ATTACHMENT 2: DATA VALIDATION REPORTS

This attachment contains the data validation reports performed by an independent subcontractor, Laboratory Data Consultants, Inc. (LDC), of Carlsbad, California.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Tidewater, Inc.
199 Shell Street
Manhattan Beach, CA 90266
ATTN: Mr. David Conner

December 12, 2014

SUBJECT: NASA JPL, 4Q2014, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on November 18, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33126:

SDG #	Fraction
14-24864, 14-25001, 14-25112	Volatiles, Chromium, Wet Chemistry

The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Pei Geng
Project Manager/Senior Chemist

HC

Attachment 1

90/10 (client select)

LDC #33126 (Tidewater- Powell, OH / NASA JPL, 4Q2014)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)		Cr (200.8)		Cl,SO_4 NO_3-N (300.0)		NO_2-N (353.2)		Cr(VI) (7196)		O-PO_4 (365.1)		CLO_4 (314.1)																	
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	14-24864	11/18/14	12/11/14	11	0	10	0	-	-	-	-	10	0	-	-	10	0																
A	14-24864	11/18/14	12/11/14	1	0	1	0	-	-	-	-	1	0	-	-	1	0																
B	14-25001	11/18/14	12/11/14	11	0	10	0	-	-	-	-	10	0	-	-	10	0																
B	14-25001	11/18/14	12/11/14	1	0	1	0	-	-	-	-	1	0	-	-	1	0																
C	14-25112	11/18/14	12/11/14	10	0	9	0	1	0	1	0	9	0	1	0	9	0																
C	14-25112	11/18/14	12/11/14	1	0	1	0	0	0	0	0	1	0	0	0	1	0																
Total	T/PG			35	0	32	0	1	0	1	0	32	0	1	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	134

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS/MSD, and DUPs

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 20, 2014

LDC Report Date: December 2, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-24864

Sample Identification

TB-1-10/20/14
EB-1-10/20/14
SB-1-10/20/14
MW-20-5
MW-20-4
MW-20-3
MW-20-2**
MW-19-5
MW-19-4
MW-19-3
MW-19-2
MW-19-1

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of the presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/23/14 (CCV-23OCT02)	Bromomethane	88	TB-1-10/20/14 BXJ2163-BLK1	J (all detects) UJ (all non-detects)	P
10/23/14 (CCV-23OCT03)	Methyl iodide	78.4	TB-1-10/20/14 BXJ2163-BLK1	J (all detects) UJ (all non-detects)	P
10/23/14 (CCV-23OCT33)	Bromomethane	59.6	MW-19-2 EB-1-10/20/14 MW-19-1 SB-1-10/20/14 MW-20-5 MW-20-4 MW-20-3 MW-20-2** MW-19-5 MW-19-4 MW-19-3 1415584-CCB2	J (all detects) UJ (all non-detects)	P

Date	Compound	%D	Associated Samples	Flag	A or P
10/23/14 (CCV-23OCT34)	trans-1,4-Dichloro-2-butene Methyl iodide Pentachloroethane	33.8 65.2 46.6	MW-19-2 EB-1-10/20/14 MW-19-1 SB-1-10/20/14 MW-20-5 MW-20-4 MW-20-3 MW-20-2** MW-19-5 MW-19-4 MW-19-3 1415584-CCB2	J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Compound Quantitation

All compound quantitations were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample TB-1-10/20/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-1-10/20/14 was identified as an equipment blank. No volatile contaminants were found.

Sample SB-1-10/20/14 was identified as a source blank. No volatile contaminants were found.

NASA JPL, 4Q2014
Volatiles - Data Qualification Summary - SDG 14-24864

SDG	Sample	Compound	Flag	A or P	Reason
14-24864	TB-1-10/20/14	Bromomethane Methyl iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
14-24864	MW-19-2 EB-1-10/20/14 MW-19-1 SB-1-10/20/14 MW-20-5 MW-20-4 MW-20-3 MW-20-2** MW-19-5 MW-19-4 MW-19-3	Bromomethane trans-1,4-Dichloro-2-butene Methyl iodide Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 4Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-24864

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-1-10/20/14

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-01 | File ID: 23OCT28.D
Sampled: 10/20/14 07:30 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 17:29
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/10/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-1-10/20/14

Laboratory:	BC Laboratories		SDG:	14-24864	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1424864-01	File ID:	23OCT28.D
Sampled:	10/20/14 07:30	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 17:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence: 1415584	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-1-10/20/14

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-01 | File ID: 23OCT28.D
Sampled: 10/20/14 07:30 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 17:29
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.470	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8400	98.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9000	89.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	193672	6.67	197165	6.66	
Chlorobenzene-d5 (IS)	64518	9.68	63627	9.68	
1,4-Difluorobenzene (IS)	255916	7.46	247519	7.45	

12/10/14

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3761 Attucks Drive
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Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-1-10/20/14

Laboratory:	BC Laboratories			SDG:	14-24864
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1424864-02	File ID:	23OCT37.D
Sampled:	10/20/14 07:40	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 20:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

11/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

EB-1-10/20/14

Laboratory:	BC Laboratories			SDG:	14-24864
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1424864-02	File ID:	23OCT37.D
Sampled:	10/20/14 07:40	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 20:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/10/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

EB-1-10/20/14

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-02 | File ID: 23OCT37.D
Sampled: 10/20/14 07:40 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 20:54
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.280	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.110	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3500	93.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	204982	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	66120	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	255021	7.46	270971	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-1-10/20/14

Laboratory:	BC Laboratories		SDG:	14-24864	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1424864-03	File ID:	23OCT38.D
Sampled:	10/20/14 07:45	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 21:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence: 1415584	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

SB-1-10/20/14

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-03 | File ID: 23OCT38.D
Sampled: 10/20/14 07:45 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 21:17
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-1-10/20/14

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-03 | File ID: 23OCT38.D
Sampled: 10/20/14 07:45 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 21:17
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.410	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.130	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0900	90.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	203809	6.67	209040	6.67	
Chlorobenzene-d5 (IS)	67336	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	255863	7.45	270971	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-5

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-04 | File ID: 23OCT39.D
Sampled: 10/20/14 08:30 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 21:39
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-5

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-04 | File ID: 23OCT39.D
Sampled: 10/20/14 08:30 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 21:39
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.22	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-5

Laboratory:	BC Laboratories		SDG:	14-24864	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1424864-04	File ID:	23OCT39.D
Sampled:	10/20/14 08:30	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 21:39
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.46	J
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.200	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8300	98.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1500	91.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	199490	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	65050	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	252591	7.46	270971	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-4

Laboratory:	BC Laboratories		SDG:	14-24864	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1424864-05	File ID:	23OCT40.D
Sampled:	10/20/14 09:10	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 22:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-4

Laboratory:	BC Laboratories			SDG:	14-24864
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1424864-05	File ID:	23OCT40.D
Sampled:	10/20/14 09:10	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 22:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-4

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-05 | File ID: 23OCT40.D
Sampled: 10/20/14 09:10 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 22:02
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.50	J
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.440	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.240	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3200	93.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194824	6.67	209040	6.67	
Chlorobenzene-d5 (IS)	64101	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	244337	7.45	270971	7.46	

1/10/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-3

Laboratory:	BC Laboratories			SDG:	14-24864
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1424864-06	File ID:	23OCT41.D
Sampled:	10/20/14 09:40	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 22:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U U5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-3

Laboratory:	BC Laboratories			SDG:	14-24864
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1424864-06	File ID:	23OCT41.D
Sampled:	10/20/14 09:40	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 22:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.14	J
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.31	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.28	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.090	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.8	J
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/10/14

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-3

Laboratory:	BC Laboratories			SDG:	14-24864		
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells		
Matrix:	Water	Laboratory ID:	1424864-06	File ID:	23OCT41.D		
Sampled:	10/20/14 09:40	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 22:25		
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml		
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.50	J
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.270	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.190	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1400	91.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	195475	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	64247	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	246309	7.46	270971	7.46	

PP10/ICL4

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-2

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-07 | File ID: 23OCT42.D
Sampled: 10/20/14 10:10 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 22:47
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.26	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-2

Laboratory:	BC Laboratories			SDG:	14-24864
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1424864-07	File ID:	23OCT42.D
Sampled:	10/20/14 10:10	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 22:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.16	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-2

Laboratory:	BC Laboratories		SDG:	14-24864	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1424864-07	File ID:	23OCT42.D
Sampled:	10/20/14 10:10	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 22:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence: 1415584	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.390	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.110	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1400	91.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	192142	6.67	209040	6.67	
Chlorobenzene-d5 (IS)	63763	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	244107	7.46	270971	7.46	

AA 10/100 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-19-5

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-08 | File ID: 23OCT43.D
Sampled: 10/20/14 10:50 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 23:10
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.16	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-5

Laboratory:	BC Laboratories		SDG:	14-24864	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1424864-08	File ID:	23OCT43.D
Sampled:	10/20/14 10:50	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 23:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.56	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-5

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-08 | File ID: 23OCT43.D
Sampled: 10/20/14 10:50 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 23:10
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.070	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.020	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1400	91.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191526	6.67	209040	6.67	
Chlorobenzene-d5 (IS)	61626	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	242965	7.46	270971	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-4

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-09 | File ID: 23OCT44.D
Sampled: 10/20/14 11:30 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 23:32
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.21	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-4

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-09 | File ID: 23OCT44.D
Sampled: 10/20/14 11:30 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 23:32
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.40	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-4

Laboratory:	BC Laboratories			SDG:	14-24864
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1424864-09	File ID:	23OCT44.D
Sampled:	10/20/14 11:30	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 23:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.540	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.210	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9900	89.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190274	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	61632	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	242207	7.46	270971	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-3

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-10 | File ID: 23OCT45.D
Sampled: 10/20/14 12:00 | Prepared: 10/23/14 07:00 | Analyzed: 10/23/14 23:55
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U U5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.49	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-19-3

Laboratory:	BC Laboratories			SDG:	14-24864
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1424864-10	File ID:	23OCT45.D
Sampled:	10/20/14 12:00	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 23:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.51	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

11/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-3

Laboratory:	BC Laboratories			SDG:	14-24864
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1424864-10	File ID:	23OCT45.D
Sampled:	10/20/14 12:00	Prepared:	10/23/14 07:00	Analyzed:	10/23/14 23:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.190	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.100	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7900	87.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	192647	6.67	209040	6.67	
Chlorobenzene-d5 (IS)	63724	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	243691	7.46	270971	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-2

Laboratory:	BC Laboratories			SDG:	14-24864
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1424864-11	File ID:	23OCT46.D
Sampled:	10/20/14 13:00	Prepared:	10/23/14 07:00	Analyzed:	10/24/14 00:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.28	J
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.77	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.17	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.16	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/10/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-2

Laboratory:	BC Laboratories		SDG:	14-24864	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1424864-11	File ID:	23OCT46.D
Sampled:	10/20/14 13:00	Prepared:	10/23/14 07:00	Analyzed:	10/24/14 00:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.78	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.57	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/10/14 dc

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-2

Laboratory:	BC Laboratories		SDG:	14-24864	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1424864-11	File ID:	23OCT46.D
Sampled:	10/20/14 13:00	Prepared:	10/23/14 07:00	Analyzed:	10/24/14 00:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.690	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.130	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0800	90.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	186178	6.67	209040	6.67	
Chlorobenzene-d5 (IS)	61605	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	240306	7.45	270971	7.46	

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-1

Laboratory:	BC Laboratories			SDG:	14-24864
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1424864-12	File ID:	23OCT47.D
Sampled:	10/20/14 13:30	Prepared:	10/23/14 07:00	Analyzed:	10/24/14 00:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U US
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.28	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-1

Laboratory:	BC Laboratories			SDG:	14-24864
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1424864-12	File ID:	23OCT47.D
Sampled:	10/20/14 13:30	Prepared:	10/23/14 07:00	Analyzed:	10/24/14 00:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2163	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:19:39PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-1

Laboratory: BC Laboratories | SDG: 14-24864
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1424864-12 | File ID: 23OCT47.D
Sampled: 10/20/14 13:30 | Prepared: 10/23/14 07:00 | Analyzed: 10/24/14 00:40
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2163 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.430	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.050	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9200	89.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	187015	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	62014	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	235370	7.46	270971	7.46	

17/00/14

LDC #: 33126A1
SDG #: 14-24864
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 11/25/14
Page: 1 of 1
Reviewer: BR
2nd Reviewer: [signature]

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/20/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ≤20?, r²
IV.	Continuing calibration/ICV	SW	ICV/CCV ≤30?
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	Client spec.
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	TB = 1 EB = 2 SB = 3

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation

Water

1	TB-1-10/20/14	11	MW-19-2	21		31	BXJ2163-BLK1
2	EB-1-10/20/14	12	MW-19-1	22		32	141584-CCB2
3	SB-1-10/20/14	13		23		33	
4	MW-20-5	14		24		34	
5	MW-20-4	15		25		35	
6	MW-20-3	16		26		36	
7	MW-20-2**	17		27		37	
8	MW-19-5	18		28		38	
9	MW-19-4	19		29		39	
10	MW-19-3	20		30		40	

DC #: 337246A1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: [signature]

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓	✓	nr	
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within +/-40% from the associated calibration standard?	✓			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/RLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	✓			
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. methyl iodide
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. trans-1,4-Dichloro-2-butene
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR. Pentachloroethane
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33126A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: BK
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y (N) N/A Were all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	10/23/14	CCV-230CT02	B	88	1+ BXJ 2163-BLK1	J/UJ/P (ND)
	10/23/14	CCV-230CT03	PPPP	78.4	↓	↓
	10/23/14	CCV-230CT33	B	59.6	2-12+1415584-CCB2	J/UJ/P (ND)
	10/23/14	CCV-230CT34	QQQQ	33.8	↓	↓
			PPPP	65.2		
			RRRR	46.6		

LDC #: 33126A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ A_x = Area of Compound A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards C_x = Concentration of compound, C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) S= Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	9/29/2014	1,1-Dichloroethene (IS1)	0.738356	0.738355	0.7196486	0.7196486	7.161084	7.161084
	MS-V5		Trichloroethene (IS2)	0.367066	0.367066	0.3568518	0.3568518	6.373252	6.373256
			1,1,2,2-Tetrachloethane	0.640540	0.640540	0.6038102	0.6038102	9.719705	9.719699

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ A_x = Area of Compound A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards C_x = Concentration of compound, C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) S= Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 32/80 std)	Recalculated RRF (RRF 32/80 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	9/29/2014	Allyl chloride (IS1)	0.735051	0.735051	0.7121014	0.7121014	6.759083	6.759089
	MS-V5		Methyl methacrylate (IS	0.078498	0.078498	0.0774599	0.0774598	6.029047	6.029007
			Pentachloroethane (IS3	0.711963	0.711963	0.6967004	0.6967004	13.77065	13.77064

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC#: 33126A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: BR
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	23OCT33	10/23/2014	1,1-Dichloroethene (IS1)	0.719649	0.709146	0.709146	1.5	1.5
			Trichloroethene (IS2)	0.356852	0.3556192	0.3556192	0.3	0.3
			1,1,2,2-Tetrachloethane	0.603810	0.6267972	0.6267972	3.8	3.8
2	23OCT34	10/23/2014	Allyl chloride (IS1)	0.712101	0.673506	0.673506	5.4	5.4
			Methyl methacrylate (IS2	0.077460	0.08274640	0.08274640	6.8	6.8
			Pentachloroethane (IS3	0.696700	0.3717477	0.3717477	46.6	46.6

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126A1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: SR
2nd reviewer: [signature]

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 7

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	10.00	10.11	101	101	0
Bromofluorobenzene	↓	9.14	91.4	91.4	0
1,2-Dichlorobenzene-d4	↓	10.39	104	104	0
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

LDC #: 33126A1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: BR
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: BKJ2163-BS1

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	25.00	-	26.290	-	105	105				
Trichloroethene	↓	↓	29.610	↓	118	118				
Benzene	↓	↓	26.820	↓	107	107				
Toluene	↓	↓	27.620	↓	110	110				
Chlorobenzene	↓	↓	27.490	↓	100	110				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126A1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: BR
2nd reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

S = 0.16

Sample I.D. 7 , S :

Conc. = $\frac{(1357)(10)(\quad)}{(24127)(0.3548518)(\quad)}$

= 0.155788008 ug/L

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 20, 2014

LDC Report Date: December 3, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-24864

Sample Identification

EB-1-10/20/14
SB-1-10/20/14
MW-20-5
MW-20-4
MW-20-3
MW-20-2**
MW-19-5
MW-19-4
MW-19-3
MW-19-2
MW-19-1
MW-20-4MS
MW-20-4MSD
MW-20-4DUP

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 14 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Calibration

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was not required by the method.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

Sample EB-1-10/20/14 was identified as an equipment blank. No chromium was found.

Sample SB-1-10/20/14 was identified as a source blank. No chromium was found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
SB-1-10/20/14	Chromium	0.66

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples MW-4-3 and Dup-7-3Q14 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-4-3	Dup-7-3Q14	
Chromium	2.5	3.1	21

XIV. Field Blanks

Sample EB-7-8/5/14 was identified as an equipment blank. No chromium was found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
EB-7-8/5/14	Chromium	1.4

Sample SB-3-8/5/14 was identified as a source blank. No chromium was found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
SB-3-8/5/14	Chromium	2.2

NASA JPL, 3Q2014
Chromium - Data Qualification Summary - SDG 14-24864

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-24864

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:13:38PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-1-10/20/14

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-02
File ID: PE_EL2_141103-078
Sampled: 10/20/14 07:40
Prepared: 11/01/14 09:10
Analyzed: 11/03/14 14:34
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0002
Sequence: 1416278
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/10/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:13:38PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

SB-1-10/20/14

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-03
File ID: PE_EL2_141103-079
Sampled: 10/20/14 07:45
Prepared: 11/01/14 09:10
Analyzed: 11/03/14 14:38
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0002
Sequence: 1416278
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.66	1	J	EPA-200.8

11/10/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:13:38PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-5

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-04
File ID: PE_EL2_141103-080
Sampled: 10/20/14 08:30
Prepared: 11/01/14 09:10
Analyzed: 11/03/14 14:41
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0002
Sequence: 1416278
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.90	1	J	EPA-200.8

12/05/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:13:38PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-20-4

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-05
File ID: PE_EL2_141103-112
Sampled: 10/20/14 09:10
Prepared: 11/03/14 08:40
Analyzed: 11/03/14 16:45
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0066
Sequence: 1416341
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/10/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:13:38PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-3

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-06
File ID: PE_EL2_141103-234
Sampled: 10/20/14 09:40
Prepared: 11/03/14 08:40
Analyzed: 11/04/14 00:40
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0066
Sequence: 1416341
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/10/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:13:38PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-2

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-07
File ID: PE_EL2_141103-235
Sampled: 10/20/14 10:10
Prepared: 11/03/14 08:40
Analyzed: 11/04/14 00:44
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0066
Sequence: 1416341
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.0	1	J	EPA-200.8

12/10/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:13:38PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-19-5

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-08
File ID: PE_EL2_141103-236
Sampled: 10/20/14 10:50
Prepared: 11/03/14 08:40
Analyzed: 11/04/14 00:47
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0066
Sequence: 1416341
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.78	1	J	EPA-200.8

11/10/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:13:38PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-19-4

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-09
File ID: PE_EL2_141103-237
Sampled: 10/20/14 11:30
Prepared: 11/03/14 08:40
Analyzed: 11/04/14 00:50
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0066
Sequence: 1416341
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.3	1	J	EPA-200.8

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:13:38PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-19-3

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-10
File ID: PE_EL2_141103-238
Sampled: 10/20/14 12:00
Prepared: 11/03/14 08:40
Analyzed: 11/04/14 00:54
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0066
Sequence: 1416341
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.5	1	J	EPA-200.8

12/10/14 Y

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:13:38PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-19-2

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-11
File ID: PE_EL2_141103-239
Sampled: 10/20/14 13:00
Prepared: 11/03/14 08:40
Analyzed: 11/04/14 00:57
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0066
Sequence: 1416341
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.0	1	J	EPA-200.8

12/10/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:13:38PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-19-1

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-12
File ID: PE_EL2_141103-240
Sampled: 10/20/14 13:30
Prepared: 11/03/14 08:40
Analyzed: 11/04/14 01:01
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0066
Sequence: 1416341
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.0	1	J	EPA-200.8

12/10/14

LDC #: 33126A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/26/14
SDG #: 14-24864 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: 1K
2nd Reviewer: 02

METHOD: Chromium (EPA Method 200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/20/14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	N	not required
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	ICP Serial Dilution	N	not performed
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	SW	*EB=1 SB=2

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
* ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	EB-1-10/20/14	11	MW-19-1	21		31	
2	SB-1-10/20/14	12	MW-20-4MS	22		32	
3	MW-20-5	13	MW-20-4MSD	23		33	
4	MW-20-4	14	MW-20-4DUP	24		34	
5	MW-20-3	15		25		35	
6	MW-20-2**	16		26		36	
7	MW-19-5	17		27		37	
8	MW-19-4	18		28		38	
9	MW-19-3	19		29		39	
10	MW-19-2	20		30		40	

Notes: _____

)C #: 331260A4

VALIDATION FINDINGS CHECKLIST

Reviewer: KK
2nd Reviewer: [illegible]

Method: Metals (EPA SW 846 Method 6010B ~~7000/6020~~)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?			✓	
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?			✓	
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were < 5X the RL.	✓			
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?		✓		
Were all percent differences (%Ds) < 10%?			✓	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XIII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.	✓			

LDC #: 33126A4

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: KA
2nd reviewer: AL

METHOD: ~~Trace Metals~~ (EPA ~~SW-846~~ Method ~~6010/6020/7000~~) 200.8 Chromium

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?

Sample: 2 Field Blank / Trip Blank / Rinsate / Other (SB) (circle one)

Analyte	Concentration Units ug/L
Chromium	0.66

Sample: _____ Field Blank / Trip Blank / Rinsate / Other_____ (circle one)

Analyte	Concentration Units ( )

LDC #: 33126A4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: KK
2nd Reviewer: 9z

METHOD: Trace Metals (EPA SW 846 Method 6010~~/6020/7000~~) B

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found / True x 100 Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
~~ICV~~	ICP (Initial calibration)			~~50.000~~		~~105~~	~~Y~~
ICV (11:01)	ICP/MS (Initial calibration)	Cr	52.742	50.000	105	105	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV (11:47)	ICP/MS (Continuing calibration)	Cr	39.908	40.000	99.8	99.8	Y
	CVAA (Continuing calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126A4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: KK
2nd Reviewer: 9

METHOD: Trace Metals (EPA SW 846 Method 6010B/~~6020/7000~~)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (mg/L) (units)	True / D / SDR (mg/L) (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
N/A	ICP interference check						
LCS	Laboratory control sample	Cr	41.219	40.0	103	103	Y
12	Matrix spike	↓	(SSR-SR) 39.165 ~~37.480~~	40.0	97.9	97.9	Y
14	Duplicate	↓	ND	ND	NC	NC	Y
N/A	ICP serial dilution						

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126A4

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: KK
2nd reviewer: [signature]

METHOD: Trace Metals (EPA ~~SW 846~~ Method ~~6010/6020/7000~~ 200.8)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for Cr were recalculated and verified using the following equation:

Concentration = (RD)(FV)(Dil) / (In. Vol.)

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

Recalculation:

6: $\frac{(1.047\ mg/L)(50\ mL)}{(50\ mL)}(1) = 1.047\ mg/L$

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration ( )	Acceptable (Y/N)
	6	Cr	1.0	1.0	Y

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 20, 2014

LDC Report Date: December 3, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-24864

Sample Identification

EB-1-10/20/14
SB-1-10/20/14
MW-20-5
MW-20-4
MW-20-3
MW-20-2**
MW-19-5
MW-19-4
MW-19-3
MW-19-2
MW-19-1
EB-1-10/20/14MS
EB-1-10/20/14MSD
EB-1-10/20/14DUP
MW-20-2MS
MW-20-2MSD
MW-20-2DUP

** Indicates sample underwent Level IV review

Introduction

This data review covers 17 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met for each method.

III. Calibration verification

Calibration verification frequency and analysis criteria were met for each method.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-1-10/20/14 was identified as an equipment blank. No contaminant concentrations were found.

Sample SB-1-10/20/14 was identified as a source blank. No contaminant concentrations were found.

NASA JPL, 4Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-24864

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-17142

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Wet Chemistry - Field Blank Data Qualification Summary - 14-24864

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-1-10/20/14

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-02
File ID: F102814.seq-40.0000.txt
Sampled: 10/20/14 07:40
Prepared: 10/28/14 16:00
Analyzed: 10/28/14 17:37
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2658
Sequence: 1416051
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/10/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

SB-1-10/20/14

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-03
File ID: F102814.seq-44.0000.txt
Sampled: 10/20/14 07:45
Prepared: 10/28/14 16:00
Analyzed: 10/28/14 18:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2658
Sequence: 1416051
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-20-5

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-04
File ID: F102814.seq-45.0000.txt
Sampled: 10/20/14 08:30
Prepared: 10/28/14 16:00
Analyzed: 10/28/14 18:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2658
Sequence: 1416051
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-20-4

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-05
File ID: F102814.seq-46.0000.txt
Sampled: 10/20/14 09:10
Prepared: 10/28/14 16:00
Analyzed: 10/28/14 19:00
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2658
Sequence: 1416051
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

11/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-20-3

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-06
File ID: F102814.seq-47.0000.txt
Sampled: 10/20/14 09:40
Prepared: 10/28/14 16:00
Analyzed: 10/28/14 19:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2658
Sequence: 1416051
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

11/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-20-2

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-07
File ID: F102814.seq-63.0000.txt
Sampled: 10/20/14 10:10
Prepared: 10/28/14 16:00
Analyzed: 10/29/14 01:30
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2658
Sequence: 1416051
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.9	1	J	EPA-314.0

11/10/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-19-5

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-08
File ID: F102814.seq-65.0000.txt
Sampled: 10/20/14 10:50
Prepared: 10/28/14 16:00
Analyzed: 10/29/14 01:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2658
Sequence: 1416051
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.2	1	J	EPA-314.0

12/10/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-4

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-09
File ID: F102814.seq-67.0000.txt
Sampled: 10/20/14 11:30
Prepared: 10/28/14 16:00
Analyzed: 10/29/14 02:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2658
Sequence: 1416051
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.1	1	J	EPA-314.0

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-3

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-10
File ID: F102814.seq-69.0000.txt
Sampled: 10/20/14 12:00
Prepared: 10/28/14 16:00
Analyzed: 10/29/14 02:53
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2658
Sequence: 1416051
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.3	1	J	EPA-314.0

11/10/14 dt

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-2

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-11
File ID: F102814.seq-54.0000.txt
Sampled: 10/20/14 13:00
Prepared: 10/28/14 16:00
Analyzed: 10/28/14 20:51
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2658
Sequence: 1416051
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	5.5	1		EPA-314.0

12/10/14 9

Tidewater Inc.
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Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-1

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-12
File ID: F102814.seq-55.0000.txt
Sampled: 10/20/14 13:30
Prepared: 10/28/14 08:00
Analyzed: 10/28/14 21:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2657
Sequence: 1416051
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/10/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-1-10/20/14

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-02
File ID: 141020 2258 CR6-005
Sampled: 10/20/14 07:40
Prepared: 10/20/14 22:58
Analyzed: 10/20/14 22:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ1878
Sequence: 1415513
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

10/10/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

SB-1-10/20/14

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-03
File ID: 141020 2258 CR6-009
Sampled: 10/20/14 07:45
Prepared: 10/20/14 22:58
Analyzed: 10/20/14 22:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ1878
Sequence: 1415513
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

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Tidewater Inc.
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Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-5

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-04
File ID: 141020 2258 CR6-010
Sampled: 10/20/14 08:30
Prepared: 10/20/14 22:58
Analyzed: 10/20/14 22:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ1878
Sequence: 1415513
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/10/14 8

Tidewater Inc.
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Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-4

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-05
File ID: 141020 2258 CR6-011
Sampled: 10/20/14 09:10
Prepared: 10/20/14 22:58
Analyzed: 10/20/14 22:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ1878
Sequence: 1415513
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/10/14 8

Tidewater Inc.
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Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-3

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-06
File ID: 141020 2258 CR6-012
Sampled: 10/20/14 09:40
Prepared: 10/20/14 22:58
Analyzed: 10/20/14 22:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ1878
Sequence: 1415513
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/10/14 JK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-2

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-07
File ID: 141021 0744 CR6-005
Sampled: 10/20/14 10:10
Prepared: 10/21/14 07:44
Analyzed: 10/21/14 07:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ1880
Sequence: 1415515
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/10/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-19-5

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-08
File ID: 141021 0744 CR6-009
Sampled: 10/20/14 10:50
Prepared: 10/21/14 07:44
Analyzed: 10/21/14 07:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ1880
Sequence: 1415515
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/10/14

Tidewater Inc.
3761 Attucks Drive
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Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-19-4

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-09
File ID: 141021 0744 CR6-010
Sampled: 10/20/14 11:30
Prepared: 10/21/14 07:44
Analyzed: 10/21/14 07:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ1880
Sequence: 1415515
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/10/14 q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-19-3

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-10
File ID: 141021 0744 CR6-011
Sampled: 10/20/14 12:00
Prepared: 10/21/14 07:44
Analyzed: 10/21/14 07:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ1880
Sequence: 1415515
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

10/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-19-2

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-11
File ID: 141021 0744 CR6-012
Sampled: 10/20/14 13:00
Prepared: 10/21/14 07:44
Analyzed: 10/21/14 07:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ1880
Sequence: 1415515
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:10:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-19-1

Laboratory: BC Laboratories
SDG: 14-24864
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1424864-12
File ID: 141021 0744 CR6-049
Sampled: 10/20/14 13:30
Prepared: 10/21/14 07:44
Analyzed: 10/21/14 08:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ1880
Sequence: 1415515
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

LDC #: 33126A6
SDG #: 14-24864
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 11/1/14
Page: 1 of 1
Reviewer: KK
2nd Reviewer: CL

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/20/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	A	Not reviewed for Level III validation.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI	Field blanks	ND	EB= 1 SB= 2

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	EB-1-10/20/14	11	MW-19-1	21		31	
2	SB-1-10/20/14	12	EB-1-10/20/14MS	22		32	
3	MW-20-5	13	EB-1-10/20/14MSD	23		33	
4	MW-20-4	14	EB-1-10/20/14DUP	24		34	
5	MW-20-3	15	MW-20-2MS	25		35	
6	MW-20-2**	16	MW-20-2MSD	26		36	
7	MW-19-5	17	MW-20-2DUP	27		37	
8	MW-19-4	18		28		38	
9	MW-19-3	19		29		39	
10	MW-19-2	20		30		40	

Notes:

LDC #: 33126A6

VALIDATION FINDINGS CHECKLIST

Reviewer: KK
2nd Reviewer: CL

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
X. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 33126A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: KK
2nd reviewer: CR

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-11	W	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [circled: Cr6+, ClO_4]
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 12-14		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [circled: Cr6+, ClO_4]
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 15-17		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [circled: Cr6+]
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 33126A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: KK
2nd Reviewer: 9

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr6+ was recalculated.Calibration date: 10/8/14

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Hexavalent Chromium	s1	0.00	0.001	*0.999946*	0.999877	Y
		s2	0.00	0.003			
		s3	0.01	0.005			
		s4	0.03	0.02			
		s5	0.05	0.039			
		s6	0.10	0.076			
Calibration verification	↓	CCV (7:50)	0.053	0.0500	106	106	Y
Calibration verification	Perchlorate	CCV (17:10)	9.22	10.000	92.2	97.1	Y
Calibration verification							FX

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: JK
2nd Reviewer: CZ

METHOD: Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	mg/L Found / S (units)	mg/L True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Cr6+	0.0504	0.0500	101	101	Y
15	Matrix spike sample	↓	(SSR-SR) 0.05442	0.052632	103	102	↓
14	Duplicate sample	ClO_4	ND	ND	N/C	N/C	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: KK
2nd reviewer: [illegible]

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y	N	N/A	Have results been reported and calculated correctly?
Y	N	N/A	Are results within the calibrated range of the instruments?
Y	N	N/A	Are all detection limits below the CRQL?

Compound (analyte) results for ClO4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = ~~(Area)(X coefficient)+~~ (Area)(X coefficient) + constant

Recalculation: (0.004 µs*min)(927.95523117) − 0.052457 = 3.65792 µg/L

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration (µg/L)	Acceptable (Y/N)
	6	ClO4	3.9	3.7	Y

Note: ~~No~~ Cr6+ results none detect

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 21, 2014

LDC Report Date: December 2, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25001

Sample Identification

TB-2-10/21/14
EB-2-10/21/14
MW-3-5
MW-3-4
MW-3-3
MW-3-2
MW-3-1
MW-14-5
MW-14-4
MW-14-3**
MW-14-2
DUP-1-4Q14
MW-3-3MS
MW-3-3MSD
MW-14-2MS
MW-14-2MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of the presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/22/14 (CCV-22OCT02)	Bromomethane	46.9	MW-3-3 MW-3-3MS MW-3-3MSD BXJ2010-BLK1	J (all detects) UJ (all non-detects)	P
10/22/14 (CCV-22OCT03)	Methyl iodide	46.2	MW-3-3 MW-3-3MS MW-3-3MSD BXJ2010-BLK1	J (all detects) UJ (all non-detects)	P
10/22/14 (CCV-22OCT33)	Bromomethane	63.9	TB-2-10/21/14 EB-2-10/21/14 MW-3-5 MW-3-4 MW-3-2 1415491-CCB2	J (all detects) UJ (all non-detects)	P

Date	Compound	%D	Associated Samples	Flag	A or P
10/22/14 (CCV-22OCT34)	trans-1,4-Dichloro-2-butene Methyl iodide	34.1 61.1	TB-2-10/21/14 EB-2-10/21/14 MW-3-5 MW-3-4 MW-3-2 1415491-CCB2	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
10/23/14 (CCV-23OCT02)	Bromomethane	88.0	MW-3-1 MW-14-5 MW-14-4 MW-14-3** MW-14-2 DUP-1-4Q14 MW-14-2MS MW-14-2MSD BXJ2011-BLK1	J (all detects) UJ (all non-detects)	P
10/23/14 (CCV-23OCT03)	Methyl iodide	78.4	MW-3-1 MW-14-5 MW-14-4 MW-14-3** MW-14-2 DUP-1-4Q14 MW-14-2MS MW-14-2MSD BXJ2011-BLK1	J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Although matrix spike (MS) and matrix spike duplicate (MSD) samples were not required by the method, MS and MSD samples were reported by the laboratory. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Compound Quantitation

All compound quantitations were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples MW-14-4 and DUP-1-4Q14 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-14-4	DUP-1-4Q14	
Chloroform	0.25	0.19	27
1,2-Dichlorobenzene	0.11	0.090	20

Compound	Concentration (ug/L)		RPD
	MW-14-4	DUP-1-4Q14	
1,4-Dichlorobenzene	0.080	0.062U	200
1,1-Dichloroethane	0.13	0.17U	200
cis-1,2-Dichloroethene	0.12	0.085U	200
Tetrachloroethene	0.26	0.20	26
Trichloroethene	0.29	0.22	27

XVII. Field Blanks

Sample TB-2-10/21/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-2-10/21/14 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL, 4Q2014
Volatiles - Data Qualification Summary - SDG 14-25001

SDG	Sample	Compound	Flag	A or P	Reason
14-25001	MW-3-3	Bromomethane Methyl iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
14-25001	TB-2-10/21/14 EB-2-10/21/14 MW-3-5 MW-3-4 MW-3-2	Bromomethane trans-1,4-Dichloro-2-butene Methyl iodide	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
14-25001	MW-3-1 MW-14-5 MW-14-4 MW-14-3** MW-14-2 DUP-1-4Q14	Bromomethane Methyl iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

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Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-25001

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-2-10/21/14

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-01 | File ID: 22OCT38.D
Sampled: 10/21/14 06:45 | Prepared: 10/22/14 06:39 | Analyzed: 10/22/14 21:27
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2010 | Sequence: 1415491 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/10/14 R

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Powell, OH 43065

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-2-10/21/14

Laboratory:	BC Laboratories		SDG:	14-25001	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425001-01	File ID:	22OCT38.D
Sampled:	10/21/14 06:45	Prepared:	10/22/14 06:39	Analyzed:	10/22/14 21:27
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2010	Sequence: 1415491		Calibration: 1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

17/10/14

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EPA-524.2

TB-2-10/21/14

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-01 | File ID: 22OCT38.D
Sampled: 10/21/14 06:45 | Prepared: 10/22/14 06:39 | Analyzed: 10/22/14 21:27
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2010 | Sequence: 1415491 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.930	109	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.020	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.2700	82.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	192612	6.66	192588	6.66	
Chlorobenzene-d5 (IS)	64587	9.68	63489	9.68	
1,4-Difluorobenzene (IS)	252745	7.46	253980	7.45	

12/10/14

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ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-2-10/21/14

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-02 | File ID: 22OCT39.D
Sampled: 10/21/14 07:00 | Prepared: 10/22/14 06:39 | Analyzed: 10/22/14 21:50
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2010 | Sequence: 1415491 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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ORGANIC ANALYSIS DATA SHEET

EPA-524.2

EB-2-10/21/14

Laboratory:	BC Laboratories		SDG:	14-25001	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425001-02	File ID:	22OCT39.D
Sampled:	10/21/14 07:00	Prepared:	10/22/14 06:39	Analyzed:	10/22/14 21:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2010	Sequence:	1415491	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

17/10/14 D

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EPA-524.2

EB-2-10/21/14

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-02 | File ID: 22OCT39.D
Sampled: 10/21/14 07:00 | Prepared: 10/22/14 06:39 | Analyzed: 10/22/14 21:50
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2010 | Sequence: 1415491 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.400	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.050	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.5300	85.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	201747	6.66	192588	6.66	
Chlorobenzene-d5 (IS)	65350	9.68	63489	9.68	
1,4-Difluorobenzene (IS)	253685	7.46	253980	7.45	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-5

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-03
File ID: 22OCT40.D
Sampled: 10/21/14 07:30
Prepared: 10/22/14 06:39
Analyzed: 10/22/14 22:12
Solids:
Preparation: EPA 5030 Water MS
Initial/Final: 25 ml / 25 ml
Batch: BXJ2010
Sequence: 1415491
Calibration: 1410010
Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.15	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-5

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-03 | File ID: 22OCT40.D
Sampled: 10/21/14 07:30 | Prepared: 10/22/14 06:39 | Analyzed: 10/22/14 22:12
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2010 | Sequence: 1415491 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.18	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-5

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-03 | File ID: 22OCT40.D
Sampled: 10/21/14 07:30 | Prepared: 10/22/14 06:39 | Analyzed: 10/22/14 22:12
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2010 | Sequence: 1415491 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.460	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.180	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.3500	83.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	195638	6.66	192588	6.66	
Chlorobenzene-d5 (IS)	63197	9.68	63489	9.68	
1,4-Difluorobenzene (IS)	247465	7.46	253980	7.45	

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-4

Laboratory:	BC Laboratories		SDG:	14-25001	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425001-04	File ID:	22OCT41.D
Sampled:	10/21/14 08:10	Prepared:	10/22/14 06:39	Analyzed:	10/22/14 22:35
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2010	Sequence: 1415491		Calibration: 1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.17	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-4

Laboratory:	BC Laboratories		SDG:	14-25001	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425001-04	File ID:	22OCT41.D
Sampled:	10/21/14 08:10	Prepared:	10/22/14 06:39	Analyzed:	10/22/14 22:35
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2010	Sequence:	1415491	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.15	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-4

Laboratory:	BC Laboratories			SDG:	14-25001
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425001-04	File ID:	22OCT41.D
Sampled:	10/21/14 08:10	Prepared:	10/22/14 06:39	Analyzed:	10/22/14 22:35
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2010	Sequence:	1415491	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.040	100	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.050	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.2800	82.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	195873	6.66	192588	6.66	
Chlorobenzene-d5 (IS)	63079	9.68	63489	9.68	
1,4-Difluorobenzene (IS)	243656	7.46	253980	7.45	

11/10/14 DS

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-3

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-05 | File ID: 22OCT08.D
Sampled: 10/21/14 08:40 | Prepared: 10/22/14 06:39 | Analyzed: 10/22/14 10:08
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2010 | Sequence: 1415491 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.20	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

P/10/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-3

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-05 | File ID: 22OCT08.D
Sampled: 10/21/14 08:40 | Prepared: 10/22/14 06:39 | Analyzed: 10/22/14 10:08
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2010 | Sequence: 1415491 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.24	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

11/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-3

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-05 | File ID: 22OCT08.D
Sampled: 10/21/14 08:40 | Prepared: 10/22/14 06:39 | Analyzed: 10/22/14 10:08
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2010 | Sequence: 1415491 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U US
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.270	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.200	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7700	87.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	199518	6.66	202922	6.66	
Chlorobenzene-d5 (IS)	62351	9.68	67847	9.68	
1,4-Difluorobenzene (IS)	248632	7.46	268500	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-3-2

Laboratory:	BC Laboratories		SDG:	14-25001	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425001-06	File ID:	22OCT42.D
Sampled:	10/21/14 09:20	Prepared:	10/22/14 06:39	Analyzed:	10/22/14 22:57
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2010	Sequence: 1415491		Calibration: 1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.52	
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.7	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-2

Laboratory:	BC Laboratories		SDG:	14-25001	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425001-06	File ID:	22OCT42.D
Sampled:	10/21/14 09:20	Prepared:	10/22/14 06:39	Analyzed:	10/22/14 22:57
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2010	Sequence:	1415491	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-2

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-06 | File ID: 22OCT42.D
Sampled: 10/21/14 09:20 | Prepared: 10/22/14 06:39 | Analyzed: 10/22/14 22:57
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2010 | Sequence: 1415491 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.960	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9800	99.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.2800	82.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	187981	6.66	192588	6.66	
Chlorobenzene-d5 (IS)	62323	9.68	63489	9.68	
1,4-Difluorobenzene (IS)	246236	7.45	253980	7.45	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-1

Laboratory:	BC Laboratories		SDG:	14-25001	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425001-07	File ID:	23OCT14.D
Sampled:	10/21/14 09:50	Prepared:	10/23/14 04:00	Analyzed:	10/23/14 12:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2011	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-1

Laboratory:	BC Laboratories		SDG:	14-25001	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425001-07	File ID:	23OCT14.D
Sampled:	10/21/14 09:50	Prepared:	10/23/14 04:00	Analyzed:	10/23/14 12:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2011	Sequence: 1415584		Calibration: 1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-1

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-07 | File ID: 23OCT14.D
Sampled: 10/21/14 09:50 | Prepared: 10/23/14 04:00 | Analyzed: 10/23/14 12:12
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2011 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U US
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.130	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.040	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.220	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	215472	6.66	197165	6.66	
Chlorobenzene-d5 (IS)	67286	9.68	63627	9.68	
1,4-Difluorobenzene (IS)	265462	7.45	247519	7.45	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-5

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-08 | File ID: 23OCT15.D
Sampled: 10/21/14 11:00 | Prepared: 10/23/14 04:00 | Analyzed: 10/23/14 12:35
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2011 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.34	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-5

Laboratory:	BC Laboratories		SDG:	14-25001	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425001-08	File ID:	23OCT15.D
Sampled:	10/21/14 11:00	Prepared:	10/23/14 04:00	Analyzed:	10/23/14 12:35
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2011	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-5

Laboratory:	BC Laboratories		SDG:	14-25001	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425001-08	File ID:	23OCT15.D
Sampled:	10/21/14 11:00	Prepared:	10/23/14 04:00	Analyzed:	10/23/14 12:35
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2011	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.310	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.140	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9100	99.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	212063	6.66	197165	6.66	
Chlorobenzene-d5 (IS)	68037	9.68	63627	9.68	
1,4-Difluorobenzene (IS)	263358	7.46	247519	7.45	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-4

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-09 | File ID: 23OCT16.D
Sampled: 10/21/14 11:40 | Prepared: 10/23/14 04:00 | Analyzed: 10/23/14 12:58
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2011 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U LJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.25	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.11	J
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.080	J
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.13	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.12	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-14-4

Laboratory:	BC Laboratories			SDG:	14-25001
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425001-09	File ID:	23OCT16.D
Sampled:	10/21/14 11:40	Prepared:	10/23/14 04:00	Analyzed:	10/23/14 12:58
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2011	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.26	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.29	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-4

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-09 | File ID: 23OCT16.D
Sampled: 10/21/14 11:40 | Prepared: 10/23/14 04:00 | Analyzed: 10/23/14 12:58
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2011 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U MJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.310	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.110	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.010	100	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	210573	6.66	197165	6.66	
Chlorobenzene-d5 (IS)	70504	9.68	63627	9.68	
1,4-Difluorobenzene (IS)	266957	7.46	247519	7.45	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-3

Laboratory:	BC Laboratories			SDG:	14-25001
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425001-10	File ID:	23OCT17.D
Sampled:	10/21/14 13:10	Prepared:	10/23/14 04:00	Analyzed:	10/23/14 13:20
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2011	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.58	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.34	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.14	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-14-3

Laboratory:	BC Laboratories		SDG:	14-25001	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425001-10	File ID:	23OCT17.D
Sampled:	10/21/14 13:10	Prepared:	10/23/14 04:00	Analyzed:	10/23/14 13:20
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2011	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.65	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.8	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-3

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-10 | File ID: 23OCT17.D
Sampled: 10/21/14 13:10 | Prepared: 10/23/14 04:00 | Analyzed: 10/23/14 13:20
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2011 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.570	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.100	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.120	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	208495	6.67	197165	6.66	
Chlorobenzene-d5 (IS)	66368	9.68	63627	9.68	
1,4-Difluorobenzene (IS)	264624	7.45	247519	7.45	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-2

Laboratory:	BC Laboratories			SDG:	14-25001
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425001-11	File ID:	23OCT07.D
Sampled:	10/21/14 13:45	Prepared:	10/23/14 04:00	Analyzed:	10/23/14 09:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2011	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U LJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.52	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.15	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.17	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-2

Laboratory:	BC Laboratories			SDG:	14-25001
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425001-11	File ID:	23OCT07.D
Sampled:	10/21/14 13:45	Prepared:	10/23/14 04:00	Analyzed:	10/23/14 09:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2011	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.54	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	3.8	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-2

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-11 | File ID: 23OCT07.D
Sampled: 10/21/14 13:45 | Prepared: 10/23/14 04:00 | Analyzed: 10/23/14 09:34
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2011 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.420	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.160	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7700	87.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	183946	6.66	197165	6.66	
Chlorobenzene-d5 (IS)	63262	9.68	63627	9.68	
1,4-Difluorobenzene (IS)	236754	7.46	247519	7.45	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-1-4Q14

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-12 | File ID: 23OCT18.D
Sampled: 10/21/14 11:50 | Prepared: 10/23/14 04:00 | Analyzed: 10/23/14 13:43
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2011 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U U5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.19	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.090	J
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-1-4Q14

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-12 | File ID: 23OCT18.D
Sampled: 10/21/14 11:50 | Prepared: 10/23/14 04:00 | Analyzed: 10/23/14 13:43
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2011 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.20	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.22	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/10/14

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3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:21:57PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-1-4Q14

Laboratory: BC Laboratories | SDG: 14-25001
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425001-12 | File ID: 23OCT18.D
Sampled: 10/21/14 11:50 | Prepared: 10/23/14 04:00 | Analyzed: 10/23/14 13:43
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2011 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U US
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.240	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.130	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9100	99.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	210800	6.66	197165	6.66	
Chlorobenzene-d5 (IS)	67513	9.68	63627	9.68	
1,4-Difluorobenzene (IS)	261275	7.45	247519	7.45	

12/10/14

LDC #: 33126B1 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/25/14
SDG #: 14-25001 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: KR
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/21/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ≤20%, r2
IV.	Continuing calibration/ICV	SW	ICV/CCV ≤30%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A ~~N~~	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	FD = 9 + 12
XVII.	Field blanks	ND	TB = 1 EB = 2

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation

Water

1	TB-2-10/21/14	11	MW-14-2	21		31	BXJ2010-BLK1
2	EB-2-10/21/14	12	DUP-1-4Q14	22		32	2141549-CCB2
3	MW-3-5	13	MW-3-3MS	23		33	BXJ2011-BLK1
4	MW-3-4	14	MW-3-3MSD	24		34	
5	MW-3-3	15	MW-14-2MS	25		35	
6	MW-3-2	16	MW-14-2MSD	26		36	
7	MW-3-1	17		27		37	
8	MW-14-5	18		28		38	
9	MW-14-4	19		29		39	
10	MW-14-3**	20		30		40	

VALIDATION FINDINGS CHECKLIST

Reviewer: BR

2nd Reviewer:

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

VALIDATION FINDINGS CHECKLIST

Reviewer: BR

2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within +/-40% from the associated calibration standard?	✓			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/RLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	✓			
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Methyl iodide
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. trans-1,4-Dichloro-2-butene
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR. Pentachloroethane
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33126B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: KR
2nd Reviewer: Q

METHOD: GC/MS VOA (EPA Method 524.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y N N/A Were all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	10/22/14	CCV-220CT02	B	46.9	B 5, 13-14 + BXJ2010-BLK1	J/UJ/P (ND)
	10/22/14	CCV-220CT03	PPPP	46.2	↓	
	10/22/14	CCV-220CT33	B	63.9	1-4 6 + 141549-CCB2	
	10/22/14	CCV-220CT34	QQQQ PPPP	34.1 61.1	↓	
	10/23/14	CCV-230CT02	B	88.0	7-12, 15-16 + BXJ2011-BLK1	
	10/23/14	CCV-230CT03	PPPP	78.4	↓	↓

LDC #: 32126B1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: BR
2nd reviewer: ~~X~~

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (~~ug/L~~ ug/L)		RPD
	9	12	
K	0.25	0.19	27
JJJ	0.11	0.090	20
HHH	0.080	0.062U	200
I	0.13	0.17U	200
QQQ	0.12	0.085U	200
AA	0.26	0.20	26
S	0.29	0.22	27

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 33126B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ A_x = Area of Compound A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards C_x = Concentration of compound, C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) S= Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	9/29/2014	1,1-Dichloroethene (IS1)	0.738356	0.738355	0.7196486	0.7196486	7.161084	7.161084
	MS-V5		Trichloroethene (IS2)	0.367066	0.367066	0.3568518	0.3568518	6.373252	6.373256
			1,1,2,2-Tetrachloethane	0.640540	0.640540	0.6038102	0.6038102	9.719705	9.719699

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ A_x = Area of Compound A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards C_x = Concentration of compound, C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) S= Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 32/80 std)	Recalculated RRF (RRF 32/80 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	9/29/2014	Allyl chloride (IS1)	0.735051	0.735051	0.7121014	0.7121014	6.759083	6.759089
	MS-V5		Methyl methacrylate (IS	0.078498	0.078498	0.0774599	0.0774598	6.029047	6.029007
			Pentachloroethane (IS3	0.711963	0.711963	0.6967004	0.6967004	13.77065	13.77064

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC#: 33126B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: BR
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	23OCT02	10/23/2014	1,1-Dichloroethene (IS1)	0.719649	0.691906	0.691906	3.9	3.9
			Trichloroethene (IS2)	0.356852	0.3565193	0.3565193	0.09	0.09
			1,1,2,2-Tetrachloethane	0.603810	0.6229781	0.6229781	3.2	3.2
2	23OCT03	10/23/2014	Allyl chloride (IS1)	0.712101	0.686717	0.686717	3.6	3.6
			Methyl methacrylate (IS2	0.077460	0.07124706	0.07124706	8.0	8.0
			Pentachloroethane (IS3	0.696700	0.6571896	0.6571896	5.7	5.7

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126B1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: BR
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1D

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	10.00	10.10	101	101	0
Bromofluorobenzene	↓	10.12	101	101	0
1,2-Dichlorobenzene-d4	↓	10.57	106	106	0
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

LDC #: 33126B1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: RR
2nd Reviewer: [signature]

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC)

MSC = Matrix spike concentration; MSDC = Matrix spike duplicate concentration

MS/MSD sample: 15/16

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
H	25.00	25.00	0	25.040	24.820	100	100	99.3	99.3	0.882	0.882
S	↓	↓	3.830	31.090	29.580	109	109	103	103	4.98	4.98
V			0	25.630	25.350	103	103	101	101	1.30	1.30
CC			0	26.900	26.630	108	108	107	107	1.01	1.01
DD			0	26.190	26.250	105	105	105	105	0.229	0.229

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126B1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: BR
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: BXJ2011-BS1

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	25.00	"	24.490	"	98.0	98.0				
Trichloroethene			25.620		102	102				
Benzene			24.760		99.0	99.0				
Toluene			26.640		107	107				
Chlorobenzene			25.600		102	102				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126B1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: BR
2nd reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

S= 1.8 ug/L

Sample I.D. 10 , 5 :

Conc. = $\frac{(17044)(10)(\quad)}{(264624)(0.3568518)(\quad)}$

= 1.806595126 ug/L

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 21, 2014

LDC Report Date: December 12, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25001

Sample Identification

EB-2-10/21/14
MW-3-5
MW-3-4
MW-3-3
MW-3-2
MW-3-1
MW-14-5
MW-14-4
MW-14-3**
MW-14-2
DUP-1-4Q14
EB-2-10/21/14MS
EB-2-10/21/14MSD
EB-2-10/21/14DUP
DUP-1-4Q14MS
DUP-1-4Q14MSD
DUP-1-4Q14DUP

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 17 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Calibration

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Chromium	1.0210 ug/L	All samples in SDG 14-25001

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-3-3	Chromium	4.4 ug/L	4.4U ug/L
MW-3-2	Chromium	0.73 ug/L	0.73U ug/L
MW-14-4	Chromium	2.4 ug/L	2.4U ug/L
MW-14-2	Chromium	0.66 ug/L	0.66U ug/L
DUP-1-4Q14	Chromium	2.5 ug/L	2.5U ug/L

V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was not required by the method.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples MW-14-4 and DUP-1-4Q14 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-14-4	DUP-1-4Q14	
Chromium	2.4	2.5	4

XIV. Field Blanks

Sample EB-2-10/21/14 was identified as an equipment blank. No chromium was found.

NASA JPL, 4Q2014
Chromium - Data Qualification Summary - SDG 14-25001

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-25001

SDG	Sample	Analyte	Modified Final Concentration	A or P
14-25001	MW-3-3	Chromium	4.4U ug/L	A
14-25001	MW-3-2	Chromium	0.73U ug/L	A
14-25001	MW-14-4	Chromium	2.4U ug/L	A
14-25001	MW-14-2	Chromium	0.66U ug/L	A
14-25001	DUP-1-4Q14	Chromium	2.5U ug/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 3:58:27PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-2-10/21/14

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-02RE2
File ID: PE_EL2_141208-072
Sampled: 10/21/14 07:00
Prepared: 11/04/14 08:30
Analyzed: 12/08/14 17:48
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0696
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

IC 12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 3:58:27PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-3-5

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-03RE2
File ID: PE_EL2_141208-101
Sampled: 10/21/14 07:30
Prepared: 11/04/14 08:30
Analyzed: 12/08/14 19:44
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0696
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	30	1		EPA-200.8

12/12/14

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3761 Attucks Drive
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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-3-4

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-04RE2
File ID: PE_EL2_141208-102
Sampled: 10/21/14 08:10
Prepared: 11/04/14 08:30
Analyzed: 12/08/14 19:47
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0696
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	13	1		EPA-200.8

12/12/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-3-3

Laboratory: BC Laboratories
Client: Tidewater Inc.
Matrix: Water
Sampled: 10/21/14 08:40
Solids: 0.00
Batch: BXL0696 Sequence: 1418209

SDG: 14-25001
Project: JPL- GW Monitoring Wells
Laboratory ID: 1425001-05RE2
Prepared: 11/04/14 08:30
Preparation: EPA 200.2
File ID: PE_EL2_141208-103
Analyzed: 12/08/14 19:50
Initial/Final: 50 ml / 50 ml
Calibration: UNASSIGNED Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	4.4 U	1		EPA-200.8

12/12/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-3-2

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-06RE2
File ID: PE_EL2_141208-104
Sampled: 10/21/14 09:20
Prepared: 11/04/14 08:30
Analyzed: 12/08/14 19:54
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0696
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.73 U	1	J	EPA-200.8

12/12/14

Tidewater Inc.
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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-3-1

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-07RE2
File ID: PE_EL2_141208-105
Sampled: 10/21/14 09:50
Prepared: 11/04/14 08:30
Analyzed: 12/08/14 19:57
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0696
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 3:58:27PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-14-5

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-08RE2
File ID: PE_EL2_141208-106
Sampled: 10/21/14 11:00
Prepared: 11/04/14 08:30
Analyzed: 12/08/14 20:01
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0696
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

R 12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 3:58:27PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-14-4

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-09RE2
File ID: PE_EL2_141208-107
Sampled: 10/21/14 11:40
Prepared: 11/04/14 08:30
Analyzed: 12/08/14 20:04
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0696
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.4 U	1	J	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 3:58:27PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-14-3

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-10RE2
File ID: PE_EL2_141208-108
Sampled: 10/21/14 13:10
Prepared: 11/04/14 08:30
Analyzed: 12/08/14 20:08
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0696
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 3:58:27PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-14-2

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-11RE2
File ID: PE_EL2_141208-109
Sampled: 10/21/14 13:45
Prepared: 11/04/14 08:30
Analyzed: 12/08/14 20:11
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0696
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.66 U	1	J	EPA-200.8

N 12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 3:58:27PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

DUP-1-4Q14

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-12RE2
File ID: PE_EL2_141208-082
Sampled: 10/21/14 11:50
Prepared: 12/08/14 08:30
Analyzed: 12/08/14 18:36
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0700
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.5 U	1	J	EPA-200.8

12/21/14

LDC #: 33126B4

SDG #: 14-25001

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/1/14

Page: 1 of 1

Reviewer: KK

2nd Reviewer: AL

METHOD: Chromium (EPA Method 200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/21/14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	~~SW~~ A	
V.	ICP Interference Check Sample (ICS) Analysis	N	not required
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	ICP Serial Dilution	N	not performed
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates SW	~~SW~~	(8, 11)
XIV.	Field Blanks ND	~~SW~~	EB = 1

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	EB-2-10/21/14	11	DUP-1-4Q14	21	#11 MS	31	
2	MW-3-5	12	~~MW-3-3MS~~	22	#11 MSD	32	
3	MW-3-4	13	MW-3-3MSD	23	#1 MSD	33	
4	MW-3-3	14	MW-3-3DUP	24		34	
5	MW-3-2	15	MW-14-2MS	25		35	
6	MW-3-1	16	MW-14-2MSD	26		36	
7	MW-14-5	17	~~MW-14-2DUP~~	27		37	
8	MW-14-4	18	#1 DUP	28		38	
9	MW-14-3**	19	#11 DUP	29		39	
10	MW-14-2	20	#1 MS	30		40	

Notes: _____

)C #: 331264B4

VALIDATION FINDINGS CHECKLIST

Reviewer: KK
2nd Reviewer: 02

Method: Metals (EPA ~~SW-846~~ Method ~~6010/7000/6020~~) 200.8

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓	X PBW		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?			✓	
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?			✓	
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?		✓		
Were all percent differences (%Ds) < 10%?			✓	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XIII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.	✗	✓		

LDC #: 33126B4

Chromium 200.8

METHOD: ~~Metals~~ (EPA ~~SW 864~~ Method ~~6020A/7471A~~)

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: NA

Sample Concentration units, unless otherwise noted: ug/l

Associated Samples: All

Reviewer: KK

2nd Reviewer:

					Sample Identification										
Analyte	**Maximum PB[a] (mg/Kg)**	**Maximum PB[a] (mg/l)**	**Maximum ICB/CCB[a] (ug/l)**	**Action Level**	**4**	5	8	10	11						
Cr			1.0210	5.105	4.4	0.73	2.4	0.66	2.5						

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC#: 33126B4

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: KK
2nd Reviewer: AV

METHOD: Metals (EPA Method 200.8)

Analyte	Concentration (ug/L)		RPD
	8	11	
Chromium	2.4	2.5	4

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33126B4.wpd

LDC #: 33126B4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: KK
2nd Reviewer: 9

METHOD: ~~Trace Metals~~ (EPA ~~SW 846 Me~~thod ~~6010/6020/7000~~) Chromium 200.8

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found x 100 / True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)			~~50.000~~			
ICV (11:00)	ICP/MS (Initial calibration)	Cr	52.847	50.000	106	106	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV (17:32)	ICP/MS (Continuing calibration)	Cr	41.564	40.000	104	104	Y
	CVAA (Continuing calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126B4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: KK
2nd Reviewer: DL

METHOD: ~~Trace Metals~~ Chromium (EPA ~~SW-846~~ Method 200.8 ~~6010/6020/7000~~)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

%D = |I-SDR| / I x 100 Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (ug/L) (units)	True / D / SDR (ug/L) (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
N/A	ICP interference check	~~Cr~~					
LCS (17:44)	Laboratory control sample	Cr	42.173	40.000	105	105	Y
20 (17:58)	Matrix spike	Cr	(SSR-SR) 43.023	40.000	108	109	↓
~~18~~ 19 (18:40)	Duplicate	Cr	2.483	2.840	13.4	~~NC~~ 13.4	↓
N/A	ICP serial dilution						

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33212
6B4

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: KK

2nd reviewer: [signature]

200.8

METHOD: Trace Metals (EPA ~~SW 846~~ Method ~~6010/6020/7000~~)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?

(Y) N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?

(Y) N N/A Are all detection limits below the CRDL?

Detected analyte results for Cr were recalculated and verified using the following equation:

Concentration = (RD)(FV)(Dil) / (In. Vol.)

Recalculation:

9:

RD = Raw data concentration

FV = Final volume (ml)

In. Vol. = Initial volume (ml) or weight (G)

Dil = Dilution factor

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration (µg/L)	Acceptable (Y/N)
	9				
		non-detect			

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 21, 2014

LDC Report Date: December 10, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25001

Sample Identification

EB-2-10/21/14
MW-3-5
MW-3-4
MW-3-3
MW-3-2
MW-3-1
MW-14-5
MW-14-4
MW-14-3**
MW-14-2
DUP-1-4Q14
MW-3-3MS
MW-3-3MSD
MW-3-3DUP
MW-14-2MS
MW-14-2MSD
MW-14-2DUP

** Indicates sample underwent Level IV review

Introduction

This data review covers 17 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium, and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent EPA Level IV review. EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met for each method.

III. Calibration verification

Calibration verification frequency and analysis criteria were met for each method.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Perchlorate	0.68150 ug/L	EB-2-10/21/14 MW-3-5 MW-3-4 MW-3-3 MW-3-2 MW-3-1 MW-14-5 MW-14-4 MW-14-3**

Sample concentrations were compared to concentrations detected in the blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-3-4	Perchlorate	1.1 ug/L	1.1U ug/L
MW-3-3	Perchlorate	1.0 ug/L	1.0U ug/L

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-14-4 and DUP-1-4Q14 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-14-4	DUP-1-4Q14	
Hexavalent Chromium	0.0017	0.0019	11
Perchlorate	4.6	4.8	4

XI. Field Blanks

Sample EB-2-10/21/14 was identified as an equipment blank. No contaminant concentrations were found.

NASA JPL, 4Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-25001

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-14-25001

SDG	Sample	Analyte	Modified Final Concentration	A or P
14-25001	MW-3-4	Perchlorate	1.1U ug/L	A
14-25001	MW-3-3	Perchlorate	1.0U ug/L	A

NASA JPL, 4Q2014
Wet Chemistry - Field Blank Data Qualification Summary - 14-25001

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-2-10/21/14

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-02
File ID: F103014.seq-7.0000.txt
Sampled: 10/21/14 07:00
Prepared: 10/30/14 15:00
Analyzed: 10/30/14 17:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2850
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/11/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-3-5

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-03
File ID: F103014.seq-8.0000.txt
Sampled: 10/21/14 07:30
Prepared: 10/30/14 15:00
Analyzed: 10/30/14 17:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2850
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

11/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-3-4

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-04
File ID: F103014.seq-9.0000.txt
Sampled: 10/21/14 08:10
Prepared: 10/30/14 15:00
Analyzed: 10/30/14 17:40
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2850
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.1	1	J U	EPA-314.0

12/11/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-3-3

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-05
File ID: F103014.seq-10.0000.txt
Sampled: 10/21/14 08:40
Prepared: 10/30/14 15:00
Analyzed: 10/30/14 17:54
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2850
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.0	1	J U	EPA-314.0

12/11/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-3-2

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-06RE1
File ID: F103014.seq-46.0000.txt
Sampled: 10/21/14 09:20
Prepared: 10/30/14 15:00
Analyzed: 10/31/14 06:24
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2850
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	32	2	D	EPA-314.0

11/11/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-3-1

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-07
File ID: F103014.seq-17.0000.txt
Sampled: 10/21/14 09:50
Prepared: 10/30/14 15:00
Analyzed: 10/30/14 19:30
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2850
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/11/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-14-5

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-08
File ID: F103014.seq-18.0000.txt
Sampled: 10/21/14 11:00
Prepared: 10/30/14 15:00
Analyzed: 10/30/14 19:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2850
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/11/14 JK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-14-4

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-09
File ID: F103014.seq-50.0000.txt
Sampled: 10/21/14 11:40
Prepared: 10/30/14 15:00
Analyzed: 10/31/14 07:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2850
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.6	1		EPA-314.0

11/14/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-14-3

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-10
File ID: F103014.seq-20.0000.txt
Sampled: 10/21/14 13:10
Prepared: 10/30/14 15:00
Analyzed: 10/30/14 20:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2850
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	5.3	1		EPA-314.0

12/11/14 Y

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-14-2

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-11
File ID: F103014.seq-54.0000.txt
Sampled: 10/21/14 13:45
Prepared: 10/30/14 23:00
Analyzed: 10/31/14 08:20
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2852
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.9	1	J	EPA-314.0

11/11/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

DUP-1-4Q14

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-12
File ID: F103014.seq-34.0000.txt
Sampled: 10/21/14 11:50
Prepared: 10/30/14 23:00
Analyzed: 10/31/14 03:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2852
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.8	1		EPA-314.0

11/11/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-2-10/21/14

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-02
File ID: 141022 0133 CR6-009
Sampled: 10/21/14 07:00
Prepared: 10/22/14 01:33
Analyzed: 10/22/14 01:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2076
Sequence: 1415638
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/11/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-3-5

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-03
File ID: 141022 0133 CR6-010
Sampled: 10/21/14 07:30
Prepared: 10/22/14 01:33
Analyzed: 10/22/14 01:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2076
Sequence: 1415638
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/11/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-3-4

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-04
File ID: 141022 0133 CR6-011
Sampled: 10/21/14 08:10
Prepared: 10/22/14 01:33
Analyzed: 10/22/14 01:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2076
Sequence: 1415638
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/11/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-3-3

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-05
File ID: 141022 0133 CR6-005
Sampled: 10/21/14 08:40
Prepared: 10/22/14 01:33
Analyzed: 10/22/14 01:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2076
Sequence: 1415638
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/11/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-3-2

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-06
File ID: 141022 0133 CR6-012
Sampled: 10/21/14 09:20
Prepared: 10/22/14 01:33
Analyzed: 10/22/14 01:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2076
Sequence: 1415638
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/11/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-3-1

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-07
File ID: 141022 0133 CR6-015
Sampled: 10/21/14 09:50
Prepared: 10/22/14 01:33
Analyzed: 10/22/14 01:36
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2076
Sequence: 1415638
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/11/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-14-5

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-08
File ID: 141022 0816 CR6-010
Sampled: 10/21/14 11:00
Prepared: 10/22/14 08:16
Analyzed: 10/22/14 08:16
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2077
Sequence: 1415640
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/11/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-14-4

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-09
File ID: 141022 0816 CR6-011
Sampled: 10/21/14 11:40
Prepared: 10/22/14 08:16
Analyzed: 10/22/14 08:16
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2077
Sequence: 1415640
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0017	1	J	EPA-7196

12/4/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-14-3

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-10
File ID: 141022 0816 CR6-012
Sampled: 10/21/14 13:10
Prepared: 10/22/14 08:16
Analyzed: 10/22/14 08:16
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2077
Sequence: 1415640
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/11/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-14-2

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-11
File ID: 141022 0816 CR6-005
Sampled: 10/21/14 13:45
Prepared: 10/22/14 08:16
Analyzed: 10/22/14 08:16
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2077
Sequence: 1415640
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/11/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:18:44PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

DUP-1-4Q14

Laboratory: BC Laboratories
SDG: 14-25001
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425001-12
File ID: 141022 0816 CR6-009
Sampled: 10/21/14 11:50
Prepared: 10/22/14 08:16
Analyzed: 10/22/14 08:16
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2077
Sequence: 1415640
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0019	1	J	EPA-7196

12/11/14

LDC #: 33126B6

SDG #: 14-25001

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/1/14

Page: 1 of 1

Reviewer: KF

2nd Reviewer: [signature]

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/21/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	SW	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	A	Not reviewed for Level III validation.
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD=(8,11)
XI	Field blanks	ND	EB=1

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	EB-2-10/21/14	11	DUP-1-4Q14	21		31	
2	MW-3-5	12	MW-3-3MS	22		32	
3	MW-3-4	13	MW-3-3MSD	23		33	
4	MW-3-3	14	MW-3-3DUP	24		34	
5	MW-3-2	15	MW-14-2MS	25		35	
6	MW-3-1	16	MW-14-2MSD	26		36	
7	MW-14-5	17	MW-14-2DUP	27		37	
8	MW-14-4	18		28		38	
9	MW-14-3**	19		29		39	
10	MW-14-2	20		30		40	

Notes:

LDC #: 33126B0

VALIDATION FINDINGS CHECKLIST

Reviewer: KK
2nd Reviewer: AR

Method: Inorganics (EPA Method 300.0 (over))

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 33126B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: KK
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-11	W	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ~~ClO_4~~ KK
QC 12-~~14~~ 17	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 33126B6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 1K
2nd Reviewer: CR

METHOD: Inorganics, Method See Cover

Conc. units: ug/L **Associated Samples:** 1-9

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB (ug/L)	ICB/CCB (mg/L)		3	4								
ClO4	0.68150		3.4075	1.1	1.0								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC# 33126B6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: KW

2nd Reviewer: [signature]

Inorganics: Method See Cover

Analyte	Concentration (ug/L)		RPD
	8	11	
Hexavalent Chromium	0.0017	0.0019	11
Perchlorate	4.6	4.8	4

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33126B6.wpd

LDC #: 33126B6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: KK
2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr6+ was recalculated.Calibration date: 10/8/14

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Hexavalent Chromium	s1	0.00	0.001	*0.999946*	0.999877	Y
		s2	0.00	0.003			
		s3	0.01	0.005			
		s4	0.03	0.02			
		s5	0.05	0.039			
		s6	0.10	0.076			
Calibration verification	↓	CCV (8:18)	0.049	0.0500	98.0	96.3	Y
Calibration verification	Perchlorate	CCV (18:35)	10.15	10.000	101.5	99.0	Y
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126B6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: ek
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (mg/L) (units)	True / D (mg/L) (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Cr6+	~~0.05305~~ ~~0.0504~~ 0.0504	0.05000	~~106~~ 101	101	Y
12	Matrix spike sample	↓	(SSR-SR) 0.0446315	0.052632	85.0	~~103~~ 85.0	Y
17	Duplicate sample	ClO_4	3.65792 mg/L	3.65792	0.00	7.63	Y

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126B6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: KP
2nd reviewer: a

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for ClO4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = Area x X coefficient + Constant

Recalculation: (0.006 ms*min)(927.59523117) - 0.052457 = 5.51311 mg/L

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	9	ClO4	5.3	5.5	Y

Note: Cr6+ results none detect

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 22, 2014

LDC Report Date: December 2, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25112

Sample Identification

TB-3-10/22/14
EB-3-10/22/14
MW-11-5
MW-11-4
MW-11-3
MW-11-2
MW-11-1
MW-17-5
MW-17-4**
MW-17-3
MW-17-2
MW-17-2MS
MW-17-2MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 13 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of the presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/23/14 (CCV-23OCT33)	Bromomethane	59.6	All samples in SDG 14-25112	J (all detects) UJ (all non-detects)	P
10/23/14 (CCV-23OCT34)	trans-1,4-Dichloro-2-butene Methyl iodide Pentachloroethane	33.8 65.2 46.6	All samples in SDG 14-25112	J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Although matrix spike (MS) and matrix spike duplicate (MSD) samples were not required by the method, MS and MSD samples were reported by the laboratory. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Compound Quantitation

All compound quantitations were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample TB-3-10/22/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-3-10/22/14 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL, 4Q2014
Volatiles - Data Qualification Summary - SDG 14-25112

SDG	Sample	Compound	Flag	A or P	Reason
14-25112	TB-3-10/22/14 EB-3-10/22/14 MW-11-5 MW-11-4 MW-11-3 MW-11-2 MW-11-1 MW-17-5 MW-17-4** MW-17-3 MW-17-2	Bromomethane trans-1,4-Dichloro-2-butene Methyl iodide Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 4Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-25112

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-3-10/22/14

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-01 | File ID: 23OCT51.D
Sampled: 10/22/14 06:30 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 02:11
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/10/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-3-10/22/14

Laboratory:	BC Laboratories			SDG:	14-25112
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425112-01	File ID:	23OCT51.D
Sampled:	10/22/14 06:30	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 02:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-3-10/22/14

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-01 | File ID: 23OCT51.D
Sampled: 10/22/14 06:30 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 02:11
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.390	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.310	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7500	87.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	182789	6.67	209040	6.67	
Chlorobenzene-d5 (IS)	60790	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	237916	7.45	270971	7.46	

12/10/14 JD

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-3-10/22/14

Laboratory:	BC Laboratories			SDG:	14-25112
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425112-02	File ID:	23OCT52.D
Sampled:	10/22/14 07:00	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 02:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/10/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-3-10/22/14

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-02 | File ID: 23OCT52.D
Sampled: 10/22/14 07:00 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 02:33
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-3-10/22/14

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-02 | File ID: 23OCT52.D
Sampled: 10/22/14 07:00 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 02:33
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.600	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.000	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6600	86.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	185853	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	62434	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	245501	7.46	270971	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-5

Laboratory:	BC Laboratories		SDG:	14-25112	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425112-03	File ID:	23OCT53.D
Sampled:	10/22/14 07:30	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 02:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-11-5

Laboratory:	BC Laboratories		SDG:	14-25112	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425112-03	File ID:	23OCT53.D
Sampled:	10/22/14 07:30	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 02:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.11	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/10/14 D

Tidewater Inc.
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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-5

Laboratory:	BC Laboratories		SDG:	14-25112	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425112-03	File ID:	23OCT53.D
Sampled:	10/22/14 07:30	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 02:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.620	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.090	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6500	86.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	179226	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	60341	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	228055	7.46	270971	7.46	

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-4

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-04 | File ID: 23OCT54.D
Sampled: 10/22/14 08:10 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 03:19
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-11-4

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-04
File ID: 23OCT54.D
Sampled: 10/22/14 08:10
Prepared: 10/23/14 12:00
Analyzed: 10/24/14 03:19
Solids:
Preparation: EPA 5030 Water MS
Initial/Final: 25 ml / 25 ml
Batch: BXJ2164
Sequence: 1415584
Calibration: 1410010
Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.11	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

17/10/14

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Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-11-4

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-04 | File ID: 23OCT54.D
Sampled: 10/22/14 08:10 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 03:19
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.47	J
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.690	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.060	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7600	87.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	165879	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	55991	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	216020	7.46	270971	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-3

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-05 | File ID: 23OCT55.D
Sampled: 10/22/14 08:40 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 03:41
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.21	J
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.20	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/10/14 K

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3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-3

Laboratory:	BC Laboratories		SDG:	14-25112	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425112-05	File ID:	23OCT55.D
Sampled:	10/22/14 08:40	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 03:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.070	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.090	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

17/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-3

Laboratory:	BC Laboratories		SDG:	14-25112	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425112-05	File ID:	23OCT55.D
Sampled:	10/22/14 08:40	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 03:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.640	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9600	99.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6100	86.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	179514	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	60415	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	236480	7.45	270971	7.46	

17/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-2

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-06 | File ID: 23OCT56.D
Sampled: 10/22/14 09:10 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 04:04
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-2

Laboratory:	BC Laboratories		SDG:	14-25112	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425112-06	File ID:	23OCT56.D
Sampled:	10/22/14 09:10	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 04:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-2

Laboratory:	BC Laboratories		SDG:	14-25112	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425112-06	File ID:	23OCT56.D
Sampled:	10/22/14 09:10	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 04:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.570	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.100	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7900	87.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	184277	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	59514	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	237999	7.46	270971	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-1

Laboratory:	BC Laboratories			SDG:	14-25112
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425112-07	File ID:	23OCT57.D
Sampled:	10/22/14 09:40	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 04:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-1

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-07 | File ID: 23OCT57.D
Sampled: 10/22/14 09:40 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 04:26
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.080	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-1

Laboratory:	BC Laboratories		SDG:	14-25112	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425112-07	File ID:	23OCT57.D
Sampled:	10/22/14 09:40	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 04:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.690	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.140	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6800	86.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	176961	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	59899	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	225001	7.46	270971	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-5

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-08 | File ID: 23OCT58.D
Sampled: 10/22/14 10:40 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 04:49
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U U5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-5

Laboratory:	BC Laboratories			SDG:	14-25112
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425112-08	File ID:	23OCT58.D
Sampled:	10/22/14 10:40	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 04:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.080	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.36	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-5

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-08 | File ID: 23OCT58.D
Sampled: 10/22/14 10:40 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 04:49
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.320	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.250	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8000	88.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	178760	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	58965	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	224519	7.45	270971	7.46	

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-4

Laboratory:	BC Laboratories			SDG:	14-25112
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425112-09	File ID:	23OCT59.D
Sampled:	10/22/14 11:20	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 05:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.32	J
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.55	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-4

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-09 | File ID: 23OCT59.D
Sampled: 10/22/14 11:20 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 05:11
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.31	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.7	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-17-4

Laboratory:	BC Laboratories		SDG:	14-25112	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425112-09	File ID:	23OCT59.D
Sampled:	10/22/14 11:20	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 05:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.930	109	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.050	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8600	88.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	177392	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	59961	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	230266	7.46	270971	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-3

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-10 | File ID: 23OCT60.D
Sampled: 10/22/14 12:00 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 05:34
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.29	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.13	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-3

Laboratory:	BC Laboratories		SDG:	14-25112	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425112-10	File ID:	23OCT60.D
Sampled:	10/22/14 12:00	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 05:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.32	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.46	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
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Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
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MW-17-3

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-10 | File ID: 23OCT60.D
Sampled: 10/22/14 12:00 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 05:34
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.630	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.100	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8300	88.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	176924	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	59443	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	228906	7.46	270971	7.46	

12/10/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-2

Laboratory:	BC Laboratories			SDG:	14-25112
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425112-11	File ID:	23OCT50.D
Sampled:	10/22/14 13:00	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 01:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/10/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-2

Laboratory:	BC Laboratories			SDG:	14-25112
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425112-11	File ID:	23OCT50.D
Sampled:	10/22/14 13:00	Prepared:	10/23/14 12:00	Analyzed:	10/24/14 01:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2164	Sequence:	1415584	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/08/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 12:17:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-2

Laboratory: BC Laboratories | SDG: 14-25112
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425112-11 | File ID: 23OCT50.D
Sampled: 10/22/14 13:00 | Prepared: 10/23/14 12:00 | Analyzed: 10/24/14 01:48
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2164 | Sequence: 1415584 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U UJ
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.280	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.080	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7600	87.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	177440	6.66	209040	6.67	
Chlorobenzene-d5 (IS)	58853	9.68	68758	9.68	
1,4-Difluorobenzene (IS)	229187	7.46	270971	7.46	

1/16/15 D

LDC #: 33126C1 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/25/14
SDG #: 14-25112 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: BK
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/22/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ≤ 20%, r2
IV.	Continuing calibration/ICV	SW	ICV/CCV ≤ 30%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	AN	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	TB = 1 EB = 2

Note: A = Acceptable ND = No compounds detected D = Duplicate
N = Not provided/applicable R = Rinsate TB = Trip blank
SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation

Water

1	TB-3-10/22/14	11	MW-17-2	21		31	BXJ2164-BLK1
2	EB-3-10/22/14	12	MW-17-2MS	22		32	
3	MW-11-5	13	MW-17-2MSD	23		33	
4	MW-11-4	14		24		34	
5	MW-11-3	15		25		35	
6	MW-11-2	16		26		36	
7	MW-11-1	17		27		37	
8	MW-17-5	18		28		38	
9	MW-17-4**	19		29		39	
10	MW-17-3	20		30		40	

DC #: 33126C1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: d

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within +/-40% from the associated calibration standard?	✓			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/RLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	✓		✓R	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	✓	✓R		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Methyl iodide
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. trans-1,4-Dichloro-2-butene
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR. Pentachloroethane
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33126C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: BR
2nd Reviewer: CV

METHOD: GC/MS VOA (EPA Method 524.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y (N) N/A Were all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	10/23/14	CCV-230CT33	B	59.6	All	J/UJ/P (WD)
			~~QQQQ~~	~~33.8~~		
	10/23/14	CCV-230CT34	QQQQ	33.8		
			PPPP	65.2		
			RRRR	46.6		

CONCAL.1S5

LDC #: 33126C1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: [signature]

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	9/29/2014	1,1-Dichloroethene (IS1)	0.738356	0.738355	0.7196486	0.7196486	7.161084	7.161084
	MS-V5		Trichloroethene (IS2)	0.367066	0.367066	0.3568518	0.3568518	6.373252	6.373256
			1,1,2,2-Tetrachloethane	0.640540	0.640540	0.6038102	0.6038102	9.719705	9.719699

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126C1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: [signature]

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ A_x = Area of Compound A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards C_x = Concentration of compound, C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) S= Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 32/80 std)	Recalculated RRF (RRF 32/80 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	9/29/2014	Allyl chloride (IS1)	0.735051	0.735051	0.7121014	0.7121014	6.759083	6.759089
	MS-V5		Methyl methacrylate (IS	0.078498	0.078498	0.0774599	0.0774598	6.029047	6.029007
			Pentachloroethane (IS3	0.711963	0.711963	0.6967004	0.6967004	13.77065	13.77064

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC#: 33126C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: [signature]

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	23OCT33	10/23/2014	1,1-Dichloroethene (IS1)	0.719649	0.709146	0.709146	1.5	1.5
			Trichloroethene (IS2)	0.356852	0.3556192	0.3556192	0.3	0.3
			1,1,2,2-Tetrachloethane	0.603810	0.6267972	0.6267972	3.8	3.8
2	23OCT34	10/23/2014	Allyl chloride (IS1)	0.712101	0.673506	0.673506	5.4	5.4
			Methyl methacrylate (IS2	0.077460	0.08274640	0.08274640	6.8	6.8
			Pentachloroethane (IS3	0.696700	0.3717477	0.3717477	46.6	46.6

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126C1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: BR
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 9

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.00	10.05	100	100.5	0.5
Bromofluorobenzene	↓	8.86	88.6	88.6	0
1,2-Dichlorobenzene-d4	↓	10.93	109	109	0
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

LDC #: 33126 C1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: BR
2nd Reviewer: [signature]

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration; MSDC = Matrix spike duplicate concentration

MS/MSD sample: 12|13

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-----	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
H	25.00	25.00	0	23.880	24.210	95.5	95.5	96.8	96.8	1.37	1.37
S	↓	↓	0	25.210	25.210	101	101	101	101	0	0
V			0	24.510	24.780	98	98	99.1	99.1	1.10	1.10
CC			0	25.710	25.550	103	103	102	102	0.624	0.624
DB			0	25.360	25.020	101	101	100	100	1.35	1.35

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126C1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: BR
2nd Reviewer: A

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: BXJ2164

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	25.00	—	24.290	—	97.2	97.2				
Trichloroethene	↓	↓	25.530	↓	102	102				
Benzene	↓	↓	24.750	↓	99	99				
Toluene	↓	↓	26.590	↓	106	106				
Chlorobenzene	↓	↓	25.490	↓	102	102				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126C1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: BR
2nd reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example: S = 1.7

Sample I.D. 9 , S :

Conc. = $\frac{(13890)(10)(\quad)}{(\cancel{177312}\ 230264)(0.3568518)(\quad)}$

= 1.690380746 ug/L

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 22, 2014

LDC Report Date: December 3, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25112

Sample Identification

EB-3-10/22/14
MW-11-5
MW-11-4
MW-11-3
MW-11-2
MW-11-1
MW-17-5
MW-17-4**
MW-17-3
MW-17-2
MW-17-2MS
MW-17-2MSD
MW-17-2DUP

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 13 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Calibration

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was not required by the method.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

Sample EB-3-10/22/14 was identified as an equipment blank. No chromium was found.

NASA JPL, 4Q2014
Chromium - Data Qualification Summary - SDG 14-25112

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-25112

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:28:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-3-10/22/14

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-02
File ID: PE_EL2_141105-136
Sampled: 10/22/14 07:00
Prepared: 11/05/14 08:30
Analyzed: 11/05/14 19:05
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0339
Sequence: 1416439
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

1/5/15 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:28:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-11-5

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-03
File ID: PE_EL2_141105-137
Sampled: 10/22/14 07:30
Prepared: 11/05/14 08:30
Analyzed: 11/05/14 19:08
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0339
Sequence: 1416439
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.2	1	J	EPA-200.8

1/5/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:28:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-11-4

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-04
File ID: PE_EL2_141105-138
Sampled: 10/22/14 08:10
Prepared: 11/05/14 08:30
Analyzed: 11/05/14 19:12
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0339
Sequence: 1416439
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/8/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:28:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-11-3

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-05
File ID: PE_EL2_141105-139
Sampled: 10/22/14 08:40
Prepared: 11/05/14 08:30
Analyzed: 11/05/14 19:15
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0339
Sequence: 1416439
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.61	1	J	EPA-200.8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:28:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-11-2

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-06
File ID: PE_EL2_141105-140
Sampled: 10/22/14 09:10
Prepared: 11/05/14 08:30
Analyzed: 11/05/14 19:19
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0339
Sequence: 1416439
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

11/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:28:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-11-1

Laboratory: BC Laboratories
Client: Tidewater Inc.
Matrix: Water
Sampled: 10/22/14 09:40
Solids: 0.00
Batch: BXK0339 Sequence: 1416439

SDG: 14-25112
Project: JPL- GW Monitoring Wells
Laboratory ID: 1425112-07
Prepared: 11/05/14 08:30
Preparation: EPA 200.2
Calibration: UNASSIGNED

File ID: PE_EL2_141105-141
Analyzed: 11/05/14 19:22
Initial/Final: 50 ml / 50 ml
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

11/18/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:28:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-17-5

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-08
File ID: PE_EL2_141105-142
Sampled: 10/22/14 10:40
Prepared: 11/05/14 08:30
Analyzed: 11/05/14 19:25
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0339
Sequence: 1416439
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.66	1	J	EPA-200.8

1/8/15 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:28:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-17-4

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-09
File ID: PE_EL2_141105-143
Sampled: 10/22/14 11:20
Prepared: 11/05/14 08:30
Analyzed: 11/05/14 19:29
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0339
Sequence: 1416439
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.56	1	J	EPA-200.8

12/3/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:28:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-17-3

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-10
File ID: PE_EL2_141105-144
Sampled: 10/22/14 12:00
Prepared: 11/05/14 08:30
Analyzed: 11/05/14 19:32
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0339
Sequence: 1416439
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.70	1	J	EPA-200.8

12/3/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:28:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-17-2

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-11
File ID: PE_EL2_141105-128
Sampled: 10/22/14 13:00
Prepared: 11/05/14 08:30
Analyzed: 11/05/14 18:36
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0339
Sequence: 1416439
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/3/14

LDC #: 33126C4

SDG #: 14-25112

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/1/14

Page: 1 of 1

Reviewer: LK

2nd Reviewer: CL

METHOD: Chromium (EPA Method 200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/22/14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	N	not required
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	ICP Serial Dilution	N	not performed
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	ND	EB = 1

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	EB-3-10/22/14	11	MW-17-2MS	21		31	
2	MW-11-5	12	MW-17-2MSD	22		32	
3	MW-11-4	13	MW-17-2DUP	23		33	
4	MW-11-3	14		24		34	
5	MW-11-2	15		25		35	
6	MW-11-1	16		26		36	
7	MW-17-5	17		27		37	
8	MW-17-4**	18		28		38	
9	MW-17-3	19		29		39	
10	MW-17-2	20		30		40	

Notes:

)C #: 33126 C4

VALIDATION FINDINGS CHECKLIST

Reviewer: KK
2nd Reviewer:

Method 200.8

Method: Metals (EPA SW ~~846 Method 6010/7000/6020)~~

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?			✓	
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?			✓	
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?		✓	✓	
Were all percent differences (%Ds) < 10%?			✓	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XIII. Field blanks				
Field blanks were identified in this SDG.	✓	✓		
Target analytes were detected in the field blanks.		✓		

LDC #: 33126C1

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: KK
2nd Reviewer: EZ

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found x 100 / True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV (11:13)	ICP/MS (Initial calibration)	Cr	50.376	50.000	101	101	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV (16:35)	ICP/MS (Continuing calibration)	Cr	39.103	40.000	97.8	97.8	Y
	CVAA (Continuing calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126C4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: KK
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA ~~SW 846~~ Method 200.8 ~~6010/6020/7000~~).

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (µg/L) (units)	True / D / SDR (µg/L) (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
N/A	ICP interference check	~~CK~~					
LCS	Laboratory control sample	Cr	40.169	40.000	100	100	Y
11	Matrix spike	↓	(SSR-SR) 35.179	40.000	87.9	87.9	Y
13	Duplicate	↓	ND	ND	NC	NC	Y
N/A	ICP serial dilution						

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126C4

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: KK
2nd reviewer: CA

METHOD: Trace Metals (EPA ~~SW 846 Method 6010/6020/7000~~) 200.8

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for Cr were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

Recalculation:

$$\frac{(0.563\ mg/L)(50\ mL)(1\ mL/KK)}{(50\ mL)} = 0.563\ mg/L$$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	8	Cr	0.56	0.56	Y

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 22, 2014

LDC Report Date: December 4, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25112

Sample Identification

EB-3-10/22/14
MW-11-5
MW-11-4
MW-11-3
MW-11-2
MW-11-1
MW-17-5
MW-17-4**
MW-17-3
MW-17-2
MW-11-1MS
MW-11-1MSD
MW-11-1DUP
MW-17-2MS
MW-17-2MSD
MW-17-2DUP

** Indicates sample underwent Level IV review

Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, and Sulfate, EPA SW 846 Method 7196 for Hexavalent Chromium, EPA Method 353.2 for Nitrite as Nitrogen, EPA Method 365.1 for Orthophosphate as Phosphorus, and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met for each method.

III. Calibration verification

Calibration verification frequency and analysis criteria were met for each method.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
ICB/CCB	Chloride	0.16800 mg/L	MW-11-1

Sample concentrations were compared to concentrations detected in the blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-3-10/22/14 was identified as an equipment blank. No contaminant concentrations were found.

NASA JPL, 4Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-25112

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-17142

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Wet Chemistry - Field Blank Data Qualification Summary - 14-25112

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-3-10/22/14

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-02
File ID: 141023 0051 CR6-009
Sampled: 10/22/14 07:00
Prepared: 10/23/14 00:51
Analyzed: 10/23/14 00:52
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2276
Sequence: 1415708
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/10/14

Tidewater Inc.
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Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-11-5

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-03
File ID: 141023 0051 CR6-010
Sampled: 10/22/14 07:30
Prepared: 10/23/14 00:51
Analyzed: 10/23/14 00:52
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2276
Sequence: 1415708
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

11/10/14 8

Tidewater Inc.
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Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-11-4

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-04
File ID: 141023 0051 CR6-011
Sampled: 10/22/14 08:10
Prepared: 10/23/14 00:51
Analyzed: 10/23/14 00:52
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2276
Sequence: 1415708
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

A10/14

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Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-11-3

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-05
File ID: 141023 0051 CR6-024
Sampled: 10/22/14 08:40
Prepared: 10/23/14 00:51
Analyzed: 10/23/14 01:34
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2276
Sequence: 1415708
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

11/10/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-11-2

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-06
File ID: 141023 0051 CR6-015
Sampled: 10/22/14 09:10
Prepared: 10/23/14 00:51
Analyzed: 10/23/14 00:54
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2276
Sequence: 1415708
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/10/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-11-1

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-07
File ID: 141023 0051 CR6-044
Sampled: 10/22/14 09:40
Prepared: 10/23/14 00:51
Analyzed: 10/23/14 07:21
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2276
Sequence: 1415708
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/10/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-17-5

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-08
File ID: 141023 0051 CR6-037
Sampled: 10/22/14 10:40
Prepared: 10/23/14 00:51
Analyzed: 10/23/14 07:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2276
Sequence: 1415708
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

11/10/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-17-4

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-09
File ID: 141023 0051 CR6-038
Sampled: 10/22/14 11:20
Prepared: 10/23/14 00:51
Analyzed: 10/23/14 07:06
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2276
Sequence: 1415708
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/10/14

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Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-17-3

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-10
File ID: 141023 0051 CR6-039
Sampled: 10/22/14 12:00
Prepared: 10/23/14 00:51
Analyzed: 10/23/14 07:06
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2276
Sequence: 1415708
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

11/13/14

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Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-17-2

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-11
File ID: 141023 0051 CR6-029
Sampled: 10/22/14 13:00
Prepared: 10/23/14 00:51
Analyzed: 10/23/14 01:51
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2276
Sequence: 1415708
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014	2	UD	EPA-7196

10/10

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-3-10/22/14

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-02
File ID: F103014.seq-35.0000.txt
Sampled: 10/22/14 07:00
Prepared: 10/30/14 23:00
Analyzed: 10/31/14 03:52
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2852
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/10/14 JK

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Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-11-5

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-03
File ID: F103014.seq-38.0000.txt
Sampled: 10/22/14 07:30
Prepared: 10/30/14 23:00
Analyzed: 10/31/14 04:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2852
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/10/14 O

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Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-11-4

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-04
File ID: F103014.seq-39.0000.txt
Sampled: 10/22/14 08:10
Prepared: 10/30/14 23:00
Analyzed: 10/31/14 04:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2852
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/10/14 8

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Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-11-3

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-05
File ID: F103014.seq-40.0000.txt
Sampled: 10/22/14 08:40
Prepared: 10/30/14 23:00
Analyzed: 10/31/14 05:01
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2852
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/10/14

Tidewater Inc.
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Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-11-2

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-06
File ID: F103014.seq-41.0000.txt
Sampled: 10/22/14 09:10
Prepared: 10/30/14 23:00
Analyzed: 10/31/14 05:15
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2852
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/10/14 DL

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-11-1

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-07
File ID: F103014.seq-42.0000.txt
Sampled: 10/22/14 09:40
Prepared: 10/30/14 23:00
Analyzed: 10/31/14 05:29
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2852
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-17-5

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-08
File ID: F103014.seq-43.0000.txt
Sampled: 10/22/14 10:40
Prepared: 10/30/14 23:00
Analyzed: 10/31/14 05:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2852
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

11/10/14

Tidewater Inc.
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Powell, OH 43065

Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-17-4

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-09
File ID: F103014.seq-44.0000.txt
Sampled: 10/22/14 11:20
Prepared: 10/30/14 23:00
Analyzed: 10/31/14 05:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2852
Sequence: 1416240
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	6.8	1		EPA-314.0

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-17-3

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-10
File ID: F103114.seq-8.0000.txt
Sampled: 10/22/14 12:00
Prepared: 10/31/14 13:00
Analyzed: 10/31/14 14:53
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0220
Sequence: 1416347
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	6.2	1		EPA-314.0

11/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/14/2014 3:26:22PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-17-2

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-11
File ID: F103114.seq-9.0000.txt
Sampled: 10/22/14 13:00
Prepared: 10/31/14 13:00
Analyzed: 10/31/14 15:07
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0220
Sequence: 1416347
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/10/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 9:06:25AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-300.0

MW-11-1

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-07
File ID: A102314.seq-22
Sampled: 10/22/14 09:40
Prepared: 10/23/14 08:00
Analyzed: 10/23/14 13:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2192
Sequence: 1416379
Calibration: UNASSIGNED
Instrument: IC1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	14	1		EPA-300.0
14797-55-8	Nitrate as N	0.22	1		EPA-300.0
14808-79-8	Sulfate	30	1		EPA-300.0

11/18/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 9:06:25AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-365.1

MW-11-1

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-07
File ID: 141023 0820 PO4-008
Sampled: 10/22/14 09:40
Prepared: 10/23/14 08:20
Analyzed: 10/23/14 08:20
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2288
Sequence: 1415764
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.020	1		EPA-365.1

11/07/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/17/2014 9:06:25AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-11-1

Laboratory: BC Laboratories
SDG: 14-25112
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425112-07
File ID: 141023 0818 NO2-014
Sampled: 10/22/14 09:40
Prepared: 10/23/14 08:18
Analyzed: 10/23/14 08:21
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2290
Sequence: 1415761
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.012	1	U	EPA-353.2

11/10/14 8

LDC #: 33126C6

SDG #: 14-25112

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/1/14

Page: 1 of 1

Reviewer: KK

2nd Reviewer: CN

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Hexavalent Chromium (EPA SW846 Method 7196), Nitrite-N (EPA ~~Methdo~~ Method 353.2), Orthophosphate (EPA Method 365.1), Perchlorate (EPA Method 314.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/22/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	SW	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VI.	Duplicates	A	D/P
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	A	Not reviewed for Level III validation.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI	Field blanks	ND	EB = 1

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	EB-3-10/22/14	11	MW-11-1MS	21		31	
2	MW-11-5	12	MW-11-1MSD	22		32	
3	MW-11-4	13	MW-11-1DUP	23		33	
4	MW-11-3	14	MW-17-2MS	24		34	
5	MW-11-2	15	MW-17-2MSD	25		35	
6	MW-11-1	16	MW-17-2DUP	26		36	
7	MW-17-5	17		27		37	
8	MW-17-4**	18		28		38	
9	MW-17-3	19		29		39	
10	MW-17-2	20		30		40	

Notes:

LDC #: 33126C6

VALIDATION FINDINGS CHECKLIST

Reviewer: KK
2nd Reviewer: CR

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
X. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 33126C6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: KK
2nd reviewer: Q

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
6	W	pH TDS (Cl) F (NO3 N) (NO2 N) (SO4) (O-PO4) Alk CN NH3 TKN TOC Cr6+ ClO4
/		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
1-10		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC (Cr6+) (ClO4)
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC 14-16		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC (Cr6+) (ClO4)
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC 11-13	↓	pH TDS Cl F NO3 (NO2 N) SO4 (O-PO4) Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 33126C6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: KK
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 6

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB (mg/L)	ICB/CCB (mg/L)		no quals									
Cl		0.16800	0.84										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 331206

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: KA
2nd Reviewer: CA

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of ClO4 was recalculated.Calibration date: 10/22/14

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	(ug/L) Standard	Conc. (ug/L)	Abs	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	ClO4	s1	2	0.0022	*0.999928*	0.999570	Y
		s2	4	0.0045			
		s3	6	0.0065			
		s4	10	0.0108			
		s5	20	0.0214			
Calibration verification		CCV(18:35)	10.20576	10.0	102	99.0	
Calibration verification	Cr6+	CCV (00:51)	0.0517	0.05	103	102	
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33126C6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: KB
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (mg/L)	True / D (mg/L)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Cr6+	0.0490	0.050000	98.0	98.6	Y
14	Matrix spike sample	ClO_4	(SSR-SR) ~~8.4088~~ 8.4088 mg/L	10.101 ug/L	83.2	83.6	↓
16	Duplicate sample	↓	ND	ND	NC	NC	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33176C6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: KB
2nd reviewer: CL

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for ClO_4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = Area * X coefficient + constant

Recalculation: $(0.007\ \mu s*min)(940.49837185) - 0.139725 = 6.44376$ mg/L

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	8	ClO_4	6.8	6.4	Y

Note: Hexavalent Chromium result non detect.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Tidewater, Inc.
199 Shell Street
Manhattan Beach, CA 90266
ATTN: Mr. David Conner

December 16, 2014

SUBJECT: NASA JPL, 4Q2014, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on November 21, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33164:

SDG #	Fraction
14-25248, 14-25441, 14-25355	Volatiles, Chromium, Wet Chemistry

The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Pei Geng
Project Manager/Senior Chemist

HC

Attachment 1

90/10 (client select)

LDC #33164 (Tidewater- Powell, OH / NASA JPL, 4Q2014)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)		Cr (200.8)		Cr(VI) (7196)		CLO_4 (314.0)																									
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	14-25248	11/21/14	12/16/14	14	0	13	0	13	0	13	0																								
A	14-25248	11/21/14	12/16/14	1	0	1	0	1	0	1	0																								
B	14-25441	11/21/14	12/16/14	12	0	11	0	11	0	11	0																								
B	14-25441	11/21/14	12/16/14	2	0	2	0	2	0	2	0																								
C	14-25355	11/21/14	12/16/14	12	0	11	0	11	0	11	0																								
C	14-25355	11/21/14	12/16/14	1	0	1	0	1	0	1	0																								
Total	T/PG			42	0	39	0	39	0	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	159

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS/MSD, and DUPs

L:\Tidewater\NASA JPL\33164ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 23, 2014

LDC Report Date: December 8, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25248

Sample Identification

TB-4-10/23/14
SB-2-10/23/14
EB-4-10/23/14
MW-22-5
MW-22-4**
Dup-2-4Q14
MW-22-3
MW-22-2
MW-22-1
MW-4-5
MW-4-4
MW-4-3
Dup-3-4Q14
MW-4-2
MW-4-1
MW-4-2MS
MW-4-2MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 17 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of the presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/24/14 (24OCT02)	Bromomethane	75.5	TB-4-10/23/14 SB-2-10/23/14 EB-4-10/23/14 MW-22-5 MW-22-4** Dup-2-4Q14 MW-22-3 MW-22-2 MW-4-2 MW-4-2MS MW-4-2MSD BXJ2259-BLK1	J (all detects) UJ (all non-detects)	P

Date	Compound	%D	Associated Samples	Flag	A or P
10/24/14 (24OCT03)	Methyl iodide	74.5	TB-4-10/23/14 SB-2-10/23/14 EB-4-10/23/14 MW-22-5 MW-22-4** Dup-2-4Q14 MW-22-3 MW-22-2 MW-4-2 MW-4-2MS MW-4-MSD BXJ2259-BLK1	J (all detects) UJ (all non-detects)	P
10/24/14 (24OCT33)	Bromomethane	77.2	MW-22-1 MW-4-5 MW-4-4 MW-4-3 Dup-3-4Q14 MW-4-1 1415673-CCB2	J (all detects) UJ (all non-detects)	P
10/24/14 (24OCT34)	Methyl iodide Pentachloroethane	74.2 87.0	MW-22-1 MW-4-5 MW-4-4 MW-4-3 Dup-3-4Q14 MW-4-1 1415673-CCB2	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Compound Quantitation

All compound quantitations were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples MW-22-4** and Dup-2-4Q14 and samples MW-4-4 and Dup-3-4Q14 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-4-4	Dup-3-4Q14	
Styrene	0.070	0.068U	200

XVII. Field Blanks

Sample TB-4-10/23/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-4-10/23/14 was identified as an equipment blank. No volatile contaminants were found.

Sample SB-2-10/23/14 was identified as a source blank. No volatile contaminants were found.

NASA JPL, 4Q2014
Volatiles - Data Qualification Summary - SDG 14-25248

SDG	Sample	Compound	Flag	A or P	Reason
14-25248	TB-4-10/23/14 SB-2-10/23/14 EB-4-10/23/14 MW-22-5 MW-22-4** Dup-2-4Q14 MW-22-3 MW-22-2 MW-4-2	Bromomethane Methyl iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
14-25248	MW-22-1 MW-4-5 MW-4-4 MW-4-3 Dup-3-4Q14 MW-4-1	Bromomethane Methyl iodide Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 4Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-25248

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-4-10/23/14

Laboratory: BC Laboratories | SDG: 14-25248
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425248-01 | File ID: 24OCT17.D
Sampled: 10/23/14 06:00 | Prepared: 10/24/14 07:00 | Analyzed: 10/24/14 13:09
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2259 | Sequence: 1415673 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-4-10/23/14

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-01	File ID:	24OCT17.D
Sampled:	10/23/14 06:00	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 13:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-4-10/23/14

Laboratory: BC Laboratories | SDG: 14-25248
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425248-01 | File ID: 24OCT17.D
Sampled: 10/23/14 06:00 | Prepared: 10/24/14 07:00 | Analyzed: 10/24/14 13:09
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2259 | Sequence: 1415673 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U LS
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.360	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9500	99.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9000	99.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	197148	6.66	200276	6.66	
Chlorobenzene-d5 (IS)	63694	9.68	65180	9.68	
1,4-Difluorobenzene (IS)	252812	7.46	260243	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-2-10/23/14

Laboratory: BC Laboratories | SDG: 14-25248
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425248-02 | File ID: 24OCT24.D
Sampled: 10/23/14 06:15 | Prepared: 10/24/14 07:00 | Analyzed: 10/24/14 15:47
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2259 | Sequence: 1415673 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UT
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-2-10/23/14

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-02	File ID:	24OCT24.D
Sampled:	10/23/14 06:15	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 15:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-2-10/23/14

Laboratory: BC Laboratories | SDG: 14-25248
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425248-02 | File ID: 24OCT24.D
Sampled: 10/23/14 06:15 | Prepared: 10/24/14 07:00 | Analyzed: 10/24/14 15:47
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2259 | Sequence: 1415673 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.360	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.040	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3500	93.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	198554	6.66	200276	6.66	
Chlorobenzene-d5 (IS)	64513	9.68	65180	9.68	
1,4-Difluorobenzene (IS)	253053	7.45	260243	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-4-10/23/14

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-03	File ID:	24OCT25.D
Sampled:	10/23/14 06:20	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 16:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-4-10/23/14

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-03	File ID:	24OCT25.D
Sampled:	10/23/14 06:20	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 16:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-4-10/23/14

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-03	File ID:	24OCT25.D
Sampled:	10/23/14 06:20	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 16:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.510	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.210	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.5900	95.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194311	6.67	200276	6.66	
Chlorobenzene-d5 (IS)	64338	9.68	65180	9.68	
1,4-Difluorobenzene (IS)	250858	7.45	260243	7.46	

Affected 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-5

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-04	File ID:	24OCT26.D
Sampled:	10/23/14 06:50	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 16:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U V5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

11/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-5

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-04	File ID:	24OCT26.D
Sampled:	10/23/14 06:50	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 16:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-5

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-04	File ID:	24OCT26.D
Sampled:	10/23/14 06:50	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 16:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U VS
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.670	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.390	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3100	93.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	193514	6.67	200276	6.66	
Chlorobenzene-d5 (IS)	66191	9.68	65180	9.68	
1,4-Difluorobenzene (IS)	246663	7.46	260243	7.46	

12/15/14 JK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-4

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-05	File ID:	24OCT27.D
Sampled:	10/23/14 07:30	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 16:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/13/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-4

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-05	File ID:	24OCT27.D
Sampled:	10/23/14 07:30	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 16:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-4

Laboratory: BC Laboratories | SDG: 14-25248
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425248-05 | File ID: 24OCT27.D
Sampled: 10/23/14 07:30 | Prepared: 10/24/14 07:00 | Analyzed: 10/24/14 16:55
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2259 | Sequence: 1415673 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.510	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.030	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4300	94.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	196530	6.66	200276	6.66	
Chlorobenzene-d5 (IS)	65477	9.68	65180	9.68	
1,4-Difluorobenzene (IS)	252627	7.46	260243	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-2-4Q14

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-06	File ID:	24OCT28.D
Sampled:	10/23/14 07:40	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 17:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-2-4Q14

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-06	File ID:	24OCT28.D
Sampled:	10/23/14 07:40	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 17:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-2-4Q14

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-06	File ID:	24OCT28.D
Sampled:	10/23/14 07:40	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 17:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.670	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.200	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9700	89.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	193037	6.67	200276	6.66	
Chlorobenzene-d5 (IS)	66116	9.68	65180	9.68	
1,4-Difluorobenzene (IS)	252467	7.46	260243	7.46	

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-3

Laboratory: BC Laboratories | SDG: 14-25248
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425248-07 | File ID: 24OCT29.D
Sampled: 10/23/14 08:10 | Prepared: 10/24/14 07:00 | Analyzed: 10/24/14 17:41
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2259 | Sequence: 1415673 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-3

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-07	File ID:	24OCT29.D
Sampled:	10/23/14 08:10	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 17:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-3

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-07	File ID:	24OCT29.D
Sampled:	10/23/14 08:10	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 17:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	11.020	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.320	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2500	92.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	192986	6.67	200276	6.66	
Chlorobenzene-d5 (IS)	64157	9.68	65180	9.68	
1,4-Difluorobenzene (IS)	243029	7.46	260243	7.46	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-2

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-08	File ID:	24OCT30.D
Sampled:	10/23/14 08:40	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 18:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.15	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-2

Laboratory: BC Laboratories | SDG: 14-25248
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425248-08 | File ID: 24OCT30.D
Sampled: 10/23/14 08:40 | Prepared: 10/24/14 07:00 | Analyzed: 10/24/14 18:04
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2259 | Sequence: 1415673 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

11/19/14 JK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-2

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-08	File ID:	24OCT30.D
Sampled:	10/23/14 08:40	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 18:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U U5
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.790	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.340	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8400	98.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	192537	6.66	200276	6.66	
Chlorobenzene-d5 (IS)	63321	9.68	65180	9.68	
1,4-Difluorobenzene (IS)	239576	7.46	260243	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-1

Laboratory: BC Laboratories | SDG: 14-25248
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425248-09 | File ID: 24OCT46.D
Sampled: 10/23/14 09:10 | Prepared: 10/24/14 07:00 | Analyzed: 10/25/14 00:07
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2259 | Sequence: 1415673 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U VS
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.55	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.13	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-1

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-09	File ID:	24OCT46.D
Sampled:	10/23/14 09:10	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 00:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.55	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	2.0	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-1

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-09	File ID:	24OCT46.D
Sampled:	10/23/14 09:10	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 00:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence:	1415673	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.330	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.020	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0000	90.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	201546	6.66	205013	6.66	
Chlorobenzene-d5 (IS)	66839	9.68	68091	9.68	
1,4-Difluorobenzene (IS)	256965	7.46	264765	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-5

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-10	File ID:	24OCT47.D
Sampled:	10/23/14 10:00	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 00:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-5

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-10	File ID:	24OCT47.D
Sampled:	10/23/14 10:00	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 00:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.14	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-5

Laboratory: BC Laboratories | SDG: 14-25248
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425248-10 | File ID: 24OCT47.D
Sampled: 10/23/14 10:00 | Prepared: 10/24/14 07:00 | Analyzed: 10/25/14 00:29
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2259 | Sequence: 1415673 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.810	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.250	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4500	94.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	182581	6.66	205013	6.66	
Chlorobenzene-d5 (IS)	58835	9.68	68091	9.68	
1,4-Difluorobenzene (IS)	230729	7.46	264765	7.46	

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-4

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-11	File ID:	24OCT48.D
Sampled:	10/23/14 10:40	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 00:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-4

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-11	File ID:	24OCT48.D
Sampled:	10/23/14 10:40	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 00:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.070	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-4

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-11	File ID:	24OCT48.D
Sampled:	10/23/14 10:40	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 00:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.560	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.090	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4000	94.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	197447	6.66	205013	6.66	
Chlorobenzene-d5 (IS)	64288	9.68	68091	9.68	
1,4-Difluorobenzene (IS)	253360	7.45	264765	7.46	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-3

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-12	File ID:	24OCT49.D
Sampled:	10/23/14 11:30	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 01:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-3

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-12	File ID:	24OCT49.D
Sampled:	10/23/14 11:30	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 01:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-3

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-12	File ID:	24OCT49.D
Sampled:	10/23/14 11:30	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 01:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence:	1415673	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.740	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9900	99.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9800	89.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191379	6.66	205013	6.66	
Chlorobenzene-d5 (IS)	64542	9.68	68091	9.68	
1,4-Difluorobenzene (IS)	248196	7.46	264765	7.46	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-3-4Q14

Laboratory:	BC Laboratories			SDG:	14-25248
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425248-13	File ID:	24OCT50.D
Sampled:	10/23/14 10:50	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 01:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence:	1415673	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U U5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-3-4Q14

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-13	File ID:	24OCT50.D
Sampled:	10/23/14 10:50	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 01:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-3-4Q14

Laboratory: BC Laboratories | SDG: 14-25248
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425248-13 | File ID: 24OCT50.D
Sampled: 10/23/14 10:50 | Prepared: 10/24/14 07:00 | Analyzed: 10/25/14 01:37
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2259 | Sequence: 1415673 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.220	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.030	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2900	92.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	196176	6.66	205013	6.66	
Chlorobenzene-d5 (IS)	63562	9.68	68091	9.68	
1,4-Difluorobenzene (IS)	245883	7.46	264765	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-2

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-14	File ID:	24OCT31.D
Sampled:	10/23/14 12:00	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 18:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence:	1415673	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.46	J
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U LAJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.91	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.21	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

11/19/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-2

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-14	File ID:	24OCT31.D
Sampled:	10/23/14 12:00	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 18:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.71	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.1	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-2

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-14	File ID:	24OCT31.D
Sampled:	10/23/14 12:00	Prepared:	10/24/14 07:00	Analyzed:	10/24/14 18:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.650	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9900	99.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6200	96.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190871	6.66	200276	6.66	
Chlorobenzene-d5 (IS)	63954	9.68	65180	9.68	
1,4-Difluorobenzene (IS)	244872	7.46	260243	7.46	

12/8/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-1

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-15	File ID:	24OCT51.D
Sampled:	10/23/14 13:00	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 02:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/16/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-1

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-15	File ID:	24OCT51.D
Sampled:	10/23/14 13:00	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 02:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:29:49PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-1

Laboratory:	BC Laboratories		SDG:	14-25248	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425248-15	File ID:	24OCT51.D
Sampled:	10/23/14 13:00	Prepared:	10/24/14 07:00	Analyzed:	10/25/14 02:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2259	Sequence: 1415673	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U US
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U US
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.240	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.060	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2400	92.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194711	6.66	205013	6.66	
Chlorobenzene-d5 (IS)	63929	9.68	68091	9.68	
1,4-Difluorobenzene (IS)	247853	7.45	264765	7.46	

12/15/14

LDC #: 33164A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/04/14
SDG #: 14-25248 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/23/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	≤ 20 % rr
IV.	Continuing calibration/ICV	SW	≤ 30 %
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	~~A~~ N	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	~~A~~ A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	*
XVI.	Field duplicates	SW	D = 5/6 ; 11/13
XVII.	Field blanks	ND	TB = 1 SB = 2 EB = 3

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
* ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation

Water

1	TB-4-10/23/14	11	MW-4-4 D✓	21 [1]	BXJ2259_BLK1	31	
2	SB-2-10/23/14	12	MW-4-3	22 [2]	1415673-CCB1	32	
3	EB-4-10/23/14	13	Dup-3-4Q14 D✓	23		33	
4	MW-22-5	14	MW-4-2	24		34	
5	MW-22-4** D1	15	MW-4-1	25		35	
6	Dup-2-4Q14 D1	16	MW-4-2MS	26		36	
7	MW-22-3	17	MW-4-2MSD	27		37	
8	MW-22-2	18		28		38	
9	MW-22-1	19		29		39	
10	MW-4-5	20		30		40	

LDC #: 39164 A1

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: 2

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

LDC #: 33164 A1

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: N

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within +/-40% from the associated calibration standard?	✓			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?				
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?		✓		
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?		✓		
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Methyl iodide
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. Pentachloroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33164 A 1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y (N) N/A Were all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0%)	Associated Samples	Qualifications
	10/24/14	24oct02	B	75.5	1-8, 14, 16, 17, BXJ2259-BLK1	J/UJ/P
	10/24/14	24oct03	NNNN	74.5	↓	
	10/24/14	24oct33	B	77.2	9-13, 15, 1415673-CCB2	
	10/24/14	24oct34	NNNN	74.3	↓	↓
			0000	87.0		

LDC #: 33164A1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd reviewer: [signature]

METHOD: GC/MS VOA (EPA Method 524.2)

(Y) N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD (≤ ~~%~~)
	11	13	
FF	0.070	0.068 U	200

Compound	Concentration (ug/L)		RPD (≤ %)

Compound	Concentration (ug/L)		RPD (≤ %)

LDC #: 33164A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of Compound
C_x = Concentration of compound,
S= Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL MS V5	9/29/2014	cis-1,2-DCE (IS1)	0.4762749	0.4762749	0.4626995	0.4626995	3.85	3.85
			Tetrachlororethene (IS2)	0.3807271	0.3807271	0.3878348	0.3878348	13.21	13.21
			1,1,2,2-TCA (IS3)	0.6405396	0.6405396	0.6038102	0.6038102	9.72	9.72
2	ICAL MS V5	10/1/2014	Allyl chloride (IS1)	0.7350514	0.7350514	0.7121014	0.7121014	6.76	6.76
			Methyl methacrylate (IS2)	0.0784983	0.0784983	0.0774599	0.0774599	6.03	6.03
			Pentachloroethane (IS3)	0.7119626	0.7119626	0.6967004	0.6967004	13.77	13.77

LDC # 33164A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	24oct02 MS V5	10/24/14	cis-1,2-DCE (IS1)	0.462700	0.465546	0.465546	0.6	0.6
			Tetrachlororethene (IS2)	0.387835	0.368508	0.368508	5.0	5.0
			1,1,2,2-TCA (IS3)	0.603810	0.614271	0.614271	1.7	1.7
	24oct03 MS V5	10/24/14	Allyl chloride (IS1)	0.712101	0.712631	0.712631	0.07	0.07
			Methyl methacrylate (IS2)	0.077460	0.085824	0.085824	10.8	10.8
			Pentachloroethane (IS3)	0.696700	0.839176	0.839176	20.5	20.5

LDC #: 33164 A1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #5

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.0	10.03	100	100	0
Bromofluorobenzene	↓	9.43	94.3	94.3	↓
1,2-Dichlorobenzene-d4	↓	10.51	105	105	↓
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

LDC #: 33164A1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSDC I * 2/(MSC + MSDC) MSC = Matrix spike percent recovery MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 16 17

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
1,1-Dichloroethene	25.0	25.0	0	24.27	26.67	97.1	97.1	107	107	9.42	9.42
Trichloroethene	↓	↓	1.12	26.27	26.36	101	101	101	101	0.34	0.34
Benzene	↓	↓	0	24.92	26.68	99.7	99.7	107	107	6.82	6.82
Toluene	↓	↓	↓	26.26	26.03	105	105	104	104	0.88	0.88
Chlorobenzene	↓	↓	↓	25.75	26.51	103	103	106	106	2.91	2.91

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164 A1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: BXJ 2259-BS1

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	25.0	NA	26.410	NA	106	106				
Trichloroethene	↓	↓	26.77	↓	107	107				
Benzene			26.74		107	107				
Toluene			27.60		110	110				
Chlorobenzene	↓	↓	27.5✓	↓	110	110				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 37169A1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

Compound results reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample purged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. MD LCS Tetrachloroethene:

Conc. = (263795)(10)( )( ) / (251116)(0.9878)( )( )

= 27.088

≈ 27.09 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Acceptable (Y/N)
			27.09		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 23, 2014

LDC Report Date: December 5, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25248

Sample Identification

SB-2-10/23/14
EB-4-10/23/14
MW-22-5
MW-22-4**
Dup-2-4Q14
MW-22-3
MW-22-2
MW-22-1
MW-4-5
MW-4-4
MW-4-3
Dup-3-4Q14
MW-4-2
MW-4-1
SB-2-10/23/14MS
SB-2-10/23/14MSD
SB-2-10/23/14DUP
MW-4-2MS
MW-4-2MSD
MW-4-2DUP

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 20 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Calibration

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was not required by the method.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples MW-22-4** and Dup-2-4Q14 and samples MW-4-4 and Dup-3-4Q14 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration ug/L		RPD
	MW-22-4**	DUP-2-4Q14	
Chromium	2.3	2.2	4

Analyte	Concentration ug/L		RPD
	MW-4-4	Dup-3-4Q14	
Chromium	0.87	0.80	8

XIV. Field Blanks

Sample EB-4-10/23/14 was identified as an equipment blank. No chromium was found.

Sample SB-2-10/23/14 was identified as a source blank. No chromium was found.

NASA JPL, 4Q2014
Chromium - Data Qualification Summary - SDG 14-25248

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-25248

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:35:11PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

SB-2-10/23/14

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-02
File ID: PE_EL2_141110-136
Sampled: 10/23/14 06:15
Prepared: 11/10/14 09:00
Analyzed: 11/10/14 18:53
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0770
Sequence: 1416668
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:35:11PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

EB-4-10/23/14

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-03
File ID: PE_EL2_141110-150
Sampled: 10/23/14 06:20
Prepared: 11/10/14 09:00
Analyzed: 11/10/14 19:41
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0770
Sequence: 1416668
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

11/15/14 K

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-22-5

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-04
File ID: PE_EL2_141110-151
Sampled: 10/23/14 06:50
Prepared: 11/10/14 09:00
Analyzed: 11/10/14 19:45
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0770
Sequence: 1416668
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/15/14 q

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Reported: 11/19/2014 5:35:11PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-22-4

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-05
File ID: PE_EL2_141110-153
Sampled: 10/23/14 07:30
Prepared: 11/10/14 09:00
Analyzed: 11/10/14 19:54
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0770
Sequence: 1416668
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.3	1	J	EPA-200.8

12/15/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

Dup-2-4Q14

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-06
File ID: PE_EL2_141111-202
Sampled: 10/23/14 07:40
Prepared: 11/11/14 09:00
Analyzed: 11/11/14 21:00
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0892
Sequence: 1416775
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.2	1	J	EPA-200.8

12/15/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-22-3

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-07
File ID: PE_EL2_141111-203
Sampled: 10/23/14 08:10
Prepared: 11/11/14 09:00
Analyzed: 11/11/14 21:03
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0892
Sequence: 1416775
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.5	1	J	EPA-200.8

12/15/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-22-2

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-08
File ID: PE_EL2_141111-204
Sampled: 10/23/14 08:40
Prepared: 11/11/14 09:00
Analyzed: 11/11/14 21:07
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0892
Sequence: 1416775
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.0	1	J	EPA-200.8

12/15/14

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Reported: 11/19/2014 5:35:11PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-22-1

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-09
File ID: PE_EL2_141111-205
Sampled: 10/23/14 09:10
Prepared: 11/11/14 09:00
Analyzed: 11/11/14 21:10
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0892
Sequence: 1416775
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.3	1	J	EPA-200.8

11/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:35:11PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-4-5

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-10
File ID: PE_EL2_141111-206
Sampled: 10/23/14 10:00
Prepared: 11/11/14 09:00
Analyzed: 11/11/14 21:14
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0892
Sequence: 1416775
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:35:11PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-4-4

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-11
File ID: PE_EL2_141111-207
Sampled: 10/23/14 10:40
Prepared: 11/11/14 09:00
Analyzed: 11/11/14 21:17
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0892
Sequence: 1416775
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.87	1	J	EPA-200.8

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:35:11PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-4-3

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-12
File ID: PE_EL2_141111-208
Sampled: 10/23/14 11:30
Prepared: 11/11/14 09:00
Analyzed: 11/11/14 21:20
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0892
Sequence: 1416775
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.95	1	J	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:35:11PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

Dup-3-4Q14

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-13
File ID: PE_EL2_141111-209
Sampled: 10/23/14 10:50
Prepared: 11/11/14 09:00
Analyzed: 11/11/14 21:24
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0892
Sequence: 1416775
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.80	1	J	EPA-200.8

17/15/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:35:11PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-4-2

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-14
File ID: PE_EL2_141111-194
Sampled: 10/23/14 12:00
Prepared: 11/11/14 09:00
Analyzed: 11/11/14 20:32
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0892
Sequence: 1416775
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.9	1		EPA-200.8

11/19/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:35:11PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-4-1

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-15
File ID: PE_EL2_141111-210
Sampled: 10/23/14 13:00
Prepared: 11/11/14 09:00
Analyzed: 11/11/14 21:27
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK0892
Sequence: 1416775
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/15/14

LDC #: 33164A4
SDG #: 14-25248
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 12/3/14
Page: 1 of 1
Reviewer: KK
2nd Reviewer: CM

METHOD: Chromium (EPA Method 200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/23/14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	N	not required
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	ICP Serial Dilution	N	not performed
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(4+5) (10#12)
XIV.	Field Blanks	ND	SB=1 EB=2

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	SB-2-10/23/14	11	MW-4-3	21		31	
2	EB-4-10/23/14	12	Dup-3-4Q14	22		32	
3	MW-22-5	13	MW-4-2	23		33	
4	MW-22-4**	14	MW-4-1	24		34	
5	Dup-2-4Q14	15	SB-2-10/23/14MS	25		35	
6	MW-22-3	16	SB-2-10/23/14MSD	26		36	
7	MW-22-2	17	SB-2-10/23/14DUP	27		37	
8	MW-22-1	18	MW-4-2MS	28		38	
9	MW-4-5	19	MW-4-2MSD	29		39	
10	MW-4-4	20	MW-4-2DUP	30		40	

Notes:

VALIDATION FINDINGS CHECKLIST

Method: Metals (EPA ~~SW 846~~ Method ~~6010/7000/6020~~ 200.8)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?			✓	
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?			✓	
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?		✓		
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?		✓		

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?		✓		
Were all percent differences (%Ds) < 10%?			✓	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XIII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC#: 33164A4

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: KK
2nd Reviewer: CW

METHOD: Chromium (EPA Method 200.8)

Analyte	Concentration (ug/L)		RPD
	4	5	
Chromium	2.3	2.2	4

Analyte	Concentration (ug/L)		RPD
	10	12	
Chromium	0.87	0.80	8

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33164A4.wpd

LDC #: 33104A4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: KK
2nd Reviewer: [signature]

Chromium 200.8
METHOD: ~~Trace Metals~~ (EPA ~~SW-846~~ Method ~~6010/6020/7000~~)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found x 100 / True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV (10:41)	ICP/MS (Initial calibration)	Cr	53.964	50.000	108	108	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV (18:29)	ICP/MS (Continuing calibration)	Cr	41.506	40.000	104	104	Y
	CVAA (Continuing calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164A4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: KK
2nd Reviewer: G

METHOD: ~~Trace Metals~~ Chromium (EPA ~~SW 846~~ Method ~~6010/6020/7000~~ 200.8)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

%D = |I-SDR| / I x 100 Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (mg/L) (units)	True / D / SDR (mg/L) (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
N/A	ICP interference check						
LCS	Laboratory control sample	Cr	41.320	40.000	103	103	Y
15	Matrix spike	↓	(SSR-SR) 39.814	40.000	99.5	99.5	↓
1720	Duplicate	↓	3.936	~~3.972~~ 4.023	2.19	2.19	↓
N/A	ICP serial dilution						

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164A4

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: KK
2nd reviewer: [illegible]

METHOD: ~~Trace Metals~~ Chromium (EPA ~~SW 846~~ Method ~~6010/6020/7000)~~ 200.8

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
(Y) N N/A Are all detection limits below the CRDL?

Detected analyte results for Cr were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In. Vol.)}$

Recalculation:

$$4: \frac{(2.257\ \mu g/L)(50\ ml)(1)}{(50\ ml)} = 2.257\ \mu g/L$$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration (µg/L)	Acceptable (Y/N)
	4	Cr	2.3	2.3	Y

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 23, 2014

LDC Report Date: December 5, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25248

Sample Identification

SB-2-10/23/14
EB-4-10/23/14
MW-22-5
MW-22-4**
Dup-2-4Q14
MW-22-3
MW-22-2
MW-22-1
MW-4-5
MW-4-4
MW-4-3
Dup-3-4Q14
MW-4-2
MW-4-1
SB-2-10/23/14MS
SB-2-10/23/14MSD
SB-2-10/23/14DUP
MW-22-4MS
MW-22-4MSD
MW-22-4DUP
MW-4-2MS
MW-4-2MSD
MW-4-2DUP

** Indicates sample underwent Level IV review

Introduction

This data review covers 23 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met for each method.

III. Calibration verification

Calibration verification frequency and analysis criteria were met for each method.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-22-4MS/MSD (SB-2-10/23/14 EB-4-10/23/14 MW-22-5 MW-22-4 Dup-2-4Q14 MW-22-3 MW-22-2 MW-22-1 MW-4-5 MW-4-4)	Perchlorate	75.1 (80-120)	74.5 (80-120)	-	J (all detects) UJ (all non-detects)	A

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-22-4** and Dup-2-4Q14 and samples MW-4-4 and Dup-3-4Q14 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-22-4**	DUP-2-4Q14	
Perchlorate	1.1 ug/L	1.1 ug/L	0
Hexavalent Chromium	0.0019 mg/L	0.0017 mg/L	11

XI. Field Blanks

Sample EB-4-10/23/14 was identified as an equipment blank. No contaminant concentrations were found.

Sample SB-2-10/23/14 was identified as a source blank. No contaminant concentrations were found.

NASA JPL, 4Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-25248

SDG	Sample	Analyte	Flag	A or P	Reason
14-25248	SB-2-10/23/14 EB-4-10/23/14 MW-22-5 MW-22-4** Dup-2-4Q14 MW-22-3 MW-22-2 MW-22-1 MW-4-5 MW-4-4	Perchlorate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)

NASA JPL, 4Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-25248

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Wet Chemistry - Field Blank Data Qualification Summary - 14-25248

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

SB-2-10/23/14

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-02
File ID: F110414B.seq-8.0000.txt
Sampled: 10/23/14 06:15
Prepared: 11/04/14 15:00
Analyzed: 11/04/14 17:28
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0360
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U UJ	EPA-314.0

17/14/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
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INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-4-10/23/14

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-03
File ID: F110414B.seq-9.0000.txt
Sampled: 10/23/14 06:20
Prepared: 11/04/14 15:00
Analyzed: 11/04/14 17:42
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0360
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	UJ	EPA-314.0

Tidewater Inc.
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INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-22-5

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-04
File ID: F110414B.seq-10.0000.txt
Sampled: 10/23/14 06:50
Prepared: 11/04/14 15:00
Analyzed: 11/04/14 17:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0360
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U UJ	EPA-314.0

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INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-22-4

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-05
File ID: F110414B.seq-11.0000.txt
Sampled: 10/23/14 07:30
Prepared: 11/04/14 15:00
Analyzed: 11/04/14 18:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0360
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.1	1	J	EPA-314.0

Tidewater Inc.
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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

Dup-2-4Q14

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-06
File ID: F110414B.seq-17.0000.txt
Sampled: 10/23/14 07:40
Prepared: 11/04/14 15:00
Analyzed: 11/04/14 19:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0360
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.1	1	J	EPA-314.0

Tidewater Inc.
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Project: JPL- GW Monitoring Wells
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INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-22-3

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-07
File ID: F110414B.seq-19.0000.txt
Sampled: 10/23/14 08:10
Prepared: 11/04/14 15:00
Analyzed: 11/04/14 20:01
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0360
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.2	1	J	EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-22-2

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-08
File ID: F110414B.seq-21.0000.txt
Sampled: 10/23/14 08:40
Prepared: 11/04/14 15:00
Analyzed: 11/04/14 20:28
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0360
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.2	1	J	EPA-314.0

Tidewater Inc.
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Powell, OH 43065

Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-22-1

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-09
File ID: F110414B.seq-23.0000.txt
Sampled: 10/23/14 09:10
Prepared: 11/04/14 15:00
Analyzed: 11/04/14 20:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0360
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.3	1	J	EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-4-5

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-10
File ID: F110414B.seq-25.0000.txt
Sampled: 10/23/14 10:00
Prepared: 11/04/14 15:00
Analyzed: 11/04/14 21:24
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0360
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U U5	EPA-314.0

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-4-4

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-11
File ID: F110414B.seq-60.0000.txt
Sampled: 10/23/14 10:40
Prepared: 11/04/14 15:00
Analyzed: 11/05/14 05:28
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0360
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U LS	EPA-314.0

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Powell, OH 43065

Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-4-3

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-12
File ID: F110414B.seq-65.0000.txt
Sampled: 10/23/14 11:30
Prepared: 11/04/14 15:00
Analyzed: 11/05/14 06:37
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0361
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.2	1	J	EPA-314.0

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

Dup-3-4Q14

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-13
File ID: F110414B.seq-66.0000.txt
Sampled: 10/23/14 10:50
Prepared: 11/04/14 15:00
Analyzed: 11/05/14 06:51
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0361
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-4-2

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-14
File ID: F110414B.seq-67.0000.txt
Sampled: 10/23/14 12:00
Prepared: 11/04/14 15:00
Analyzed: 11/05/14 07:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0361
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	18	1		EPA-314.0

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-4-1

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-15
File ID: F110414B.seq-71.0000.txt
Sampled: 10/23/14 13:00
Prepared: 11/04/14 15:00
Analyzed: 11/05/14 08:00
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0361
Sequence: 1416477
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.2	1	J	EPA-314.0

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

SB-2-10/23/14

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-02
File ID: 141023 1912 CR6-005
Sampled: 10/23/14 06:15
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2283
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

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Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

EB-4-10/23/14

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-03
File ID: 141023 1912 CR6-009
Sampled: 10/23/14 06:20
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2283
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

10/25/14

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Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-22-5

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-04
File ID: 141023 1912 CR6-010
Sampled: 10/23/14 06:50
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2283
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

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Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-22-4

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-05
File ID: 141023 1912 CR6-011
Sampled: 10/23/14 07:30
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2283
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0019	1	J	EPA-7196

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Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

Dup-2-4Q14

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-06
File ID: 141023 1912 CR6-012
Sampled: 10/23/14 07:40
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2283
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0017	1	J	EPA-7196

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Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-22-3

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-07
File ID: 141023 1912 CR6-036
Sampled: 10/23/14 08:10
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:41
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2283
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0019	1	J	EPA-7196

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Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-22-2

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-08
File ID: 141023 1912 CR6-016
Sampled: 10/23/14 08:40
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2283
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014	1	J	EPA-7196

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Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-22-1

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-09
File ID: 141023 1912 CR6-017
Sampled: 10/23/14 09:10
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2283
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-4-5

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-10
File ID: 141023 1912 CR6-018
Sampled: 10/23/14 10:00
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2283
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00092	1	J	EPA-7196

12/05/14 9

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-4-4

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-11
File ID: 141023 1912 CR6-027
Sampled: 10/23/14 10:40
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2284
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

11/19/14 D

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Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-4-3

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-12
File ID: 141023 1912 CR6-047
Sampled: 10/23/14 11:30
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 20:07
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2284
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014	2	UD	EPA-7196

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Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

Dup-3-4Q14

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-13
File ID: 141023 1912 CR6-029
Sampled: 10/23/14 10:50
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2284
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

11/15/14

Tidewater Inc.
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Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-4-2

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-14
File ID: 141023 1912 CR6-021
Sampled: 10/23/14 12:00
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2284
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

11/19/14

Tidewater Inc.
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Reported: 11/19/2014 5:32:50PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-4-1

Laboratory: BC Laboratories
SDG: 14-25248
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425248-15
File ID: 141023 1912 CR6-030
Sampled: 10/23/14 13:00
Prepared: 10/23/14 19:12
Analyzed: 10/23/14 19:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2284
Sequence: 1415768
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

11/19/14 K

LDC #: 33164A6
SDG #: 14-25248
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 12/3/14
Page: 1 of 1
Reviewer: KK
2nd Reviewer: CL

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/23/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	~~FB~~
V	Matrix Spike/Matrix Spike Duplicates	SW	MS/D
VI.	Duplicates	~~SW~~ A	DUP
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	A	Not reviewed for Level III validation.
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	(4+5) (10+12)
XI.	Field blanks	ND	SB = 1 EB = 2

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation water

1	SB-2-10/23/14	11	MW-4-3	21	MW-4-2MS	31	
2	EB-4-10/23/14	12	Dup-3-4Q14	22	MW-4-2MSD	32	
3	MW-22-5	13	MW-4-2	23	MW-4-2DUP	33	
4	MW-22-4**	14	MW-4-1	24		34	
5	Dup-2-4Q14	15	SB-2-10/23/14MS	25		35	
6	MW-22-3	16	SB-2-10/23/14MSD	26		36	
7	MW-22-2	17	SB-2-10/23/14DUP	27		37	
8	MW-22-1	18	MW-22-4MS	28		38	
9	MW-4-5	19	MW-22-4MSD	29		39	
10	MW-4-4	20	MW-22-4DUP	30		40	

Notes:

LDC #: 33164A0

VALIDATION FINDINGS CHECKLIST

Reviewer: KK
2nd Reviewer: OR

Method: Inorganics (EPA Method See Cover

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)		✓	✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	✓	✓		
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
X. Field blanks				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

LDC #: 33164A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: KK
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-14	W	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 15-17/21-23	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 18-23	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

SDG #: 33164A6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: KA
2nd Reviewer: CA

METHOD: Inorganics, EPA Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	18/19	W	ClO4	75.1 (80-120)	74.5		1-10	J/UJ/A (Det/ND)

Comments: _____

LDC# 33164A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: KK

2nd Reviewer:

Inorganics: Method See Cover

Analyte	Concentration (mg/L)		RPD
	4	5	
Perchlorate (ug/L)	1.1	1.1	0
Hexavalent Chromium	0.0019	0.0017	11

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\wettemp.WPD

LDC #: 33164A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: KK
2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of ClO4 was recalculated.Calibration date: 10/22/14

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	~~(ug/L)~~ KK Standard	Conc. (ug/L)	Abs	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	ClO4	s1	2	0.0022	*0.999911*	0.999570	Y
		s2	4	0.0045			
		s3	6	0.0065			
		s4	10	0.0108			
		s5	20	0.0214			
Calibration verification	↓	CCV (18:51)	10.2	10.0	102	101	↓
Calibration verification	Cr6+	CCV (19:12)	0.0517	0.05	103	102	
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: KK
2nd Reviewer: [signature]

METHOD: Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$$\%R = \frac{Found}{True} \times 100$$

Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	mg/L Found / S (units)	mg/L True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Cr6+	0.0490	0.050000	98.0	97.2	Y
15	Matrix spike sample	↓	(SSR-SR) 0.0517	0.052632	98.2	103	↓
23	Duplicate sample	ClO_4	17.682 µg/L	18.612 µg/L	5.12	1.75	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33104A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: KP
2nd reviewer: CA

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y	N	N/A	Have results been reported and calculated correctly?
Y	N	N/A	Are results within the calibrated range of the instruments?
Y	N	N/A	Are all detection limits below the CRQL?

Compound (analyte) results for ClO4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = Area x X coefficient

Recalculation: 4: $(0.001\ \mu S * min)(930.6165683) = 0.931\ \mu g/L$

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration (µg/L)	Acceptable (Y/N)
	4	ClO4	1.1	~~0.80~~ 0.93*	Y
	↓	Cr6+	0.0019 (mg/L)	0.0023* (mg/L)	↓

Note: * not enough significant figures reported by the laboratory in the raw data to accurately recalculate

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 27, 2014

LDC Report Date: December 8, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25441

Sample Identification

TB-6-10/27/14
EB-6-10/27/14
MW-18-5
MW-18-4**
MW-18-3
Dup-5-4Q14
MW-18-2
MW-26-2
MW-26-1
Dup-6-4Q14
MW-21-5**
MW-21-4
MW-21-3
MW-21-2
EB-6-10/27/14MS
EB-6-10/27/14MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of the presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/28/14 (CCV-28OCT02)	Bromomethane	69.3	TB-6-10/27/14 EB-6-10/27/14 MW-18-5 MW-18-4** MW-18-3 Dup-5-4Q14 MW-18-2 MW-26-2 MW-26-1 EB-6-10/27/14MS EB-6-10/27/14MSD BXJ2520-BLK1	J (all detects) UJ (all non-detects)	P

Date	Compound	%D	Associated Samples	Flag	A or P
10/28/14 (CCV-28OCT03)	Methyl iodide	66.6	TB-6-10/27/14 EB-6-10/27/14 MW-18-5 MW-18-4** MW-18-3 Dup-5-4Q14 MW-18-2 MW-26-2 MW-26-1 EB-6-10/27/14MS EB-6-10/27/14MSD BXJ2520-BLK1	J (all detects) UJ (all non-detects)	P
10/28/14 (CCV-28OCT33)	Bromomethane	63.9	Dup-6-4Q14 MW-21-5** MW-21-4 MW-21-3 MW-21-2 1415840-CCB2	J (all detects) UJ (all non-detects)	P
10/28/14 (CCV-28OCT34)	Methyl iodide Pentachloroethane	64.0 39.1	Dup-6-4Q14 MW-21-5** MW-21-4 MW-21-3 MW-21-2 1415840-CCB2	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Compound Quantitation

All compound quantitations were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples MW-18-3 and Dup-5-4Q14 and samples MW-26-1 and Dup-6-4Q14 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-18-3	Dup-5-4Q14	
Carbon tetrachloride	5.0	3.8	27

Compound	Concentration (ug/L)		RPD
	MW-18-3	Dup-5-4Q14	
Chloroform	1.0	0.84	17
Trichloroethene	0.40	0.31	25

Compound	Concentration (ug/L)		RPD
	MW-26-1	Dup-6-4Q14	
Chloroform	0.25	0.22	13
Tetrachloroethene	0.27	0.26	4
Trichloroethene	0.11	0.090	20

XVII. Field Blanks

Sample TB-6-10/27/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-6-10/27/14 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL, 4Q2014
Volatiles - Data Qualification Summary - SDG 14-25441

SDG	Sample	Compound	Flag	A or P	Reason
14-25441	TB-6-10/27/14 EB-6-10/27/14 MW-18-5 MW-18-4** MW-18-3 Dup-5-4Q14 MW-18-2 MW-26-2 MW-26-1	Bromomethane Methyl iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
14-25441	Dup-6-4Q14 MW-21-5** MW-21-4 MW-21-3 MW-21-2	Bromomethane Methyl iodide Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 4Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-25441

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-6-10/27/14

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-01	File ID:	28OCT21.D
Sampled:	10/27/14 06:45	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 13:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-6-10/27/14

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-01	File ID:	28OCT21.D
Sampled:	10/27/14 06:45	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 13:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

17/15/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-6-10/27/14

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-01	File ID:	28OCT21.D
Sampled:	10/27/14 06:45	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 13:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.160	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9700	99.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2300	92.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	195194	6.66	211373	6.66	
Chlorobenzene-d5 (IS)	62454	9.68	69320	9.68	
1,4-Difluorobenzene (IS)	244699	7.46	271762	7.46	

12/16/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-6-10/27/14

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-02	File ID:	28OCT20.D
Sampled:	10/27/14 06:50	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 12:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

1/15/15 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-6-10/27/14

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-02	File ID:	28OCT20.D
Sampled:	10/27/14 06:50	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 12:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-6-10/27/14

Laboratory: BC Laboratories | SDG: 14-25441
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425441-02 | File ID: 28OCT20.D
Sampled: 10/27/14 06:50 | Prepared: 10/28/14 07:00 | Analyzed: 10/28/14 12:37
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2520 | Sequence: 1415840 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.060	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9900	99.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9400	89.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	198302	6.66	211373	6.66	
Chlorobenzene-d5 (IS)	64224	9.68	69320	9.68	
1,4-Difluorobenzene (IS)	250456	7.45	271762	7.46	

1/15/15 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-5

Laboratory: BC Laboratories | SDG: 14-25441
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425441-03 | File ID: 28OCT22.D
Sampled: 10/27/14 07:20 | Prepared: 10/28/14 07:00 | Analyzed: 10/28/14 13:22
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2520 | Sequence: 1415840 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U VS
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-5

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-03	File ID:	28OCT22.D
Sampled:	10/27/14 07:20	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 13:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.080	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-5

Laboratory: BC Laboratories | SDG: 14-25441
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425441-03 | File ID: 28OCT22.D
Sampled: 10/27/14 07:20 | Prepared: 10/28/14 07:00 | Analyzed: 10/28/14 13:22
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2520 | Sequence: 1415840 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.240	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.030	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0300	90.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	195626	6.67	211373	6.66	
Chlorobenzene-d5 (IS)	62578	9.68	69320	9.68	
1,4-Difluorobenzene (IS)	240549	7.45	271762	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-4

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-04	File ID:	28OCT23.D
Sampled:	10/27/14 08:00	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 13:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U MS
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	1.5	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.64	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-4

Laboratory:	BC Laboratories			SDG:	14-25441
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425441-04	File ID:	28OCT23.D
Sampled:	10/27/14 08:00	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 13:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.90	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.92	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-4

Laboratory: BC Laboratories | SDG: 14-25441
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425441-04 | File ID: 28OCT23.D
Sampled: 10/27/14 08:00 | Prepared: 10/28/14 07:00 | Analyzed: 10/28/14 13:51
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2520 | Sequence: 1415840 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.220	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9800	99.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7400	87.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194054	6.66	211373	6.66	
Chlorobenzene-d5 (IS)	62639	9.68	69320	9.68	
1,4-Difluorobenzene (IS)	246374	7.46	271762	7.46	

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-3

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-05	File ID:	28OCT24.D
Sampled:	10/27/14 08:30	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 14:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	5.0	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.0	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-3

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-05	File ID:	28OCT24.D
Sampled:	10/27/14 08:30	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 14:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.40	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/16/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-3

Laboratory: BC Laboratories | SDG: 14-25441
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425441-05 | File ID: 28OCT24.D
Sampled: 10/27/14 08:30 | Prepared: 10/28/14 07:00 | Analyzed: 10/28/14 14:13
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2520 | Sequence: 1415840 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.240	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.120	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1300	91.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	195275	6.66	211373	6.66	
Chlorobenzene-d5 (IS)	62757	9.68	69320	9.68	
1,4-Difluorobenzene (IS)	246100	7.45	271762	7.46	

12/16/14 ql

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-5-4Q14

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-06	File ID:	28OCT25.D
Sampled:	10/27/14 08:40	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 14:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U VS
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	3.8	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.84	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/16/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-5-4Q14

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-06	File ID:	28OCT25.D
Sampled:	10/27/14 08:40	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 14:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.31	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

A15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-5-4Q14

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-06	File ID:	28OCT25.D
Sampled:	10/27/14 08:40	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 14:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U US
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.480	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.120	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7100	87.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	176032	6.66	211373	6.66	
Chlorobenzene-d5 (IS)	58306	9.68	69320	9.68	
1,4-Difluorobenzene (IS)	225761	7.46	271762	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-2

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-07	File ID:	28OCT26.D
Sampled:	10/27/14 09:10	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 14:58
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-2

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-07	File ID:	28OCT26.D
Sampled:	10/27/14 09:10	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 14:58
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

11/6/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-2

Laboratory:	BC Laboratories			SDG:	14-25441
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425441-07	File ID:	28OCT26.D
Sampled:	10/27/14 09:10	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 14:58
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U VJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.440	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.090	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8200	88.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	189014	6.66	211373	6.66	
Chlorobenzene-d5 (IS)	63984	9.68	69320	9.68	
1,4-Difluorobenzene (IS)	243481	7.46	271762	7.46	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-2

Laboratory: BC Laboratories | SDG: 14-25441
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425441-08 | File ID: 28OCT27.D
Sampled: 10/27/14 10:00 | Prepared: 10/28/14 07:00 | Analyzed: 10/28/14 15:21
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2520 | Sequence: 1415840 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.2	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.16	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-2

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-08	File ID:	28OCT27.D
Sampled:	10/27/14 10:00	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 15:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	1.9	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.25	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-2

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-08	File ID:	28OCT27.D
Sampled:	10/27/14 10:00	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 15:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.290	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.170	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8800	88.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190545	6.66	211373	6.66	
Chlorobenzene-d5 (IS)	61707	9.68	69320	9.68	
1,4-Difluorobenzene (IS)	240707	7.46	271762	7.46	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-1

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-09	File ID:	28OCT28.D
Sampled:	10/27/14 10:30	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 15:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.25	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

4/15/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-1

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-09	File ID:	28OCT28.D
Sampled:	10/27/14 10:30	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 15:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.27	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.11	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-1

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-09	File ID:	28OCT28.D
Sampled:	10/27/14 10:30	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 15:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U US
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.270	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.060	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8200	88.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190278	6.66	211373	6.66	
Chlorobenzene-d5 (IS)	62703	9.68	69320	9.68	
1,4-Difluorobenzene (IS)	242125	7.46	271762	7.46	

17/15/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-6-4Q14

Laboratory:	BC Laboratories			SDG:	14-25441
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425441-10	File ID:	28OCT38.D
Sampled:	10/27/14 10:40	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 19:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U U5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.22	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-6-4Q14

Laboratory:	BC Laboratories			SDG:	14-25441
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425441-10	File ID:	28OCT38.D
Sampled:	10/27/14 10:40	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 19:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.26	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.090	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-6-4Q14

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-10	File ID:	28OCT38.D
Sampled:	10/27/14 10:40	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 19:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.220	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.180	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9300	89.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	198247	6.66	202297	6.66	
Chlorobenzene-d5 (IS)	64078	9.68	65844	9.68	
1,4-Difluorobenzene (IS)	253389	7.45	261246	7.46	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-5

Laboratory:	BC Laboratories			SDG:	14-25441
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425441-11	File ID:	28OCT39.D
Sampled:	10/27/14 11:45	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 19:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UT
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	6.2	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-5

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-11	File ID:	28OCT39.D
Sampled:	10/27/14 11:45	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 19:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.79	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.090	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	12	
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-5

Laboratory: BC Laboratories | SDG: 14-25441
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425441-11 | File ID: 28OCT39.D
Sampled: 10/27/14 11:45 | Prepared: 10/28/14 07:00 | Analyzed: 10/28/14 19:52
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2520 | Sequence: 1415840 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.140	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.050	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7400	87.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	195399	6.66	202297	6.66	
Chlorobenzene-d5 (IS)	64742	9.68	65844	9.68	
1,4-Difluorobenzene (IS)	252538	7.45	261246	7.46	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-4

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-12	File ID:	28OCT40.D
Sampled:	10/27/14 12:15	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 20:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U US
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	7.2	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.12	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-4

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-12	File ID:	28OCT40.D
Sampled:	10/27/14 12:15	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 20:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	1.0	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.16	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-4

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-12	File ID:	28OCT40.D
Sampled:	10/27/14 12:15	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 20:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.220	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.010	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7100	87.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	196960	6.66	202297	6.66	
Chlorobenzene-d5 (IS)	63437	9.68	65844	9.68	
1,4-Difluorobenzene (IS)	246032	7.46	261246	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-3

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-13	File ID:	28OCT41.D
Sampled:	10/27/14 13:10	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 20:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.0	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.22	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.44	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
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Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-3

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-13	File ID:	28OCT41.D
Sampled:	10/27/14 13:10	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 20:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.19	J
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	3.0	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.3	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-3

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-13	File ID:	28OCT41.D
Sampled:	10/27/14 13:10	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 20:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence:	1415840	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U U5
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U U5
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.420	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.170	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8100	88.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	197795	6.66	202297	6.66	
Chlorobenzene-d5 (IS)	63303	9.68	65844	9.68	
1,4-Difluorobenzene (IS)	248441	7.46	261246	7.46	

1/16/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-2

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-14	File ID:	28OCT42.D
Sampled:	10/27/14 13:40	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 21:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U V5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.29	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Effective 4

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/20/2014 3:29:28PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-2

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-14	File ID:	28OCT42.D
Sampled:	10/27/14 13:40	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 21:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.13	J
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	1.1	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.21	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
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Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-2

Laboratory:	BC Laboratories		SDG:	14-25441	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425441-14	File ID:	28OCT42.D
Sampled:	10/27/14 13:40	Prepared:	10/28/14 07:00	Analyzed:	10/28/14 21:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2520	Sequence: 1415840	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U LJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U LJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.550	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.200	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6000	86.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	192218	6.66	202297	6.66	
Chlorobenzene-d5 (IS)	63880	9.68	65844	9.68	
1,4-Difluorobenzene (IS)	245225	7.45	261246	7.46	

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LDC #: 33164B1
SDG #: 14-25441
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 12/04/14
Page: 1 of 1
Reviewer: JVC
2nd Reviewer: N

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/27/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	≤ 20 % rr
IV.	Continuing calibration/ICV	SW	≤ 30 %
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	~~N~~ A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	~~A~~ A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 5/6 ; 9/10
XVII.	Field blanks	ND	TB = 1 EB = 2

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation

Water

1	TB-6-10/27/14	11	MW-21-5**	21	BXJ2520-BLK1	31	
2	EB-6-10/27/14	12	MW-21-4	22	1415840a CCB2	32	
3	MW-18-5	13	MW-21-3	23		33	
4	MW-18-4**	14	MW-21-2	24		34	
5	MW-18-3 D1	15	EB-6-10/27/14MS	25		35	
6	Dup-5-4Q14 D1	16	EB-6-10/27/14MSD	26		36	
7	MW-18-2	17		27		37	
8	MW-26-2	18		28		38	
9	MW-26-1 D2	19		29		39	
10	Dup-6-4Q14 D2	20		30		40	

LDC #: 33164 B1

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: A

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓	✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within +/-40% from the associated calibration standard?	✓			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?		✓		
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?		✓		
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.		✓		
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Methyl iodide
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. Pentachloroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33164B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0%)	Associated Samples	Qualifications
	10/28/14	28Oct02	B	69.3	1-9, 15, 16, BXJ2520-BLK1	J/UJ/P
	10/28/14	28Oct03	NNNN	66.6		
	10/28/14	28Oct33	B	63.9	10-14, 1415840-CCB2	
		28Oct34	NNNN	64.0		
			0000	39.1		

CONCAL.wpd

LDC #: 33164 B1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd reviewer: A

METHOD: GC/MS VOA (EPA Method 524.2)

(Y) N N/A Were field duplicate pairs identified in this SDG?
(Y) N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD (≤ ~~%~~)
	5	6	
O	5.0	3.8	27
K	1.0	0.84	17
S	0.40	0.31	25

Compound	Concentration (ug/L)		RPD (≤ ~~%~~)
	9	10	
K	0.25	0.22	13
AA	0.27	0.26	4
S	0.11	0.090	20

Compound	Concentration (ug/L)		RPD (≤ %)

LDC #: 33164B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL MS V5	9/29/2014	cis-1,2-DCE (IS1)	0.4762749	0.4762749	0.4626995	0.4626995	3.85	3.85
			Tetrachlororethene (IS2)	0.3807271	0.3807271	0.3878348	0.3878348	13.21	13.21
			1,1,2,2-TCA (IS3)	0.6405396	0.6405396	0.6038102	0.6038102	9.72	9.72
2	ICAL MS V5	10/1/2014	Allyl chloride (IS1)	0.7350514	0.7350514	0.7121014	0.7121014	6.76	6.76
			Methyl methacrylate (IS2)	0.0784983	0.0784983	0.0774599	0.0774599	6.03	6.03
			Pentachloroethane (IS3)	0.7119626	0.7119626	0.6967004	0.6967004	13.77	13.77

LDC # 33164B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound	(IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	28oct02 MS V5	10/28/14	cis-1,2-DCE	(IS1)	0.462700	0.459518	0.459518	0.7	0.7
			Tetrachlororethene	(IS2)	0.387835	0.372807	0.372807	3.9	3.9
			1,1,2,2-TCA	(IS3)	0.603810	0.621435	0.621435	2.9	2.9
	28oct03 MS V5	10/28/14	Allyl chloride	(IS1)	0.712101	0.683462	0.683462	4.0	4.0
			Methyl methacrylate	(IS2)	0.077460	0.085535	0.085535	10.4	10.4
			Pentachloroethane	(IS3)	0.696700	0.798507	0.798507	14.6	14.6
2	28oct33 MS V5	10/28/14	cis-1,2-DCE	(IS1)	0.462700	0.464720	0.464720	0.4	0.4
			Tetrachlororethene	(IS2)	0.387835	0.379248	0.379248	2.2	2.2
			1,1,2,2-TCA	(IS3)	0.603810	0.589224	0.589224	2.4	2.4
	28oct34 MS V5	10/28/14	Allyl chloride	(IS1)	0.712101	0.696235	0.696235	2.2	2.2
			Methyl methacrylate	(IS2)	0.077460	0.080263	0.080263	3.6	3.6
			Pentachloroethane	(IS3)	0.696700	0.424365	0.424365	39.1	39.1

LDC #: 33164B1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: JVG
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 4

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	10.0	9.98	99.8	99.8	0
Bromofluorobenzene	↓	8.74	87.4	87.4	↓
1,2-Dichlorobenzene-d4	↓	10.22	102	102	↓
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

LDC #: 23164 B1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSDC I * 2/(MSC + MSDC) MSC = Matrix spike percent recovery MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 15/16

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
1,1-Dichloroethene	25.0	25.0	0	24.72	24.51	98.9	98.9	98.0	98.0	0.853	0.853
Trichloroethene				25.09	25.40	100	101	102	102	1.23	1.23
Benzene				25.23	25.33	101	101	101	101	0.396	0.396
Toluene				25.16	26.06	101	103	104	104	3.51	3.57
Chlorobenzene				25.29	25.88	101	101	104	104	2.31	2.31

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164 B1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: BXJ2520-BS1

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	25.00	NA	25.910	NA	104	104				
Trichloroethene			27.32		109	109				
Benzene			26.32		105	105				
Toluene			27.46		110	110				
Chlorobenzene	↓	↓	26.68	↓	107	107				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164 #7

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

Compound results reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
RRF	=	Relative response factor of the calibration standard.
V_o	=	Volume or weight of sample purged in milliliters (ml) or grams (g).
Df	=	Dilution factor.
%S	=	Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 11, Tetrachloroethene

Conc. = $\frac{(7766)(10)(\quad)}{(252538)(0.387835)(\quad)(\quad)}$

= 0.792 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Acceptable (Y/N)
			0.79		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 27, 2014

LDC Report Date: December 12, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25441

Sample Identification

EB-6-10/27/14
MW-18-5
MW-18-4**
MW-18-3
Dup-5-4Q14
MW-18-2
MW-26-2
MW-26-1
Dup-6-4Q14
MW-21-5**
MW-21-4
MW-21-3
MW-21-2
MW-21-5DUP
MW-21-5MS
MW-21-5MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Calibration

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Chromium	1.0210 ug/L	All samples in SDG 14-25441

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-18-4**	Chromium	1.6 ug/L	1.6U ug/L
MW-18-3	Chromium	2.2 ug/L	2.2U ug/L
Dup-5-4Q14	Chromium	2.4 ug/L	2.4U ug/L
MW-26-2	Chromium	2.3 ug/L	2.3U ug/L
MW-21-5**	Chromium	1.4 ug/L	1.4U ug/L
MW-21-4	Chromium	1.2 ug/L	1.2U ug/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-21-3	Chromium	0.78 ug/L	0.78U ug/L

V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was not required by the method.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples MW-18-3 and Dup-5-4Q14 and samples MW-26-1 and Dup-6-4Q14 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration ug/L		RPD
	MW-18-3	Dup-5-4Q14	
Chromium	2.2	2.4	9

XIV. Field Blanks

Sample EB-6-10/27/14 was identified as an equipment blank. No chromium was found.

NASA JPL, 4Q2014
Chromium - Data Qualification Summary - SDG 14-25441

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-25441

SDG	Sample	Analyte	Modified Final Concentration	A or P
14-25441	MW-18-4**	Chromium	1.6U ug/L	A
14-25441	MW-18-3	Chromium	2.2U ug/L	A
14-25441	Dup-5-4Q14	Chromium	2.4U ug/L	A
14-25441	MW-26-2	Chromium	2.3U ug/L	A
14-25441	MW-21-5**	Chromium	1.4U ug/L	A
14-25441	MW-21-4	Chromium	1.2U ug/L	A
14-25441	MW-21-3	Chromium	0.78U ug/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-6-10/27/14

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-02RE1
File ID: PE_EL2_141208-112
Sampled: 10/27/14 06:50
Prepared: 12/08/14 08:30
Analyzed: 12/08/14 20:22
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0700
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-18-5

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-03RE1
File ID: PE_EL2_141208-113
Sampled: 10/27/14 07:20
Prepared: 12/08/14 08:30
Analyzed: 12/08/14 20:25
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0700
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-18-4

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-04RE1
File ID: PE_EL2_141208-114
Sampled: 10/27/14 08:00
Prepared: 12/08/14 08:30
Analyzed: 12/08/14 20:28
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0700
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.6 U	1	J	EPA-200.8

K 12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-18-3

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-05RE1
File ID: PE_EL2_141208-115
Sampled: 10/27/14 08:30
Prepared: 12/08/14 08:30
Analyzed: 12/08/14 20:32
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0700
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.2 U	1	J	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

Dup-5-4Q14

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-06RE1
File ID: PE_EL2_141208-116
Sampled: 10/27/14 08:40
Prepared: 12/08/14 08:30
Analyzed: 12/08/14 20:35
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0700
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.4 4	1	J	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-18-2

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-07RE1
File ID: PE_EL2_141208-117
Sampled: 10/27/14 09:10
Prepared: 12/08/14 08:30
Analyzed: 12/08/14 20:39
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0700
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-26-2

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-08RE1
File ID: PE_EL2_141208-118
Sampled: 10/27/14 10:00
Prepared: 12/08/14 08:30
Analyzed: 12/08/14 20:42
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0700
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.3 U	1	J	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-26-1

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-09RE1
File ID: PE_EL2_141208-119
Sampled: 10/27/14 10:30
Prepared: 12/08/14 08:30
Analyzed: 12/08/14 20:46
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0700
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

Dup-6-4Q14

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-10RE1
File ID: PE_EL2_141208-120
Sampled: 10/27/14 10:40
Prepared: 12/08/14 08:30
Analyzed: 12/08/14 20:49
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0700
Sequence: 1418209
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-21-5

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-11RE1
File ID: PE_EL2_141208-092
Sampled: 10/27/14 11:45
Prepared: 12/08/14 11:30
Analyzed: 12/08/14 19:11
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0714
Sequence: 1418210
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.4 U	1	J	EPA-200.8

12/24/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-21-4

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-12RE1
File ID: PE_EL2_141208-146
Sampled: 10/27/14 12:15
Prepared: 12/08/14 11:30
Analyzed: 12/08/14 22:30
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0714
Sequence: 1418210
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.2 U	1	J	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-21-3

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-13RE1
File ID: PE_EL2_141208-147
Sampled: 10/27/14 13:10
Prepared: 12/08/14 11:30
Analyzed: 12/08/14 22:34
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0714
Sequence: 1418210
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.78 U	1	J	EPA-200.8

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 12/11/2014 4:00:30PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-21-2

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-14RE1
File ID: PE_EL2_141208-148
Sampled: 10/27/14 13:40
Prepared: 12/08/14 11:30
Analyzed: 12/08/14 22:37
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXL0714
Sequence: 1418210
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/12/14

LDC #: 33164B4 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/3/14

SDG #: 14-25441 Level III/IV Page: 1 of 1

Laboratory: BC Laboratories, Inc. Reviewer: VK

2nd Reviewer: AL

METHOD: Chromium (EPA Method 200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/27/14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	~~A~~ SW	
V.	ICP Interference Check Sample (ICS) Analysis	N	not required
VI.	Matrix Spike Analysis	A	MS/D from SDG 14-25001
VII.	Duplicate Sample Analysis	A	DUP from SDG 14-25001
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	ICP Serial Dilution	N	not performed
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(4+5) (8+9)*
XIV.	Field Blanks	NDSW	EB=1

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; *ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	EB-6-10/27/14	11	MW-21-4	21	# 10 MS	31	
2	MW-18-5	12	MW-21-3	22	# 10 MSD	32	
3	MW-18-4**	13	MW-21-2	23		33	
4	MW-18-3	14	~~EB-6-10/27/14MS~~	24		34	
5	Dup-5-4Q14	15	EB-6-10/27/14MSD	25		35	
6	MW-18-2	16	EB-6-10/27/14DUP	26		36	
7	MW-26-2	17	MW-21-4MS	27		37	
8	MW-26-1	18	MW-21-4MSD	28		38	
9	Dup-6-4Q14	19	~~MW-21-4DUP~~	~~29~~		39	
10	MW-21-5**	20	# 10 DUP	30		40	

Notes: _____

)C #: 331484

VALIDATION FINDINGS CHECKLIST

Reviewer: KK
2nd Reviewer: CA

Method: Metals (EPA ~~SW 846~~ Method ~~6010/7000/6020~~ 200.8)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✗ KC	✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?			✓	
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?			✓	
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were < 5X the RL.	✓			
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?	/			
If the %Rs were outside the criteria, was a reanalysis performed?			/	
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?		/	~~/~~ KK	
Were all percent differences (%Ds) < 10%?			/	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			/	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
XIII. Field blanks				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.	X KK	/		

LDC #: 33164B4

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: KK
2nd Reviewer:

METHOD: Chromium (EPA Method 200.8) Soil preparation factor applied: NA
Sample Concentration units, unless otherwise noted: ug/l Associated Samples: All

					Sample Identification										
Analyte	**Maximum PB[a] (mg/Kg)**	**Maximum PB[a] (mg/l)**	**Maximum ICB/CCB[a] (ug/l)**	**Action Level**	**3**	4	5	7	10	11	12				
Cr			1.0210	5.105	1.6	2.2	2.4	2.3	1.4	1.2	0.78				

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC#: 33164B4

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: KK

2nd Reviewer: [signature]

METHOD: Chromium (EPA Method 200.8)

Analyte	Concentration (ug/L)		RPD
	4	5	
Chromium	2.2	2.4	9

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33164B4.wpd

LDC #: 33186 4B4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: KK
2nd Reviewer: CK

METHOD: Trace Metals (EPA ~~SW 846~~ Method 200.8 ~~6010/6020/7000~~)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found x 100 / True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV (11:06)	ICP/MS (Initial calibration)	Cr	52.847	50.000	106	106	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV (17:32)	ICP/MS (Continuing calibration)	Cr	41.564	40.000	104	104	Y
	CVAA (Continuing calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164B4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: KK
2nd Reviewer: 2

METHOD: Trace Metals (EPA ~~SW 846~~ Method 200.8 ~~6010/6020/7000)~~

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (ug/L) (units)	True / D / SDR (mg/L) (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
N/A	ICP interference check						
LCS	Laboratory control sample	Cr	43.287	40.000	108	108	Y
~~MS~~ 21	Matrix spike	↓	(SSR-SR) 39.751	40.000	99.4	99.4	↓
20	Duplicate	↓	~~1.371~~ 1.444	1.371	5.19	5.19	↓
N/A	ICP serial dilution						

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164B4

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: KK
2nd reviewer: CL

200.8

METHOD: Trace Metals (EPA ~~SW 846~~ Method ~~6010/6020/7000~~)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for Cr were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

Recalculation:

10: $\frac{1.444\ \mu g/L\ (50mL)(1)}{(50mL)} = 1.444\ \mu g/L$

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration (µg/L)	Acceptable (Y/N)
	3	Cr	1.6	1.6	Y
	10	↓	1.4	1.4	↓

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 27, 2014

LDC Report Date: December 9, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25441

Sample Identification

EB-6-10/27/14
MW-18-5
MW-18-4**
MW-18-3
Dup-5-4Q14
MW-18-2
MW-26-2
MW-26-1
Dup-6-4Q14
MW-21-5**
MW-21-4
MW-21-3
MW-21-2
EB-6-10/27/14MS
EB-6-10/27/14MSD
EB-6-10/27/14DUP
MW-18-4MS
MW-18-4MSD
MW-18-4DUP
MW-21-5MS
MW-21-5MSD
MW-21-5DUP

** Indicates sample underwent Level IV review

Introduction

This data review covers 22 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met for each method.

III. Calibration verification

Calibration verification frequency and analysis criteria were met for each method.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-18-3 and Dup-5-4Q14 and samples MW-26-1 and Dup-6-4Q14 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-18-3	Dup-5-4Q14	
Perchlorate	17 ug/L	17 ug/L	0
Hexavalent chromium	0.0018 mg/L	0.0017 mg/L	6

Analyte	Concentration (ug/L)		RPD
	MW-26-1	Dup-6-4Q14	
Perchlorate	2.2	1.9	15

XI. Field Blanks

Sample EB-6-10/27/14 was identified as an equipment blank. No contaminant concentrations were found.

NASA JPL, 4Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-25441

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-25441

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Wet Chemistry - Field Blank Data Qualification Summary - 14-25441

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

EB-6-10/27/14

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-02
File ID: 141027 2213 CR6-005
Sampled: 10/27/14 06:50
Prepared: 10/27/14 22:13
Analyzed: 10/27/14 22:13
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2590
Sequence: 1415962
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/15/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-18-5

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-03
File ID: 141027 2213 CR6-009
Sampled: 10/27/14 07:20
Prepared: 10/27/14 22:13
Analyzed: 10/27/14 22:13
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2590
Sequence: 1415962
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/15/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-18-4

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-04
File ID: 141027 2213 CR6-010
Sampled: 10/27/14 08:00
Prepared: 10/27/14 22:13
Analyzed: 10/27/14 22:13
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2590
Sequence: 1415962
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00099	1	J	EPA-7196

12/15/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-18-3

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-05
File ID: 141027 2213 CR6-011
Sampled: 10/27/14 08:30
Prepared: 10/27/14 22:13
Analyzed: 10/27/14 22:13
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2590
Sequence: 1415962
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0018	1	J	EPA-7196

12/15/14

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3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

Dup-5-4Q14

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-06
File ID: 141027 2213 CR6-021
Sampled: 10/27/14 08:40
Prepared: 10/27/14 22:13
Analyzed: 10/27/14 22:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2590
Sequence: 1415962
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0017	1	J	EPA-7196

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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-18-2

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-07
File ID: 141027 2213 CR6-015
Sampled: 10/27/14 09:10
Prepared: 10/27/14 22:13
Analyzed: 10/27/14 22:16
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2590
Sequence: 1415962
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-26-2

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-08
File ID: 141028 0731 CR6-009
Sampled: 10/27/14 10:00
Prepared: 10/28/14 07:31
Analyzed: 10/28/14 07:31
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2592
Sequence: 1415973
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/15/14

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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-26-1

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-09
File ID: 141028 0731 CR6-010
Sampled: 10/27/14 10:30
Prepared: 10/28/14 07:31
Analyzed: 10/28/14 07:31
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2592
Sequence: 1415973
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/15/14

Tidewater Inc.
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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

Dup-6-4Q14

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-10
File ID: 141028 0731 CR6-011
Sampled: 10/27/14 10:40
Prepared: 10/28/14 07:31
Analyzed: 10/28/14 07:31
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2592
Sequence: 1415973
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-21-5

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-11
File ID: 141028 0731 CR6-005
Sampled: 10/27/14 11:45
Prepared: 10/28/14 07:31
Analyzed: 10/28/14 07:31
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2592
Sequence: 1415973
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00081	1	J	EPA-7196

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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-21-4

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-12
File ID: 141028 0731 CR6-019
Sampled: 10/27/14 12:15
Prepared: 10/28/14 07:31
Analyzed: 10/28/14 07:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2592
Sequence: 1415973
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/Feed 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-21-3

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-13
File ID: 141028 0731 CR6-015
Sampled: 10/27/14 13:10
Prepared: 10/28/14 07:31
Analyzed: 10/28/14 07:34
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2592
Sequence: 1415973
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

11/5/14 JK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-21-2

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-14
File ID: 141028 0731 CR6-016
Sampled: 10/27/14 13:40
Prepared: 10/28/14 07:31
Analyzed: 10/28/14 07:34
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2592
Sequence: 1415973
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/12/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-6-10/27/14

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-02
File ID: F110715.seq-11.0000.txt
Sampled: 10/27/14 06:50
Prepared: 11/07/14 19:00
Analyzed: 11/07/14 21:24
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0895
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

11/19/14

Tidewater Inc.
3761 Attucks Drive
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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-5

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-03
File ID: F110715.seq-12.0000.txt
Sampled: 10/27/14 07:20
Prepared: 11/07/14 19:00
Analyzed: 11/07/14 21:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0895
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.66	1	J	EPA-314.0

Tidewater Inc.
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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-4

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-04
File ID: F110715.seq-13.0000.txt
Sampled: 10/27/14 08:00
Prepared: 11/07/14 19:00
Analyzed: 11/07/14 21:52
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0895
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	15	1		EPA-314.0

11/19/14

Tidewater Inc.
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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-3

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-05
File ID: F110715.seq-19.0000.txt
Sampled: 10/27/14 08:30
Prepared: 11/07/14 19:00
Analyzed: 11/07/14 23:15
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0895
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	17	1		EPA-314.0

Tidewater Inc.
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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

Dup-5-4Q14

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-06
File ID: F110715.seq-20.0000.txt
Sampled: 10/27/14 08:40
Prepared: 11/07/14 19:00
Analyzed: 11/07/14 23:29
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0895
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	17	1		EPA-314.0

17/15/14

Tidewater Inc.
3761 Attucks Drive
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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-2

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-07
File ID: F110715.seq-21.0000.txt
Sampled: 10/27/14 09:10
Prepared: 11/07/14 19:00
Analyzed: 11/07/14 23:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0895
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/15/14

Tidewater Inc.
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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-26-2

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-08RE3
File ID: F110715.seq-79.0000.txt
Sampled: 10/27/14 10:00
Prepared: 11/07/14 19:00
Analyzed: 11/11/14 03:06
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0895
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.9	1	J	EPA-314.0

12/16/14 8

Tidewater Inc.
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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-26-1

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-09
File ID: F110715.seq-25.0000.txt
Sampled: 10/27/14 10:30
Prepared: 11/07/14 19:00
Analyzed: 11/08/14 00:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0896
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.2	1	J	EPA-314.0

Tidewater Inc.
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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

Dup-6-4Q14

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-10
File ID: F110715.seq-28.0000.txt
Sampled: 10/27/14 10:40
Prepared: 11/07/14 19:00
Analyzed: 11/08/14 01:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0896
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.9	1	J	EPA-314.0

12/15/14

Tidewater Inc.
3761 Attucks Drive
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Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-21-5

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-11
File ID: F110715.seq-29.0000.txt
Sampled: 10/27/14 11:45
Prepared: 11/07/14 19:00
Analyzed: 11/08/14 01:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0896
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.9	1	J	EPA-314.0

12/16/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-21-4

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-12
File ID: F110715.seq-33.0000.txt
Sampled: 10/27/14 12:15
Prepared: 11/07/14 19:00
Analyzed: 11/08/14 02:29
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0896
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.0	1	J	EPA-314.0

14/14/14 8

Tidewater Inc.
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Powell, OH 43065

Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-21-3

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-13
File ID: F110715.seq-34.0000.txt
Sampled: 10/27/14 13:10
Prepared: 11/07/14 19:00
Analyzed: 11/08/14 02:42
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0896
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.9	1	J	EPA-314.0

11/19/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:46:56PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-21-2

Laboratory: BC Laboratories
SDG: 14-25441
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425441-14
File ID: F110715.seq-35.0000.txt
Sampled: 10/27/14 13:40
Prepared: 11/07/14 19:00
Analyzed: 11/08/14 02:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0896
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.6	1	J	EPA-314.0

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LDC #: 33164B6

SDG #: 14-25441

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/3/14

Page: 1 of 1

Reviewer: KK

2nd Reviewer: a

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/27/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	A	Not reviewed for Level III validation.
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	(4+5) (8+9)
XI	Field blanks	ND	EB= 1

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	EB-6-10/27/14	11	MW-21-4	21	MW-21-5MSD	31	
2	MW-18-5	12	MW-21-3	22	MW-21-5DUP	32	
3	MW-18-4**	13	MW-21-2	23		33	
4	MW-18-3	14	EB-6-10/27/14MS	24		34	
5	Dup-5-4Q14	15	EB-6-10/27/14MSD	25		35	
6	MW-18-2	16	EB-6-10/27/14DUP	26		36	
7	MW-26-2	17	MW-18-4MS	27		37	
8	MW-26-1	18	MW-18-4MSD	28		38	
9	Dup-6-4Q14	19	MW-18-4DUP	29		39	
10	MW-21-5**	20	MW-21-5MS	30		40	

Notes:

LDC #: 33164B0

VALIDATION FINDINGS CHECKLIST

Reviewer: KK
2nd Reviewer: AL

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
X. Field blanks				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

LDC #: 33164B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: KK
2nd reviewer: [signature]

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-13	W	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC (Cr6+) (ClO_4)
	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 14-16/20-22	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC (Cr6+) ClO_4
	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 17-22	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ (ClO_4)
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC# 33164B6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: KK
2nd Reviewer: AV

Inorganics: Method See Cover

Analyte	Concentration (mg/L)		RPD
	4	5	
Perchlorate (ug/L)	17	17	0
Hexavalent Chromium	0.0018	0.0017	6

Analyte	Concentration (mg/L)		RPD
	8	9	
Perchlorate (ug/L)	2.2	1.9	15

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33164B6.wpd

LDC #: 33164B6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of ClO4 was recalculated.Calibration date: 10/22/14

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ug/L)	Abs	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	ClO4	s1	2	0.0022	*0.999911*	0.999570	Y
		s2	4	0.0045			
		s3	6	0.0065			
		s4	10	0.0108			
		s5	20	0.0214			
Calibration verification		CCV (22:06)	10.237	10.0	102	98	
Calibration verification	Cr6+	CCV (7:31)	0.05305	0.050000	106	105	
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164B60

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: VK
2nd Reviewer: Q

METHOD: Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found x 100 / True Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| x 100 / (S+D)/2 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	µg/L Found / S (units)	µg/L True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	ClO_4	10.237	10.000	102	100	Y
17	Matrix spike sample	↓	(SSR-SR) ~~8.40448~~ 8.375	10.101	82.9	83.4	↓
22	Duplicate sample	CrO_4	0.00094* mg/L (Reported=0.00081 mg/L)	0.00094* mg/L (Reported=0.00046 mg/L)	16.9 (recalculated from reported values)	17.4	↓

Comments: ~~Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.~~
*Cannot accurately recalculate due to the limited significant figures reported in the raw data response

LDC #: 33164B6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: KK
2nd reviewer: CR

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for ClO_4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = Area x X Coefficient

Recalculation: 3: $(0.016\ ms*min)(930.61656853) = 14.890\ \mu g/L$

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	3	ClO_4	15	15	Y
	~~10~~ ↓	Cr6+ (mg/L)	0.00099 ~~mg/L~~	0.00094* ~~mg~~	↓
	10	ClO_4	1.9	1.9	
	↓	Cr6+ (mg/L)	0.00081	0.00094*	↓

Note: * not enough significant figures reported in the raw data response to accurately recalculate

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 24, 2014

LDC Report Date: December 5, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25355

Sample Identification

TB-5-10/24/14
EB-5-10/24/14
MW-23-5
MW-23-4
MW-23-3**
MW-23-2
MW-23-1
MW-25-5
MW-25-4
MW-25-3
MW-25-2
MW-25-1
DUP-4-4Q14
EB-5-10/24/14MS
EB-5-10/24/14MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 15 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of the presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/27/14 (27OCT03)	Bromomethane	73.5	TB-5-10/24/14 EB-5-10/24/14 MW-23-5 MW-23-4 MW-23-3** MW-23-2 MW-23-1 MW-25-5 MW-25-4 EB-5-10/24/14MS EB-5-10/24/14MSD BXJ2413-BLK1	J (all detects) UJ (all non-detects)	P

Date	Compound	%D	Associated Samples	Flag	A or P
10/27/14 (27OCT04)	Methyl iodide	62.1	TB-5-10/24/14 EB-5-10/24/14 MW-23-5 MW-23-4 MW-23-3** MW-23-2 MW-23-1 MW-25-5 MW-25-4 EB-5-10/24/14MS EB-5-10/24/14MSD BXJ2413-BLK1	J (all detects) UJ (all non-detects)	P
10/27/14 (27OCT33)	Bromomethane	73.8	MW-25-3 MW-25-2 MW-25-1 DUP-4-4Q14 1415750-CCB2	J (all detects) UJ (all non-detects)	P
10/27/14 (27OCT34)	Methyl iodide	61.4	MW-25-3 MW-25-2 MW-25-1 DUP-4-4Q14 1415750-CCB2	J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Compound Quantitation

All compound quantitations were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples MW-25-1 and DUP-4-4Q14 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-25-1	DUP-4-4Q14	
Chloroform	0.61	0.72	17
Methyl-tert-butyl ether	0.40	0.44	10
Trichloroethene	1.3	1.6	21

XVII. Field Blanks

Sample TB-5-10/24/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-5-10/24/14 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL, 4Q2014
Volatiles - Data Qualification Summary - SDG 14-25355

SDG	Sample	Compound	Flag	A or P	Reason
14-25355	TB-5-10/24/14 EB-5-10/24/14 MW-23-5 MW-23-4 MW-23-3** MW-23-2 MW-23-1 MW-25-5 MW-25-4 MW-25-3 MW-25-2 MW-25-1 DUP-4-4Q14	Bromomethane Methyl iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 4Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-25355

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-5-10/24/14

Laboratory: BC Laboratories | SDG: 14-25355
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425355-01 | File ID: 27OCT19.D
Sampled: 10/24/14 06:45 | Prepared: 10/27/14 07:00 | Analyzed: 10/27/14 12:28
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2413 | Sequence: 1415750 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U LS
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

1/15/15 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-5-10/24/14

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-01	File ID:	27OCT19.D
Sampled:	10/24/14 06:45	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 12:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-5-10/24/14

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-01	File ID:	27OCT19.D
Sampled:	10/24/14 06:45	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 12:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.8400	98.4	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9900	99.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.5300	85.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	200207	6.66	213119	6.67	
Chlorobenzene-d5 (IS)	63884	9.68	67346	9.68	
1,4-Difluorobenzene (IS)	253017	7.45	274607	7.45	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-5-10/24/14

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-02	File ID:	27OCT18.D
Sampled:	10/24/14 07:00	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 12:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-5-10/24/14

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-02	File ID:	27OCT18.D
Sampled:	10/24/14 07:00	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 12:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

11/18/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-5-10/24/14

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-02	File ID:	27OCT18.D
Sampled:	10/24/14 07:00	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 12:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.6900	96.9	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8600	98.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.2600	82.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	196188	6.66	213119	6.67	
Chlorobenzene-d5 (IS)	62310	9.68	67346	9.68	
1,4-Difluorobenzene (IS)	248948	7.45	274607	7.45	

12/15/14 gs

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-5

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-03	File ID:	27OCT25.D
Sampled:	10/24/14 07:25	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 14:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-5

Laboratory: BC Laboratories | SDG: 14-25355
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425355-03 | File ID: 27OCT25.D
Sampled: 10/24/14 07:25 | Prepared: 10/27/14 07:00 | Analyzed: 10/27/14 14:44
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2413 | Sequence: 1415750 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.12	J
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.30	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-5

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-03	File ID:	27OCT25.D
Sampled:	10/24/14 07:25	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 14:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.070	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8700	98.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7000	87.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	201312	6.66	213119	6.67	
Chlorobenzene-d5 (IS)	63170	9.68	67346	9.68	
1,4-Difluorobenzene (IS)	256677	7.46	274607	7.45	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-4

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-04	File ID:	27OCT26.D
Sampled:	10/24/14 08:05	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 15:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U U5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

11/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-4

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-04	File ID:	27OCT26.D
Sampled:	10/24/14 08:05	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 15:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-4

Laboratory: BC Laboratories | SDG: 14-25355
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425355-04 | File ID: 27OCT26.D
Sampled: 10/24/14 08:05 | Prepared: 10/27/14 07:00 | Analyzed: 10/27/14 15:06
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2413 | Sequence: 1415750 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.010	100	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.300	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.3500	83.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	202332	6.66	213119	6.67	
Chlorobenzene-d5 (IS)	62979	9.68	67346	9.68	
1,4-Difluorobenzene (IS)	248465	7.46	274607	7.45	

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-3

Laboratory:	BC Laboratories			SDG:	14-25355
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425355-05	File ID:	27OCT27.D
Sampled:	10/24/14 08:35	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 15:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence:	1415750	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-3

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-05	File ID:	27OCT27.D
Sampled:	10/24/14 08:35	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 15:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-3

Laboratory: BC Laboratories | SDG: 14-25355
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425355-05 | File ID: 27OCT27.D
Sampled: 10/24/14 08:35 | Prepared: 10/27/14 07:00 | Analyzed: 10/27/14 15:29
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2413 | Sequence: 1415750 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U US
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.210	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.190	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.5100	85.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	197277	6.66	213119	6.67	
Chlorobenzene-d5 (IS)	62886	9.68	67346	9.68	
1,4-Difluorobenzene (IS)	248149	7.46	274607	7.45	

17 Refill 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-2

Laboratory: BC Laboratories | SDG: 14-25355
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425355-06 | File ID: 27OCT28.D
Sampled: 10/24/14 09:10 | Prepared: 10/27/14 07:00 | Analyzed: 10/27/14 15:52
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2413 | Sequence: 1415750 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U U5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.49	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.14	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-2

Laboratory: BC Laboratories | SDG: 14-25355
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425355-06 | File ID: 27OCT28.D
Sampled: 10/24/14 09:10 | Prepared: 10/27/14 07:00 | Analyzed: 10/27/14 15:52
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2413 | Sequence: 1415750 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.34	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.3	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-2

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-06	File ID:	27OCT28.D
Sampled:	10/24/14 09:10	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 15:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.350	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9000	99.0	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6600	86.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	195675	6.66	213119	6.67	
Chlorobenzene-d5 (IS)	62575	9.68	67346	9.68	
1,4-Difluorobenzene (IS)	248580	7.46	274607	7.45	

17/Oct/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-1

Laboratory:	BC Laboratories			SDG:	14-25355		
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells		
Matrix:	Water	Laboratory ID:	1425355-07	File ID:	27OCT29.D		
Sampled:	10/24/14 09:35	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 16:14		
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml		
Batch:	BXJ2413	Sequence:	1415750	Calibration:	1410010	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.59	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.12	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.13	J
156-60-5	trans-1,2-Dichloroethene	1	0.19	J
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-1

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-07	File ID:	27OCT29.D
Sampled:	10/24/14 09:35	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 16:14
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.13	J
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.48	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	3.9	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
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Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-1

Laboratory: BC Laboratories | SDG: 14-25355
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425355-07 | File ID: 27OCT29.D
Sampled: 10/24/14 09:35 | Prepared: 10/27/14 07:00 | Analyzed: 10/27/14 16:14
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2413 | Sequence: 1415750 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.190	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.030	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.1700	81.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	199977	6.66	213119	6.67	
Chlorobenzene-d5 (IS)	63968	9.68	67346	9.68	
1,4-Difluorobenzene (IS)	247003	7.46	274607	7.45	

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Tidewater Inc.
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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-5

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-08	File ID:	27OCT30.D
Sampled:	10/24/14 10:40	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 16:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U US
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

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Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-5

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-08	File ID:	27OCT30.D
Sampled:	10/24/14 10:40	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 16:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-5

Laboratory: BC Laboratories | SDG: 14-25355
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425355-08 | File ID: 27OCT30.D
Sampled: 10/24/14 10:40 | Prepared: 10/27/14 07:00 | Analyzed: 10/27/14 16:37
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2413 | Sequence: 1415750 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.400	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.070	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.4600	84.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194444	6.66	213119	6.67	
Chlorobenzene-d5 (IS)	63982	9.68	67346	9.68	
1,4-Difluorobenzene (IS)	246788	7.46	274607	7.45	

1/16/15 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-4

Laboratory:	BC Laboratories			SDG:	14-25355
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425355-09	File ID:	27OCT31.D
Sampled:	10/24/14 11:20	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 16:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence:	1415750	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

11/15/14

Tidewater Inc.
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Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-4

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-09	File ID:	27OCT31.D
Sampled:	10/24/14 11:20	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 16:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence:	1415750	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
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MW-25-4

Laboratory: BC Laboratories | SDG: 14-25355
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425355-09 | File ID: 27OCT31.D
Sampled: 10/24/14 11:20 | Prepared: 10/27/14 07:00 | Analyzed: 10/27/14 16:59
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2413 | Sequence: 1415750 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U U5
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.310	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.110	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.2400	82.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	195703	6.66	213119	6.67	
Chlorobenzene-d5 (IS)	61898	9.68	67346	9.68	
1,4-Difluorobenzene (IS)	245416	7.45	274607	7.45	

1/Rec/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-3

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-10	File ID:	27OCT39.D
Sampled:	10/24/14 12:00	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 20:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U U5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.59	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

11/19/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-3

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-10	File ID:	27OCT39.D
Sampled:	10/24/14 12:00	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 20:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.28	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-3

Laboratory: BC Laboratories | SDG: 14-25355
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425355-10 | File ID: 27OCT39.D
Sampled: 10/24/14 12:00 | Prepared: 10/27/14 07:00 | Analyzed: 10/27/14 20:01
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2413 | Sequence: 1415750 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U U5
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.360	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9400	99.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.320	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	211048	6.67	182897	6.66	
Chlorobenzene-d5 (IS)	69449	9.68	58460	9.68	
1,4-Difluorobenzene (IS)	270240	7.45	238538	7.46	

17/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-2

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-11	File ID:	27OCT40.D
Sampled:	10/24/14 13:00	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 20:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.15	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-2

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-11	File ID:	27OCT40.D
Sampled:	10/24/14 13:00	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 20:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.28	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-2

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-11	File ID:	27OCT40.D
Sampled:	10/24/14 13:00	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 20:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.100	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.040	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8300	98.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	219092	6.66	182897	6.66	
Chlorobenzene-d5 (IS)	71270	9.68	58460	9.68	
1,4-Difluorobenzene (IS)	276190	7.45	238538	7.46	

17/12/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-1

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-12	File ID:	27OCT41.D
Sampled:	10/24/14 13:30	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 20:46
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.61	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

17/15/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-1

Laboratory:	BC Laboratories			SDG:	14-25355
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425355-12	File ID:	27OCT41.D
Sampled:	10/24/14 13:30	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 20:46
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence:	1415750	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.40	J
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.3	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-1

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-12	File ID:	27OCT41.D
Sampled:	10/24/14 13:30	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 20:46
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U VS
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.100	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.180	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8700	98.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	216585	6.66	182897	6.66	
Chlorobenzene-d5 (IS)	70508	9.68	58460	9.68	
1,4-Difluorobenzene (IS)	268971	7.46	238538	7.46	

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-4-4Q14

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-13	File ID:	27OCT42.D
Sampled:	10/24/14 13:40	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 21:08
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U V5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.72	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

17/15/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-4-4Q14

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-13	File ID:	27OCT42.D
Sampled:	10/24/14 13:40	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 21:08
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.44	J
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.6	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:38:05PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-4-4Q14

Laboratory:	BC Laboratories		SDG:	14-25355	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425355-13	File ID:	27OCT42.D
Sampled:	10/24/14 13:40	Prepared:	10/27/14 07:00	Analyzed:	10/27/14 21:08
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2413	Sequence: 1415750	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.120	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.140	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8800	98.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	213606	6.67	182897	6.66	
Chlorobenzene-d5 (IS)	69491	9.68	58460	9.68	
1,4-Difluorobenzene (IS)	269472	7.45	238538	7.46	

LDC #: 33164C1
SDG #: 14-25355
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 12/04/14
Page: 1 of 1
Reviewer: SVG
2nd Reviewer: M

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/24/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	≤ 20 % r²
IV.	Continuing calibration/ICV	SW	≤ 30 %
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	~~A~~ A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 12, 13
XVII.	Field blanks	ND	TB = 1 EB = 2

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation

Water

1	TB-5-10/24/14	11	MW-25-2	21	BXJ2413-BLK1	31	
2	EB-5-10/24/14	12	MW-25-1 D	22	1415750-CCB2	32	
3	MW-23-5	13	DUP-4-4Q14 D	23		33	
4	MW-23-4	14	EB-5-10/24/14MS	24		34	
5	MW-23-3**	15	EB-5-10/24/14MSD	25		35	
6	MW-23-2	16		26		36	
7	MW-23-1	17		27		37	
8	MW-25-5	18		28		38	
9	MW-25-4	19		29		39	
10	MW-25-3	20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Methyl iodide
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 23164 C1

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: [signature]

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓	✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within +/-40% from the associated calibration standard?	✓			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?		✓		
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?		✓		
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.			✓	

LDC #: 33164C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y (N) N/A Were all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0%)	Associated Samples	Qualifications
	10/27/14	27Oct03	B	73.5	1-9, 14, 15, BXJ3	413-BLK1 J/UJ/P
	10/27/14	27Oct04	NNNN	62.1	↓	
	10/27/14	27Oct33	B	73.8	10-13, 1415750-CCB2	
	10/27/14	27Oct34	NNNN	61.4	↓	↓

CONCAL.wpd

LDC #: 33164C1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JVG
2nd reviewer: A

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD (≤ %)
	12	13	
K	0.61	0.72	17
LL	0.40	0.44	16
S	1.3	1.6	21

Compound	Concentration (ug/L)		RPD (≤ %)

Compound	Concentration (ug/L)		RPD (≤ %)

LDC #: 33164C1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of Compound
C_x = Concentration of compound,
S= Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL MS V5	9/29/2014	cis-1,2-DCE (IS1)	0.4762749	0.4762749	0.4626995	0.4626995	3.85	3.85
			Tetrachlororethene (IS2)	0.3807271	0.3807271	0.3878348	0.3878348	13.21	13.21
			1,1,2,2-TCA (IS3)	0.6405396	0.6405396	0.6038102	0.6038102	9.72	9.72
2	ICAL MS V5	10/1/2014	Allyl chloride (IS1)	0.7350514	0.7350514	0.7121014	0.7121014	6.76	6.76
			Methyl methacrylate (IS2)	0.0784983	0.0784983	0.0774599	0.0774599	6.03	6.03
			Pentachloroethane (IS3)	0.7119626	0.7119626	0.6967004	0.6967004	13.77	13.77

LDC # 33164C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound	(IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	27oct03 MS V5	10/27/14	cis-1,2-DCE	(IS1)	0.462700	0.447284	0.447284	3.3	3.3
			Tetrachlororethene	(IS2)	0.387835	0.359699	0.359699	7.3	7.3
			1,1,2,2-TCA	(IS3)	0.603810	0.621990	0.621990	3.0	3.0
2	27oct04 MS V5	10/27/14	Allyl chloride	(IS1)	0.712101	0.682902	0.682902	4.1	4.1
			Methyl methacrylate	(IS2)	0.077460	0.081255	0.081255	4.9	4.9
			Pentachloroethane	(IS3)	0.696700	0.863006	0.863006	23.9	23.9

LDC #: 37164C1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 5

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	10.00	10.190	102	102	0
Bromofluorobenzene	↓	8.510	85	85	↓
1,2-Dichlorobenzene-d4	↓	10.210	102	102	↓
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

LDC #: 33164C1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSDC I * 2/(MSC + MSDC) MSC = Matrix spike percent recovery MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 14/15

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
1,1-Dichloroethene	25.0	25.0	0	24.39	24.42	97.6	97.6	97.7	97.7	0.123	0.123
Trichloroethene				24.95	25.28	99.8	99.8	101	101	1.31	1.31
Benzene				24.46	25.090	97.8	97.8	100	100	2.54	2.54
Toluene				25.07	25.050	100	100	100	100	0.0798	0.0798
Chlorobenzene				25.50	25.60	102	102	102	102	0.391	0.391

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164 C1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: BXJ2413-BS1

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	25.0	NA	23.580	NA	94.3	94.3				
Trichloroethene			23.760		95.0	95.0				
Benzene			23.86		95.4	95.4				
Toluene			24.02		96.1	96.1				
Chlorobenzene			24.26		97.0	97.0				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164 C1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

Compound results reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample purged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. ICS ND, Benzene:

Conc. = (862443)(10)( )
(197293)(1.83256)( )( )

= 23.859

≈ 23.86 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Acceptable (Y/N)
			23.86		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 24, 2014

LDC Report Date: December 5, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25355

Sample Identification

EB-5-10/24/14
MW-23-5
MW-23-4
MW-23-3**
MW-23-2
MW-23-1
MW-25-5
MW-25-4
MW-25-3
MW-25-2
MW-25-1
DUP-4-4Q14
EB-5-10/24/14MS
EB-5-10/24/14MSD
EB-5-10/24/14DUP

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 15 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Calibration

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was not required by the method.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples MW-25-1 and DUP-4-4Q14 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration ug/L		RPD
	MW-25-1	DUP-4-4Q14	
Chromium	1.4	1.5	7

XIV. Field Blanks

Sample EB-5-10/24/14 was identified as an equipment blank. No chromium was found.

NASA JPL, 4Q2014
Chromium - Data Qualification Summary - SDG 14-25355

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-25355

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:43:13PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

EB-5-10/24/14

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-02
File ID: PE_EL2_141112-139
Sampled: 10/24/14 07:00
Prepared: 11/12/14 09:00
Analyzed: 11/12/14 18:56
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1001
Sequence: 1416859
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/15/14 D

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3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:43:13PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-23-5

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-03
File ID: PE_EL2_141112-147
Sampled: 10/24/14 07:25
Prepared: 11/12/14 09:00
Analyzed: 11/12/14 19:24
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1001
Sequence: 1416859
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-23-4

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-04
File ID: PE_EL2_141112-148
Sampled: 10/24/14 08:05
Prepared: 11/12/14 09:00
Analyzed: 11/12/14 19:27
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1001
Sequence: 1416859
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.0	1	J	EPA-200.8

12/15/14 8

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Reported: 11/19/2014 5:43:13PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-23-3

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-05
File ID: PE_EL2_141112-149
Sampled: 10/24/14 08:35
Prepared: 11/12/14 09:00
Analyzed: 11/12/14 19:30
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1001
Sequence: 1416859
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.9	1	J	EPA-200.8

12/15/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-23-2

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-06
File ID: PE_EL2_141112-150
Sampled: 10/24/14 09:10
Prepared: 11/12/14 09:00
Analyzed: 11/12/14 19:34
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1001
Sequence: 1416859
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.70	1	J	EPA-200.8

12/15/14

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Reported: 11/19/2014 5:43:13PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-23-1

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-07
File ID: PE_EL2_141112-151
Sampled: 10/24/14 09:35
Prepared: 11/12/14 09:00
Analyzed: 11/12/14 19:37
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1001
Sequence: 1416859
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.70	1	J	EPA-200.8

12/16/14 K

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Reported: 11/19/2014 5:43:13PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-5

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-08
File ID: PE_EL2_141112-152
Sampled: 10/24/14 10:40
Prepared: 11/12/14 09:00
Analyzed: 11/12/14 19:41
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1001
Sequence: 1416859
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

Tidewater Inc.
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Reported: 11/19/2014 5:43:13PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-4

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-09
File ID: PE_EL2_141112-153
Sampled: 10/24/14 11:20
Prepared: 11/12/14 09:00
Analyzed: 11/12/14 19:44
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1001
Sequence: 1416859
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.88	1	J	EPA-200.8

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Reported: 11/19/2014 5:43:13PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-3

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-10
File ID: PE_EL2_141112-154
Sampled: 10/24/14 12:00
Prepared: 11/12/14 09:00
Analyzed: 11/12/14 19:48
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1001
Sequence: 1416859
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.6	1	J	EPA-200.8

17/12/14

Tidewater Inc.
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Reported: 11/19/2014 5:43:13PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-2

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-11
File ID: PE_EL2_141112-155
Sampled: 10/24/14 13:00
Prepared: 11/12/14 09:00
Analyzed: 11/12/14 19:51
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1001
Sequence: 1416859
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.3	1	J	EPA-200.8

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:43:13PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-1

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-12
File ID: PE_EL2_141112-199
Sampled: 10/24/14 13:30
Prepared: 11/12/14 09:00
Analyzed: 11/12/14 22:23
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1002
Sequence: 1416860
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.4	1	J	EPA-200.8

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:43:13PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

DUP-4-4Q14

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-13
File ID: PE_EL2_141112-200
Sampled: 10/24/14 13:40
Prepared: 11/12/14 09:00
Analyzed: 11/12/14 22:26
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1002
Sequence: 1416860
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.5	1	J	EPA-200.8

11/19/14

LDC #: 33164C4

SDG #: 14-25355

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/4/14

Page: 1 of 1

Reviewer: KK

2nd Reviewer: CL

METHOD: Chromium (EPA Method 200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/24/14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	N	not required
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	ICP Serial Dilution	N	not performed
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(11 + 12)
XIV.	Field Blanks	ND	EB = 1

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	EB-5-10/24/14	11	MW-25-1	21		31	
2	MW-23-5	12	DUP-4-4Q14	22		32	
3	MW-23-4	13	EB-5-10/24/14MS	23		33	
4	MW-23-3**	14	EB-5-10/24/14MSD	24		34	
5	MW-23-2	15	EB-5-10/24/14DUP	25		35	
6	MW-23-1	16		26		36	
7	MW-25-5	17		27		37	
8	MW-25-4	18		28		38	
9	MW-25-3	19		29		39	
10	MW-25-2	20		30		40	

Notes:

)C #: 33164CH

VALIDATION FINDINGS CHECKLIST

Reviewer: KK
2nd Reviewer: CR

Method: Metals (EPA ~~SW 846~~ Method ~~6010/7000/6020~~ 200.8)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✗		✓	
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?			✓	
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were < 5X the RL.	✓			
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?	/			
If the %Rs were outside the criteria, was a reanalysis performed?	/			
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?		/		
Were all percent differences (%Ds) < 10%?			/	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			/	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
XIII. Field blanks				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

LDC#: 33164C4

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: KK

2nd Reviewer: AV

METHOD: Chromium (EPA Method 200.8)

Analyte	Concentration (ug/L)		RPD
	11	12	
Chromium	1.4	1.5	7

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33164C4.wpd

LDC #: 33164C4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: KK
2nd Reviewer: CL

METHOD: ~~Trace Metals~~ Chromium (EPA ~~SW-846~~ Method ~~6010/6020/7000~~ 200.8)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found / True x 100 Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV (11:23)	ICP/MS (Initial calibration)	Cr	53.829	50.000	108	108	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV (18:42)	ICP/MS (Continuing calibration)	Cr	40.216	40.000	101	101	Y
	CVAA (Continuing calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164C4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: KK
2nd Reviewer: [illegible]

METHOD: ~~Trace Metals~~ (EPA ~~SW 846~~ Method ~~6010/6020/7000~~) Chromium 200.8

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units) ug/L	True / D / SDR (units) ug/L	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
N/A	ICP interference check						
LCS	Laboratory control sample	Cr	39.182	40.000	98.0	98.0	Y
13	Matrix spike	Cr	(SSR-SR) 43.179	40.000	108	108	Y
15	Duplicate	Cr	ND	ND	NC	NC	Y
N/A	ICP serial dilution						

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164C4

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: KK
2nd reviewer: [signature]

Chromium 200.8
METHOD: ~~Trace Metals~~ (EPA ~~SW 846~~ Method ~~6010/6020/7000~~)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for Cr were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

Recalculation:

4: $\frac{(2.935)(50ml)(1)}{(50ml)}$

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (Mg/L)	Acceptable (Y/N)
	4	Cr	2.9	2.9	Y

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 24, 2014

LDC Report Date: December 10, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25355

Sample Identification

EB-5-10/24/14
MW-23-5
MW-23-4
MW-23-3**
MW-23-2
MW-23-1
MW-25-5
MW-25-4
MW-25-3
MW-25-2
MW-25-1
DUP-4-4Q14
EB-5-10/24/14MS
EB-5-10/24/14MSD
EB-5-10/24/14DUP
MW-25-1MS
MW-25-1MSD
MW-25-1DUP

** Indicates sample underwent Level IV review

Introduction

This data review covers 18 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met for each method.

III. Calibration verification

Calibration verification frequency and analysis criteria were met for each method.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-25-1 and DUP-4-4Q14 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-25-1	DUP-4-4Q14	
Perchlorate	9.5	9.3	2

XI. Field Blanks

Sample EB-5-10/24/14 was identified as an equipment blank. No contaminant concentrations were found.

NASA JPL, 4Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-25355

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-25355

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Wet Chemistry - Field Blank Data Qualification Summary - 14-25355

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-5-10/24/14

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-02
File ID: 141024 1755 CR6-023
Sampled: 10/24/14 07:00
Prepared: 10/24/14 23:29
Analyzed: 10/24/14 23:29
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2372
Sequence: 1415790
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

11/15/14 D

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Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-23-5

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-03
File ID: 141024 1755 CR6-027
Sampled: 10/24/14 07:25
Prepared: 10/24/14 23:29
Analyzed: 10/24/14 23:29
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2372
Sequence: 1415790
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-4

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-04
File ID: 141024 1755 CR6-028
Sampled: 10/24/14 08:05
Prepared: 10/24/14 23:29
Analyzed: 10/24/14 23:29
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2372
Sequence: 1415790
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0023	1		EPA-7196

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-3

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-05
File ID: 141024 1755 CR6-029
Sampled: 10/24/14 08:35
Prepared: 10/24/14 23:29
Analyzed: 10/24/14 23:29
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2372
Sequence: 1415790
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0030	1		EPA-7196

12/16/14 K

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-2

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-06
File ID: 141024 1755 CR6-030
Sampled: 10/24/14 09:10
Prepared: 10/24/14 23:29
Analyzed: 10/24/14 23:29
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2372
Sequence: 1415790
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0011	1	J	EPA-7196

11/15/14

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Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-1

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-07
File ID: 141024 1755 CR6-033
Sampled: 10/24/14 09:35
Prepared: 10/24/14 23:29
Analyzed: 10/24/14 23:36
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2372
Sequence: 1415790
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00080	1	J	EPA-7196

12/15/14 K

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Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-5

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-08
File ID: 141024 1755 CR6-034
Sampled: 10/24/14 10:40
Prepared: 10/24/14 23:29
Analyzed: 10/24/14 23:36
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2372
Sequence: 1415790
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
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INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-4

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-09
File ID: 141024 1755 CR6-035
Sampled: 10/24/14 11:20
Prepared: 10/24/14 23:29
Analyzed: 10/24/14 23:36
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2372
Sequence: 1415790
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00080	1	J	EPA-7196

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-3

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-10
File ID: 141024 1755 CR6-053
Sampled: 10/24/14 12:00
Prepared: 10/24/14 23:29
Analyzed: 10/24/14 23:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2372
Sequence: 1415790
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0030	1		EPA-7196

11/18/14 gr

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-2

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-11
File ID: 141024 1755 CR6-054
Sampled: 10/24/14 13:00
Prepared: 10/24/14 23:29
Analyzed: 10/24/14 23:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2372
Sequence: 1415790
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0023	1		EPA-7196

12/16/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-1

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-12
File ID: 141024 1755 CR6-040
Sampled: 10/24/14 13:30
Prepared: 10/24/14 23:29
Analyzed: 10/24/14 23:36
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2374
Sequence: 1415790
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

11/18/14

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Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

DUP-4-4Q14

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-13
File ID: 141024 1755 CR6-046
Sampled: 10/24/14 13:40
Prepared: 10/24/14 23:29
Analyzed: 10/24/14 23:39
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2374
Sequence: 1415790
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

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Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-5-10/24/14

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-02RE1
File ID: F111214.seq-14.0000.txt
Sampled: 10/24/14 07:00
Prepared: 11/12/14 18:00
Analyzed: 11/12/14 18:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1130
Sequence: 1416896
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

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Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-23-5

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-03RE1
File ID: F111214.seq-18.0000.txt
Sampled: 10/24/14 07:25
Prepared: 11/12/14 18:00
Analyzed: 11/12/14 19:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1130
Sequence: 1416896
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/16/14 8

Tidewater Inc.
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Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-23-4

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-04RE1
File ID: F111214.seq-19.0000.txt
Sampled: 10/24/14 08:05
Prepared: 11/12/14 18:00
Analyzed: 11/12/14 19:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1130
Sequence: 1416896
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.1	1	J	EPA-314.0

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-23-3

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-05RE2
File ID: F111214.seq-20.0000.txt
Sampled: 10/24/14 08:35
Prepared: 11/12/14 18:00
Analyzed: 11/12/14 20:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1130
Sequence: 1416896
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.6	1	J	EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-23-2

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-06RE4
File ID: F111214.seq-21.0000.txt
Sampled: 10/24/14 09:10
Prepared: 11/12/14 18:00
Analyzed: 11/12/14 20:24
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1130
Sequence: 1416896
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.1	1		EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-23-1

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-07RE2
File ID: F111214.seq-22.0000.txt
Sampled: 10/24/14 09:35
Prepared: 11/12/14 18:00
Analyzed: 11/12/14 20:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1130
Sequence: 1416896
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.8	1	J	EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-5

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-08RE1
File ID: F111214.seq-26.0000.txt
Sampled: 10/24/14 10:40
Prepared: 11/12/14 18:00
Analyzed: 11/12/14 21:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1130
Sequence: 1416896
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-4

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-09RE2
File ID: F111214.seq-27.0000.txt
Sampled: 10/24/14 11:20
Prepared: 11/12/14 18:00
Analyzed: 11/12/14 21:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1130
Sequence: 1416896
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	9.1	1		EPA-314.0

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-3

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-10RE2
File ID: F111214.seq-28.0000.txt
Sampled: 10/24/14 12:00
Prepared: 11/12/14 18:00
Analyzed: 11/12/14 22:01
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1130
Sequence: 1416896
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	10	1		EPA-314.0

12/14/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-2

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-11RE2
File ID: F111214.seq-29.0000.txt
Sampled: 10/24/14 13:00
Prepared: 11/12/14 18:00
Analyzed: 11/12/14 22:15
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1130
Sequence: 1416896
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	14	1		EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-1

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-12
File ID: F110715.seq-8.0000.txt
Sampled: 10/24/14 13:30
Prepared: 11/07/14 19:00
Analyzed: 11/07/14 20:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0895
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	9.5	1		EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/19/2014 5:40:37PM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

DUP-4-4Q14

Laboratory: BC Laboratories
SDG: 14-25355
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425355-13
File ID: F110715.seq-9.0000.txt
Sampled: 10/24/14 13:40
Prepared: 11/07/14 19:00
Analyzed: 11/07/14 20:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0895
Sequence: 1416747
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	9.3	1		EPA-314.0

12/15/14 X

LDC #: 33164C6
SDG #: 14-25355
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 12/3/14
Page: 1 of 1
Reviewer: KK
2nd Reviewer: OK

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/24/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/D from SDG 14-25441
VI.	Duplicates	A	DUP from SDG 14-25441
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	A	Not reviewed for Level III validation.
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	(11+12)
XI	Field blanks	ND	EB = 1

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	EB-5-10/24/14	11	MW-25-1	21		31	
2	MW-23-5	12	DUP-4-4Q14	22		32	
3	MW-23-4	13	EB-5-10/24/14MS	23		33	
4	MW-23-3**	14	EB-5-10/24/14MSD	24		34	
5	MW-23-2	15	EB-5-10/24/14DUP	25		35	
6	MW-23-1	16	MW-25-1MS	26		36	
7	MW-25-5	17	MW-25-1MSD	27		37	
8	MW-25-4	18	MW-25-1DUP	28		38	
9	MW-25-3	19		29		39	
10	MW-25-2	20		30		40	

Notes:

LDC #: 33164C6

VALIDATION FINDINGS CHECKLIST

Reviewer: KJ
2nd Reviewer: AV

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 33164C6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: KK
2nd reviewer: [signature]

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1 - 12	W	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC **Cr6+** **ClO_4**
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 13-15		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ **ClO_4**
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 13-18	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC **Cr6+** ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC# 33164C6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: KK
2nd Reviewer: [signature]

Inorganics: Method See Cover

Analyte	Concentration (mg/L)		RPD
	11	12	
Perchlorate (ug/L)	9.5	9.3	2

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33164C6.wpd

LDC #: 33164C6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: HK
2nd Reviewer: AL

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of ClO4 was recalculated.Calibration date: 10/22/14

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ug/L)	Abs	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	ClO4	s1	2	0.0022	*0.999911*	0.999570	Y
		s2	4	0.0045			
		s3	6	0.0065			
		s4	10	0.0108			
		s5	20	0.0214			
Calibration verification	↓	CCV (22:06)	10.237	10.0	102	98	↓
Calibration verification	Cr6+	CCV (17:55)	0.04904	0.050000	98.1	97.6	
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164C6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: KR
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	ClO_4	10.237	10.000	102	100	Y
13	Matrix spike sample	↓	(SSR-SR) 9.306	10.101	92.1 ~~93.1~~	95.1 ~~83.4~~	Y
18	Duplicate sample	ClO_4	ND	ND	N/C	N/C	Y

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33164C6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: KK
2nd reviewer: AR

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for ClO4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = Area x X coefficient

Recalculation:

4: $(0.004\ \mu s * min)(930.61656853) = 3.62227\ \mu g/L$

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration (µg/L)	Acceptable (Y/N)
	4	ClO4	3.6	3.6	Y
	↓	Cr6+ (mg/L)	0.0030	0.0023*	↓

Note: * not enough significant figures reported in the raw data response to accurately recalculate

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Tidewater, Inc.
199 Shell Street
Manhattan Beach, CA 90266
ATTN: Mr. David Conner

December 16, 2014

SUBJECT: NASA JPL, 4Q2014, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on November 25, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33174:

SDG #	Fraction
14-25550, 14-25655, 14-25765	Volatiles, Chromium, Wet Chemistry

The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Pei Geng
Project Manager/Senior Chemist

HC

Attachment 1

90/10 (client select)

LDC #33174 (Tidewater- Powell, OH / NASA JPL, 4Q2014)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)		Cr (200.8)		Cl, SO_4 NO_3-N (300.0)		NO_2-N (353.2)		Cr(VI) (7196)		O-PO_4 (365.1)		CLO_4 (314.0)																			
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	14-25550	11/25/14	12/18/14	14	0	13	0	1	0	1	0	13	0	1	0	13	0																		
B	14-25655	11/25/14	12/18/14	5	0	3	0	1	0	1	0	3	0	1	0	4	0																		
C	14-25765	11/25/14	12/18/14	6	0	3	0	3	0	3	0	3	0	3	0	5	0																		
C	14-25765	11/25/14	12/18/14	1	0	1	0	0	0	0	0	1	0	0	0	1	0																		
Total	T/PG			26	0	20	0	5	0	5	0	20	0	5	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS/MSD, and DUPs

L:\Tidewater\NASA JPL\33174ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 28, 2014

LDC Report Date: December 11, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25550

Sample Identification

TB-7-10/28/14
SB-3-10/28/14
EB-7-10/28/14
MW-12-5
MW-12-4
MW-12-3
DUP-7-4Q14
MW-12-2
MW-24-5
MW-24-4
DUP-8-4Q14
MW-24-3
MW-24-2
MW-24-1
SB-3-10/28/14MS
SB-3-10/28/14MSD

Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of the presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/29/14 (29OCT02)	Bromomethane	62.0	TB-7-10/28/14 SB-3-10/28/14 EB-7-10/28/14 MW-12-5 MW-12-4 MW-12-3 DUP-7-4Q14 MW-12-2 MW-24-5 SB-3-10/28/14MS SB-3-10/28/14MSD BXJ2654-BLK1	J (all detects) UJ (all non-detects)	P

Date	Compound	%D	Associated Samples	Flag	A or P
10/29/14 (29OCT03)	Methol iodide	61.2	TB-7-10/28/14 SB-3-10/28/14 EB-7-10/28/14 MW-12-5 MW-12-4 MW-12-3 DUP-7-4Q14 MW-12-2 MW-24-5 SB-3-10/28/14MS SB-3-10/28/14MSD BXJ2654-BLK1	J (all detects) UJ (all non-detects)	P
10/29/14 (29OCT33)	Bromomethane	64.7	MW-24-4 DUP-8-4Q14 MW-24-3 MW-24-2 MW-24-1 1415924-CCB2	J (all detects) UJ (all non-detects)	P
10/29/14 (29OCT34)	Methol iodide Pentachloroethane	72.5 73.6	MW-24-4 DUP-8-4Q14 MW-24-3 MW-24-2 MW-24-1 1415924-CCB2	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples MW-12-3 and DUP-7-4Q14 and samples MW-24-4 and DUP-8-4Q14 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-12-3	DUP-7-4Q14	
Carbon tetrachloride	0.63	1.1	54
Chloroform	2.9	3.5	19
Trichloroethene	0.26	0.34	27

Compound	Concentration (ug/L)		RPD
	MW-24-4	DUP-8-4Q14	
Ethylbenzene	0.10	0.15	40
Styrene	0.15	0.19	24

XVII. Field Blanks

Sample TB-7-10/28/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-7-10/28/14 was identified as an equipment blank. No volatile contaminants were found.

Sample SB-3-10/28/14 was identified as a source blank. No volatile contaminants were found.

NASA JPL, 4Q2014
Volatiles - Data Qualification Summary - SDG 14-25550

SDG	Sample	Compound	Flag	A or P	Reason
14-25550	TB-7-10/28/14 SB-3-10/28/14 EB-7-10/28/14 MW-12-5 MW-12-4 MW-12-3 DUP-7-4Q14 MW-12-2 MW-24-5	Bromomethane Methol iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
14-25550	MW-24-4 DUP-8-4Q14 MW-24-3 MW-24-2 MW-24-1	Bromomethane Methol iodide Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 4Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-25550

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-7-10/28/14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-01	File ID:	29OCT20.D
Sampled:	10/28/14 06:45	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 12:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-7-10/28/14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-01	File ID:	29OCT20.D
Sampled:	10/28/14 06:45	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 12:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14 DL

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

TB-7-10/28/14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-01	File ID:	29OCT20.D
Sampled:	10/28/14 06:45	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 12:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U NT
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.8700	98.7	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.200	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4000	94.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	221823	6.67	195693	6.66	
Chlorobenzene-d5 (IS)	72508	9.68	62959	9.68	
1,4-Difluorobenzene (IS)	279927	7.46	253321	7.46	

11/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-3-10/28/14

Laboratory:	BC Laboratories			SDG:	14-25550
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425550-02	File ID:	29OCT21.D
Sampled:	10/28/14 07:00	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 12:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence:	1415924	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-3-10/28/14

Laboratory:	BC Laboratories			SDG:	14-25550
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425550-02	File ID:	29OCT21.D
Sampled:	10/28/14 07:00	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 12:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence:	1415924	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

17/14/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-3-10/28/14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-02	File ID:	29OCT21.D
Sampled:	10/28/14 07:00	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 12:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U U5
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.7400	97.4	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.000	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4300	94.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	219677	6.66	195693	6.66	
Chlorobenzene-d5 (IS)	69617	9.68	62959	9.68	
1,4-Difluorobenzene (IS)	274792	7.46	253321	7.46	

17/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-7-10/28/14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-03	File ID:	29OCT22.D
Sampled:	10/28/14 07:05	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 13:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-7-10/28/14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-03	File ID:	29OCT22.D
Sampled:	10/28/14 07:05	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 13:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

EB-7-10/28/14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-03	File ID:	29OCT22.D
Sampled:	10/28/14 07:05	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 13:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.7700	97.7	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.260	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3700	93.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	218915	6.66	195693	6.66	
Chlorobenzene-d5 (IS)	71527	9.68	62959	9.68	
1,4-Difluorobenzene (IS)	273879	7.46	253321	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-5

Laboratory:	BC Laboratories			SDG:	14-25550
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425550-04	File ID:	29OCT23.D
Sampled:	10/28/14 07:30	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 13:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence:	1415924	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.24	J
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.27	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-5

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-04	File ID:	29OCT23.D
Sampled:	10/28/14 07:30	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 13:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.090	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-5

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-04	File ID:	29OCT23.D
Sampled:	10/28/14 07:30	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 13:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.7200	97.2	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.170	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1400	91.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	217859	6.67	195693	6.66	
Chlorobenzene-d5 (IS)	69970	9.68	62959	9.68	
1,4-Difluorobenzene (IS)	270618	7.46	253321	7.46	

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-4

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-05	File ID:	29OCT24.D
Sampled:	10/28/14 08:10	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 13:58
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U U5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.46	J
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.55	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-4

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-05	File ID:	29OCT24.D
Sampled:	10/28/14 08:10	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 13:58
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.18	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-4

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-05	File ID:	29OCT24.D
Sampled:	10/28/14 08:10	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 13:58
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9900	99.9	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.310	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2400	92.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	208002	6.67	195693	6.66	
Chlorobenzene-d5 (IS)	68929	9.68	62959	9.68	
1,4-Difluorobenzene (IS)	262239	7.45	253321	7.46	

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-3

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-06	File ID:	29OCT25.D
Sampled:	10/28/14 08:45	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 14:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.63	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	2.9	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-3

Laboratory:	BC Laboratories			SDG:	14-25550
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425550-06	File ID:	29OCT25.D
Sampled:	10/28/14 08:45	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 14:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence:	1415924	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.26	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-3

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-06	File ID:	29OCT25.D
Sampled:	10/28/14 08:45	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 14:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U LS
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.040	100	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.220	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1900	91.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	210678	6.66	195693	6.66	
Chlorobenzene-d5 (IS)	68088	9.68	62959	9.68	
1,4-Difluorobenzene (IS)	264257	7.45	253321	7.46	

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-7-4Q14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-07	File ID:	29OCT26.D
Sampled:	10/28/14 08:55	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 14:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U LJS
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	1.1	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	3.5	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-7-4Q14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-07	File ID:	29OCT26.D
Sampled:	10/28/14 08:55	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 14:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.34	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-7-4Q14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-07	File ID:	29OCT26.D
Sampled:	10/28/14 08:55	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 14:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.8300	98.3	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.270	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0600	90.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	210565	6.66	195693	6.66	
Chlorobenzene-d5 (IS)	68301	9.68	62959	9.68	
1,4-Difluorobenzene (IS)	263831	7.46	253321	7.46	

12/15/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-2

Laboratory: BC Laboratories | SDG: 14-25550
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425550-08 | File ID: 29OCT27.D
Sampled: 10/28/14 09:25 | Prepared: 10/29/14 06:44 | Analyzed: 10/29/14 15:06
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2654 | Sequence: 1415924 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U LT
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

11/18/14 R

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-2

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-08	File ID:	29OCT27.D
Sampled:	10/28/14 09:25	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 15:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/16/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-2

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-08	File ID:	29OCT27.D
Sampled:	10/28/14 09:25	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 15:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.7600	97.6	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.080	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1100	91.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	214228	6.66	195693	6.66	
Chlorobenzene-d5 (IS)	68354	9.68	62959	9.68	
1,4-Difluorobenzene (IS)	267543	7.46	253321	7.46	

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-5

Laboratory: BC Laboratories | SDG: 14-25550
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425550-09 | File ID: 29OCT28.D
Sampled: 10/28/14 10:35 | Prepared: 10/29/14 06:44 | Analyzed: 10/29/14 15:29
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2654 | Sequence: 1415924 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

1/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-5

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-09	File ID:	29OCT28.D
Sampled:	10/28/14 10:35	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 15:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-5

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-09	File ID:	29OCT28.D
Sampled:	10/28/14 10:35	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 15:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9600	99.6	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.240	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1100	91.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	206492	6.66	195693	6.66	
Chlorobenzene-d5 (IS)	66132	9.68	62959	9.68	
1,4-Difluorobenzene (IS)	257693	7.46	253321	7.46	

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-4

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-10	File ID:	29OCT39.D
Sampled:	10/28/14 11:15	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 19:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-4

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-10	File ID:	29OCT39.D
Sampled:	10/28/14 11:15	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 19:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.10	J
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.15	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14 a

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-4

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-10	File ID:	29OCT39.D
Sampled:	10/28/14 11:15	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 19:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.090	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.170	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7900	87.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	202648	6.66	208015	6.66	
Chlorobenzene-d5 (IS)	66169	9.68	68299	9.68	
1,4-Difluorobenzene (IS)	257694	7.46	269400	7.46	

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-8-4Q14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-11	File ID:	29OCT40.D
Sampled:	10/28/14 11:25	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 20:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-8-4Q14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-11	File ID:	29OCT40.D
Sampled:	10/28/14 11:25	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 20:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.15	J
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.19	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-8-4Q14

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-11	File ID:	29OCT40.D
Sampled:	10/28/14 11:25	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 20:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.120	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.190	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8800	88.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	205284	6.66	208015	6.66	
Chlorobenzene-d5 (IS)	66691	9.68	68299	9.68	
1,4-Difluorobenzene (IS)	256220	7.45	269400	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-3

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-12	File ID:	29OCT41.D
Sampled:	10/28/14 12:00	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 20:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-24-3

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-12	File ID:	29OCT41.D
Sampled:	10/28/14 12:00	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 20:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.070	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

1/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-3

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-12	File ID:	29OCT41.D
Sampled:	10/28/14 12:00	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 20:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.070	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.100	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7900	87.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	203924	6.66	208015	6.66	
Chlorobenzene-d5 (IS)	65575	9.68	68299	9.68	
1,4-Difluorobenzene (IS)	255612	7.46	269400	7.46	

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-2

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-13	File ID:	29OCT42.D
Sampled:	10/28/14 13:05	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 20:46
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.64	
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.78	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.16	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-2

Laboratory: BC Laboratories | SDG: 14-25550
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425550-13 | File ID: 29OCT42.D
Sampled: 10/28/14 13:05 | Prepared: 10/29/14 06:44 | Analyzed: 10/29/14 20:46
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2654 | Sequence: 1415924 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.20	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-2

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-13	File ID:	29OCT42.D
Sampled:	10/28/14 13:05	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 20:46
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence:	1415924	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.140	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.260	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7900	87.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	201722	6.66	208015	6.66	
Chlorobenzene-d5 (IS)	67169	9.68	68299	9.68	
1,4-Difluorobenzene (IS)	257165	7.45	269400	7.46	

12/15/14 R

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-1

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-14	File ID:	29OCT43.D
Sampled:	10/28/14 13:40	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 21:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.30	J
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.8	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-1

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-14	File ID:	29OCT43.D
Sampled:	10/28/14 13:40	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 21:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.60	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:47:19AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-1

Laboratory:	BC Laboratories		SDG:	14-25550	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425550-14	File ID:	29OCT43.D
Sampled:	10/28/14 13:40	Prepared:	10/29/14 06:44	Analyzed:	10/29/14 21:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2654	Sequence: 1415924	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.400	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.100	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7900	87.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	199351	6.66	208015	6.66	
Chlorobenzene-d5 (IS)	64251	9.68	68299	9.68	
1,4-Difluorobenzene (IS)	258305	7.46	269400	7.46	

12/12/14 R

LDC #: 33174A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/04/14
SDG #: 14-25550 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: SW
2nd Reviewer: A

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/28/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	≤ 20% r²
IV.	Continuing calibration/ICV	SW	≤ 30%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	NA	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 6/7 ; 10/11
XVII.	Field blanks	ND	TB = 1 SB = 2 EB = 3

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Water

1	TB-7-10/28/14	11	DUP-8-4Q14 D7	21	BXJ2654-BLK1	31	
2	SB-3-10/28/14	12	MW-24-3	22		32	
3	EB-7-10/28/14	13	MW-24-2	23		33	
4	MW-12-5	14	MW-24-1	24		34	
5	MW-12-4	15	SB-3-10/28/14MS	25		35	
6	MW-12-3 D1	16	SB-3-10/28/14MSD	26		36	
7	DUP-7-4Q14 D1	17		27		37	
8	MW-12-2	18		28		38	
9	MW-24-5	19		29		39	
10	MW-24-4 D2	20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Methyl iodide
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. Pentachloroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33174 A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y (N) N/A Were all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	10/29/14	29Oct02	B	62.0	1-9, 15, 16, BXJ2654-BLK1	J/UJ/P
	10/29/14	29Oct03	NNNN	61.2		
	10/29/14	29Oct33	B	64.7	10-14, 1415924-CCB2	
	10/29/14	29Oct34	NNNN	72.5		
			0000	73.6		

LDC #: 39174A1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd reviewer: A

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD (≤ ~~%~~)
	6	7	
O	0.63	1.1	54
K	2.9	3.5	19
S	0.26	0.34	27

Compound	Concentration (ug/L)		RPD (~~≤ %~~)
	10	11	
EE	0.10	0.15	40
FF	0.15	0.19	24

Compound	Concentration (ug/L)		RPD (≤ %)

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 28, 2014

LDC Report Date: December 11, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25550

Sample Identification

SB-3-10/28/14
EB-7-10/28/14
MW-12-5
MW-12-4
MW-12-3
DUP-7-4Q14
MW-12-2
MW-24-5
MW-24-4
DUP-8-4Q14
MW-24-3
MW-24-2
MW-24-1
SB-3-10/28/14MS
SB-3-10/28/14MSD
SB-3-10/28/14DUP

Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Calibration

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was not required by the method.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples MW-12-3 and DUP-7-4Q14 and samples MW-24-4 and DUP-8-4Q14 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-12-3	DUP-7-4Q14	
Chromium	0.50U	0.57	200

Analyte	Concentration (ug/L)		RPD
	MW-24-4	DUP-8-4Q14	
Chromium	0.50U	0.69	200

XIV. Field Blanks

Sample EB-7-10/28/14 was identified as an equipment blank. No chromium was found.

Sample SB-3-10/28/14 was identified as a source blank. No chromium was found.

NASA JPL, 4Q2014
Chromium - Data Qualification Summary - SDG 14-25550

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-25550

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

SB-3-10/28/14

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-02
File ID: PE_EL2_141114-032
Sampled: 10/28/14 07:00
Prepared: 11/13/14 13:00
Analyzed: 11/14/14 11:40
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1107
Sequence: 1416986
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

17/15/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

EB-7-10/28/14

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-03
File ID: PE_EL2_141114-040
Sampled: 10/28/14 07:05
Prepared: 11/13/14 13:00
Analyzed: 11/14/14 12:08
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1107
Sequence: 1416986
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

11/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-12-5

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-04
File ID: PE_EL2_141114-041
Sampled: 10/28/14 07:30
Prepared: 11/13/14 13:00
Analyzed: 11/14/14 12:11
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1107
Sequence: 1416986
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.7	1	J	EPA-200.8

12/15/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-12-4

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-05
File ID: PE_EL2_141114-042
Sampled: 10/28/14 08:10
Prepared: 11/13/14 13:00
Analyzed: 11/14/14 12:14
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1107
Sequence: 1416986
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.75	1	J	EPA-200.8

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-12-3

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-06
File ID: PE_EL2_141114-043
Sampled: 10/28/14 08:45
Prepared: 11/13/14 13:00
Analyzed: 11/14/14 12:18
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1107
Sequence: 1416986
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/15/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

DUP-7-4Q14

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-07
File ID: PE_EL2_141114-044
Sampled: 10/28/14 08:55
Prepared: 11/13/14 13:00
Analyzed: 11/14/14 12:21
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1107
Sequence: 1416986
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.57	1	J	EPA-200.8

11/15/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-12-2

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-08
File ID: PE_EL2_141114-045
Sampled: 10/28/14 09:25
Prepared: 11/13/14 13:00
Analyzed: 11/14/14 12:25
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1107
Sequence: 1416986
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.8	1	J	EPA-200.8

12/16/14 &

Tidewater Inc.
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Powell, OH 43065

Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-24-5

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-09
File ID: PE_EL2_141114-046
Sampled: 10/28/14 10:35
Prepared: 11/13/14 13:00
Analyzed: 11/14/14 12:28
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1107
Sequence: 1416986
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.1	1	J	EPA-200.8

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-24-4

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-10
File ID: PE_EL2_141114-047
Sampled: 10/28/14 11:15
Prepared: 11/13/14 13:00
Analyzed: 11/14/14 12:32
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1107
Sequence: 1416986
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

11/14/10

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

DUP-8-4Q14

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-11
File ID: PE_EL2_141114-048
Sampled: 10/28/14 11:25
Prepared: 11/13/14 13:00
Analyzed: 11/14/14 12:35
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1107
Sequence: 1416986
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.69	1	J	EPA-200.8

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-24-3

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-12
File ID: PE_EL2_141114-125
Sampled: 10/28/14 12:00
Prepared: 11/14/14 08:30
Analyzed: 11/14/14 17:16
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1216
Sequence: 1417018
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

12/15/14 8

Tidewater Inc.
3761 Attucks Drive
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Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-24-2

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-13
File ID: PE_EL2_141114-126
Sampled: 10/28/14 13:05
Prepared: 11/14/14 08:30
Analyzed: 11/14/14 17:20
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1216
Sequence: 1417018
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.6	1	J	EPA-200.8

11/14/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:49:57AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-24-1

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-14
File ID: PE_EL2_141114-127
Sampled: 10/28/14 13:40
Prepared: 11/14/14 08:30
Analyzed: 11/14/14 17:23
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1216
Sequence: 1417018
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	4.7	1		EPA-200.8

12/15/14 R

LDC #: 33174A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/4/14
SDG #: 14-25550 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: KK
2nd Reviewer: CN

METHOD: Chromium (EPA Method 200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/28/14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	N	not required
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	not reviewed
X.	ICP Serial Dilution	N	not performed
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(5+6) (9+10)
XIV.	Field Blanks	ND	SB=1 EB=2

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Water

1	SB-3-10/28/14	11	MW-24-3	21		31	
2	EB-7-10/28/14	12	MW-24-2	22		32	
3	MW-12-5	13	MW-24-1	23		33	
4	MW-12-4	14	SB-3-10/28/14MS	24		34	
5	MW-12-3	15	SB-3-10/28/14MSD	25		35	
6	DUP-7-4Q14	16	SB-3-10/28/14DUP	26		36	
7	MW-12-2	17		27		37	
8	MW-24-5	18		28		38	
9	MW-24-4	19		29		39	
10	DUP-8-4Q14	20		30		40	

Notes:

LDC#: 33174A4

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: KK
2nd Reviewer: CL

METHOD: Chromium (EPA Method 200.8)

Analyte	Concentration (ug/L)		RPD
	5	6	
Chromium	0.50U	0.57	~~13~~ 200

Analyte	Concentration (ug/L)		RPD
	9	10	
Chromium	0.50U	0.69	~~32~~ 200

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33174A4.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 28, 2014

LDC Report Date: December 11, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25550

Sample Identification

SB-3-10/28/14
EB-7-10/28/14
MW-12-5
MW-12-4
MW-12-3
DUP-7-4Q14
MW-12-2
MW-24-5
MW-24-4
DUP-8-4Q14
MW-24-3
MW-24-2
MW-24-1
SB-3-10/28/14MS
SB-3-10/28/14MSD
SB-3-10/28/14DUP
DUP-8-4Q14MS
DUP-8-4Q14MSD
DUP-8-4Q14DUP
MW-24-3MS
MW-24-3MSD
MW-24-3DUP

Introduction

This data review covers 22 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, and Sulfate, EPA Method 353.2 for Nitrite as Nitrogen, EPA Method 365.1 for Orthophosphate as Phosphorus, EPA SW 846 Method 7196 for Hexavalent Chromium, and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Chloride	0.10700 mg/L	MW-24-1
ICB/CCB	Chloride	0.13300 mg/L	MW-24-1

Sample concentrations were compared to concentrations detected in the blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-24-3MS/MSD (MW-24-3 MW-24-2 MW-24-1)	Hexavalent chromium	77.0 (85-115)	76.4 (85-115)	-	J (all detects) UJ (all non-detects)	A

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-12-3 and DUP-7-4Q14 and samples MW-24-4 and DUP-8-4Q14 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-12-3	DUP-7-4Q14	
Perchlorate	0.70	1.2	53

XI. Field Blanks

Sample EB-7-10/28/14 was identified as an equipment blank. No contaminant concentrations were found.

Sample SB-3-10/28/14 was identified as a source blank. No contaminant concentrations were found.

NASA JPL, 4Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-25550

SDG	Sample	Analyte	Flag	A or P	Reason
14-25550	MW-24-3 MW-24-2 MW-24-1	Hexavalent chromium	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)

NASA JPL, 4Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-25550

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-24-1

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-14
File ID: 141029 0836 NO2-020
Sampled: 10/28/14 13:40
Prepared: 10/29/14 08:36
Analyzed: 10/29/14 08:36
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2612
Sequence: 1416059
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.012	1	U	EPA-353.2

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-365.1

MW-24-1

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-14
File ID: 141029 0814 PO4-009
Sampled: 10/28/14 13:40
Prepared: 10/29/14 08:14
Analyzed: 10/29/14 08:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2613
Sequence: 1416061
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.011	1	J	EPA-365.1

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-300.0

MW-24-1

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-14
File ID: B102814.seq-32
Sampled: 10/28/14 13:40
Prepared: 10/28/14 21:00
Analyzed: 10/29/14 00:30
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2665
Sequence: 1416067
Calibration: UNASSIGNED
Instrument: IC2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	83	1		EPA-300.0
14797-55-8	Nitrate as N	1.5	1		EPA-300.0
14808-79-8	Sulfate	44	1		EPA-300.0

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

SB-3-10/28/14

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-02
File ID: F111114.seq-17.0000.txt
Sampled: 10/28/14 07:00
Prepared: 11/11/14 14:00
Analyzed: 11/11/14 21:24
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1031
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

Tidewater Inc.
3761 Attucks Drive
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Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-7-10/28/14

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-03
File ID: F111114.seq-21.0000.txt
Sampled: 10/28/14 07:05
Prepared: 11/11/14 14:00
Analyzed: 11/11/14 22:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1031
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

11/25/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-12-5

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-04
File ID: F111114.seq-22.0000.txt
Sampled: 10/28/14 07:30
Prepared: 11/11/14 14:00
Analyzed: 11/11/14 22:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1031
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.5	1	J	EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-12-4

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-05
File ID: F111114.seq-23.0000.txt
Sampled: 10/28/14 08:10
Prepared: 11/11/14 14:00
Analyzed: 11/11/14 22:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1031
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.2	1	J	EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-12-3

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-06
File ID: F111114.seq-24.0000.txt
Sampled: 10/28/14 08:45
Prepared: 11/11/14 14:00
Analyzed: 11/11/14 23:01
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1031
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.70	1	J	EPA-314.0

1/16/15 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

DUP-7-4Q14

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-07
File ID: F111114.seq-25.0000.txt
Sampled: 10/28/14 08:55
Prepared: 11/11/14 14:00
Analyzed: 11/11/14 23:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1031
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.2	1	J	EPA-314.0

12/18/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-12-2

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-08
File ID: F111114.seq-28.0000.txt
Sampled: 10/28/14 09:25
Prepared: 11/11/14 14:00
Analyzed: 11/11/14 23:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1031
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.8	1	J	EPA-314.0

11/25/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-24-5

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-09
File ID: F111114.seq-29.0000.txt
Sampled: 10/28/14 10:35
Prepared: 11/11/14 14:00
Analyzed: 11/12/14 00:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1031
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-24-4

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-10
File ID: F111114.seq-30.0000.txt
Sampled: 10/28/14 11:15
Prepared: 11/11/14 14:00
Analyzed: 11/12/14 00:24
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1031
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

DUP-8-4Q14

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-11
File ID: F111114.seq-33.0000.txt
Sampled: 10/28/14 11:25
Prepared: 11/11/14 14:00
Analyzed: 11/12/14 01:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1032
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/5/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-24-3

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-12
File ID: F111114.seq-37.0000.txt
Sampled: 10/28/14 12:00
Prepared: 11/11/14 14:00
Analyzed: 11/12/14 02:00
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1032
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/15/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-24-2

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-13
File ID: F111114.seq-40.0000.txt
Sampled: 10/28/14 13:05
Prepared: 11/11/14 14:00
Analyzed: 11/12/14 02:42
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1032
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	5.4	1		EPA-314.0

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-24-1

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-14
File ID: F111114.seq-62.0000.txt
Sampled: 10/28/14 13:40
Prepared: 11/11/14 14:00
Analyzed: 11/12/14 11:46
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1032
Sequence: 1416838
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	140	10	D	EPA-314.0

12/15/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

SB-3-10/28/14

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-02
File ID: 141028 2202 CR6-025
Sampled: 10/28/14 07:00
Prepared: 10/28/14 22:02
Analyzed: 10/28/14 22:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2608
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

EB-7-10/28/14

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-03
File ID: 141028 2202 CR6-029
Sampled: 10/28/14 07:05
Prepared: 10/28/14 22:02
Analyzed: 10/28/14 22:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2608
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-12-5

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-04
File ID: 141028 2202 CR6-030
Sampled: 10/28/14 07:30
Prepared: 10/28/14 22:02
Analyzed: 10/28/14 22:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2608
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0013	1	J	EPA-7196

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-12-4

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-05
File ID: 141028 2202 CR6-031
Sampled: 10/28/14 08:10
Prepared: 10/28/14 22:02
Analyzed: 10/28/14 22:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2608
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/15/14 ⊗

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-12-3

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-06
File ID: 141028 2202 CR6-032
Sampled: 10/28/14 08:45
Prepared: 10/28/14 22:02
Analyzed: 10/28/14 22:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2608
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

DUP-7-4Q14

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-07
File ID: 141028 2202 CR6-035
Sampled: 10/28/14 08:55
Prepared: 10/28/14 22:02
Analyzed: 10/28/14 23:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2608
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-12-2

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-08
File ID: 141028 2202 CR6-036
Sampled: 10/28/14 09:25
Prepared: 10/28/14 22:02
Analyzed: 10/28/14 23:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2608
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

11/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-5

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-09
File ID: 141028 2202 CR6-052
Sampled: 10/28/14 10:35
Prepared: 10/28/14 22:02
Analyzed: 10/28/14 23:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2608
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0020	1		EPA-7196

12/1/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-4

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-10
File ID: 141028 2202 CR6-038
Sampled: 10/28/14 11:15
Prepared: 10/28/14 22:02
Analyzed: 10/28/14 23:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2608
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

DUP-8-4Q14

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-11
File ID: 141028 2202 CR6-039
Sampled: 10/28/14 11:25
Prepared: 10/28/14 22:02
Analyzed: 10/28/14 23:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2608
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

Verified

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-3

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-12
File ID: 141028 2202 CR6-072
Sampled: 10/28/14 12:00
Prepared: 10/28/14 22:02
Analyzed: 10/29/14 07:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2610
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U U5	EPA-7196

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-2

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-13
File ID: 141028 2202 CR6-048
Sampled: 10/28/14 13:05
Prepared: 10/28/14 22:02
Analyzed: 10/28/14 23:08
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2610
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0019	1	J 5	EPA-7196

12/15/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:48:38AM
Project: JPL- GW Monitoring Wells
Project Number: 4TH Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-24-1

Laboratory: BC Laboratories
SDG: 14-25550
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425550-14
File ID: 141028 2202 CR6-049
Sampled: 10/28/14 13:40
Prepared: 10/28/14 22:02
Analyzed: 10/28/14 23:08
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2610
Sequence: 1415995
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U UJ	EPA-7196

1/16/15 cl

LDC #: 33174A6
SDG #: 14-25550
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 12/4/14
Page: 1 of 1
Reviewer: LK
2nd Reviewer: [illegible]

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Hexavalent Chromium (EPA SW846 Method 7196), Nitrite-N (EPA Methdo 353.2), Orthophosphate (EPA Method 365.1), Perchlorate (EPA Method 314.0)
P

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/28/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	~~SW~~ SW	
V	Matrix Spike/Matrix Spike Duplicates	SW	MS/D from SDG 14-25441
VI.	Duplicates	A	DUP ↓
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	(5+6) (9+10)
XI	Field blanks	ND	SB = 1 EB=2

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Water

1	SB-3-10/28/14	11	MW-24-3	21	MW-24-3MSD	31	
2	EB-7-10/28/14	12	MW-24-2	22	MW-24-3DUP	32	
3	MW-12-5	13	MW-24-1	23		33	
4	MW-12-4	14	SB-3-10/28/14MS	24		34	
5	MW-12-3	15	SB-3-10/28/14MSD	25		35	
6	DUP-7-4Q14	16	SB-3-10/28/14DUP	26		36	
7	MW-12-2	17	DUP-8-4Q14MS	27		37	
8	MW-24-5	18	DUP-8-4Q14MSD	28		38	
9	MW-24-4	19	DUP-8-4Q14DUP	29		39	
10	DUP-8-4Q14	20	MW-24-3MS	30		40	

Notes:

LDC #: 33174A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: KK
2nd reviewer: CR

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
4	W	pH TDS **Cl** F **NO_3-N** **NO_2-N** **SO_4** **O-PO_4-P** Alk CN NH_3 TKN TOC Cr6+ ClO_4
	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
1-13		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC **Cr6+** **ClO_4**
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 14-19		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ **ClO_4**
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 14-16/20-22	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC **Cr6+** ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 33174A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: KK
2nd Reviewer: CQ

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 13

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB (mg/L)	ICB/CCB (mg/L)		no quals									
Cl	0.10700	0.13300	0.665										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

33174A6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: KK
2nd Reviewer: [illegible]

METHOD: Inorganics, EPA Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	20/21	W	Cr6+	77.0 (85-115)	76.4 (85-115)		11-13	J/UJ/A (Det/ND)

Comments: _____

LDC# 33174A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: KM
2nd Reviewer: CM

Inorganics: Method See Cover

Analyte	Concentration (mg/L)		RPD
	5	6	
Perchlorate (ug/L)	0.70	1.2	53

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33174A6.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 29, 2014

LDC Report Date: December 11, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25655

Sample Identification

TB-8-10/29/14
MW-13
MW-1
MW-9
MW-15
MW-13MS
MW-13MSD
MW-15MS
MW-15MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of the presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/30/14 (30OCT02)	Bromomethane	64.3	TB-8-10/29/14 MW-13 MW-1 MW-9 MW-13MS MW-13MSD BXJ2735-BLK1	J (all detects) UJ (all non-detects)	P
10/30/14 (30OCT03)	Methol iodide Pentachloroethane	70.0 31.1	TB-8-10/29/14 MW-13 MW-1 MW-9 MW-13MS MW-13MSD BXJ2735-BLK1	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

Date	Compound	%D	Associated Samples	Flag	A or P
10/30/14 (30OCT33)	Bromomethane	76.7	MW-15 MW-15MS MW-15MSD BXJ2736-BLK1	J (all detects) UJ (all non-detects)	P
10/30/14 (30OCT34)	Methol iodide Pentachloroethane	68.6 75.0	MW-15 MW-15MS MW-15MSD BXJ2736-BLK1	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample TB-8-10/29/14 was identified as a trip blank. No volatile contaminants were found.

NASA JPL, 4Q2014
Volatiles - Data Qualification Summary - SDG 14-25655

SDG	Sample	Compound	Flag	A or P	Reason
14-25655	TB-8-10/29/14 MW-13 MW-1 MW-9 MW-15	Bromomethane Methol iodide Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 4Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-25655

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-8-10/29/14

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-01	File ID:	30OCT19.D
Sampled:	10/29/14 08:00	Prepared:	10/30/14 06:02	Analyzed:	10/30/14 11:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2735	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U US
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

17/15/14 R

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-8-10/29/14

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-01	File ID:	30OCT19.D
Sampled:	10/29/14 08:00	Prepared:	10/30/14 06:02	Analyzed:	10/30/14 11:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2735	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-8-10/29/14

Laboratory: BC Laboratories | SDG: 14-25655
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425655-01 | File ID: 30OCT19.D
Sampled: 10/29/14 08:00 | Prepared: 10/30/14 06:02 | Analyzed: 10/30/14 11:52
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2735 | Sequence: 1416017 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9100	99.1	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.150	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6500	96.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	203280	6.67	196181	6.67	
Chlorobenzene-d5 (IS)	64800	9.68	64829	9.68	
1,4-Difluorobenzene (IS)	255578	7.46	249583	7.46	

12/16/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-13

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-02	File ID:	30OCT13.D
Sampled:	10/29/14 09:28	Prepared:	10/30/14 06:02	Analyzed:	10/30/14 09:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2735	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.1	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.28	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/02/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-13

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-02	File ID:	30OCT13.D
Sampled:	10/29/14 09:28	Prepared:	10/30/14 06:02	Analyzed:	10/30/14 09:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2735	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	1.3	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.20	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-13

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-02	File ID:	30OCT13.D
Sampled:	10/29/14 09:28	Prepared:	10/30/14 06:02	Analyzed:	10/30/14 09:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2735	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.8700	98.7	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.190	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.5400	95.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	209294	6.66	196181	6.67	
Chlorobenzene-d5 (IS)	68217	9.68	64829	9.68	
1,4-Difluorobenzene (IS)	262181	7.46	249583	7.46	

12/15/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-1

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-03	File ID:	30OCT20.D
Sampled:	10/29/14 11:44	Prepared:	10/30/14 06:02	Analyzed:	10/30/14 12:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2735	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-1

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-03	File ID:	30OCT20.D
Sampled:	10/29/14 11:44	Prepared:	10/30/14 06:02	Analyzed:	10/30/14 12:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2735	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-1

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-03	File ID:	30OCT20.D
Sampled:	10/29/14 11:44	Prepared:	10/30/14 06:02	Analyzed:	10/30/14 12:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2735	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.340	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.240	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.5500	95.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	204240	6.66	196181	6.67	
Chlorobenzene-d5 (IS)	67245	9.68	64829	9.68	
1,4-Difluorobenzene (IS)	259364	7.46	249583	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-9

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-04	File ID:	30OCT21.D
Sampled:	10/29/14 12:46	Prepared:	10/30/14 06:02	Analyzed:	10/30/14 12:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2735	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-9

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-04	File ID:	30OCT21.D
Sampled:	10/29/14 12:46	Prepared:	10/30/14 06:02	Analyzed:	10/30/14 12:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2735	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-9

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-04	File ID:	30OCT21.D
Sampled:	10/29/14 12:46	Prepared:	10/30/14 06:02	Analyzed:	10/30/14 12:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2735	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.080	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.060	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4800	94.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	205696	6.66	196181	6.67	
Chlorobenzene-d5 (IS)	65201	9.68	64829	9.68	
1,4-Difluorobenzene (IS)	261019	7.46	249583	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-15

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-05	File ID:	30OCT53.D
Sampled:	10/29/14 14:30	Prepared:	10/30/14 12:00	Analyzed:	10/31/14 00:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2736	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U US
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-15

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-05	File ID:	30OCT53.D
Sampled:	10/29/14 14:30	Prepared:	10/30/14 12:00	Analyzed:	10/31/14 00:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2736	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

17/15/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:51:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-15

Laboratory:	BC Laboratories		SDG:	14-25655	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425655-05	File ID:	30OCT53.D
Sampled:	10/29/14 14:30	Prepared:	10/30/14 12:00	Analyzed:	10/31/14 00:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2736	Sequence: 1416017	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.470	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.200	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.5000	85.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	179422	6.66	193626	6.66	
Chlorobenzene-d5 (IS)	60711	9.68	66713	9.68	
1,4-Difluorobenzene (IS)	228348	7.45	247092	7.46	

11/24/14

LDC #: 33174B1 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/04/14

SDG #: 14-25655 Level III Page: 1 of 1

Laboratory: BC Laboratories, Inc. Reviewer: SVG

2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/29/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	≤ 20% r²
IV.	Continuing calibration/ICV	SW	≤ 30%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	NA	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	TB = 1

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Water

1	TB-8-10/29/14	11	BXJ2735-BLK1	21		31	
2	MW-13	12	BXJ2736 - 1	22		32	
3	MW-1	13		23		33	
4	MW-9	14		24		34	
5	MW-15	15		25		35	
6	MW-13MS	16		26		36	
7	MW-13MSD	17		27		37	
8	MW-15MS	18		28		38	
9	MW-15MSD	19		29		39	
10		20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Methyl iodide
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. Pentachloroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33174 B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y (N) N/A Were all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	10/30/14	30 Oct 02	B	64.3	1-4, 6, 7, BXJ2735-Blk1	J/UJ/P
	10/30/14	30 Oct 03	NNNN	70.0		
			0000	31.1		
	10/30/14	30 Oct 33	B	76.7	5, 8, 9, BXJ2736-Blk1	
	10/30/14	30 Oct 34	NNNN	68.6		
			0000	75.0		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 29, 2014

LDC Report Date: December 11, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25655

Sample Identification

MW-1
MW-9
MW-15
MW-15MS
MW-15MSD
MW-15DUP

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Calibration

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was not required by the method.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

NASA JPL, 4Q2014
Chromium - Data Qualification Summary - SDG 14-25655

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-25655

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:02:33AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-1

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-03
File ID: PE_EL2_141117-044
Sampled: 10/29/14 11:44
Prepared: 11/14/14 09:00
Analyzed: 11/17/14 12:38
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1223
Sequence: 1417049
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.59	1	J	EPA-200.8

12/15/14 O

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:02:33AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-9

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-04
File ID: PE_EL2_141117-045
Sampled: 10/29/14 12:46
Prepared: 11/14/14 09:00
Analyzed: 11/17/14 12:42
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1223
Sequence: 1417049
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.0	1		EPA-200.8

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:02:33AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-15

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-05
File ID: PE_EL2_141117-031
Sampled: 10/29/14 14:30
Prepared: 11/14/14 09:00
Analyzed: 11/17/14 11:50
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1223
Sequence: 1417049
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.82	1	J	EPA-200.8

17/15/14

LDC #: 33174B4 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/4/14
SDG #: 14-25655 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: KB
2nd Reviewer: CA

METHOD: Chromium (EPA Method 200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/29/14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	N	not required
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	not reviewed
X.	ICP Serial Dilution	N	not performed
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: water

1	MW-1	11		21		31	
2	MW-9	12		22		32	
3	MW-15	13		23		33	
4	MW-15MS	14		24		34	
5	MW-15MSD	15		25		35	
6	MW-15DUP	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 29, 2014

LDC Report Date: December 11, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25655

Sample Identification

MW-13
MW-1
MW-9
MW-15
MW-13MS
MW-13MSD
MW-13DUP
MW-15MS
MW-15MSD
MW-15DUP

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, and Sulfate, EPA Method 353.2 for Nitrite as Nitrogen, EPA Method 365.1 for Orthophosphate as Phosphorus, EPA SW 846 Method 7196 for Hexavalent Chromium, and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
ICB/CCB	Chloride Orthophosphate as P	0.10000 mg/L 0.0059950 mg/L	MW-13

Sample concentrations were compared to concentrations detected in the blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-13	Orthophosphate as P	0.011 mg/L	0.011U mg/L

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
LCS	Orthophosphate as P	117 (90-110)	MW-13	J (all detects)	P

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

No field blanks were identified in this SDG.

NASA JPL, 4Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-25655

SDG	Sample	Analyte	Flag	A or P	Reason
14-25655	MW-13	Orthophosphate as P	J (all detects)	P	Laboratory control samples (%R)

NASA JPL, 4Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-25655

SDG	Sample	Analyte	Modified Final Concentration	A or P
14-25655	MW-13	Orthophosphate as P	0.011U mg/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:01:21AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-1

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-03
File ID: 141029 2335 CR6-027
Sampled: 10/29/14 11:44
Prepared: 10/30/14 00:41
Analyzed: 10/30/14 00:41
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2785
Sequence: 1416062
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:01:21AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-9

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-04
File ID: 141029 2335 CR6-028
Sampled: 10/29/14 12:46
Prepared: 10/30/14 00:41
Analyzed: 10/30/14 00:41
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2785
Sequence: 1416062
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:01:21AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-15

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-05
File ID: 141029 2335 CR6-023
Sampled: 10/29/14 14:30
Prepared: 10/30/14 00:41
Analyzed: 10/30/14 00:41
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2785
Sequence: 1416062
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:01:21AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-365.1

MW-13

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-02
File ID: 141030 0928 PO4-116
Sampled: 10/29/14 09:28
Prepared: 10/30/14 09:28
Analyzed: 10/30/14 10:50
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0009
Sequence: 1416205
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.011	1	J U	EPA-365.1

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:01:21AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-13

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-02
File ID: 141030 0855 NO2-048
Sampled: 10/29/14 09:28
Prepared: 10/30/14 08:55
Analyzed: 10/30/14 08:55
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2790
Sequence: 1416196
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.012	1	U	EPA-353.2

17/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:01:21AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-300.0

MW-13

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-02
File ID: B103014.seq-06
Sampled: 10/29/14 09:28
Prepared: 10/30/14 12:00
Analyzed: 10/30/14 14:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXJ2878
Sequence: 1416813
Calibration: UNASSIGNED
Instrument: IC2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	110	1		EPA-300.0
14797-55-8	Nitrate as N	9.2	1		EPA-300.0
14808-79-8	Sulfate	140	1		EPA-300.0

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:01:21AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-13

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-02
File ID: F111414.seq-11.0000.txt
Sampled: 10/29/14 09:28
Prepared: 11/14/14 12:00
Analyzed: 11/14/14 14:53
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1303
Sequence: 1417047
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	160	10	D	EPA-314.0

12/16/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:01:21AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-1

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-03
File ID: F111414.seq-17.0000.txt
Sampled: 10/29/14 11:44
Prepared: 11/14/14 12:00
Analyzed: 11/14/14 16:07
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1303
Sequence: 1417047
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/16/14 8

Tidewater Inc.
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Powell, OH 43065

Reported: 11/24/2014 10:01:21AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-9

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-04
File ID: F111414.seq-18.0000.txt
Sampled: 10/29/14 12:46
Prepared: 11/14/14 12:00
Analyzed: 11/14/14 16:20
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1303
Sequence: 1417047
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/15/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:01:21AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-15

Laboratory: BC Laboratories
SDG: 14-25655
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425655-05
File ID: F111414.seq-21.0000.txt
Sampled: 10/29/14 14:30
Prepared: 11/14/14 12:00
Analyzed: 11/14/14 16:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1304
Sequence: 1417047
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/15/14 Q

LDC #: 33174B6
SDG #: 14-25655
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 12/4/14
Page: 1 of 1
Reviewer: KH
2nd Reviewer: G

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Hexavalent Chromium (EPA SW846 Method 7196), Nitrite-N (EPA Methdo 353.2), Orthophosphate (EPA Method 365.1), Perchlorate (EPA Method 314.0)
P

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/29/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	SW	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	SW	LCS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Water

1	MW-13	11		21		31	
2	MW-1	12		22		32	
3	MW-9	13		23		33	
4	MW-15	14		24		34	
5	MW-13MS	15		25		35	
6	MW-13MSD	16		26		36	
7	MW-13DUP	17		27		37	
8	MW-15MS	18		28		38	
9	MW-15MSD	19		29		39	
10	MW-15DUP	20		30		40	

Notes:

LDC #: 33174B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: KK

2nd reviewer: [signature]

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1	W	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
2-5	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
1-4		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 5-7		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 5-10		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 8-10	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 33174B6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: KK
2nd Reviewer: CZ

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 1

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB (mg/L)	ICB/CCB (mg/L)		1									
Cl		0.10000	0.5										
O-PO4-P		0.0059950	0.029975	0.011									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: ~~33099A4~~ 33514B6

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: KK
2nd Reviewer: CR

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y (N) N/A Were all LCS percent recoveries (%R) within the control limits of ~~80-120%~~ 90-110 (85-115% for Method 300.0)?

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
		LCS	W	O-PO4-P	117 (90-110)	1	J det/AP (1: Det)

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 30, 2014

LDC Report Date: December 11, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25765

Sample Identification

TB-9-10/30/14
MW-5
MW-10**
MW-6
MW-8
MW-7
MW-16
MW-6MS
MW-6MSD
MW-8MS
MW-8MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of the presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/31/14 (31OCT32)	Bromomethane	61.2	TB-9-10/30/14 MW-5 MW-10** MW-6 MW-6MS MW-6MSD BXJ2934-BLK1	J (all detects) UJ (all non-detects)	P
10/31/14 (31OCT33)	Methyl iodide Pentachloroethane	52.4 64.5	TB-9-10/30/14 MW-5 MW-10** MW-6 MW-6MS MW-6MSD BXJ2934-BLK1	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

Date	Compound	%D	Associated Samples	Flag	A or P
11/03/14 (03NOV03)	Bromomethane	45.5	MW-8 MW-7 MW-16 MW-8MS MW-8MSD BXK0015-BLK1	J (all detects) UJ (all non-detects)	P
11/03/14 (03NOV04)	Methyl iodide	39.3	MW-8 MW-7 MW-16 MW-8MS MW-8MSD BXK0015-BLK1	J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Compound Quantitation

All compound quantitations were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample TB-9-10/30/14 was identified as a trip blank. No volatile contaminants were found.

NASA JPL, 4Q2014
Volatiles - Data Qualification Summary - SDG 14-25765

SDG	Sample	Compound	Flag	A or P	Reason
14-25765	TB-9-10/30/14 MW-5 MW-10** MW-6	Bromomethane Methyl iodide Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
14-25765	MW-8 MW-7 MW-16	Bromomethane Methyl iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 4Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-25765

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-9-10/30/14

Laboratory: BC Laboratories | SDG: 14-25765
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425765-01 | File ID: 31OCT44.D
Sampled: 10/30/14 07:00 | Prepared: 10/31/14 09:00 | Analyzed: 10/31/14 21:21
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXJ2934 | Sequence: 1416091 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

17/15/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-9-10/30/14

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-01	File ID:	31OCT44.D
Sampled:	10/30/14 07:00	Prepared:	10/31/14 09:00	Analyzed:	10/31/14 21:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2934	Sequence:	1416091	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-9-10/30/14

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-01	File ID:	31OCT44.D
Sampled:	10/30/14 07:00	Prepared:	10/31/14 09:00	Analyzed:	10/31/14 21:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2934	Sequence: 1416091	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.420	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.150	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.090	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	198339	6.66	179040	6.66	
Chlorobenzene-d5 (IS)	66504	9.68	59461	9.68	
1,4-Difluorobenzene (IS)	256122	7.46	230404	7.45	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories			SDG:	14-25765
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425765-02	File ID:	31OCT45.D
Sampled:	10/30/14 08:48	Prepared:	10/31/14 09:00	Analyzed:	10/31/14 21:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2934	Sequence:	1416091	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U U5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.77	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.15	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories			SDG:	14-25765
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425765-02	File ID:	31OCT45.D
Sampled:	10/30/14 08:48	Prepared:	10/31/14 09:00	Analyzed:	10/31/14 21:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2934	Sequence:	1416091	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.70	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	4.7	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-02	File ID:	31OCT45.D
Sampled:	10/30/14 08:48	Prepared:	10/31/14 09:00	Analyzed:	10/31/14 21:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2934	Sequence: 1416091	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.130	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.130	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7800	97.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	201292	6.66	179040	6.66	
Chlorobenzene-d5 (IS)	66363	9.68	59461	9.68	
1,4-Difluorobenzene (IS)	259663	7.45	230404	7.45	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-03	File ID:	31OCT46.D
Sampled:	10/30/14 10:30	Prepared:	10/31/14 09:00	Analyzed:	10/31/14 22:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2934	Sequence: 1416091	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.71	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.18	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.25	J
156-60-5	trans-1,2-Dichloroethene	1	0.39	J
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

1/15/15 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-03	File ID:	31OCT46.D
Sampled:	10/30/14 10:30	Prepared:	10/31/14 09:00	Analyzed:	10/31/14 22:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2934	Sequence: 1416091	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.77	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	7.7	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-03	File ID:	31OCT46.D
Sampled:	10/30/14 10:30	Prepared:	10/31/14 09:00	Analyzed:	10/31/14 22:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2934	Sequence: 1416091	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.150	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.170	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.5700	95.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	199722	6.66	179040	6.66	
Chlorobenzene-d5 (IS)	65653	9.68	59461	9.68	
1,4-Difluorobenzene (IS)	248955	7.45	230404	7.45	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-04	File ID:	31OCT37.D
Sampled:	10/30/14 12:00	Prepared:	10/31/14 09:00	Analyzed:	10/31/14 18:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2934	Sequence: 1416091	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.70	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.20	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.16	J
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

17/12/14 CC

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-04	File ID:	31OCT37.D
Sampled:	10/30/14 12:00	Prepared:	10/31/14 09:00	Analyzed:	10/31/14 18:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2934	Sequence:	1416091	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	1.0	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	3.7	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-04	File ID:	31OCT37.D
Sampled:	10/30/14 12:00	Prepared:	10/31/14 09:00	Analyzed:	10/31/14 18:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXJ2934	Sequence: 1416091	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.500	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.230	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.1500	81.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	171389	6.66	179040	6.66	
Chlorobenzene-d5 (IS)	56289	9.68	59461	9.68	
1,4-Difluorobenzene (IS)	218975	7.46	230404	7.45	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-8

Laboratory: BC Laboratories | SDG: 14-25765
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1425765-05 | File ID: 03NOV08.D
Sampled: 10/30/14 13:06 | Prepared: 11/03/14 06:00 | Analyzed: 11/03/14 08:02
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXK0015 | Sequence: 1416166 | Calibration: 1410010 | Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.25	J
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	9.8	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

17/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-8

Laboratory:	BC Laboratories			SDG:	14-25765
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425765-05	File ID:	03NOV08.D
Sampled:	10/30/14 13:06	Prepared:	11/03/14 06:00	Analyzed:	11/03/14 08:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXK0015	Sequence:	1416166	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-8

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-05	File ID:	03NOV08.D
Sampled:	10/30/14 13:06	Prepared:	11/03/14 06:00	Analyzed:	11/03/14 08:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXK0015	Sequence: 1416166	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UT
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.8500	98.5	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.210	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6700	86.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	181243	6.66	184305	6.66	
Chlorobenzene-d5 (IS)	58483	9.68	60056	9.68	
1,4-Difluorobenzene (IS)	229881	7.46	241683	7.46	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-7

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-06	File ID:	03NOV14.D
Sampled:	10/30/14 14:05	Prepared:	11/03/14 06:00	Analyzed:	11/03/14 10:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXK0015	Sequence: 1416166	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.4	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-7

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-06	File ID:	03NOV14.D
Sampled:	10/30/14 14:05	Prepared:	11/03/14 06:00	Analyzed:	11/03/14 10:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXK0015	Sequence: 1416166	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.16	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-7

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-06	File ID:	03NOV14.D
Sampled:	10/30/14 14:05	Prepared:	11/03/14 06:00	Analyzed:	11/03/14 10:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXK0015	Sequence: 1416166	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.360	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.170	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.4700	84.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191466	6.66	184305	6.66	
Chlorobenzene-d5 (IS)	62304	9.68	60056	9.68	
1,4-Difluorobenzene (IS)	240705	7.46	241683	7.46	

17/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories			SDG:	14-25765
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1425765-07	File ID:	03NOV15.D
Sampled:	10/30/14 14:40	Prepared:	11/03/14 06:00	Analyzed:	11/03/14 10:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXK0015	Sequence:	1416166	Calibration:	1410010
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.71	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

Hatfield &

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-07	File ID:	03NOV15.D
Sampled:	10/30/14 14:40	Prepared:	11/03/14 06:00	Analyzed:	11/03/14 10:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXK0015	Sequence: 1416166	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 9:45:11AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories		SDG:	14-25765	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1425765-07	File ID:	03NOV15.D
Sampled:	10/30/14 14:40	Prepared:	11/03/14 06:00	Analyzed:	11/03/14 10:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXK0015	Sequence: 1416166	Calibration:	1410010	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.40	J
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U VJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.340	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.170	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.4700	84.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	187449	6.66	184305	6.66	
Chlorobenzene-d5 (IS)	62606	9.68	60056	9.68	
1,4-Difluorobenzene (IS)	240437	7.45	241683	7.46	

12/15/14

LDC #: 33174C1 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/02/14
SDG #: 14-25765 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: JVL
2nd Reviewer: M

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/30/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	≤ 20 %, r²
IV.	Continuing calibration/ICV	SW	≤ 30 %
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	TB = 1

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation

water

1	TB-9-10/30/14	11	MW-8MSD	21	BXJ2934-BLK1	31	
2	MW-5	12		22	BXJK0015-1	32	
3	MW-10**	13		23		33	
4	MW-6	14		24		34	
5	MW-8	15		25		35	
6	MW-7	16		26		36	
7	MW-16	17		27		37	
8	MW-6MS	18		28		38	
9	MW-6MSD	19		29		39	
10	MW-8MS	20		30		40	

LDC #: 32174C1

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: [illegible]

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within +/-40% from the associated calibration standard?	✓			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?				
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?				
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?		✓		
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?		✓		
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Methyl iodide
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. Penta chloroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33174C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y (N) N/A Were all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	10/31/14	310ct32	B	61.2	1-4, 8, 9, BXJ2934-Blk1	J/UJ/P
	10/31/14	310ct33	NNNN	52.4	↓	
			0000	64.5		
	11/03/14	03NOV03	B	45.5	5-7, 10, 11, BXK0015-Blk1	
		03NOV04	NNNN	39.3	↓	↓

LDC #: 33174C1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer: M

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of Compound
C_x = Concentration of compound,
S= Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL MS V5	9/29/2014	cis-1,2-DCE (IS1)	0.4762749	0.4762749	0.4626995	0.4626995	3.85	3.85
			Tetrachlororethene (IS2)	0.3807271	0.3807271	0.3878348	0.3878348	13.21	13.21
			1,1,2,2-TCA (IS3)	0.6405396	0.6405396	0.6038102	0.6038102	9.72	9.72
2	ICAL MS V5	10/1/2014	Allyl chloride (IS1)	0.7350514	0.7350514	0.7121014	0.7121014	6.76	6.76
			Methyl methacrylate (IS2)	0.0784983	0.0784983	0.0774599	0.0774599	6.03	6.03
			Pentachloroethane (IS3)	0.7119626	0.7119626	0.6967004	0.6967004	13.77	13.77

LDC # 33174C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVG
2nd Reviewer: A

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	31oct32 MS V5	10/31/14	cis-1,2-DCE (IS1)	0.462700	0.468361	0.468361	1.2	1.2
			Tetrachlororethene (IS2)	0.387835	0.385206	0.385206	0.7	0.7
			1,1,2,2-TCA (IS3)	0.603810	0.606143	0.606143	0.4	0.4
	31oct33 MS V5	10/31/14	Allyl chloride (IS1)	0.712101	0.638724	0.638724	10.3	10.3
			Methyl methacrylate (IS2)	0.077460	0.080011	0.080011	3.3	3.3
			Pentachloroethane (IS3)	0.696700	0.247189	0.247189	64.5	64.5

LDC #: 33174C1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: JVG
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 3

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	10.0	10.17	102	102	0
Bromofluorobenzene	↓	9.57	95.7	95.7	↓
1,2-Dichlorobenzene-d4	↓	10.15	102	102	↓
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

LDC #: 33174C1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSDC I * 2/(MSC + MSDC) MSC = Matrix spike percent recovery MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 8/9

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-----	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
1,1-Dichloroethene	25.0	25.0	0	27.27	24.74	109	109	99.0	99.0	9.73	9.73
Trichloroethene	↓	↓	3.72	30.84	28.16	108	108	97.8	97.8	9.08	9.08
Benzene	↓	↓	0	27.33	24.84	109	109	99.4	99.4	9.55	9.55
Toluene	↓	↓	↓	27.54	24.82	110	110	99.3	99.3	10.4	10.4
Chlorobenzene	↓	↓	↓	28.74	24.99	113	113	100	100	12.2	10.7

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33174C1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: JVG
2nd Reviewer: A

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: BXJ2934-BS1

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	25.0	NA	24.70	NA	98.8	98.8				
Trichloroethene			26.58		106	106				
Benzene			24.44		97.8	97.8				
Toluene			24.5✓		98.1	98.1				
Chlorobenzene			24.52		98.1	98.1				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33174C1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer: A

METHOD: GC/MS VOA (EPA Method 524.2)

Compound results reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
RRF	=	Relative response factor of the calibration standard.
V_o	=	Volume or weight of sample purged in milliliters (ml) or grams (g).
Df	=	Dilution factor.
%S	=	Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 3, Tetrachloroethene

Conc. = (7412)(10)( )
(248955)(6.3878)( )( )

= 0.768

≈ 0.77 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Acceptable (Y/N)
			0.77		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 30, 2014

LDC Report Date: December 11, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25765

Sample Identification

MW-5
MW-10**
MW-6
MW-8
MW-6MS
MW-6MSD
MW-6DUP

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Calibration

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was not required by the method.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

NASA JPL, 4Q2014
Chromium - Data Qualification Summary - SDG 14-25765

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-25765

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:03:34AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-5

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-02
File ID: PE_EL2_141117-129
Sampled: 10/30/14 08:48
Prepared: 11/15/14 08:20
Analyzed: 11/17/14 18:07
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1291
Sequence: 1417086
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.7	1	J	EPA-200.8

1/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:03:34AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-10

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-03
File ID: PE_EL2_141117-136
Sampled: 10/30/14 10:30
Prepared: 11/15/14 08:20
Analyzed: 11/17/14 18:38
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1291
Sequence: 1417086
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	10	1		EPA-200.8

12/15/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:03:34AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-6

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-04
File ID: PE_EL2_141117-124
Sampled: 10/30/14 12:00
Prepared: 11/15/14 08:20
Analyzed: 11/17/14 17:50
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1291
Sequence: 1417086
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	270	1		EPA-200.8

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:03:34AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-8

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-05
File ID: PE_EL2_141117-137
Sampled: 10/30/14 13:06
Prepared: 11/15/14 08:20
Analyzed: 11/17/14 18:41
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXK1291
Sequence: 1417086
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	20	1		EPA-200.8

11/15/14

LDC #: 33174C4

SDG #: 14-25765

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/4/14

Page: 1 of 1

Reviewer: KK

2nd Reviewer:

METHOD: Chromium (EPA Method 200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/30/14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	N	not required
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	ICP Serial Dilution	N	not performed
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	MW-5	11		21		31	
2	MW-10**	12		22		32	
3	MW-6	13		23		33	
4	MW-8	14		24		34	
5	MW-6MS	15		25		35	
6	MW-6MSD	16		26		36	
7	MW-6DUP	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

)C #: 331746

VALIDATION FINDINGS CHECKLIST

Reviewer: KK
2nd Reviewer: [illegible]

200.8
Method: Metals (EPA ~~SW-846~~ Method ~~6010/7000/6020~~)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	TKW		✓	
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?			✓	
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?	✓	CA		
If the %Rs were outside the criteria, was a reanalysis performed?	NA		✓	
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?	~~✓~~ KK		✓	
Were all percent differences (%Ds) < 10%?			✓	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XIII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 33174C4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: KK
2nd Reviewer: CC

METHOD: Chromium 200.8 ~~Trace Metals~~ (EPA ~~SW 846~~ Method ~~6010/6020/7000~~)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found x 100 / True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV (11:30)	ICP/MS (Initial calibration)	Cr	50.801	50.000	102	102	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV (18:21)	ICP/MS (Continuing calibration)	Cr	39.753	40.000	99.4	~~98.6~~ 99.4	Y
	CVAA (Continuing calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 331744C4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: KK
2nd Reviewer:

METHOD: ~~Trace Metals~~ Chromium (EPA ~~SW 846~~ Method ~~6010/6020/7000~~ 200.8)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (mg/L) (units)	True / D / SDR (mg/L) (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
N/A	ICP interference check						
LCS	Laboratory control sample	Cr	40.620	40.000	102	102	Y
5	Matrix spike	↓	(SSR-SR) 36.098	40.000	90.2	90.2	↓
7	Duplicate	↓	274.385	271.150	1.19	1.19	↓
N/A	ICP serial dilution						

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 33174CH

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: KK
2nd reviewer: AL

METHOD: ~~Trace Metals~~ (EPA ~~SW 846~~ Method ~~6010/6020/7000~~) Chromium 200.8

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for Cr were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

Recalculation:

2: $\frac{(10.090\ \mu g/L)(50ml)(1)}{(50ml)} = 10.090\ \mu g/L$

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration (µg/L)	Acceptable (Y/N)
	2	Cr	10	10	Y

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 4Q2014

Collection Date: October 30, 2014

LDC Report Date: December 11, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-25765

Sample Identification

MW-5
MW-10**
MW-6
MW-8
MW-7
MW-16
MW-10MS
MW-10MSD
MW-10DUP
MW-6MS
MW-6MSD
MW-6DUP
MW-8MS
MW-8MSD
MW-8DUP

** Indicates sample underwent Level IV review

Introduction

This data review covers 15 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, and Sulfate, EPA Method 353.2 for Nitrite as Nitrogen, EPA Method 365.1 for Orthophosphate as Phosphorus, EPA SW 846 Method 7196 for Hexavalent Chromium, and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent EPA Level IV review. EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met for each method.

III. Calibration verification

Calibration verification frequency and analysis criteria were met for each method.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Chloride Sulfate	0.064000 mg/L 0.19200 mg/L	MW-8 MW-7 MW-16
ICB/CCB	Chloride Sulfate	0.17900 mg/L 0.19200 mg/L	MW-8 MW-7 MW-16

Sample concentrations were compared to concentrations detected in the blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
MW-8DUP (MW-8 MW-7 MW-16)	Orthophosphate as P	-	0.341808 mg/L (≤0.02000)	J (all detects) UJ (all non-detects)	A

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

No field blanks were identified in this SDG.

NASA JPL, 4Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-25765

SDG	Sample	Analyte	Flag	A or P	Reason
14-25765	MW-8 MW-7 MW-16	Orthophosphate as P	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (difference)

NASA JPL, 4Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-14-25765

No Sample Data Qualified in this SDG

NASA JPL, 4Q2014
Wet Chemistry - Field Blank Data Qualification Summary - 14-25765

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:12:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-5

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-02
File ID: 141031 0027 CR6-053
Sampled: 10/30/14 08:48
Prepared: 10/31/14 03:40
Analyzed: 10/31/14 03:40
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0014
Sequence: 1416225
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00092	1	J	EPA-7196

12/15/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:12:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-10

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-03
File ID: 141031 0027 CR6-054
Sampled: 10/30/14 10:30
Prepared: 10/31/14 03:40
Analyzed: 10/31/14 03:40
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0014
Sequence: 1416225
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

12/15/14 A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:12:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-6

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-04
File ID: 141031 0027 CR6-049
Sampled: 10/30/14 12:00
Prepared: 10/31/14 03:40
Analyzed: 10/31/14 03:40
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0014
Sequence: 1416225
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0010	1	J	EPA-7196

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:12:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-8

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-05
File ID: 141031 0027 CR6-055
Sampled: 10/30/14 13:06
Prepared: 10/31/14 03:40
Analyzed: 10/31/14 03:40
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0014
Sequence: 1416225
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0082	1		EPA-7196

12/15/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:12:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-5

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-02
File ID: F111714B.seq-19.0000.txt
Sampled: 10/30/14 08:48
Prepared: 11/17/14 10:00
Analyzed: 11/17/14 15:35
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1433
Sequence: 1417178
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	6.8	1		EPA-314.0

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:12:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-10

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-03
File ID: F111714B.seq-20.0000.txt
Sampled: 10/30/14 10:30
Prepared: 11/17/14 10:00
Analyzed: 11/17/14 15:48
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1433
Sequence: 1417178
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.4	1	J	EPA-314.0

12/15/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:12:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-6

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-04
File ID: F111714B.seq-27.0000.txt
Sampled: 10/30/14 12:00
Prepared: 11/17/14 10:00
Analyzed: 11/17/14 17:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1434
Sequence: 1417178
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.0	1	J	EPA-314.0

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:12:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-8

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-05
File ID: F111714B.seq-30.0000.txt
Sampled: 10/30/14 13:06
Prepared: 11/17/14 10:00
Analyzed: 11/17/14 18:07
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1435
Sequence: 1417178
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	7.8	1		EPA-314.0

12/15/14 R

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:12:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-7

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-06
File ID: F111714B.seq-34.0000.txt
Sampled: 10/30/14 14:05
Prepared: 11/17/14 10:00
Analyzed: 11/17/14 19:02
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1435
Sequence: 1417178
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	8.5	1		EPA-314.0

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:12:05AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-16

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-07
File ID: F111714B.seq-35.0000.txt
Sampled: 10/30/14 14:40
Prepared: 11/17/14 10:00
Analyzed: 11/17/14 19:16
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK1435
Sequence: 1417178
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.45	1	U	EPA-314.0

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:11:02AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-365.1

MW-8

Laboratory: BC Laboratories
Client: Tidewater Inc.
Matrix: Water
Sampled: 10/30/14 13:06
Solids: 0.00
Batch: BXK0010 Sequence: 1416271

SDG: 14-25765
Project: JPL- GW Monitoring Wells
Laboratory ID: 1425765-05
Prepared: 10/31/14 09:00
Preparation: No Prep
Calibration: UNASSIGNED

File ID: 141031 0900 PO4-038
Analyzed: 10/31/14 09:02
Initial/Final: 20 ml / 20 ml
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.015	1	J J	EPA-365.1

12/15/14 R

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:11:02AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-365.1

MW-7

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-06
File ID: 141031 0900 PO4-041
Sampled: 10/30/14 14:05
Prepared: 10/31/14 09:00
Analyzed: 10/31/14 09:02
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0010
Sequence: 1416271
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.016	1	J J	EPA-365.1

A/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:11:02AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-365.1

MW-16

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-07
File ID: 141031 0900 PO4-042
Sampled: 10/30/14 14:40
Prepared: 10/31/14 09:00
Analyzed: 10/31/14 09:02
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0010
Sequence: 1416271
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.019	1	J	EPA-365.1

11/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:11:02AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-8

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-05
File ID: 141031 0837 NO2-056
Sampled: 10/30/14 13:06
Prepared: 10/31/14 09:00
Analyzed: 10/31/14 09:35
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0106
Sequence: 1416289
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.012	1	U	EPA-353.2

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:11:02AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-7

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-06
File ID: 141031 0837 NO2-060
Sampled: 10/30/14 14:05
Prepared: 10/31/14 09:00
Analyzed: 10/31/14 09:35
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0106
Sequence: 1416289
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.012	1	U	EPA-353.2

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:11:02AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-16

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-07
File ID: 141031 0837 NO2-061
Sampled: 10/30/14 14:40
Prepared: 10/31/14 09:00
Analyzed: 10/31/14 09:35
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0106
Sequence: 1416289
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.012	1	U	EPA-353.2

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:11:02AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-300.0

MW-8

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-05
File ID: A103114.seq-06
Sampled: 10/30/14 13:06
Prepared: 10/31/14 10:00
Analyzed: 10/31/14 12:11
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0047
Sequence: 1416865
Calibration: UNASSIGNED
Instrument: IC1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	78	1		EPA-300.0
14797-55-8	Nitrate as N	1.3	1		EPA-300.0
14808-79-8	Sulfate	43	1		EPA-300.0

12/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:11:02AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-300.0

MW-7

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-06
File ID: A103114.seq-10
Sampled: 10/30/14 14:05
Prepared: 10/31/14 10:00
Analyzed: 10/31/14 13:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0047
Sequence: 1416865
Calibration: UNASSIGNED
Instrument: IC1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	80	1		EPA-300.0
14797-55-8	Nitrate as N	1.2	1		EPA-300.0
14808-79-8	Sulfate	45	1		EPA-300.0

12/15/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 11/24/2014 10:11:02AM
Project: JPL- GW Monitoring Wells
Project Number: 4th Quarter
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-300.0

MW-16

Laboratory: BC Laboratories
SDG: 14-25765
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1425765-07
File ID: A103114.seq-11
Sampled: 10/30/14 14:40
Prepared: 10/31/14 10:00
Analyzed: 10/31/14 13:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXK0047
Sequence: 1416865
Calibration: UNASSIGNED
Instrument: IC1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	77	1		EPA-300.0
14797-55-8	Nitrate as N	0.88	1		EPA-300.0
14808-79-8	Sulfate	41	1		EPA-300.0

12/15/14

LDC #: 33174C6

SDG #: 14-25765

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/4/14

Page: 1 of 1

Reviewer: KK

2nd Reviewer: ON

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Hexavalent Chromium (EPA SW846 Method 7196), Nitrite-N (EPA Methdo 353.2), Orthophosphate (EPA Method 365.1), Perchlorate (EPA Method 314.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/30/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	SW	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VI.	Duplicates	SW	DUP
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	A	Not reviewed for Level III validation.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation Water

1	MW-5	11	MW-6MSD	21		31	
2	MW-10**	12	MW-6DUP	22		32	
3	MW-6	13	MW-8MS	23		33	
4	MW-8	14	MW-8MSD	24		34	
5	MW-7	15	MW-8DUP	25		35	
6	MW-16	16		26		36	
7	MW-10MS	17		27		37	
8	MW-10MSD	18		28		38	
9	MW-10DUP	19		29		39	
10	MW-6MS	20		30		40	

Notes:

LDC #: 331746

VALIDATION FINDINGS CHECKLIST

Reviewer: KF
2nd Reviewer: CR

Method: Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?				
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 33174C6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: KK
2nd reviewer: CL

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
4-6	W	pH TDS **Cl** F **NO_3** **NO_2** **SO_4** **O-PO_4** Alk CN NH_3 TKN TOC Cr6+ ClO_4
1-4	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC **Cr6+** ClO_4
1-6		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ **ClO_4**
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 13-15		pH TDS **Cl** F **NO_3** **NO_2** **SO_4** **O-PO_4** Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 7-15		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ **ClO_4**
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 10-12	↓	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC **Cr6+** ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 33174C6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: KK
2nd Reviewer: CZ

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 4-6

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB (mg/L)	ICB/CCB (mg/L)		no quals									
Cl	0.064000	0.17900	0.895										
S04	0.19200	0.19200	0.96										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 33174C6

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: KK
2nd Reviewer: G

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤ 35% for soil samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits) (mg/L)	Associated Samples	Qualifications
		15	W	O-PO4-P		0.341808 (≤0.02000)	4-6	J/UJ/A (All Det)

Comments:

LDC #: 33174C6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: KH
2nd Reviewer: CA

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of ClO4 was recalculated.Calibration date: 10/22/14

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ug/L)	Abs	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	ClO4	s1	2	0.0022	*0.999911*	0.999570	Y
		s2	4	0.0045			
		s3	6	0.0065			
		s4	10	0.0108			
		s5	20	0.0214			
Calibration verification	↓	CCV(16:44)	10.237	10.000000	110 ~~102~~ * a	110	↓
Calibration verification	Cr6+	CCV (0:27)	0.05037	0.050000	101 *	99.3	
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. * calculations based off significant figures provided on raw data (not enough to recalculate)

LDC #: 33174C6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: KK
2nd Reviewer: CA

METHOD: Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	µg/L Found / S (units)	µg/L True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	ClO_4	9.306	10.000	93.1*	104	Y
7	Matrix spike sample	↓	(SSR-SR) ~~9.306~~ 9.400	10.101	~~93.01~~ KK ~~92.1~~ KK 93.1	94.7	↓
12	Duplicate sample	Cr6+	0.00100** mg/L	0.00087 mg/L**	13.9	13.5	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.
* Calculations based off significant figures on raw data. ~~which~~
** Calculations off results in raw data.

LDC #: 33174C6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: ICK
2nd reviewer: CR

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for ClO4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = (X Coefficient)(Area)

Recalculation:

2 #: (0.003 µs*min)(930.61656853) = 2.792 µg/L

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration (µg/L)	Acceptable (Y/N)
	2	ClO4	3.4	2.8 *	Y

Note: Crot results none detect
* Calculations based off significant figures provided on raw data (not enough to accurately recalculate)