spike Results

Analyte	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Benzene	97	92	(39-150)	3	20%
Toluene	95	95	(46-148)	0	20%
Ethylbenzene	97	100	(32-160)	2	20%
m,p-Xylene	97	97	(35-145)	0	20%
o-Xylene	98	100	(35-145)	1	20%

Surrogate Recoveries

Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered	S3 Percent Recovered
Limits	(70-130)		
3899-2286	101		

S1: Fluorobenzene