

Technical Report for

Marathon Oil

MOC Fresh Water Pond Samples

Accutest Job Number: D47798

Sampling Date: 07/01/13

Report to:

Marathon Oil Company
743 Horizon Court Suite 220
Grand Junction, CO 81056
zjtoellner@marathonoil.com; bmtalancon@marathonoil.com
ATTN: Ben Talancon

Total number of pages in report: 35



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.



Scott Heideman
Laboratory Director

Client Service contact: Ann Doerr 303-425-6021

Certifications: CO (CO00049), ID, NE (CO00049), ND (R-027), NJ (CO 0007), OK (D9942), UT (NELAP CO00049), TX (T104704511)

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Sample Summary

Marathon Oil

Job No: D47798

MOC Fresh Water Pond Samples

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D47798-1	07/01/13	15:40 BT	07/02/13	AQ	Surface Water	SW_POND_C



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D47798

Site: MOC Fresh Water Pond Samples

Report Date 7/3/2013 4:35:59 PM

On 07/02/2013, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 4.1 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D47798 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix AQ **Batch ID:** V3V1494

- All samples were analyzed within the recommended method holding time.
- Sample(s) D47596-4MS, D47596-4MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Volatiles by GC By Method SW846 8015B

Matrix AQ **Batch ID:** GFA735

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D47798-1MS, D47798-1MSD were used as the QC samples indicated.

Matrix AQ **Batch ID:** GGA1084

- All samples were analyzed within the recommended method holding time.
- Sample(s) D47798-1MS, D47798-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GC By Method SW846-8015B

Matrix AQ **Batch ID:** OP8127

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D47509-27MS, D47509-27MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method EPA 300.0/SW846 9056

Matrix AQ **Batch ID:** GP10348

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D47798-1MS, D47798-1MSD were used as the QC samples for the Chloride, Sulfate, Chloride analysis.

Wet Chemistry By Method SM 2540C-2011

Matrix AQ

Batch ID: GN20859

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D47668-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Summary of Hits

Job Number: D47798
Account: Marathon Oil
Project: MOC Fresh Water Pond Samples
Collected: 07/01/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

D47798-1 SW_POND_C

Benzene	0.0295	0.0010	0.00027	mg/l	SW846 8260B
Toluene	0.0563	0.0020	0.0010	mg/l	SW846 8260B
Ethylbenzene	0.0017 J	0.0020	0.00033	mg/l	SW846 8260B
Xylene (total)	0.0243	0.0030	0.0020	mg/l	SW846 8260B
TPH-GRO (C6-C10)	0.424	0.20	0.10	mg/l	SW846 8015B
TPH-DRO (C10-C28)	0.230	0.19	0.17	mg/l	SW846-8015B
Chloride	267	10		mg/l	EPA 300.0/SW846 9056
Solids, Total Dissolved	894	10		mg/l	SM 2540C-2011
Sulfate	104	10		mg/l	EPA 300.0/SW846 9056

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: SW_POND_C Lab Sample ID: D47798-1 Matrix: AQ - Surface Water Method: SW846 8260B Project: MOC Fresh Water Pond Samples	Date Sampled: 07/01/13 Date Received: 07/02/13 Percent Solids: n/a
---	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V25433.D	1	07/02/13	BR	n/a	n/a	V3V1494
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.0295	0.0010	0.00027	mg/l	
108-88-3	Toluene	0.0563	0.0020	0.0010	mg/l	
100-41-4	Ethylbenzene	0.0017	0.0020	0.00033	mg/l	J
1330-20-7	Xylene (total)	0.0243	0.0030	0.0020	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	122%		62-130%
2037-26-5	Toluene-D8	100%		70-130%
460-00-4	4-Bromofluorobenzene	101%		69-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: SW_POND_C Lab Sample ID: D47798-1 Matrix: AQ - Surface Water Method: SW846 8015B Project: MOC Fresh Water Pond Samples	Date Sampled: 07/01/13 Date Received: 07/02/13 Percent Solids: n/a
---	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FA12091.D	1	07/02/13	AV	n/a	n/a	GFA735
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1.0 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	0.50	0.40	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
71-36-3	n-Butyl Alcohol	123%		25-169%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: SW_POND_C Lab Sample ID: D47798-1 Matrix: AQ - Surface Water Method: SW846 8015B Project: MOC Fresh Water Pond Samples	Date Sampled: 07/01/13 Date Received: 07/02/13 Percent Solids: n/a
---	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA19139.D	1	07/03/13	EV	n/a	n/a	GGA1084
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	0.424	0.20	0.10	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	91%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: SW_POND_C Lab Sample ID: D47798-1 Matrix: AQ - Surface Water Method: SW846-8015B SW846 3510C Project: MOC Fresh Water Pond Samples	Date Sampled: 07/01/13 Date Received: 07/02/13 Percent Solids: n/a
---	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH011112.D	1	07/03/13	TU	07/02/13	OP8127	GFH618
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1060 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	0.230	0.19	0.17	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	54%		20-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: SW_POND_C	Date Sampled: 07/01/13
Lab Sample ID: D47798-1	Date Received: 07/02/13
Matrix: AQ - Surface Water	Percent Solids: n/a
Project: MOC Fresh Water Pond Samples	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	267	10	mg/l	20	07/03/13 09:26	SK	EPA 300.0/SW846 9056
Solids, Total Dissolved	894	10	mg/l	1	07/02/13	BF	SM 2540C-2011
Sulfate	104	10	mg/l	20	07/03/13 09:26	SK	EPA 300.0/SW846 9056

RL = Reporting Limit

4.1
4

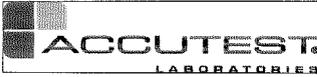
Misc. Forms

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Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

4036 Youngfield Street, Wheat Ridge, CO 80033
TEL: 303-425-6021 FAX: 303-425-6854
www.accutest.com

FED-EX Tracking #
Accutest Quote #
Bottle Order Control #
Accutest Job # D47798

Client / Reporting Information
Project Information
Requested Analysis (see TEST CODE sheet)
Matrix Codes
Company Name: Marathon Oil
Project Name: MOC SURFACE WATER POND C
Street Address: 743 Horizon Ct Suite 220
City: Grand Junction Co
Project Contact: Ben Talancon
Phone #: 970-778-51-14
Sampler(s) Name(s): Ben Talancon
Collection table with columns: MECH/DI Vial #, Date, Time, Sampled by, Matrix, # of bottles, HCl, HNO3, H2SO4, NONE, DI Water, MEDIT, ENCORE. Row 1: SW_POND-C, 7/11/13, 15:40, B.T SW, 9 7, 1 1.

5.1
5

Turnaround Time (Business days)
Data Deliverable Information
Comments / Special Instructions
Please sample for all of table 910-1 standards and attachment.

Sample Custody must be documented below each time samples change possession, including courier delivery.
1 Relinquished by: Ben Talancon Date Time: 4:55 PM Received By: [Signature]
2 Relinquished By: [Signature] Date Time: 7/11/13 Received By: [Signature]
3 Relinquished by: [Signature] Date Time: 7-1-13 Received By: [Signature]
4 Relinquished By: [Signature] Date Time: [Signature] Received By: [Signature]
5 Relinquished by: [Signature] Date Time: [Signature] Received By: [Signature]
Custody Seal # HS/CO Intact Not Intact Preserved where applicable On Ice Cooler Temp. 4.1

D47798: Chain of Custody
Page 1 of 2

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D47798

Client: MARATHON OIL

Immediate Client Services Action Required: No

Date / Time Received: 7/2/2013 3:00:00 PM

No. Coolers: 1

Client Service Action Required at Login: No

Project: MOC SURFACE WATER POND C

Airbill #'s: HD/CO

<u>Cooler Security</u>	<u>Y or N</u>		<u>Y or N</u>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smp'l Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y or N</u>	
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Cooler temp verification:	Infrared gun	
3. Cooler media:	Ice (bag)	

<u>Quality Control Preservation</u>	<u>Y or N</u>		<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>	<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y or N</u>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y or N</u>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Condition of sample:	Intact	

<u>Sample Integrity - Instructions</u>	<u>Y or N</u>		<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

5.1
5

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D47798
Account: MOILCOGJ Marathon Oil
Project: MOC Fresh Water Pond Samples

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V1494-MB	3V25422.D	1	07/02/13	BR	n/a	n/a	V3V1494

The QC reported here applies to the following samples:

Method: SW846 8260B

D47798-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.27	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.33	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
17060-07-0	1,2-Dichloroethane-D4	111% 62-130%
2037-26-5	Toluene-D8	98% 70-130%
460-00-4	4-Bromofluorobenzene	98% 69-130%

Blank Spike Summary

Job Number: D47798
 Account: MOILCOGJ Marathon Oil
 Project: MOC Fresh Water Pond Samples

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V1494-BS	3V25423.D	1	07/02/13	BR	n/a	n/a	V3V1494

The QC reported here applies to the following samples:

Method: SW846 8260B

D47798-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	50.0	100	70-130
100-41-4	Ethylbenzene	50	50.6	101	70-130
108-88-3	Toluene	50	50.6	101	70-130
1330-20-7	Xylene (total)	150	152	101	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	111%	62-130%
2037-26-5	Toluene-D8	98%	70-130%
460-00-4	4-Bromofluorobenzene	110%	69-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D47798
 Account: MOILCOGJ Marathon Oil
 Project: MOC Fresh Water Pond Samples

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D47596-4MS	3V25435.D	50	07/02/13	BR	n/a	n/a	V3V1494
D47596-4MSD	3V25436.D	50	07/02/13	BR	n/a	n/a	V3V1494
D47596-4	3V25434.D	50	07/02/13	BR	n/a	n/a	V3V1494

The QC reported here applies to the following samples:

Method: SW846 8260B

D47798-1

CAS No.	Compound	D47596-4 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	374	2500	2820	98	2940	103	4	62-130/30
100-41-4	Ethylbenzene	22.6	J 2500	2480	98	2600	103	5	63-130/30
108-88-3	Toluene	ND	2500	2420	97	2580	103	6	60-130/30
1330-20-7	Xylene (total)	ND	7500	7480	100	7740	103	3	67-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D47596-4	Limits
17060-07-0	1,2-Dichloroethane-D4	108%	104%	119%	62-130%
2037-26-5	Toluene-D8	98%	99%	98%	70-130%
460-00-4	4-Bromofluorobenzene	110%	109%	96%	69-130%

* = Outside of Control Limits.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D47798
Account: MOILCOGJ Marathon Oil
Project: MOC Fresh Water Pond Samples

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GC3706-MB	FA12087.D	1	07/02/13	AV	n/a	n/a	GFA735

The QC reported here applies to the following samples:

Method: SW846 8015B

D47798-1

CAS No.	Compound	Result	RL	MDL	Units	Q
67-56-1	Methanol	ND	0.50	0.40	mg/l	

CAS No.	Surrogate Recoveries	Limits
71-36-3	n-Butyl Alcohol	109% 25-169%

7.1.1
7

Method Blank Summary

Job Number: D47798
 Account: MOILCOGJ Marathon Oil
 Project: MOC Fresh Water Pond Samples

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA1084-MB	GA19137.D	1	07/03/13	EV	n/a	n/a	GGA1084

The QC reported here applies to the following samples:

Method: SW846 8015B

D47798-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	98% 60-140%

7.1.2

7

Blank Spike Summary

Job Number: D47798
 Account: MOILCOGJ Marathon Oil
 Project: MOC Fresh Water Pond Samples

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GC3706-BS	FA12088.D	1	07/02/13	AV	n/a	n/a	GFA735

The QC reported here applies to the following samples:

Method: SW846 8015B

D47798-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
67-56-1	Methanol	25	22.8	91	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
71-36-3	n-Butyl Alcohol	89%	25-169%

7.2.1

7

* = Outside of Control Limits.

Blank Spike Summary

Job Number: D47798
 Account: MOILCOGJ Marathon Oil
 Project: MOC Fresh Water Pond Samples

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA1084-BS	GA19138.D	1	07/03/13	EV	n/a	n/a	GGA1084

The QC reported here applies to the following samples:

Method: SW846 8015B

D47798-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-GRO (C6-C10)	2.2	2.22	101	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	100%	60-140%

7.2.2

7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D47798
 Account: MOILCOGJ Marathon Oil
 Project: MOC Fresh Water Pond Samples

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GC3706-MS	FA12089.D	1	07/02/13	AV	n/a	n/a	GFA735
GC3706-MSD	FA12090.D	1	07/02/13	AV	n/a	n/a	GFA735
D47798-1	FA12091.D	1	07/02/13	AV	n/a	n/a	GFA735

The QC reported here applies to the following samples:

Method: SW846 8015B

D47798-1

CAS No.	Compound	D47798-1 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
67-56-1	Methanol	ND	25	22.9	92	19.9	80	14	25-176/30

CAS No.	Surrogate Recoveries	MS	MSD	D47798-1	Limits
71-36-3	n-Butyl Alcohol	89%	74%	123%	25-169%

* = Outside of Control Limits.

7.3.1
7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D47798
 Account: MOILCOGJ Marathon Oil
 Project: MOC Fresh Water Pond Samples

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D47798-1MS	GA19140.D	1	07/03/13	EV	n/a	n/a	GGA1084
D47798-1MSD	GA19141.D	1	07/03/13	EV	n/a	n/a	GGA1084
D47798-1	GA19139.D	1	07/03/13	EV	n/a	n/a	GGA1084

The QC reported here applies to the following samples:

Method: SW846 8015B

D47798-1

CAS No.	Compound	D47798-1 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	0.424	2.2	2.59	98	2.52	95	3	60-145/30

CAS No.	Surrogate Recoveries	MS	MSD	D47798-1	Limits
120-82-1	1,2,4-Trichlorobenzene	102%	104%	91%	60-140%

* = Outside of Control Limits.

7.3.2
7

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D47798
 Account: MOILCOGJ Marathon Oil
 Project: MOC Fresh Water Pond Samples

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8127-MB	FH011064.D	1	07/02/13	TU	07/02/13	OP8127	GFH618

The QC reported here applies to the following samples:

Method: SW846-8015B

D47798-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	0.20	0.18	mg/l	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	41% 20-140%

Blank Spike Summary

Job Number: D47798
 Account: MOILCOGJ Marathon Oil
 Project: MOC Fresh Water Pond Samples

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8127-BS	FH011066.D	1	07/02/13	TU	07/02/13	OP8127	GFH618

The QC reported here applies to the following samples:

Method: SW846-8015B

D47798-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	20	9.26	46	36-140

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	45%	20-140%

8.2.1

8

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D47798
 Account: MOILCOGJ Marathon Oil
 Project: MOC Fresh Water Pond Samples

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8127-MS	FH011068.D	1	07/02/13	TU	07/02/13	OP8127	GFH618
OP8127-MSD	FH011070.D	1	07/02/13	TU	07/02/13	OP8127	GFH618
D47509-27	FH011072.D	1	07/02/13	TU	07/02/13	OP8127	GFH618

The QC reported here applies to the following samples:

Method: SW846-8015B

D47798-1

CAS No.	Compound	D47509-27 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND	20	11.3	57	8.64	43	27	28-140/30
CAS No.	Surrogate Recoveries	MS	MSD	D47509-27	Limits				
84-15-1	o-Terphenyl	57%	47%	39%	20-140%				

8.3.1
8

* = Outside of Control Limits.

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D47798
Account: MOILCOGJ - Marathon Oil
Project: MOC Fresh Water Pond Samples

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Bromide	GP10348/GN20878	0.050	0.0	mg/l	20	19.7	98.5	90-110%
Chloride	GP10348/GN20878	0.50	0.0	mg/l	20	19.9	99.5	90-110%
Fluoride	GP10348/GN20878	0.10	0.0	mg/l	10	9.82	98.2	90-110%
Nitrogen, Nitrate	GP10348/GN20878	0.010	0.0	mg/l	4.52	4.41	97.6	90-110%
Nitrogen, Nitrite	GP10348/GN20878	0.0040	0.0	mg/l	6.09	6.24	102.5	90-110%
Solids, Total Dissolved	GN20859	10	0.0	mg/l	400	387	96.8	90-110%
Sulfate	GP10348/GN20878	0.50	0.0	mg/l	30	29.7	99.0	90-110%

Associated Samples:
Batch GN20859: D47798-1
Batch GP10348: D47798-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D47798
Account: MOILCOGJ - Marathon Oil
Project: MOC Fresh Water Pond Samples

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Solids, Total Dissolved	GN20859	D47668-1	mg/l	2380	2370	0.4	0-20%

Associated Samples:
Batch GN20859: D47798-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D47798
Account: MOILCOGJ - Marathon Oil
Project: MOC Fresh Water Pond Samples

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Bromide	GP10348/GN20878	D47798-1	mg/l	2.1	50	53.3	102.4	80-120%
Chloride	GP10348/GN20878	D47798-1	mg/l	267	200	478	105.5	80-120%
Fluoride	GP10348/GN20878	D47798-1	mg/l	1.6	50	51.3	99.4	80-120%
Nitrogen, Nitrate	GP10348/GN20878	D47798-1	mg/l	0.0	11.3	11.6	102.7	80-120%
Nitrogen, Nitrite	GP10348/GN20878	D47798-1	mg/l	0.0	6.09	6.5	106.7	80-120%
Sulfate	GP10348/GN20878	D47798-1	mg/l	104	200	310	103.0	80-120%

Associated Samples:

Batch GP10348: D47798-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D47798
Account: MOILCOGJ - Marathon Oil
Project: MOC Fresh Water Pond Samples

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Bromide	GP10348/GN20878	D47798-1	mg/l	2.1	50	53.3	0.0	20%
Chloride	GP10348/GN20878	D47798-1	mg/l	267	200	475	0.6	20%
Fluoride	GP10348/GN20878	D47798-1	mg/l	1.6	50	50.6	1.4	20%
Nitrogen, Nitrate	GP10348/GN20878	D47798-1	mg/l	0.0	11.3	11.5	0.9	20%
Nitrogen, Nitrite	GP10348/GN20878	D47798-1	mg/l	0.0	6.09	6.5	0.0	20%
Sulfate	GP10348/GN20878	D47798-1	mg/l	104	200	311	0.3	20%

Associated Samples:

Batch GP10348: D47798-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits