ATTACHMENT 1: QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

This attachment summarizes the field and laboratory quality assurance (QA), data verification and data validation procedures utilized for the JPL groundwater monitoring program. Data validation was performed by an independent contractor, Laboratory Data Consultants, Inc., of Carlsbad, California. Data verification and validation indicated that all volatile organic compounds (VOC), perchlorate, and metal results obtained from the third quarter 2014 groundwater monitoring event were acceptable for their intended use of characterizing the aquifer quality.

ATTACHMENT 1: QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

Field and laboratory quality control (QC) samples were collected and analyzed to fulfill quality requirements. Proper sample collection and handling procedures were utilized to ensure the integrity of the analytical results. A comprehensive QA/QC plan for groundwater monitoring is described in the *Work Plan for Performing a Remedial Investigation/Feasibility Study* (Ebasco, 1993).

FIELD QUALITY ASSURANCE/QUALITY CONTROL

The field QA/QC samples collected for JPL groundwater monitoring included field duplicate samples, equipment rinsate blanks and trip blanks. The QC sample results were used for the qualitative evaluation of the data. Table 1-1 summarizes analytical results for the field QC samples during the third quarter 2014 groundwater monitoring event.

Field Duplicate Samples. Duplicate samples were collected to evaluate the precision of the sample collection process. Duplicate samples for VOCs, perchlorate and metals were collected from monitoring wells MW-3 (Screen 3), MW-4 (Screen 3), MW-17 (Screen 3), MW-18 (Screen 4), MW-20 (Screen 2), MW-21 (Screen 4) and MW-25 (Screen 2). The analytical results for the field duplicate samples were comparable to the results of the original groundwater samples for VOCs (Table 1) and metals (Table 2), with the exception of total chromium in MW-3 (Screen 3), where the primary sample was non-detect (with a reporting limit of 3.0 µg/L) and the duplicate sample had a total chromium concentration of 4.5 µg/L.

Equipment Rinsate Blanks. Equipment rinsate blanks were collected each day that non-dedicated sampling equipment was used. The equipment rinsate blanks, consisting of distilled water run through the sampling equipment after decontamination, were analyzed for all contaminants of concern to monitor possible cross-contamination of the samples due to inadequate decontamination. Total chromium was detected at a low level (0.61J µg/L) in one equipment rinsate blank. The detection was below the standard reporting limit of 3.0 µg/L. The source of the blank contamination could not be determined. Detected total chromium concentrations in the equipment blank were compared to the detected concentrations in the associated monitoring wells during the data validation process to determine if data validation qualifiers were necessary. No other contaminants or tentatively identified compounds (TICs) were detected in the equipment blanks as shown in Table 1-1.

Trip Blanks. Trip blanks, which consisted of reagent-grade water in vials transported with the sample bottles to and from the field, were submitted to the laboratory with each shipment of groundwater samples. Trip blanks were used to help identify cross-contamination of groundwater samples during transport and sample handling procedures. No VOC contaminants or TICs were detected in the trip blanks as shown in Table 1-1.

Source Blanks. Three source blanks which consisted of distilled water used by sampling personnel for equipment decontamination were collected during the sampling event. No VOC contaminants or TICs were detected in the source blanks as shown in Table 1-1.

LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

Laboratory QC samples included surrogate compounds (for VOC analyses), matrix spike samples, blank spike samples, and method blanks. The results of the laboratory QC samples were used by the laboratory to determine the accuracy and precision of the analytical techniques, and to identify anomalous results due to laboratory contamination or instrument malfunction.

DATA VERIFICATION AND VALIDATION

The purpose of data verification and validation is to ensure that the data collected meet the data quality objectives (DQOs) outlined in the Quality Assurance Project Plan of the Groundwater Monitoring Plan (Ebasco, 1993).

Data Verification. Data verification is a review of the analytical data that includes confirming that the sample identification numbers on the laboratory reports match those on the chain-of-custody records. Data verification also includes a review of the analytical data reports to confirm that all samples were analyzed and all required analytes were quantified for each sample.

Data Validation. Data validation is a systematic review of the analytical data to determine the compliance with established method performance criteria. Validation of a data package included review of the technical holding time requirements, review of sample preparation, review of the initial and continuing calibration data, review and recalculation of the laboratory QC sample data, review of the equipment performance, reconciliation of the raw data with the reduced results, identification of data anomalies, and qualification of data to identify data usability limitations.

Data validation was performed by an independent contractor, Laboratory Data Consultants, Inc., of Carlsbad, CA. All of the data provided by BC Laboratories, Inc., of Bakersfield, California were validated. Ninety percent of the data were subjected to Level III validation and 10 percent of the data were subjected to Level IV validation in accordance with the EPA Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review (U.S. EPA, 2008; 2010).

Data Validation Qualifiers. Analytical data were qualified based on the data validation. Data qualifiers were assigned in accordance with EPA guidelines.

All samples were analyzed within the analytical holding times. Data validation indicated that all of the data from the third quarter 2014 groundwater monitoring event were acceptable for their intended use of characterizing aquifer quality.

The data validation reports are included in Attachment 2.

REFERENCES

Ebasco. 1993. *Work Plan for Performing a Remedial Investigation/Feasibility Study*. National Aeronautics and Space Administration Jet Propulsion Laboratory, Pasadena, California. December.

U.S. EPA. 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*. June.

U.S. EPA. 2010. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*. January.

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

September 18, 2014

SUBJECT: NASA JPL, 3Q2014, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on August 27, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32549:

SDG #	Fraction
14-16932, 14-17037	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 #32549 (Tidewater- Powell, OH / NASA JPL, 3Q2014)

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	W	S
A	14-16932	08/27/14	09/18/14	12	0	7	0	-	-	-	-	7	0	-	-	11	0																		
A	14-16932	08/27/14	09/18/14	1	0	0	0	-	-	-	-	0	0	-	-	1	0																		
B	14-17037	08/27/14	09/18/14	10	0	7	0	1	0	1	0	7	0	1	0	9	0																		
B	14-17037	08/27/14	09/18/14	1	0	0	0	0	0	0	0	0	0	0	0	1	0																		
Total	T/PG			24	0	14	0	1	0	1	0	14	0	1	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77

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, 3Q2014

Collection Date: July 28, 2014

LDC Report Date: September 17, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-16932

Sample Identification

TB-1-7/28/14
MW-20-5
MW-20-4
MW-20-3
MW-20-2
Dup-1-3Q14
MW-19-5
MW-19-4
MW-19-3**
MW-19-2
MW-19-1
SB-1-7/28/14
EB-1-7/28/14
MW-20-4MS
MW-20-4MSD

**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.

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)

Tentatively identified compounds were not reported by the laboratory.

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-20-2 and Dup-1-3Q14 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-20-2	Dup-1-3Q14	
Chloroform	0.28	0.49	55
Trichloroethene	0.13	0.31	82
Tetrachloroethene	0.13U	0.19	200

XVII. Field Blanks

Sample TB-1-7/28/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-1-7/28/14 was identified as an equipment blank. No volatile contaminants were found.

Sample SB-1-7/28/14 was identified as a source blank. No volatile contaminants were found.

NASA JPL, 3Q2014
Volatiles - Data Qualification Summary - SDG 14-16932

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-16932

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-1-7/28/14

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-01	File ID:	31JUL13.D
Sampled:	07/28/14 07:00	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 14:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence: 1410759	Calibration:	1407027	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

KE 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-1-7/28/14

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-01
File ID: 31JUL13.D
Sampled: 07/28/14 07:00
Prepared: 07/31/14 10:28
Analyzed: 07/31/14 14:25
Solids:
Preparation: EPA 5030 Water MS
Initial/Final: 25 ml / 25 ml
Batch: BXG2732
Sequence: 1410759
Calibration: 1407027
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-1-7/28/14

Laboratory: BC Laboratories | SDG: 14-16932
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1416932-01 | File ID: 31JUL13.D
Sampled: 07/28/14 07:00 | Prepared: 07/31/14 10:28 | Analyzed: 07/31/14 14:25
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXG2732 | Sequence: 1410759 | Calibration: 1407027 | 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	10.350	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.210	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9000	89.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	232095	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	73425	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	289688	7.51	295425	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-5

Laboratory:	BC Laboratories			SDG:	14-16932
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1416932-02	File ID:	31JUL14.D
Sampled:	07/28/14 08:00	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 14:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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

KK 9·16·14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-5

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-02	File ID:	31JUL14.D
Sampled:	07/28/14 08:00	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 14:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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	0.21	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-5

Laboratory:	BC Laboratories			SDG:	14-16932
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1416932-02	File ID:	31JUL14.D
Sampled:	07/28/14 08:00	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 14:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.44	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
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	10.370	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.280	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6800	86.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	231050	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	73858	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	288681	7.52	295425	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-4

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-03	File ID:	31JUL07.D
Sampled:	07/28/14 08:40	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 12:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-4

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-03	File ID:	31JUL07.D
Sampled:	07/28/14 08:40	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 12:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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	5.5	J
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-4

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-03	File ID:	31JUL07.D
Sampled:	07/28/14 08:40	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 12:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence: 1410759		Calibration: 1407027	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	10.620	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.170	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8900	88.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	230702	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	73788	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	290431	7.51	295425	7.51	

VK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-3

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-04	File ID:	31JUL15.D
Sampled:	07/28/14 09:30	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 15:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-3

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-04	File ID:	31JUL15.D
Sampled:	07/28/14 09:30	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 15:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence: 1410759	Calibration:	1407027	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	0.16	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	0.33	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	0.32	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	0.13	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	2.0	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

KK 9·16·14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-3

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-04	File ID:	31JUL15.D
Sampled:	07/28/14 09:30	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 15:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence: 1410759	Calibration:	1407027	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	10.740	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.190	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8700	88.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	232041	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	72340	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	289994	7.51	295425	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-2

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-05	File ID:	31JUL16.D
Sampled:	07/28/14 10:00	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 15:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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	0.28	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

kk 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-2

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-05	File ID:	31JUL16.D
Sampled:	07/28/14 10:00	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 15:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence: 1410759	Calibration:	1407027	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	0.13	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-2

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-05	File ID:	31JUL16.D
Sampled:	07/28/14 10:00	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 15:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027	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	10.370	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.320	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7800	87.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	234388	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	73424	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	289781	7.52	295425	7.51	

KK 9·16·14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-1-3Q14

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-06	File ID:	31JUL17.D
Sampled:	07/28/14 10:10	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 15:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence: 1410759	Calibration:	1407027	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	0.49	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-1-3Q14

Laboratory:	BC Laboratories			SDG:	14-16932
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1416932-06	File ID:	31JUL17.D
Sampled:	07/28/14 10:10	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 15:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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	0.19	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	0.31	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

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-1-3Q14

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-06	File ID:	31JUL17.D
Sampled:	07/28/14 10:10	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 15:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027	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	10.730	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.100	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6700	86.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	232317	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	74549	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	291669	7.52	295425	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-5

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-07	File ID:	31JUL18.D
Sampled:	07/28/14 11:10	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 16:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027	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	0.21	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

KE 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-5

Laboratory:	BC Laboratories			SDG:	14-16932
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1416932-07	File ID:	31JUL18.D
Sampled:	07/28/14 11:10	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 16:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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	0.74	
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	0.10	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-5

Laboratory:	BC Laboratories			SDG:	14-16932
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1416932-07	File ID:	31JUL18.D
Sampled:	07/28/14 11:10	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 16:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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	10.510	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.220	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7000	87.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	229380	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	72935	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	289674	7.51	295425	7.51	

KK 9·16·14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-4

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-08	File ID:	31JUL19.D
Sampled:	07/28/14 11:50	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 16:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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	0.25	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-4

Laboratory:	BC Laboratories			SDG:	14-16932
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1416932-08	File ID:	31JUL19.D
Sampled:	07/28/14 11:50	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 16:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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	0.10	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

KK 9·16·14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-4

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-08	File ID:	31JUL19.D
Sampled:	07/28/14 11:50	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 16:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027	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	10.490	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.250	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8500	88.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	233117	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	73781	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	292671	7.51	295425	7.51	

KK 9·16·14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-3

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-09	File ID:	31JUL20.D
Sampled:	07/28/14 12:40	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 17:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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	0.42	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-3

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-09	File ID:	31JUL20.D
Sampled:	07/28/14 12:40	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 17:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence: 1410759	Calibration:	1407027	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	0.74	
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	0.12	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-3

Laboratory:	BC Laboratories			SDG:	14-16932
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1416932-09	File ID:	31JUL20.D
Sampled:	07/28/14 12:40	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 17:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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	10.690	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.200	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7300	87.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	231805	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	75035	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	289223	7.52	295425	7.51	

CK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-2

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-10	File ID:	31JUL21.D
Sampled:	07/28/14 13:15	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 17:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027	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	0.37	J
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	0.99	
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	0.16	J
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	0.23	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	0.15	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

KH 9-16-14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-2

Laboratory:	BC Laboratories			SDG:	14-16932
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1416932-10	File ID:	31JUL21.D
Sampled:	07/28/14 13:15	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 17:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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	0.80	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-2

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-10	File ID:	31JUL21.D
Sampled:	07/28/14 13:15	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 17:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence: 1410759	Calibration:	1407027	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	10.440	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.280	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8200	88.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	235195	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	74343	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	293533	7.51	295425	7.51	

KF 9-16-14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-1

Laboratory:	BC Laboratories			SDG:	14-16932
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1416932-11	File ID:	31JUL22.D
Sampled:	07/28/14 13:45	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 17:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-1

Laboratory:	BC Laboratories			SDG:	14-16932
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1416932-11	File ID:	31JUL22.D
Sampled:	07/28/14 13:45	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 17:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-1

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-11	File ID:	31JUL22.D
Sampled:	07/28/14 13:45	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 17:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence: 1410759	Calibration:	1407027	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	10.670	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.360	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.5300	85.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	232769	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	75797	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	288564	7.51	295425	7.51	

kk 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-1-7/28/14

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-12	File ID:	31JUL23.D
Sampled:	07/28/14 15:30	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 18:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence: 1410759	Calibration:	1407027	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-1-7/28/14

Laboratory:	BC Laboratories			SDG:	14-16932
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1416932-12	File ID:	31JUL23.D
Sampled:	07/28/14 15:30	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 18:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-1-7/28/14

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-12	File ID:	31JUL23.D
Sampled:	07/28/14 15:30	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 18:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027	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	10.480	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.370	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9000	89.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	233259	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	74187	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	288852	7.52	295425	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-1-7/28/14

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-13	File ID:	31JUL24.D
Sampled:	07/28/14 15:45	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 18:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-1-7/28/14

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-13	File ID:	31JUL24.D
Sampled:	07/28/14 15:45	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 18:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:55:18AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-1-7/28/14

Laboratory:	BC Laboratories		SDG:	14-16932	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1416932-13	File ID:	31JUL24.D
Sampled:	07/28/14 15:45	Prepared:	07/31/14 10:28	Analyzed:	07/31/14 18:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2732	Sequence:	1410759	Calibration:	1407027
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	10.530	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.180	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6800	86.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	235056	6.73	217286	6.73	
Chlorobenzene-d5 (IS)	74360	9.73	72969	9.73	
1,4-Difluorobenzene (IS)	297178	7.52	295425	7.51	

KK 9·16·14

LDC #: 32549A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/4/14
SDG #: 14-16932 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: KYC
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: 7/28/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	≤ 20 % r²
IV.	Continuing calibration/ICV	A	≤ 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.	Tentatively identified compounds (TICs)	N	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
XVII.	Field blanks	ND	TB = 1 SB = 12 EB = 13

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-1-7/28/14	11	MW-19-1	21	BXG2732-BLK1	31	
2	MW-20-5	12	SB-1-7/28/14	22		32	
3	MW-20-4	13	EB-1-7/28/14	23		33	
4	MW-20-3	14	MW-20-4MS	24		34	
5	MW-20-2 D	15	MW-20-4MSD	25		35	
6	Dup-1-3Q14 D	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	

LDC #: 32549 A1

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: CV

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.
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 #: 32549A1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JVG
2nd reviewer:

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	
K	0.28	0.49	55
S	0.13	0.31	82
AA	0.13 U	0.19	200

Compound	Concentration (ug/L)		RPD (≤ %)

Compound	Concentration (ug/L)		RPD (≤ %)

LDC #: 32549A1

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	7/28/2014	Benzene (IS1)	1.85043	1.85043	1.83625	1.83625	7.81	7.81
			Trichloroethene (IS2)	0.34743	0.34743	0.34934	0.34934	11.40	11.40
			1,1,2,2-TCA (IS3)	0.58156	0.58156	0.59871	0.59871	4.07	4.07
2	ICAL MS V5 App 9	7/28/2014	Methacrylonitrile (IS1)	0.06479	0.06479	0.06339	0.06339	5.35	5.35
			Methyl methacrylate (IS2)	0.09319	0.09319	0.08779	0.08779	9.26	9.26
			Pentachloroethane (IS3)	0.66948	0.66948	0.63047	0.63047	5.76	5.76

LDC # 32549A1

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	31jul 02 1410759-ccv1	07/31/14	Benzene	(IS1)	1.836252	1.826926	1.826926	0.5	0.5
			Trichloroethene	(IS2)	0.349343	0.345626	0.345626	1.1	1.1
			1,1,2,2-TCA	(IS3)	0.598708	0.615057	0.615057	2.7	2.7
	31jul 03 1410759-ccv2	07/31/14	Methacrylonitrile	(IS1)	0.063386	0.062122	0.062122	2.0	2.0
			Methyl methacrylate	(IS2)	0.087787	0.084339	0.084339	3.9	3.9
			Pentachloroethane	(IS3)	0.630469	0.489043	0.489043	22.4	22.4

LDC #: 32549A1

VALIDATION FINDINGS WORKSHEET

Surrogate Results Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer: d

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	10.0	10.2	102	102	0
Bromofluorobenzene		8.73	87.3	87.3	
1,2-Dichlorobenzene-d4		10.69	107	107	
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 #: 32549A1

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	23.49	24.26	94.0	94.0	97.0	97.0	3.23	3.23
Trichloroethene				23.12	23.94	92.5	92.5	95.8	95.8	3.48	3.48
Benzene				24.03	24.97	96.1	96.1	99.7	99.7	3.64	3.64
Toluene				23.7	24.55	94.8	94.8	98.2	98.2	3.52	3.52
Chlorobenzene				24.09	25.13	96.4	96.4	101	101	4.23	4.23

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 #: 32549 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: BXG 2732-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	23.73	NA	94.9	94.9				
Trichloroethene			23.55		94.2	94.2				
Benzene			23.96		95.8	95.8				
Toluene			23.86		93.8	93.8				
Chlorobenzene	↓	↓	23.87	↓	95.5	95.5				

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 #: 32549 A1

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:

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

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. 9, TCE:

$$\text{Conc.} = \frac{(1251)(10)(\quad)}{(289223)(0.349343)(\quad)(\quad)}$$

$= 0.1238$

≈ 0.12 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Acceptable (Y/N)
			0.12		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: July 28, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-16932

Sample Identification

MW-20-5
MW-20-4
MW-20-3
MW-20-2
Dup-1-3Q14
SB-1-7/28/14
EB-1-7/28/14
MW-20-4MS
MW-20-4MSD
MW-20-4DUP

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 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 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 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-20-2 and Dup-1-3Q14 were identified as field duplicates. No chromium was detected in any of the samples.

XIV. Field Blanks

Sample EB-1-7/28/14 was identified as an equipment blank. No chromium was detected.

Sample SB-1-7/28/14 was identified as a source blank. No chromium was detected.

NASA JPL, 3Q2014
Chromium - Data Qualification Summary - SDG 14-16932

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-16932

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-5

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-02
File ID: PE_EL2_140801-107
Sampled: 07/28/14 08:00
Prepared: 08/01/14 08:30
Analyzed: 08/01/14 17:39
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0028
Sequence: 1410883
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

9-10-14
KF

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-4

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-03
File ID: PE_EL2_140801-099
Sampled: 07/28/14 08:40
Prepared: 08/01/14 08:30
Analyzed: 08/01/14 17:13
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0028
Sequence: 1410883
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

9.16.14
KK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-3

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-04
File ID: PE_EL2_140801-108
Sampled: 07/28/14 09:30
Prepared: 08/01/14 08:30
Analyzed: 08/01/14 17:43
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0028
Sequence: 1410883
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

KL
9-16-14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-2

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-05
File ID: PE_EL2_140801-109
Sampled: 07/28/14 10:00
Prepared: 08/01/14 08:30
Analyzed: 08/01/14 17:46
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0028
Sequence: 1410883
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

KK
9/16/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

Dup-1-3Q14

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-06
File ID: PE_EL2_140801-110
Sampled: 07/28/14 10:10
Prepared: 08/01/14 08:30
Analyzed: 08/01/14 17:50
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0028
Sequence: 1410883
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

9.16.14
KK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

SB-1-7/28/14

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-12
File ID: PE_EL2_140801-111
Sampled: 07/28/14 15:30
Prepared: 08/01/14 08:30
Analyzed: 08/01/14 17:53
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0028
Sequence: 1410883
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

9.16.14
KK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-1-7/28/14

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-13
File ID: PE_EL2_140801-112
Sampled: 07/28/14 15:45
Prepared: 08/01/14 08:30
Analyzed: 08/01/14 17:56
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0028
Sequence: 1410883
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

8/16/14
KK

LDC #: 32549A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/3/14
SDG #: 14-16932 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

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: 7/28/14
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	
VII.	Duplicate Sample Analysis	A	
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	ND	(4, 5)
XIV.	Field Blanks	ND	SB = 6, TB = 7

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: All

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

Notes: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: July 28, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-16932

Sample Identification

MW-20-5
MW-20-4
MW-20-3
MW-20-2
Dup-1-3Q14
MW-19-5
MW-19-4
MW-19-3**
MW-19-2
MW-19-1
SB-1-7/28/14
EB-1-7/28/14
MW-20-4MS
MW-20-4MSD
MW-20-4DUP
SB-1-7/28/14MS
SB-1-7/28/14MSD
SB-1-7/28/14DUP

** 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.

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 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. 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-20-4MS/MSD (MW-20-5 MW-20-4 MW-20-3 MW-20-2 Dup-1-3Q14 SB-1-7/28/14 EB-1-7/28/14)	Hexavalent chromium	73.1 (85-115)	72.8 (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 at level III.

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-20-2 and Dup-1-3Q14 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-20-2	Dup-1-3Q1	
Perchlorate	3.5	3.5	41

XI. Field Blanks

Sample EB-1-7/28/14 was identified as an equipment blank. No contaminant concentrations were found.

Sample SB-1-7/28/14 was identified as a source blank. No contaminant concentrations were found.

NASA JPL, 3Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-16932

SDG	Sample	Analyte	Flag	A or P	Reason
14-16932	MW-20-5 MW-20-4 MW-20-3 MW-20-2 Dup-1-3Q14 SB-1-7/28/14 EB-1-7/28/14	Hexavalent chromium	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)

NASA JPL, 3Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-17142

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Wet Chemistry - Field Blank Data Qualification Summary - 14-16932

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:48AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-5

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-02
File ID: 140728 2131 CR6-027
Sampled: 07/28/14 08:00
Prepared: 07/28/14 21:31
Analyzed: 07/28/14 22:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2614
Sequence: 1410689
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014 UJ	2	UD	EPA-7196

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:48AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-4

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-03
File ID: 140728 2131 CR6-023
Sampled: 07/28/14 08:40
Prepared: 07/28/14 21:31
Analyzed: 07/28/14 22:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2614
Sequence: 1410689
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014 UJ	2	UD	EPA-7196

kk 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:48AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-3

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-04
File ID: 140728 2131 CR6-028
Sampled: 07/28/14 09:30
Prepared: 07/28/14 21:31
Analyzed: 07/28/14 22:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2614
Sequence: 1410689
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014 UJ	2	UD	EPA-7196

KL 9·16·14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:48AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-2

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-05
File ID: 140728 2131 CR6-029
Sampled: 07/28/14 10:00
Prepared: 07/28/14 21:31
Analyzed: 07/28/14 22:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2614
Sequence: 1410689
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014 UJ	2	UD	EPA-7196

KK 9-16-14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:48AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

Dup-1-3Q14

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-06
File ID: 140728 2131 CR6-030
Sampled: 07/28/14 10:10
Prepared: 07/28/14 21:31
Analyzed: 07/28/14 22:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2614
Sequence: 1410689
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014 UJ	2	UD	EPA-7196

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:48AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

SB-1-7/28/14

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-12
File ID: 140728 2131 CR6-033
Sampled: 07/28/14 15:30
Prepared: 07/28/14 21:31
Analyzed: 07/28/14 22:20
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2614
Sequence: 1410689
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014 UJ	2	UD	EPA-7196

KK 9.10.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:29:48AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-1-7/28/14

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-13
File ID: 140728 2131 CR6-034
Sampled: 07/28/14 15:45
Prepared: 07/28/14 21:31
Analyzed: 07/28/14 22:20
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2614
Sequence: 1410689
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014UJ	2	UD	EPA-7196

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:30:46AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-20-5

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-02
File ID: F081214.seq-8.0000.txt
Sampled: 07/28/14 08:00
Prepared: 08/12/14 13:00
Analyzed: 08/12/14 15:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1131
Sequence: 1411507
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

kk 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:30:46AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-20-4

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-03
File ID: F081214.seq-9.0000.txt
Sampled: 07/28/14 08:40
Prepared: 08/12/14 13:00
Analyzed: 08/12/14 15:18
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1131
Sequence: 1411507
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:30:46AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-20-3

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-04
File ID: F081214.seq-13.0000.txt
Sampled: 07/28/14 09:30
Prepared: 08/12/14 13:00
Analyzed: 08/12/14 16:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1131
Sequence: 1411507
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

KK 9·16·14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:30:46AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-20-2

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-05
File ID: F081214.seq-18.0000.txt
Sampled: 07/28/14 10:00
Prepared: 08/12/14 13:00
Analyzed: 08/12/14 18:50
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1131
Sequence: 1411507
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.5	1	J	EPA-314.0

KK 9.10.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:30:46AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

Dup-1-3Q14

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-06
File ID: F081214.seq-19.0000.txt
Sampled: 07/28/14 10:10
Prepared: 08/12/14 13:00
Analyzed: 08/12/14 19:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1131
Sequence: 1411507
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.3	1	J	EPA-314.0

kk 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:30:46AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-5

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-07
File ID: F081214.seq-69.0000.txt
Sampled: 07/28/14 11:10
Prepared: 08/12/14 13:00
Analyzed: 08/13/14 11:27
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1131
Sequence: 1411507
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.3	1	J	EPA-314.0

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:30:46AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-4

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-08
File ID: F081214.seq-70.0000.txt
Sampled: 07/28/14 11:50
Prepared: 08/12/14 13:00
Analyzed: 08/13/14 11:41
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1131
Sequence: 1411507
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:30:46AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-3

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-09
File ID: F081214.seq-22.0000.txt
Sampled: 07/28/14 12:40
Prepared: 08/12/14 13:00
Analyzed: 08/12/14 19:46
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1131
Sequence: 1411507
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.4	1		EPA-314.0

kk 9·16·14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:30:46AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-2

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-10
File ID: F081214.seq-74.0000.txt
Sampled: 07/28/14 13:15
Prepared: 08/12/14 13:00
Analyzed: 08/13/14 12:48
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1131
Sequence: 1411507
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	5.7	1		EPA-314.0

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:30:46AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-19-1

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-11
File ID: F081214.seq-24.0000.txt
Sampled: 07/28/14 13:45
Prepared: 08/12/14 13:00
Analyzed: 08/12/14 20:13
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1131
Sequence: 1411507
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

kk 9/16/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:30:46AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

SB-1-7/28/14

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-12
File ID: F081214.seq-27.0000.txt
Sampled: 07/28/14 15:30
Prepared: 08/12/14 13:00
Analyzed: 08/12/14 20:55
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1132
Sequence: 1411507
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

VL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:30:46AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-1-7/28/14

Laboratory: BC Laboratories
SDG: 14-16932
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1416932-13
File ID: F081214.seq-33.0000.txt
Sampled: 07/28/14 15:45
Prepared: 08/12/14 13:00
Analyzed: 08/12/14 22:18
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1132
Sequence: 1411507
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

KL 9-16-14

LDC #: 32549A6
SDG #: 14-16932
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 9/3/14
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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: 7/28/14
II	Initial calibration	A	
III.	Calibration verification		
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	SW	
VI.	Duplicates	A	
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)
XI	Field blanks	ND	SB=11, EB=12

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

AA

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

Notes:

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%~~ 85-115 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 #: 32849A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer:
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-5,11,12	Aq	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC [✓ CR^{6+}] ClO_4
1-12	↓	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} [✓ ClO_4]
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
13,15	Aq	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC [✓ CR^{6+}] ClO_4
13-18	↓	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} [✓ ClO_4]
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4

Comments:

LDC #: 32549A6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer:
2nd Reviewer:

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 lab? 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) within the control limits of lab?

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
1	13/14		Cr6+	73.1 (85-115)	72.8 (85-115)		1-5,11,12	J/UJ/A

Comments:

LDC# 32549A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

Inorganics: Method See Cover

Analyte	Concentration (ug/L)		RPD	
	4	5		
ClO4	3.5	2.3	41	

V:\FIELD DUPLICATES\FD_inorganic\32549A6.wpd

LDC #: 35486

Validatin 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: 8/11/14

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. (ug/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	ClO4	s1	2	0.0025	*0.99829*	0.99581	Y
		s2	4	0.0041			
		s3	6	0.0066			
		s4	10	0.0103			
		s5	20	0.0228			
Calibration verification (CCV)	ClO4	10	9.017		90.2	87.1	Y
Calibration verification							
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 #: 32549A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: [illegible]
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:

$$\%R = \frac{Found}{True} \times 100$$

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	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Ca	9.02	10	90.2	92.1	Y
13	Matrix spike sample	↓	(SSR-SR) 8.95	10.101	88.6	88.6	↓
13/14	Duplicate sample	↓	8.41 ~~8.09~~	8.95	6.[illegible]	6.08	↓

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 #: 32549A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

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 8 reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

#8 $CrO_4 = \frac{0.005}{0.00111} = 4.50$

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
1	8	CrO_4	4.4	4.5	Y

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: July 29, 2014

LDC Report Date: September 11, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17037

Sample Identification

TB-2-7/29/14
EB-2-7/29/14
MW-11-4
MW-11-3
MW-11-2
MW-11-1
MW-14-5**
MW-14-4
MW-14-3
MW-14-2
MW-14-1
MW-11-1MS
MW-11-1MSD

**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
7/31/14	Bromomethane 1,2,3-Trichlorobenzene trans-1,4-Dichloro-2-butene Methyl iodide Pentachloroethane	66.4 30.9 30.1 48.1 51.7	All samples in SDG 14-17037	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)

Tentatively identified compounds were not reported by the laboratory.

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-2-7/29/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-2-7/29/14 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL, 3Q2014
Volatiles - Data Qualification Summary - SDG 14-17037

SDG	Sample	Compound	Flag	A or P	Reason
14-17037	TB-2-7/29/14 EB-2-7/29/14 MW-11-4 MW-11-3 MW-11-2 MW-11-1 MW-14-5** MW-14-4 MW-14-3 MW-14-2 MW-14-1	Bromomethane 1,2,3-Trichlorobenzene trans-1,4-Dichloro-2-butene Methyl iodide Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-17037

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-2-7/29/14

Laboratory: BC Laboratories | SDG: 14-17037
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417037-01 | File ID: 31JUL44.D
Sampled: 07/29/14 07:00 | Prepared: 07/31/14 10:29 | Analyzed: 08/01/14 02:06
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXG2733 | Sequence: 1410759 | Calibration: 1407027 | 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 UJ	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-2-7/29/14

Laboratory: BC Laboratories | SDG: 14-17037
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417037-01 | File ID: 31JUL44.D
Sampled: 07/29/14 07:00 | Prepared: 07/31/14 10:29 | Analyzed: 08/01/14 02:06
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXG2733 | Sequence: 1410759 | Calibration: 1407027 | 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 UJ	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

9.10.14 KK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-2-7/29/14

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-01	File ID:	31JUL44.D
Sampled:	07/29/14 07:00	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 02:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence:	1410759	Calibration:	1407027
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 VJ	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 VJ	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 VJ	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	10.300	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7100	87.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	238621	6.73	221769	6.73	
Chlorobenzene-d5 (IS)	77780	9.73	73260	9.73	
1,4-Difluorobenzene (IS)	299282	7.51	297631	7.51	

9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-2-7/29/14

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-02	File ID:	31JUL45.D
Sampled:	07/29/14 07:05	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 02:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759		Calibration: 1407027	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 WJ	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-2-7/29/14

Laboratory:	BC Laboratories			SDG:	14-17037
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1417037-02	File ID:	31JUL45.D
Sampled:	07/29/14 07:05	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 02:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence:	1410759	Calibration:	1407027
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 VJ	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-2-7/29/14

Laboratory:	BC Laboratories			SDG:	14-17037
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1417037-02	File ID:	31JUL45.D
Sampled:	07/29/14 07:05	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 02:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence:	1410759	Calibration:	1407027
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 UJ	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 UJ	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 UJ	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	10.500	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.350	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0700	90.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	236694	6.73	221769	6.73	
Chlorobenzene-d5 (IS)	77145	9.73	73260	9.73	
1,4-Difluorobenzene (IS)	297259	7.51	297631	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-4

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-03	File ID:	31JUL46.D
Sampled:	07/29/14 07:40	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 02:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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

PA 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-4

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-03	File ID:	31JUL46.D
Sampled:	07/29/14 07:40	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 02:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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

kk 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-4

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-03	File ID:	31JUL46.D
Sampled:	07/29/14 07:40	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 02:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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 UJ	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 UJ	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	10.270	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2800	92.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	235249	6.73	221769	6.73	
Chlorobenzene-d5 (IS)	75287	9.73	73260	9.73	
1,4-Difluorobenzene (IS)	295284	7.52	297631	7.51	

RK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-3

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-04	File ID:	31JUL47.D
Sampled:	07/29/14 08:20	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 03:14
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-3

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-04	File ID:	31JUL47.D
Sampled:	07/29/14 08:20	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 03:14
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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	0.26	J
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.28	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 UJ	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	0.10	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

FK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-3

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-04	File ID:	31JUL47.D
Sampled:	07/29/14 08:20	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 03:14
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence:	1410759	Calibration:	1407027
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 UJ	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 UJ	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 UJ	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	10.300	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.380	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1800	91.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	239092	6.73	221769	6.73	
Chlorobenzene-d5 (IS)	77653	9.73	73260	9.73	
1,4-Difluorobenzene (IS)	295890	7.51	297631	7.51	

KK 9-16-14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-2

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-05	File ID:	31JUL48.D
Sampled:	07/29/14 09:00	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 03:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-2

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-05	File ID:	31JUL48.D
Sampled:	07/29/14 09:00	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 03:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-2

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-05	File ID:	31JUL48.D
Sampled:	07/29/14 09:00	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 03:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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 UJ	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 UJ	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	10.270	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3100	93.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	237518	6.73	221769	6.73	
Chlorobenzene-d5 (IS)	77573	9.73	73260	9.73	
1,4-Difluorobenzene (IS)	296508	7.51	297631	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-1

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-06	File ID:	31JUL38.D
Sampled:	07/29/14 09:40	Prepared:	07/31/14 10:29	Analyzed:	07/31/14 23:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-1

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-06	File ID:	31JUL38.D
Sampled:	07/29/14 09:40	Prepared:	07/31/14 10:29	Analyzed:	07/31/14 23:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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

9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-1

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-06	File ID:	31JUL38.D
Sampled:	07/29/14 09:40	Prepared:	07/31/14 10:29	Analyzed:	07/31/14 23:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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 UJ	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 UJ	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	10.410	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.230	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7200	87.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	227060	6.73	221769	6.73	
Chlorobenzene-d5 (IS)	72818	9.73	73260	9.73	
1,4-Difluorobenzene (IS)	287033	7.52	297631	7.51	

KK 9.10.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-5

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-07	File ID:	31JUL49.D
Sampled:	07/29/14 10:50	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 03:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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	0.37	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-5

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-07	File ID:	31JUL49.D
Sampled:	07/29/14 10:50	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 03:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 WJ	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

KK 9·16·14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-5

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-07	File ID:	31JUL49.D
Sampled:	07/29/14 10:50	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 03:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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 UJ	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 UJ	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	10.450	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.150	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1700	91.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	241298	6.73	221769	6.73	
Chlorobenzene-d5 (IS)	77179	9.73	73260	9.73	
1,4-Difluorobenzene (IS)	300240	7.51	297631	7.51	

KK 9-16-14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-4

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-08	File ID:	31JUL50.D
Sampled:	07/29/14 11:30	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 04:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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	0.29	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	0.080	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	0.16	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	0.15	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

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-4

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-08	File ID:	31JUL50.D
Sampled:	07/29/14 11:30	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 04:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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	0.39	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16 UJ	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	0.38	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

VF 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-4

Laboratory: BC Laboratories | SDG: 14-17037
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417037-08 | File ID: 31JUL50.D
Sampled: 07/29/14 11:30 | Prepared: 07/31/14 10:29 | Analyzed: 08/01/14 04:21
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXG2733 | Sequence: 1410759 | Calibration: 1407027 | 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 UJ	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 UJ	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 UJ	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	10.560	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.340	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0900	90.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	236978	6.73	221769	6.73	
Chlorobenzene-d5 (IS)	77734	9.73	73260	9.73	
1,4-Difluorobenzene (IS)	297364	7.51	297631	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-3

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-09	File ID:	31JUL51.D
Sampled:	07/29/14 12:40	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 04:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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	0.79	
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	0.49	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	0.24	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-3

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-09	File ID:	31JUL51.D
Sampled:	07/29/14 12:40	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 04:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence:	1410759	Calibration:	1407027
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	0.93	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16 UJ	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	2.7	
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

PL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-3

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-09	File ID:	31JUL51.D
Sampled:	07/29/14 12:40	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 04:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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 UJ	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 UJ	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	10.630	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.130	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3300	93.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	235857	6.73	221769	6.73	
Chlorobenzene-d5 (IS)	76387	9.73	73260	9.73	
1,4-Difluorobenzene (IS)	302798	7.51	297631	7.51	

KF 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-2

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-10	File ID:	31JUL52.D
Sampled:	07/29/14 13:20	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 05:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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	0.66	
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	0.23	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

9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-2

Laboratory: BC Laboratories | SDG: 14-17037
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417037-10 | File ID: 31JUL52.D
Sampled: 07/29/14 13:20 | Prepared: 07/31/14 10:29 | Analyzed: 08/01/14 05:06
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXG2733 | Sequence: 1410759 | Calibration: 1407027 | 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 UJ	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	4.1	
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

9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-2

Laboratory: BC Laboratories | SDG: 14-17037
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417037-10 | File ID: 31JUL52.D
Sampled: 07/29/14 13:20 | Prepared: 07/31/14 10:29 | Analyzed: 08/01/14 05:06
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXG2733 | Sequence: 1410759 | Calibration: 1407027 | 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 UJ	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 UJ	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 UJ	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	10.500	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.300	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1600	91.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	216953	6.73	221769	6.73	
Chlorobenzene-d5 (IS)	72412	9.73	73260	9.73	
1,4-Difluorobenzene (IS)	276088	7.52	297631	7.51	

KK 9-16-14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-1

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-11	File ID:	31JUL53.D
Sampled:	07/29/14 13:50	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 05:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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	0.52	
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	0.11	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	0.11	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

HL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-1

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-11	File ID:	31JUL53.D
Sampled:	07/29/14 13:50	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 05:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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	0.35	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16 UJ	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	2.6	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:57:23AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-1

Laboratory:	BC Laboratories		SDG:	14-17037	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417037-11	File ID:	31JUL53.D
Sampled:	07/29/14 13:50	Prepared:	07/31/14 10:29	Analyzed:	08/01/14 05:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXG2733	Sequence: 1410759	Calibration:	1407027	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 UJ	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 UJ	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 UJ	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	10.730	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.110	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0600	90.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	238315	6.73	221769	6.73	
Chlorobenzene-d5 (IS)	78322	9.73	73260	9.73	
1,4-Difluorobenzene (IS)	301991	7.51	297631	7.51	

KK 9.16.14

LDC #: 32549B1
SDG #: 14-17037
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 9/24/14
Page: 1 of 1
Reviewer: VG
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: 7/29/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	≤ 20 % r^2
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)	N	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
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-2-7/29/14	11	MW-14-1	21	BXG2733-BLK1	31	
2	EB-2-7/29/14	12	MW-11-1MS	22		32	
3	MW-11-4	13	MW-11-1MSD	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-14-5**	17		27		37	
8	MW-14-4	18		28		38	
9	MW-14-3	19		29		39	
10	MW-14-2	20		30		40	

LDC #: 32549 B1

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
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?	✓			

LDC #: 32549 B1

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: [signature]

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. trans-1,4-Dichloro-2-buten
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. Methyl iodide
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Pentachloroethane
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 #: 32549 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
	7/31/14	31Jul33	B	66.4	All	J/UJ/P
		↓	NNN	30.9	↓	↓
		31Jul34	NNNN	30.1		
			0000	48.1		
			PPPP	51.7	✓	✓

LDC #: 32549B1

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	7/28/2014	Benzene (IS1)	1.85043	1.85043	1.83625	1.83625	7.81	7.81
			Trichloroethene (IS2)	0.34743	0.34743	0.34934	0.34934	11.40	11.40
			1,1,2,2-TCA (IS3)	0.58156	0.58156	0.59871	0.59871	4.07	4.07
2	ICAL MS V5 App 9	7/28/2014	Methacrylonitrile (IS1)	0.06479	0.06479	0.06339	0.06339	5.35	5.35
			Methyl methacrylate (IS2)	0.09319	0.09319	0.08779	0.08779	9.26	9.26
			Pentachloroethane (IS3)	0.66948	0.66948	0.63047	0.63047	5.76	5.76

LDC # 32549B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVG
2nd Reviewer: 9

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	31jul 33 1410759-ccv3	07/31/14	Benzene	(IS1)	1.836252	1.780200	1.780200	3.1	3.1
			Trichloroethene	(IS2)	0.349343	0.336209	0.336209	3.8	3.8
			1,1,2,2-TCA	(IS3)	0.598708	0.595272	0.595272	0.6	0.6
	31jul 34 1410759-ccv4	07/31/14	Methacrylonitrile	(IS1)	0.063386	0.060037	0.060037	5.3	5.3
			Methyl methacrylate	(IS2)	0.087787	0.081044	0.081044	7.7	7.7
			Pentachloroethane	(IS3)	0.630469	0.304412	0.304412	51.7	51.7

LDC #: 32549 B1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

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	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.0	10.15	102	102	0
Bromofluorobenzene	↓	9.17	91.7	91.7	↓
1,2-Dichlorobenzene-d4	↓	10.45	104	104	↓
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 #: 32549 B1

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: 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	Recalc
1,1-Dichloroethene	25.0	25.0	0	23.87	23.65	95.5	95.5	94.6	94.6	0.926	0.93
Trichloroethene				23.94	24.42	95.8	95.8	97.7	97.7	2.03	2.03
Benzene				24.46	24.67	97.8	97.8	98.7	98.7	0.855	0.85
Toluene				24.57	25.16	98.1	98.1	101	101	2.58	2.58
Chlorobenzene				25.1	25.07	100	100	100	100	0.319	0.32

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 #: 32549 B1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample 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 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: BXG2733-BS

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	23.0	NA	92.1	92.1				
Trichloroethene			22.65		90.6	90.6				
Benzene			23.66		94.6	94.6				
Toluene			23.31		93.2	93.2				
Chlorobenzene			23.63		94.5	94.5				

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 #: 32549 B1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer: CY

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. 7 , Chloroform

Conc. = $\frac{(7063)(10)(\quad)}{(241298)(0.79235)(\quad)(\quad)}$

= 0.369

≈ 0.37 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Acceptable (Y/N)
			0.37		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: July 29, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17037

Sample Identification

EB-2-7/29/14
MW-11-3
MW-11-2
MW-11-1
MW-14-3
MW-14-2
MW-14-1
MW-11-1MS
MW-11-1MSD
MW-11-1DUP

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 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 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 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

Sample EB-2-7/29/14 was identified as an equipment blank. No chromium was detected.

NASA JPL, 3Q2014
Chromium - Data Qualification Summary - SDG 14-17037

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-17037

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:28:20AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

EB-2-7/29/14

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-02
File ID: PE_EL2_140806-025
Sampled: 07/29/14 07:05
Prepared: 08/05/14 08:30
Analyzed: 08/06/14 10:03
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0244
Sequence: 1411125
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

9.16.14
KC

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:28:20AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-11-3

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-04
File ID: PE_EL2_140806-026
Sampled: 07/29/14 08:20
Prepared: 08/05/14 08:30
Analyzed: 08/06/14 10:07
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0244
Sequence: 1411125
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

9.16.14
JAL

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:28:20AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-11-2

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-05
File ID: PE_EL2_140806-027
Sampled: 07/29/14 09:00
Prepared: 08/05/14 08:30
Analyzed: 08/06/14 10:10
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0244
Sequence: 1411125
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

9.16.14
KL

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:28:20AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-11-1

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-06
File ID: PE_EL2_140806-015
Sampled: 07/29/14 09:40
Prepared: 08/05/14 08:30
Analyzed: 08/06/14 09:29
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0244
Sequence: 1411125
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

9.10.14
KK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:28:20AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-14-3

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-09
File ID: PE_EL2_140806-028
Sampled: 07/29/14 12:40
Prepared: 08/05/14 08:30
Analyzed: 08/06/14 10:14
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0244
Sequence: 1411125
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.92	1	J	EPA-200.8

9.16.14
KK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:28:20AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-14-2

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-10
File ID: PE_EL2_140806-029
Sampled: 07/29/14 13:20
Prepared: 08/05/14 08:30
Analyzed: 08/06/14 10:17
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0244
Sequence: 1411125
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

9.16.14
KK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:28:20AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-14-1

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-11
File ID: PE_EL2_140806-030
Sampled: 07/29/14 13:50
Prepared: 08/05/14 08:30
Analyzed: 08/06/14 10:20
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0244
Sequence: 1411125
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.51	1	J	EPA-200.8

9.16.14
KA

LDC #: 32549B4 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/3/14
SDG #: 14-17037 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer:
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: 7/29/14
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	
VII.	Duplicate Sample Analysis	A	
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	ND	TB = 1

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: All

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

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: July 29, 2014

LDC Report Date: September 17, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17037

Sample Identification

EB-2-7/29/14
MW-11-4
MW-11-3
MW-11-2
MW-11-1
MW-14-5**
MW-14-4
MW-14-3
MW-14-2
MW-14-1
MW-11-1MS
MW-11-1MSD
MW-11-1DUP
MW-14-1MS
MW-14-1MSD
MW-14-1DUP

** Indicates sample underwent EPA Level IV validation

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.

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. 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 at level III.

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-2-7/29/14 was identified as an equipment blank. No contaminant concentrations were found.

NASA JPL, 3Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-17037

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-17037

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Wet Chemistry - Field Blank Data Qualification Summary - 14-17037

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:23:47AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-300.0

MW-11-1

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-06
File ID: B072914A.seq-24
Sampled: 07/29/14 09:40
Prepared: 07/29/14 23:30
Analyzed: 07/30/14 04:06
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2579
Sequence: 1411199
Calibration: UNASSIGNED
Instrument: IC2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	13	1		EPA-300.0
14797-55-8	Nitrate as N	0.26	1		EPA-300.0
14808-79-8	Sulfate	29	1		EPA-300.0

8/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:23:47AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-353.2

MW-11-1

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-06
File ID: 140730 0851 NO2-051
Sampled: 07/29/14 09:40
Prepared: 07/30/14 08:52
Analyzed: 07/30/14 09:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2626
Sequence: 1410698
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

8/7/14 JF

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:23:47AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-365.1

MW-11-1

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-06
File ID: 140730 1012 PO4-076
Sampled: 07/29/14 09:40
Prepared: 07/30/14 10:12
Analyzed: 07/30/14 10:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2627
Sequence: 1410700
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.018	1	J	EPA-365.1

8/17/14 R

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:23:47AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-2-7/29/14

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-02
File ID: 140729 2154 CR6-009
Sampled: 07/29/14 07:05
Prepared: 07/29/14 21:54
Analyzed: 07/29/14 21:54
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2618
Sequence: 1410696
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

9/17/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:23:47AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-11-3

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-04
File ID: 140729 2154 CR6-010
Sampled: 07/29/14 08:20
Prepared: 07/29/14 21:54
Analyzed: 07/29/14 21:54
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2618
Sequence: 1410696
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

9/17/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:23:47AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-11-2

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-05
File ID: 140729 2154 CR6-011
Sampled: 07/29/14 09:00
Prepared: 07/29/14 21:54
Analyzed: 07/29/14 21:54
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2618
Sequence: 1410696
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:23:47AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-11-1

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-06
File ID: 140729 2154 CR6-005
Sampled: 07/29/14 09:40
Prepared: 07/29/14 21:54
Analyzed: 07/29/14 21:54
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2618
Sequence: 1410696
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

9/17/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:23:47AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-14-3

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-09
File ID: 140729 2154 CR6-012
Sampled: 07/29/14 12:40
Prepared: 07/29/14 21:54
Analyzed: 07/29/14 21:54
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2618
Sequence: 1410696
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

9/17/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:23:47AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-14-2

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-10
File ID: 140729 2154 CR6-015
Sampled: 07/29/14 13:20
Prepared: 07/29/14 21:54
Analyzed: 07/29/14 21:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2618
Sequence: 1410696
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:23:47AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-14-1

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-11
File ID: 140729 2154 CR6-016
Sampled: 07/29/14 13:50
Prepared: 07/29/14 21:54
Analyzed: 07/29/14 21:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2618
Sequence: 1410696
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00089	1	J	EPA-7196

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:24:59AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

EB-2-7/29/14

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-02
File ID: F081314.seq-9.0000.txt
Sampled: 07/29/14 07:05
Prepared: 08/13/14 14:00
Analyzed: 08/13/14 16:02
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1228
Sequence: 1411560
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:24:59AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-11-4

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-03
File ID: F081314.seq-10.0000.txt
Sampled: 07/29/14 07:40
Prepared: 08/13/14 14:00
Analyzed: 08/13/14 16:16
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1228
Sequence: 1411560
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

8/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:24:59AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-11-3

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-04
File ID: F081314.seq-11.0000.txt
Sampled: 07/29/14 08:20
Prepared: 08/13/14 14:00
Analyzed: 08/13/14 16:30
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1228
Sequence: 1411560
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:24:59AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-11-2

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-05
File ID: F081314.seq-12.0000.txt
Sampled: 07/29/14 09:00
Prepared: 08/13/14 14:00
Analyzed: 08/13/14 16:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1228
Sequence: 1411560
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:24:59AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-11-1

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-06
File ID: F081314.seq-13.0000.txt
Sampled: 07/29/14 09:40
Prepared: 08/13/14 14:00
Analyzed: 08/13/14 16:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1228
Sequence: 1411560
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:24:59AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-14-5

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-07
File ID: F081314.seq-19.0000.txt
Sampled: 07/29/14 10:50
Prepared: 08/13/14 14:00
Analyzed: 08/13/14 18:21
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1228
Sequence: 1411560
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:24:59AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-14-4

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-08RE1
File ID: F081314.seq-42.0000.txt
Sampled: 07/29/14 11:30
Prepared: 08/13/14 14:00
Analyzed: 08/14/14 01:53
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1228
Sequence: 1411560
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.5	1		EPA-314.0

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:24:59AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-14-3

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-09
File ID: F081314.seq-21.0000.txt
Sampled: 07/29/14 12:40
Prepared: 08/13/14 14:00
Analyzed: 08/13/14 18:48
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1228
Sequence: 1411560
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.9	1		EPA-314.0

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:24:59AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-14-2

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-10
File ID: F081314.seq-22.0000.txt
Sampled: 07/29/14 13:20
Prepared: 08/13/14 14:00
Analyzed: 08/13/14 19:02
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1228
Sequence: 1411560
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/20/2014 10:24:59AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-14-1

Laboratory: BC Laboratories
SDG: 14-17037
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417037-11
File ID: F081314.seq-25.0000.txt
Sampled: 07/29/14 13:50
Prepared: 08/13/14 14:00
Analyzed: 08/13/14 19:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1229
Sequence: 1411560
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

9/17/14

LDC #: 32549B6
SDG #: 14-17037
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 9/3/14
Page: 1 of 1
Reviewer:
2nd Reviewer:

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: 7/29/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	A	
VI.	Duplicates	A	
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	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

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

Notes:

LDC #: 32541B6

VALIDATION FINDINGS CHECKLIST

Reviewer: W
2nd Reviewer: 4

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%~~ 85-115% 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 #: 30369B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
5	Aq	pH TDS [✓ Cl] F [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ PO_4] ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
1,3,5,8-10	↓	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC [✓ CR^{6+}] ClO_4 ______ ______
1-10	↓	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} [✓ ClO_4] ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
~11-13	Aq	pH TDS [✓ Cl] F [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ PO_4] ALK CN^- NH_3 TKN TOC [✓ CR^{6+}] ClO_4 ______ ______
↓11-16	↓	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} [✓ ClO_4] ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4

Comments: ______________________________

LDC #: 35496B6

Validatin Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer:
2nd Reviewer:

Method: Inorganics, Method See cover

The correlation coefficient (r) for the calibration of ClO4 was recalculated.Calibration date: 8/11/14

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)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	ClO4	s1	2	0.0025	*0.99829*	0.99581	Y
		s2	4	0.0041			
		s3	6	0.0066			
		s4	10	0.0103			
		s5	20	0.0228			
CCV Calibration verification	ClO4	10	9.017		90.2	89.4	Y
Calibration verification							
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 #: 32918b

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, Method cee Com

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	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	cee	9.37	10.0	93.8	93.8	Y
11	Matrix spike sample	↓	(SSR-SR) 8.49	10.101	84.0	84.0	↓
11/12	Duplicate sample	↓	9.37	8.49	9.85	9.93	↓

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 #: 32929B6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
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 b (No) reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

Note:

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

September 19, 2014

SUBJECT: NASA JPL, 3Q2014, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on August 29, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32573:

SDG #	Fraction
14-17142, 14-17234	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 #32573 (Tidewater- Powell, OH / NASA JPL, 3Q2014)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)		Cr (200.8)		Cr(VI) (7196)		CLO_4 (314.0)		Cl,SO_4 NO_3-N (300.0)		NO_2-N (353.2)		O-PO_4 (365.1)																			
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	14-17142	08/29/14	09/22/14	12	0	10	0	10	0	11	0	-	-	-	-	-	-																
B	14-17234	08/29/14	09/22/14	9	0	9	0	9	0	8	0	1	0	1	0	1	0																
B	14-17234	08/29/14	09/22/14	1	0	1	0	1	0	1	0	0	0	0	0	0	0																
Total	A/PG			22	0	20	0	20	0	20	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85

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, 3Q2014

Collection Date: July 30, 2014

LDC Report Date: September 17, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17142

Sample Identification

TB-3-7/30/14
SB-2-7/30/14
EB-3-7/30/14
MW-17-4
MW-17-3
DUP-2-3Q14
MW-17-2
MW-18-5
MW-18-4
DUP-3-3Q14
MW-18-3
MW-18-2
MW-18-3MS
MW-18-3MSD

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 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 at or above the stated limit.

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
8/1/14	Bromomethane	50.5	All samples in SDG 14-17142	J (all detects) UJ (all non-detects)	P
8/1/14	trans-1,4,-Dichloro-2-butene Methyl iodide	32.5 40.5	All samples in SDG 14-17142	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

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-17-3 and DUP-2-3Q14 and samples MW-18-4 and DUP-3-3Q14 were identified as field duplicates. No volatiles were detected in any of the samples with the

following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-17-3	DUP-2-3Q14	
Carbon tetrachloride	0.18	0.20	11
Chloroform	0.39	0.40	3
1,1-Dichloroethane	0.20	0.20	0
Tetrachloroethene	0.54	0.54	0
Trichloroethene	0.62	0.64	3

Compound	Concentration (ug/L)		RPD
	MW-18-4	DUP-3-3Q14	
Carbon tetrachloride	4.2	5.0	17
Chloroform	1.2	1.2	0
Tetrachloroethene	2.2	2.5	13
Trichloroethene	2.2	2.3	4

XVII. Field Blanks

Sample TB-3-7/30/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-3-7/30/14 was identified as an equipment blank. No volatile contaminants were found.

Sample SB-2-7/30/14 was identified as a source blank. No volatile contaminants were found.

NASA JPL, 3Q2014
Volatiles - Data Qualification Summary - SDG 14-17142

SDG	Sample	Compound	Flag	A or P	Reason
14-17142	TB-3-7/30/14 SB-2-7/30/14 EB-3-7/30/14 MW-17-4 MW-17-3 DUP-2-3Q14 MW-17-2 MW-18-5 MW-18-4 DUP-3-3Q14 MW-18-3 MW-18-2	Bromomethane trans-1,4,-Dichloro-2-butene Methyl iodide	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-17142

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

TB-3-7/30/14

Laboratory:	BC Laboratories			SDG:	14-17142
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1417142-01	File ID:	01AUG14.D
Sampled:	07/30/14 07:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 14:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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 UJ	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

TB-3-7/30/14

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-01	File ID:	01AUG14.D
Sampled:	07/30/14 07:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 14:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

TB-3-7/30/14

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-01	File ID:	01AUG14.D
Sampled:	07/30/14 07:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 14:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.380	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.160	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)	241033	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	78170	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	305034	7.51	300258	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-2-7/30/14

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-02	File ID:	01AUG15.D
Sampled:	07/30/14 07:10	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 15:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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 UJ	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-2-7/30/14

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-02	File ID:	01AUG15.D
Sampled:	07/30/14 07:10	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 15:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

SB-2-7/30/14

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-02	File ID:	01AUG15.D
Sampled:	07/30/14 07:10	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 15:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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 UJ	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 UJ	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	10.480	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.390	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7400	87.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	237929	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	77422	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	299553	7.51	300258	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-3-7/30/14

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-03	File ID:	01AUG16.D
Sampled:	07/30/14 07:20	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 15:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-3-7/30/14

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-03	File ID:	01AUG16.D
Sampled:	07/30/14 07:20	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 15:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-3-7/30/14

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-03	File ID:	01AUG16.D
Sampled:	07/30/14 07:20	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 15:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.520	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.140	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7200	87.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	239453	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	77143	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	303525	7.51	300258	7.51	

KF 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-4

Laboratory: BC Laboratories | SDG: 14-17142
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417142-04 | File ID: 01AUG17.D
Sampled: 07/30/14 08:00 | Prepared: 08/01/14 07:51 | Analyzed: 08/01/14 15:45
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0004 | Sequence: 1410817 | Calibration: 1407027 | 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 UJ	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	0.91	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.79	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-4

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-04	File ID:	01AUG17.D
Sampled:	07/30/14 08:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 15:45
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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	3.1	
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

KK 9-16-14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-4

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-04	File ID:	01AUG17.D
Sampled:	07/30/14 08:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 15:45
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.550	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.120	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7700	87.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	240353	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	77729	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	304373	7.52	300258	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-3

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-05	File ID:	01AUG18.D
Sampled:	07/30/14 09:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 16:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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 UJ	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	J
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.39	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	0.20	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-3

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-05	File ID:	01AUG18.D
Sampled:	07/30/14 09:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 16:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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	0.62	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-3

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-05	File ID:	01AUG18.D
Sampled:	07/30/14 09:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 16:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.560	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.350	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8200	88.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	240154	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	77282	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	298131	7.51	300258	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-2-3Q14

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-06	File ID:	01AUG19.D
Sampled:	07/30/14 09:10	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 16:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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	0.20	J
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.40	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	0.20	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

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-2-3Q14

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-06	File ID:	01AUG19.D
Sampled:	07/30/14 09:10	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 16:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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	0.64	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

DUP-2-3Q14

Laboratory: BC Laboratories | SDG: 14-17142
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417142-06 | File ID: 01AUG19.D
Sampled: 07/30/14 09:10 | Prepared: 08/01/14 07:51 | Analyzed: 08/01/14 16:30
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0004 | Sequence: 1410817 | Calibration: 1407027 | 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 UJ	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 UJ	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	10.640	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.270	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6600	86.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	242865	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	77833	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	305977	7.51	300258	7.51	

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-2

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-07	File ID:	01AUG20.D
Sampled:	07/30/14 09:50	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 16:53
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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

KL 9-16-14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-2

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-07	File ID:	01AUG20.D
Sampled:	07/30/14 09:50	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 16:53
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-2

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-07	File ID:	01AUG20.D
Sampled:	07/30/14 09:50	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 16:53
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.840	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.270	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6200	86.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	237124	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	76666	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	303428	7.51	300258	7.51	

9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-5

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-08	File ID:	01AUG21.D
Sampled:	07/30/14 11:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 17:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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

KL 9·16·14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-5

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-08	File ID:	01AUG21.D
Sampled:	07/30/14 11:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 17:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 ~~UJ~~ KL	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

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-18-5

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-08	File ID:	01AUG21.D
Sampled:	07/30/14 11:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 17:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.750	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.270	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6500	86.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	236995	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	78956	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	299848	7.52	300258	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-4

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-09	File ID:	01AUG22.D
Sampled:	07/30/14 11:40	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 17:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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	4.2	
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	0.085	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-4

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-09	File ID:	01AUG22.D
Sampled:	07/30/14 11:40	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 17:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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	2.2	
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	2.2	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-4

Laboratory: BC Laboratories | SDG: 14-17142
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417142-09 | File ID: 01AUG22.D
Sampled: 07/30/14 11:40 | Prepared: 08/01/14 07:51 | Analyzed: 08/01/14 17:38
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0004 | Sequence: 1410817 | Calibration: 1407027 | 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 UJ	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 UJ	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	10.670	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.400	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8200	88.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	242713	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	77488	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	297559	7.51	300258	7.51	

KF 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-3-3Q14

Laboratory: BC Laboratories | SDG: 14-17142
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417142-10 | File ID: 01AUG23.D
Sampled: 07/30/14 11:50 | Prepared: 08/01/14 07:51 | Analyzed: 08/01/14 18:01
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0004 | Sequence: 1410817 | Calibration: 1407027 | 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 UJ	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	5.0	
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	0.085	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

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-3-3Q14

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-10	File ID:	01AUG23.D
Sampled:	07/30/14 11:50	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 18:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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	2.5	
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	2.3	
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

KL 9-16-14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-3-3Q14

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-10	File ID:	01AUG23.D
Sampled:	07/30/14 11:50	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 18:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.760	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.290	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8600	88.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	238483	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	78260	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	305642	7.51	300258	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-3

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-11	File ID:	01AUG08.D
Sampled:	07/30/14 13:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 12:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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	0.25UJ	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	9.6	
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

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-3

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-11	File ID:	01AUG08.D
Sampled:	07/30/14 13:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 12:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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	0.23	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	0.76	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-3

Laboratory: BC Laboratories | SDG: 14-17142
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417142-11 | File ID: 01AUG08.D
Sampled: 07/30/14 13:00 | Prepared: 08/01/14 07:51 | Analyzed: 08/01/14 12:21
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0004 | Sequence: 1410817 | Calibration: 1407027 | 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 UJ	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 UJ	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	10.490	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.220	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8700	88.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	241506	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	77195	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	301990	7.51	300258	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-2

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-12	File ID:	01AUG24.D
Sampled:	07/30/14 13:40	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 18:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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	0.25UJ	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

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-2

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-12	File ID:	01AUG24.D
Sampled:	07/30/14 13:40	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 18:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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

9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:32:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-2

Laboratory:	BC Laboratories		SDG:	14-17142	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417142-12	File ID:	01AUG24.D
Sampled:	07/30/14 13:40	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 18:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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	0.47UJ	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	10.540	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.250	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.5900	85.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	242896	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	78746	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	302848	7.51	300258	7.51	

KK 9.16.14

LDC #: 32573A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/11/14
SDG #: 14-17142 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: n
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: 7/30/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ≤ 20, r²
IV.	Continuing calibration/ICV	SW	CCV/ICV ≤ 30
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
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	SW	D = 5+6, 9+10
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: W

1	TB-3-7/30/14	11	MW-18-3	21	BXH0004-BLK1	31	
2	SB-2-7/30/14	12	MW-18-2	22		32	
3	EB-3-7/30/14	13	MW-18-3MS	23		33	
4	MW-17-4	14	↓ MSD	24		34	
5	MW-17-3	15		25		35	
6	DUP-2-3Q14	16		26		36	
7	MW-17-2	17		27		37	
8	MW-18-5	18		28		38	
9	MW-18-4	19		29		39	
10	DUP-3-3Q14	20		30		40	

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. trans-1,4-Dichloro-2-butene
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Methyl iodide
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 #: 32573A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: [illegible]
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
	8/1/14	01A4G03	B	50.5	All	J/UJ/P
	8/1/14	01A4G04	PPPP	32.5	All	
			QQQQ	40.5		

LDC #: 32573A1

Validation Findings Worksheet
Field Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS VOA

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (ug/L)				
	5	6			
O	0.18	0.20	11		
K	0.39	0.40	3		
I	0.20	0.20	0		
AA	0.54	0.54	0		
S	0.62	0.64	3		

Analyte	Concentration (ug/L)				
	9	10			
O	4.2	5.0	17		
K	1.2	1.2	0		
AA	2.2	2.5	13		
S	2.2	2.3	4		

~~Privileged and Confidential~~

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: July 30, 2014

LDC Report Date: September 10, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17142

Sample Identification

SB-2-7/30/14
EB-3-7/30/14
MW-17-4
MW-17-3
DUP-2-3Q14
MW-17-2
MW-18-4
DUP-3-3Q14
MW-18-3
MW-18-2
MW-18-3MS
MW-18-3MSD
MW-18-3DUP

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.

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 constituent.

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-MS was not required in this SDG.

VI. Matrix Spike Analysis

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

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-17-3 and DUP-2-3Q14 and samples MW-18-4 and DUP-3-3Q14 were identified as field duplicates. No chromium was detected in any of the samples with the following exception:

Analyte	Concentration (ug/L)		RPD
	MW-18-4	DUP-3-3Q14	
Chromium	2.4	2.4	0

XIV. Field Blanks

Sample EB-3-7/30/14 was identified as an equipment blank. No chromium was found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
EB-3-7/30/14	Chromium	0.61

Sample SB-2-7/30/14 was identified as a source blank. No chromium was found.

NASA JPL, 3Q2014
Chromium - Data Qualification Summary - SDG 14-17142

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-17142

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:31:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

SB-2-7/30/14

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-02
File ID: PE_EL2_140805-121
Sampled: 07/30/14 07:10
Prepared: 08/05/14 08:30
Analyzed: 08/05/14 22:52
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0245
Sequence: 1411072
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

KF 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:31:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

EB-3-7/30/14

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-03
File ID: PE_EL2_140805-122
Sampled: 07/30/14 07:20
Prepared: 08/05/14 08:30
Analyzed: 08/05/14 22:55
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0245
Sequence: 1411072
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:31:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-17-4

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-04
File ID: PE_EL2_140805-123
Sampled: 07/30/14 08:00
Prepared: 08/05/14 08:30
Analyzed: 08/05/14 22:59
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0245
Sequence: 1411072
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:31:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-17-3

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-05
File ID: PE_EL2_140805-124
Sampled: 07/30/14 09:00
Prepared: 08/05/14 08:30
Analyzed: 08/05/14 23:02
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0245
Sequence: 1411072
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:31:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

DUP-2-3Q14

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-06
File ID: PE_EL2_140805-125
Sampled: 07/30/14 09:10
Prepared: 08/05/14 08:30
Analyzed: 08/05/14 23:06
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0245
Sequence: 1411072
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

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:31:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-17-2

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-07
File ID: PE_EL2_140805-126
Sampled: 07/30/14 09:50
Prepared: 08/05/14 08:30
Analyzed: 08/05/14 23:09
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0245
Sequence: 1411072
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

kk 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:31:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-18-4

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-09
File ID: PE_EL2_140805-127
Sampled: 07/30/14 11:40
Prepared: 08/05/14 08:30
Analyzed: 08/05/14 23:12
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0245
Sequence: 1411072
Calibration: UNASSIGNED
Instrument: PE-EL2

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

bf 9·16·14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:31:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

DUP-3-3Q14

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-10
File ID: PE_EL2_140805-128
Sampled: 07/30/14 11:50
Prepared: 08/05/14 08:30
Analyzed: 08/05/14 23:16
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0245
Sequence: 1411072
Calibration: UNASSIGNED
Instrument: PE-EL2

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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:31:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-18-3

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-11
File ID: PE_EL2_140805-113
Sampled: 07/30/14 13:00
Prepared: 08/05/14 08:30
Analyzed: 08/05/14 22:25
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0245
Sequence: 1411072
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.9	1	J	EPA-200.8

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:31:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-18-2

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-12
File ID: PE_EL2_140805-129
Sampled: 07/30/14 13:40
Prepared: 08/05/14 08:30
Analyzed: 08/05/14 23:19
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0245
Sequence: 1411072
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

KK 9.16.14

LDC #: 32573A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/3/14
SDG #: 14-17142 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: ~~Metals~~ (EPA Method 200.7/200.8)

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: 7/30/14
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	
VII.	Duplicate Sample Analysis	A	
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	(4,5) (7,8)
XIV.	Field Blanks	SW	SB = 1, TB = 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: All

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

Notes:

LDC#: 32573A4

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: WW

2nd Reviewer: JL

METHOD: Metals (EPA Method 200.8)

Analyte	Concentration (ug/L)		RPD	
	7	8		
Chromium	2.4	2.4	0	

V:\FIELD DUPLICATES\FD_inorganic\32573A4.wpd

LDC #: 32593A4

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer:
2nd reviewer:

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

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 FB (circle one)

Analyte	Concentration Units ug/L
Cr	0.61

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

Analyte	Concentration Units ( )

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: July 30, 2014

LDC Report Date: September 10, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17142

Sample Identification

SB-2-7/30/14
EB-3-7/30/14
MW-17-4
MW-17-3
DUP-2-3Q14
MW-17-2
MW-18-4
DUP-3-3Q14
MW-18-3
MW-18-2
MW-18-3MS
MW-18-3MSD
MW-18-3DUP
MW-18-5

Introduction

This data review covers 14 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 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. 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-17-3 and Dup-2-3Q14 and samples MW-18-4 and DUP-3-3Q14 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-17-3	Dup-2-3Q14	
Hexavalent Chromium	0.00071 mg/L	0.00070U mg/L	200
Perchlorate	6.4 ug/L	6.6 ug/L	3

Analyte	Concentration		RPD
	MW-18-4	Dup-3-4Q14	
Hexavalent Chromium	0.0016 mg/L	0.0017 mg/L	6
Perchlorate	16 ug/L	16 ug/L	0

XI. Field Blanks

Sample EB-3-7/30/14 was identified as an equipment blank. No contaminant concentrations were found.

Sample SB-2-7/30/14 was identified as a source blank. No contaminant concentrations were found.

NASA JPL, 3Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-17142

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-17142

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Wet Chemistry - Field Blank Data Qualification Summary - 14-17142

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

SB-2-7/30/14

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-02
File ID: 140730 2333 CR6-009
Sampled: 07/30/14 07:10
Prepared: 07/30/14 23:33
Analyzed: 07/30/14 23:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2710
Sequence: 1410860
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

EB-3-7/30/14

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-03
File ID: 140730 2333 CR6-010
Sampled: 07/30/14 07:20
Prepared: 07/30/14 23:33
Analyzed: 07/30/14 23:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2710
Sequence: 1410860
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-17-4

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-04
File ID: 140730 2333 CR6-011
Sampled: 07/30/14 08:00
Prepared: 07/30/14 23:33
Analyzed: 07/30/14 23:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2710
Sequence: 1410860
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-17-3

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-05
File ID: 140730 2333 CR6-012
Sampled: 07/30/14 09:00
Prepared: 07/30/14 23:33
Analyzed: 07/30/14 23:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2710
Sequence: 1410860
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00071	1	J	EPA-7196

KK 9-16-14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

DUP-2-3Q14

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-06
File ID: 140730 2333 CR6-015
Sampled: 07/30/14 09:10
Prepared: 07/30/14 23:33
Analyzed: 07/30/14 23:39
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2710
Sequence: 1410860
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-17-2

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-07
File ID: 140730 2333 CR6-016
Sampled: 07/30/14 09:50
Prepared: 07/30/14 23:33
Analyzed: 07/30/14 23:39
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2710
Sequence: 1410860
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-18-4

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-09
File ID: 140730 2333 CR6-017
Sampled: 07/30/14 11:40
Prepared: 07/30/14 23:33
Analyzed: 07/30/14 23:39
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2710
Sequence: 1410860
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0016	1	J	EPA-7196

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

DUP-3-3Q14

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-10
File ID: 140730 2333 CR6-018
Sampled: 07/30/14 11:50
Prepared: 07/30/14 23:33
Analyzed: 07/30/14 23:39
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2710
Sequence: 1410860
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

VK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-18-3

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-11
File ID: 140730 2333 CR6-005
Sampled: 07/30/14 13:00
Prepared: 07/30/14 23:33
Analyzed: 07/30/14 23:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2710
Sequence: 1410860
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0015	1	J	EPA-7196

PK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-18-2

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-12
File ID: 140730 2333 CR6-019
Sampled: 07/30/14 13:40
Prepared: 07/30/14 23:33
Analyzed: 07/30/14 23:39
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2710
Sequence: 1410860
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

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

SB-2-7/30/14

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-02
File ID: F081413.seq-7.0000.txt
Sampled: 07/30/14 07:10
Prepared: 08/14/14 03:00
Analyzed: 08/14/14 05:27
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1608
Sequence: 1411738
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-3-7/30/14

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-03
File ID: F081413.seq-8.0000.txt
Sampled: 07/30/14 07:20
Prepared: 08/14/14 03:00
Analyzed: 08/14/14 05:41
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1608
Sequence: 1411738
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-17-4

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-04
File ID: F081413.seq-9.0000.txt
Sampled: 07/30/14 08:00
Prepared: 08/14/14 03:00
Analyzed: 08/14/14 05:55
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1608
Sequence: 1411738
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	18	1		EPA-314.0

KF 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-17-3

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-05
File ID: F081413.seq-10.0000.txt
Sampled: 07/30/14 09:00
Prepared: 08/14/14 03:00
Analyzed: 08/14/14 06:09
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1608
Sequence: 1411738
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	6.4	1		EPA-314.0

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

DUP-2-3Q14

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-06RE1
File ID: F081413.seq-61.0000.txt
Sampled: 07/30/14 09:10
Prepared: 08/14/14 03:00
Analyzed: 08/14/14 22:27
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1608
Sequence: 1411738
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	6.6	1		EPA-314.0

kp 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-17-2

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-07
File ID: F081413.seq-12.0000.txt
Sampled: 07/30/14 09:50
Prepared: 08/14/14 03:00
Analyzed: 08/14/14 06:37
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1608
Sequence: 1411738
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-5

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-08
File ID: F081413.seq-15.0000.txt
Sampled: 07/30/14 11:00
Prepared: 08/14/14 03:00
Analyzed: 08/14/14 07:18
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1608
Sequence: 1411738
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

9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-4

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-09
File ID: F081413.seq-16.0000.txt
Sampled: 07/30/14 11:40
Prepared: 08/14/14 03:00
Analyzed: 08/14/14 07:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1608
Sequence: 1411738
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	16	1		EPA-314.0

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

DUP-3-3Q14

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-10
File ID: F081413.seq-17.0000.txt
Sampled: 07/30/14 11:50
Prepared: 08/14/14 03:00
Analyzed: 08/14/14 07:46
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1608
Sequence: 1411738
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	16	1		EPA-314.0

9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-3

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-11RE1
File ID: F081413.seq-48.0000.txt
Sampled: 07/30/14 13:00
Prepared: 08/14/14 03:00
Analyzed: 08/14/14 19:27
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1608
Sequence: 1411738
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	27	2	D	EPA-314.0

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:29:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-2

Laboratory: BC Laboratories
SDG: 14-17142
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417142-12
File ID: F081413.seq-33.0000.txt
Sampled: 07/30/14 13:40
Prepared: 08/14/14 03:00
Analyzed: 08/14/14 11:27
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1609
Sequence: 1411738
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

VK 9.16.14

LDC #: 32573A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/3/14
SDG #: 14-17142 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), perchlorate (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: 7/30/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	A	
VI.	Duplicates	A	
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	(4,5) (7,8)
XI	Field blanks	ND	EB=1, TB=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: All

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

Notes: _____

LDC #: 32593A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer:
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-10	Aq	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC [✓ CR^{6+}] [✓ ClO_4]
14	↓	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} [✓ ClO_4]
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
11-13	Aq	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC [✓ CR^{6+}] ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4

Comments:

LDC# 32573A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: LW

2nd Reviewer: K

Inorganics: Method See Cover

Analyte	Concentration (mg/L)		RPD	
	4	5		
Hexavalent Chromium	0.00071	0.00070U	200	
Perchlorate (ug/L)	6.4	6.6	3	

Analyte	Concentration (mg/L)		RPD	
	7	8		
Hexavalent Chromium	0.0016	0.0017	6	
Perchlorate (ug/L)	16	16	0	

V:\FIELD DUPLICATES\FD_inorganic\32573A6.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: July 31, 2014

LDC Report Date: September 16, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17234

Sample Identification

TB-4-7/31/14
EB-4-7/31/14
MW-22-3
MW-22-2
MW-22-1
MW-24-3**
MW-24-2
MW-24-1
MW-26-2
MW-26-1
MW-24-1MS
MW-24-1MSD

**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 at or above the stated limit.

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
8/1/14 (01AUG03)	Bromomethane	50.5	TB-4-7/31/14 EB-4-7/31/14 MW-22-3 MW-22-2 MW-22-1 MW-24-3** MW-24-2 BXH10004-BLK1	J (all detects) UJ (all non-detects)	P
8/1/14 (01AUG04)	trans-1,4-Dichloro-2-butene Methyl iodide	32.5 40.5	TB-4-7/31/14 EB-4-7/31/14 MW-22-3 MW-22-2 MW-22-1 MW-24-3** MW-24-2 BXH10004-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
8/1/14 (01AUG34)	Bromomethane	50.3	MW-24-1 MW-26-2 MW-26-1 MW-24-1MS MW-24-1MSD BXH0005-BLK1	J (all detects) UJ (all non-detects)	P
8/1/14 (01AUG35)	trans-1,4-Dichloro-2-butene Methyl iodide	37.0 50.7	MW-24-1 MW-26-2 MW-26-1 MW-24-1MS MW-24-1MSD BXH0005-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

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-4-7/31/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-4-7/31/14 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL, 3Q2014
Volatiles - Data Qualification Summary - SDG 14-14-17234

SDG	Sample	Compound	Flag	A or P	Reason
14-17234	TB-4-7/31/14 EB-4-7/31/14 MW-22-3 MW-22-2 MW-22-1 MW-24-3** MW-24-2 MW-24-1 MW-26-2 MW-26-1	Bromomethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
14-17234	TB-4-7/31/14 EB-4-7/31/14 MW-22-3 MW-22-2 MW-22-1 MW-24-3** MW-24-2 MW-24-1 MW-26-2 MW-26-1	trans-1,4-Dichloro-2-butene Methyl iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-17234

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-4-7/31/14

Laboratory: BC Laboratories | SDG: 14-17234
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417234-01 | File ID: 01AUG25.D
Sampled: 07/31/14 06:00 | Prepared: 08/01/14 07:51 | Analyzed: 08/01/14 18:46
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0004 | Sequence: 1410817 | Calibration: 1407027 | 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 VJ	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-4-7/31/14

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-01	File ID:	01AUG25.D
Sampled:	07/31/14 06:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 18:46
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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

KE 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-4-7/31/14

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-01	File ID:	01AUG25.D
Sampled:	07/31/14 06:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 18:46
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 VJ	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 VJ	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	10.650	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.470	105	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8900	88.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	238042	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	77725	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	297180	7.51	300258	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-4-7/31/14

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-02	File ID:	01AUG26.D
Sampled:	07/31/14 06:10	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 19:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-4-7/31/14

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-02	File ID:	01AUG26.D
Sampled:	07/31/14 06:10	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 19:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-4-7/31/14

Laboratory: BC Laboratories | SDG: 14-17234
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417234-02 | File ID: 01AUG26.D
Sampled: 07/31/14 06:10 | Prepared: 08/01/14 07:51 | Analyzed: 08/01/14 19:09
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0004 | Sequence: 1410817 | Calibration: 1407027 | 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 UJ	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 UJ	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	10.450	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.090	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8700	88.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	244891	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	78780	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	306633	7.52	300258	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-3

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-03	File ID:	01AUG27.D
Sampled:	07/31/14 06:40	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 19:31
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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

PK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-3

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-03	File ID:	01AUG27.D
Sampled:	07/31/14 06:40	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 19:31
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-3

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-03	File ID:	01AUG27.D
Sampled:	07/31/14 06:40	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 19:31
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.280	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.370	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0400	90.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	240448	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	77626	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	299691	7.52	300258	7.51	

LK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-2

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-04	File ID:	01AUG28.D
Sampled:	07/31/14 07:20	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 19:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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 UJ	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	0.14	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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-2

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-04	File ID:	01AUG28.D
Sampled:	07/31/14 07:20	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 19:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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	0.14	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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-2

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-04	File ID:	01AUG28.D
Sampled:	07/31/14 07:20	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 19:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.650	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.350	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9400	89.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	236072	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	78318	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	299712	7.51	300258	7.51	

MK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-1

Laboratory: BC Laboratories | SDG: 14-17234
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417234-05 | File ID: 01AUG29.D
Sampled: 07/31/14 08:00 | Prepared: 08/01/14 07:51 | Analyzed: 08/01/14 20:16
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0004 | Sequence: 1410817 | Calibration: 1407027 | 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 UJ	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	0.54	
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	0.085	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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-1

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-05	File ID:	01AUG29.D
Sampled:	07/31/14 08:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 20:16
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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	0.59	
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	2.2	
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

KF 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-1

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-05	File ID:	01AUG29.D
Sampled:	07/31/14 08:00	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 20:16
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.610	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.190	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0600	90.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	245426	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	77859	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	304325	7.52	300258	7.51	

14 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-3

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-07
File ID: 01AUG30.D
Sampled: 07/31/14 09:35
Prepared: 08/01/14 07:51
Analyzed: 08/01/14 20:39
Solids:
Preparation: EPA 5030 Water MS
Initial/Final: 25 ml / 25 ml
Batch: BXH0004
Sequence: 1410817
Calibration: 1407027
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 VJ	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	0.16	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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-3

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-07	File ID:	01AUG30.D
Sampled:	07/31/14 09:35	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 20:39
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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	0.14	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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-3

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-07	File ID:	01AUG30.D
Sampled:	07/31/14 09:35	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 20:39
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.680	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.480	105	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1800	91.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	237957	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	76965	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	299881	7.51	300258	7.51	

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-2

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-08	File ID:	01AUG31.D
Sampled:	07/31/14 10:10	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 21:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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	0.95	
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25 UJ	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	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	0.16	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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-2

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-08	File ID:	01AUG31.D
Sampled:	07/31/14 10:10	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 21:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence: 1410817	Calibration:	1407027	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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-2

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-08	File ID:	01AUG31.D
Sampled:	07/31/14 10:10	Prepared:	08/01/14 07:51	Analyzed:	08/01/14 21:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0004	Sequence:	1410817	Calibration:	1407027
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 UJ	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 UJ	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	10.470	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.310	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2900	92.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	240310	6.73	230414	6.73	
Chlorobenzene-d5 (IS)	76557	9.73	76613	9.73	
1,4-Difluorobenzene (IS)	302600	7.51	300258	7.51	

KF 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-1

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-09	File ID:	01AUG39.D
Sampled:	07/31/14 10:45	Prepared:	08/01/14 11:13	Analyzed:	08/02/14 00:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0005	Sequence:	1410817	Calibration:	1407027
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	0.25UJ	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	3.0	
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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-24-1

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-09	File ID:	01AUG39.D
Sampled:	07/31/14 10:45	Prepared:	08/01/14 11:13	Analyzed:	08/02/14 00:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0005	Sequence: 1410817	Calibration:	1407027	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

kk 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-1

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-09	File ID:	01AUG39.D
Sampled:	07/31/14 10:45	Prepared:	08/01/14 11:13	Analyzed:	08/02/14 00:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0005	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.440	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.420	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7700	87.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	240996	6.73	235652	6.73	
Chlorobenzene-d5 (IS)	77057	9.73	75998	9.73	
1,4-Difluorobenzene (IS)	299839	7.52	308796	7.51	

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-2

Laboratory:	BC Laboratories			SDG:	14-17234
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1417234-10	File ID:	01AUG46.D
Sampled:	07/31/14 11:45	Prepared:	08/01/14 11:13	Analyzed:	08/02/14 02:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0005	Sequence:	1410817	Calibration:	1407027
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	0.17	J
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25 WJ	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	1.3	
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	0.15	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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-2

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-10	File ID:	01AUG46.D
Sampled:	07/31/14 11:45	Prepared:	08/01/14 11:13	Analyzed:	08/02/14 02:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0005	Sequence: 1410817	Calibration:	1407027	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	2.0	
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	0.25	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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-26-2

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-10	File ID:	01AUG46.D
Sampled:	07/31/14 11:45	Prepared:	08/01/14 11:13	Analyzed:	08/02/14 02:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0005	Sequence: 1410817	Calibration:	1407027	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 UJ	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 UJ	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	10.330	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.180	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)	241582	6.73	235652	6.73	
Chlorobenzene-d5 (IS)	76672	9.73	75998	9.73	
1,4-Difluorobenzene (IS)	308458	7.51	308796	7.51	

HK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-1

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-11	File ID:	01AUG47.D
Sampled:	07/31/14 13:00	Prepared:	08/01/14 11:13	Analyzed:	08/02/14 03:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0005	Sequence: 1410817	Calibration:	1407027	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 VT	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	0.32	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

kk 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-1

Laboratory:	BC Laboratories		SDG:	14-17234	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417234-11	File ID:	01AUG47.D
Sampled:	07/31/14 13:00	Prepared:	08/01/14 11:13	Analyzed:	08/02/14 03:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0005	Sequence: 1410817	Calibration:	1407027	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	0.72	
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	0.41	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

MC 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:38:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-1

Laboratory: BC Laboratories | SDG: 14-17234
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417234-11 | File ID: 01AUG47.D
Sampled: 07/31/14 13:00 | Prepared: 08/01/14 11:13 | Analyzed: 08/02/14 03:03
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0005 | Sequence: 1410817 | Calibration: 1407027 | 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 UJ	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 UJ	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	10.560	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9700	99.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.5300	85.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	242577	6.73	235652	6.73	
Chlorobenzene-d5 (IS)	78418	9.73	75998	9.73	
1,4-Difluorobenzene (IS)	308408	7.51	308796	7.51	

KK 9.17.14

LDC #: 32573B1 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/11/14

SDG #: 14-17234 Level III/IV Page: 1 of 1

Laboratory: BC Laboratories, Inc. Reviewer:

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: 7/31/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ≤ 20, r²
IV.	Continuing calibration/ICV	SW	CCV/ICV ≤ 30
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	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 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

1	TB-4-7/31/14	11	MW-24-1MS	21	BXH0004-BLK1	31	
2	EB-4-7/31/14	12	MW-24-1MSD	22	BXH0005-BLK1	32	
3	MW-22-3	13		23		33	
4	MW-26-2	14		24		34	
5	MW-22-1	15		25		35	
6	MW-24-3**	16		26		36	
7	MW-24-2	17		27		37	
8	MW-24-1	18		28		38	
9	MW-26-2	19		29		39	
10	MW-26-1	20		30		40	

LDC #: 32572R1

VALIDATION FINDINGS CHECKLIST

Reviewer: M
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/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. trans-1,4-Dichloro-2-butene
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Methyl iodide
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 #: 32573B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: A
2nd Reviewer: A

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
	8/1/14	01AUG03	B	50.5	1-7, BX10004-BLK1	J/UJ/P
	8/1/14	01AUG04	PPPP	32.5		
			QQQQ	40.5		
	8/1/14	01AUG34	B	50.2	8-12 BX10005-BLK1	
	8/1/14	01AUG35	PPPP	37.0		
			QQQQ	50.7		

CONCAL.1S5

LDC #: 32573B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: [signature]
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 = $(A_x)(C_{is})/(A_{is})(C_x)$
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
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (10 std)	Recalculated RRF (10 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/28/14	C (1st Internal Standard)	0.554541	0.554541	0.551524	0.551524	4.144573	4.144578
			S (2nd Internal Standard)	0.347324	0.347324	0.349326	0.349326	11.39791	11.39791
			DD (3rd Internal Standard)	2.998771	2.998771	3.030789	3.030789	10.99915	10.99915
2			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						
3			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						
4			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						

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 #: 32572B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 8
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
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	01AUG03	8/1/14	C (1st Internal Standard)	0.5515241	0.550527	0.550527	0.2	0.2
			S (2nd Internal Standard)	0.3493426	0.3319057	0.3319057	5.0	5.0
			DD (3rd Internal Standard)	3.030789	2.932003	2.932003	3.3	3.3
2			(1st Internal Standard)					
			(2nd Internal Standard)					
			(3rd Internal Standard)					
3			(1st Internal Standard)					
			(2nd Internal Standard)					
			(3rd Internal Standard)					
4			(1st Internal Standard)					
			(2nd Internal Standard)					
			(3rd Internal Standard)					

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 #: 32573B1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

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: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10	10.48	105	105	0
Bromofluorobenzene	↓	9.18	91.8	91.8	↓
1,2-Dichlorobenzene-d4		10.68	107	107	
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 #: 32573B1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: KP
2nd Reviewer: CL

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 = | MSC - MSC | * 2/(MSC + MSDC) MSC = Matrix spike concentration; MSDC = Matrix spike duplicate concentration

MS/MSD sample: 11/12

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
1,1-Dichloroethene	25	25	ND	26.25	25.62	105	105	102	102	2.43	2.43
Trichloroethene				25.39	24.23	102	102	96.9	96.9	4.68	4.68
Benzene				25.62	25.20	102	102	101	101	1.65	1.65
Toluene				25.53	24.44	102	102	97.8	97.8	4.36	4.36
Chlorobenzene				25.03	24.30	100	100	97.2	97.2	2.96	2.96

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 #: 32573B1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: A
2nd Reviewer: [illegible]

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: BX11000 4-LCS

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		24.00		96.0	96.0				
Trichloroethene			24.27		97.1	97.1				
Benzene			24.86		99.4	99.4				
Toluene			24.35		97.4	97.4				
Chlorobenzene			25.24		101	101				

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 #: 32573B1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

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:

Sample I.D. 1, I:

Conc. = $\frac{(3312)(10)(1)}{(237957)(0.876449)(\quad)}$

= 0.16 ug/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: July 31, 2014

LDC Report Date: September 11, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17234

Sample Identification

EB-4-7/31/14
MW-22-3
MW-22-2
MW-22-1
MW-24-4
MW-24-3**
MW-24-2
MW-24-1
MW-26-2
MW-26-1
MW-24-3MS
MW-24-3MSD
MW-24-3DUP

**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 Methods 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 constituent.

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. ICP/MS 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 Analysis

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-4-7/31/14 was identified as an equipment blank. No chromium was found.

NASA JPL, 3Q2014
Chromium - Data Qualification Summary - SDG 14-17234

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-17234

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Chromium - Field Blank Data Qualification Summary - SDG 14-17234

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:36:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

EB-4-7/31/14

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-02
File ID: PE_EL2_140806-119
Sampled: 07/31/14 06:10
Prepared: 08/06/14 08:30
Analyzed: 08/06/14 19:19
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0359
Sequence: 1411130
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

kk 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:36:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-22-3

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-03
File ID: PE_EL2_140806-120
Sampled: 07/31/14 06:40
Prepared: 08/06/14 08:30
Analyzed: 08/06/14 19:22
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0359
Sequence: 1411130
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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:36:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-22-2

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-04
File ID: PE_EL2_140806-121
Sampled: 07/31/14 07:20
Prepared: 08/06/14 08:30
Analyzed: 08/06/14 19:26
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0359
Sequence: 1411130
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

LK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:36:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-22-1

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-05
File ID: PE_EL2_140806-122
Sampled: 07/31/14 08:00
Prepared: 08/06/14 08:30
Analyzed: 08/06/14 19:29
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0359
Sequence: 1411130
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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:36:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-24-4

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-06
File ID: PE_EL2_140806-123
Sampled: 07/31/14 09:00
Prepared: 08/06/14 08:30
Analyzed: 08/06/14 19:33
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0359
Sequence: 1411130
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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:36:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-24-3

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-07
File ID: PE_EL2_140806-111
Sampled: 07/31/14 09:35
Prepared: 08/06/14 08:30
Analyzed: 08/06/14 18:50
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0359
Sequence: 1411130
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

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:36:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-24-2

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-08
File ID: PE_EL2_140806-124
Sampled: 07/31/14 10:10
Prepared: 08/06/14 08:30
Analyzed: 08/06/14 19:36
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0359
Sequence: 1411130
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.7	1	J	EPA-200.8

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:36:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-24-1

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-09
File ID: PE_EL2_140806-125
Sampled: 07/31/14 10:45
Prepared: 08/06/14 08:30
Analyzed: 08/06/14 19:39
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0359
Sequence: 1411130
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	6.1	1		EPA-200.8

KK 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:36:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-26-2

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-10
File ID: PE_EL2_140806-126
Sampled: 07/31/14 11:45
Prepared: 08/06/14 08:30
Analyzed: 08/06/14 19:43
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0359
Sequence: 1411130
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

kk 9.17.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:36:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-26-1

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-11
File ID: PE_EL2_140806-127
Sampled: 07/31/14 13:00
Prepared: 08/06/14 08:30
Analyzed: 08/06/14 19:46
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0359
Sequence: 1411130
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

KK 9-17-14

LDC #: 32573B4 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/3/14

SDG #: 14-17234 Level III/IV Page: 1 of 1

Laboratory: BC Laboratories, Inc. Reviewer:

2nd Reviewer:

METHOD: ~~Metals (EPA Method 200.7/200.8)~~ Cr (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: 7/31/14
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	
VII.	Duplicate Sample Analysis	A	
VIII.	Laboratory Control Samples (LCS)	A	
IX.	Internal Standard (ICP-MS)	A	Not reviewed for Level III
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	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

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

Notes:

LDC #: 31393B4

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer:
2nd Reviewer:

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?	✓			

LDC #: 31393B4

VALIDATION FINDINGS CHECKLIST

Reviewer:
2nd Reviewer:

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 #: 30573B4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

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	ICP/MS (Initial calibration)	Cr	48.53	50	97.1	97.1	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV	ICP/MS (Continuing calibration)	Cr	38.49	40	96.2	96.2	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 #: 33933134

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: ~
2nd Reviewer: R

METHOD: Trace Metals (EPA SW 846 Method 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 (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
MA	ICP interference check						
LCS	Laboratory control sample	Cr	38.24	40	95.6	95.6	Y
11	Matrix spike	↓	(SSR-SR) 36.37	40	90.9	90.9	↓
11/12	Duplicate	↓	36.11	36.37	0.717	0.704	↓
MA	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 #: 31393B4

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 6(N6) were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$ Recalculation:

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

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: July 31, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17234

Sample Identification

EB-4-7/31/14
MW-22-3
MW-22-2
MW-22-1
MW-24-4
MW-24-3**
MW-24-2
MW-24-1
MW-26-2
MW-26-1
EB-4-7/31/14MS
EB-4-7/31/14MSD
EB-4-7/31/14DUP
MW-24-1MS
MW-24-1MSD
MW-24-1DUP

**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.

The 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 were met.

III. Calibration verification

Calibration verification frequency and analysis criteria were met.

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
MB	Chloride	0.245 mg/L	MW-24-1
ICB/CCB	Chloride	0.229	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.

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

No field duplicates were detected in this SDG.

XI. Field Blanks

Sample EB-4-7/31/14 was identified as an equipment blank. No contaminant concentrations were found.

NASA JPL, 3Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-17234

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-17234

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:33:58PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-300.0

MW-24-1

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-09
File ID: B080114.seq-22
Sampled: 07/31/14 10:45
Prepared: 08/01/14 01:00
Analyzed: 08/01/14 06:39
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0048
Sequence: 1411570
Calibration: UNASSIGNED
Instrument: IC2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	86	1		EPA-300.0
14797-55-8	Nitrate as N	1.3	1		EPA-300.0
14808-79-8	Sulfate	47	1		EPA-300.0

9/17/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:33:58PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-24-1

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-09
File ID: 140801 0816 NO2-026
Sampled: 07/31/14 10:45
Prepared: 08/01/14 08:16
Analyzed: 08/01/14 08:16
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXG2715
Sequence: 1410904
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:33:58PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-365.1

MW-24-1

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-09
File ID: 140801 0804 PO4-049
Sampled: 07/31/14 10:45
Prepared: 08/01/14 08:04
Analyzed: 08/01/14 09:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0014
Sequence: 1410907
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.0040	1	U	EPA-365.1

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

EB-4-7/31/14

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-02
File ID: 140731 2150 CR6-005
Sampled: 07/31/14 06:10
Prepared: 07/31/14 21:50
Analyzed: 07/31/14 21:51
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0015
Sequence: 1410869
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

9/17/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-22-3

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-03
File ID: 140731 2150 CR6-009
Sampled: 07/31/14 06:40
Prepared: 07/31/14 21:50
Analyzed: 07/31/14 21:51
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0015
Sequence: 1410869
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0022	1		EPA-7196

8/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-22-2

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-04
File ID: 140731 2150 CR6-010
Sampled: 07/31/14 07:20
Prepared: 07/31/14 21:50
Analyzed: 07/31/14 21:51
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0015
Sequence: 1410869
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0016	1	J	EPA-7196

4/17/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-22-1

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-05
File ID: 140731 2150 CR6-011
Sampled: 07/31/14 08:00
Prepared: 07/31/14 21:50
Analyzed: 07/31/14 21:51
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0015
Sequence: 1410869
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

9/17/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-4

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-06
File ID: 140731 2150 CR6-012
Sampled: 07/31/14 09:00
Prepared: 07/31/14 21:50
Analyzed: 07/31/14 21:51
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0015
Sequence: 1410869
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

9/17/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-3

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-07
File ID: 140731 2150 CR6-015
Sampled: 07/31/14 09:35
Prepared: 07/31/14 21:50
Analyzed: 07/31/14 21:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0015
Sequence: 1410869
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

9/17/14 CO

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-2

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-08
File ID: 140731 2150 CR6-016
Sampled: 07/31/14 10:10
Prepared: 07/31/14 21:50
Analyzed: 07/31/14 21:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0015
Sequence: 1410869
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0021	1		EPA-7196

9/17/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-1

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-09
File ID: 140731 2150 CR6-017
Sampled: 07/31/14 10:45
Prepared: 07/31/14 21:50
Analyzed: 07/31/14 21:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0015
Sequence: 1410869
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

9/17/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-26-2

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-10
File ID: 140731 2150 CR6-018
Sampled: 07/31/14 11:45
Prepared: 07/31/14 21:50
Analyzed: 07/31/14 21:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0015
Sequence: 1410869
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

8/17/14-8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-26-1

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-11
File ID: 140731 2150 CR6-019
Sampled: 07/31/14 13:00
Prepared: 07/31/14 21:50
Analyzed: 07/31/14 21:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0015
Sequence: 1410869
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-4-7/31/14

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-02
File ID: F082114.seq-10.0000.txt
Sampled: 07/31/14 06:10
Prepared: 08/21/14 17:00
Analyzed: 08/21/14 19:40
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1643
Sequence: 1412172
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-22-3

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-03
File ID: F082114.seq-16.0000.txt
Sampled: 07/31/14 06:40
Prepared: 08/21/14 17:00
Analyzed: 08/21/14 21:03
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1643
Sequence: 1412172
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.7	1	J	EPA-314.0

9/17/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-22-2

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-04
File ID: F082114.seq-17.0000.txt
Sampled: 07/31/14 07:20
Prepared: 08/21/14 17:00
Analyzed: 08/21/14 21:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1643
Sequence: 1412172
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

9/17/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-22-1

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-05
File ID: F082114.seq-18.0000.txt
Sampled: 07/31/14 08:00
Prepared: 08/21/14 17:00
Analyzed: 08/21/14 21:30
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1643
Sequence: 1412172
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

8/27/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-24-3

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-07
File ID: F082114.seq-19.0000.txt
Sampled: 07/31/14 09:35
Prepared: 08/21/14 17:00
Analyzed: 08/21/14 21:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1643
Sequence: 1412172
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-24-2

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-08RE1
File ID: F082114.seq-34.0000.txt
Sampled: 07/31/14 10:10
Prepared: 08/21/14 17:00
Analyzed: 08/22/14 04:53
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1643
Sequence: 1412172
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	6.0	1		EPA-314.0

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-24-1

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-09
File ID: F082114.seq-21.0000.txt
Sampled: 07/31/14 10:45
Prepared: 08/21/14 17:00
Analyzed: 08/21/14 22:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1643
Sequence: 1412172
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

8/17/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-26-2

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-10
File ID: F082114.seq-22.0000.txt
Sampled: 07/31/14 11:45
Prepared: 08/21/14 17:00
Analyzed: 08/21/14 22:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1643
Sequence: 1412172
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

9/17/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2014 3:34:59PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-26-1

Laboratory: BC Laboratories
SDG: 14-17234
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417234-11
File ID: F082114.seq-23.0000.txt
Sampled: 07/31/14 13:00
Prepared: 08/21/14 17:00
Analyzed: 08/21/14 22:40
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1643
Sequence: 1412172
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

9/17/14

LDC #: 32573B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/3/14
SDG #: 14-17234 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer:
2nd Reviewer:

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: 7/31/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	SW	
V	Matrix Spike/Matrix Spike Duplicates	A	
VI.	Duplicates	A	
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	N	
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:

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

Notes:

LDC #: 35793B6

VALIDATION FINDINGS CHECKLIST

Reviewer: W
2nd Reviewer: A

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%~~ method 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 #: 32593B2

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
8	Aq	pH TDS [✓ Cl] F [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ PO_4] ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
1-10		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC [✓ CR^{6+}] ClO_4 _____ _____
1-4,6-10		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} [✓ ClO_4] _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
14-16	Aq	pH TDS [✓ Cl] F [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ PO_4] ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
11-13	↓	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC [✓ CR^{6+}] [✓ ClO_4] _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4

Comments: ____

LDC #: 32573B6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: Inorganics, Method See Cover
Conc. units: mg/L **Associated Samples:** 8 (>5X)

Analyte	Blank ID	Blank ID	Blank Action Limit											
	MB	ICB/CCB												
Cl	0.245	0.229	1.225											

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 #: 32593B6

Validatin Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: W
2nd Reviewer: 9

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr6+ was recalculated.Calibration date: 6/26/14

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)	Abs	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr6+	s1	0	0.001	*0.999936*	0.999932	Y
		s2	0.002	0.002			
		s3	0.005	0.005			
		s4	0.025	0.02			
		s5	0.05	0.039			
		s6	0.1	0.077			
CCV Calibration verification	Cr6+	0.05	0.0526		105	105	Y
CCV Calibration verification	Cr6+	10	9.47		94.7	94.7	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 #: 32873B6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: [illegible]
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	Cr6+	0.050	0.0500	100	99.4	Y
11	Matrix spike sample	Cr6+	(SSR-SR) 0.553	10.101	84.4	84.4	✓
11/12	Duplicate sample	Cr6+	0.487	0.487	0	0.0123	✓

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 #: 34732Bb

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
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 6 (ND) reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

Note:

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

September 23, 2014

SUBJECT: NASA JPL, 3Q2014, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on September 3, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32594:

SDG #	Fraction
14-17349, 14-17461	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,

for

Pei Geng
Project Manager/Senior Chemist

HC

Attachment 1

90/10 (client select)

LDC #32594 (Tidewater- Powell, OH / NASA JPL, 3Q2014)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)		Cr (200.8)		Cr(VI) (7196)		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	W	S
A	14-17349	09/03/14	09/24/14	10	0	10	0	10	0	9	0																								
A	14-17349	09/03/14	09/24/14	1	0	1	0	1	0	1	0																								
B	14-17461	09/03/14	09/24/14	10	0	9	0	9	0	9	0																								
B	14-17461	09/03/14	09/24/14	1	0	1	0	1	0	1	0																								
Total	T/PG			22	0	21	0	21	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84

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, 3Q2014

Collection Date: August 1, 2014

LDC Report Date: September 22, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17349

Sample Identification

TB-5-8/1/14
EB-5-8/1/14
MW-23-3
MW-23-2
MW-23-1
MW-25-5**
MW-25-4
MW-25-3
MW-25-2
Dup-4-3Q14
MW-25-1
MW-23-3MS
MW-23-3MSD

**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 at or above the stated limit.

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
8/5/14 (05AUG02)	Bromomethane	52.1	All samples in SDG 14-17349	J (all detects) UJ (all non-detects)	P
8/5/14 (05AUG03)	Methyl iodide	42.5	All samples in SDG 14-17349	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-25-2 and Dup-4-3Q14 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-25-2	Dup-4-3Q14	
Chloroform	0.12U	0.16	200
Trichloroethene	0.19	0.33	54

XVII. Field Blanks

Sample TB-5-8/1/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-5-8/1/14 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL, 3Q2014
Volatiles - Data Qualification Summary - SDG 14-17349

SDG	Sample	Compound	Flag	A or P	Reason
14-17349	TB-5-8/1/14 EB-5-8/1/14 MW-23-3 MW-23-2 MW-23-1 MW-25-5** MW-25-4 MW-25-3 MW-25-2 Dup-4-3Q14 MW-25-1	Bromomethane Methyl iodide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-17349

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-5-8/1/14

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-01	File ID:	05AUG13.D
Sampled:	08/01/14 06:10	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 10:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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

9/22/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-5-8/1/14

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-01	File ID:	05AUG13.D
Sampled:	08/01/14 06:10	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 10:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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

8/29/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-5-8/1/14

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-01	File ID:	05AUG13.D
Sampled:	08/01/14 06:10	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 10:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence:	1410965	Calibration:	1407027
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	10.590	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.390	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6300	96.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	223007	6.73	207549	6.73	
Chlorobenzene-d5 (IS)	73025	9.73	68069	9.73	
1,4-Difluorobenzene (IS)	277439	7.51	266479	7.52	

9/2/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-5-8/1/14

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-02	File ID:	05AUG14.D
Sampled:	08/01/14 06:30	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 10:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-5-8/1/14

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-02	File ID:	05AUG14.D
Sampled:	08/01/14 06:30	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 10:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-5-8/1/14

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-02	File ID:	05AUG14.D
Sampled:	08/01/14 06:30	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 10:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence:	1410965	Calibration:	1407027
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	10.740	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.310	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9500	99.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	222686	6.73	207549	6.73	
Chlorobenzene-d5 (IS)	72922	9.73	68069	9.73	
1,4-Difluorobenzene (IS)	279803	7.51	266479	7.52	

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-3

Laboratory: BC Laboratories | SDG: 14-17349
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417349-04 | File ID: 05AUG07.D
Sampled: 08/01/14 07:40 | Prepared: 08/05/14 06:00 | Analyzed: 08/05/14 08:06
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0177 | Sequence: 1410965 | Calibration: 1407027 | 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

8/29/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-3

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-04	File ID:	05AUG07.D
Sampled:	08/01/14 07:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 08:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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

8/29/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-3

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-04	File ID:	05AUG07.D
Sampled:	08/01/14 07:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 08:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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	10.100	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.290	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8300	98.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	217126	6.73	207549	6.73	
Chlorobenzene-d5 (IS)	70370	9.73	68069	9.73	
1,4-Difluorobenzene (IS)	270778	7.51	266479	7.52	

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-2

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-05	File ID:	05AUG15.D
Sampled:	08/01/14 08:10	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 11:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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	0.21	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

9/22/14 JJ

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-2

Laboratory:	BC Laboratories			SDG:	14-17349
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1417349-05	File ID:	05AUG15.D
Sampled:	08/01/14 08:10	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 11:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence:	1410965	Calibration:	1407027
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	1.4	
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

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-2

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-05	File ID:	05AUG15.D
Sampled:	08/01/14 08:10	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 11:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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	10.870	109	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.250	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7400	97.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	222724	6.73	207549	6.73	
Chlorobenzene-d5 (IS)	74045	9.73	68069	9.73	
1,4-Difluorobenzene (IS)	281620	7.52	266479	7.52	

9/22/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-1

Laboratory: BC Laboratories | SDG: 14-17349
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417349-06 | File ID: 05AUG16.D
Sampled: 08/01/14 08:40 | Prepared: 08/05/14 06:00 | Analyzed: 08/05/14 11:30
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0177 | Sequence: 1410965 | Calibration: 1407027 | 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	0.13	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	0.13	J
156-60-5	trans-1,2-Dichloroethene	1	0.18	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

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-1

Laboratory:	BC Laboratories			SDG:	14-17349
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1417349-06	File ID:	05AUG16.D
Sampled:	08/01/14 08:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 11:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence:	1410965	Calibration:	1407027
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	0.52	
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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-1

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-06	File ID:	05AUG16.D
Sampled:	08/01/14 08:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 11:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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	10.720	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.460	105	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7100	97.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	222767	6.73	207549	6.73	
Chlorobenzene-d5 (IS)	74090	9.73	68069	9.73	
1,4-Difluorobenzene (IS)	277638	7.51	266479	7.52	

9/22/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-5

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-07	File ID:	05AUG17.D
Sampled:	08/01/14 09:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 11:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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

9/22/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-5

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-07	File ID:	05AUG17.D
Sampled:	08/01/14 09:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 11:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-5

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-07	File ID:	05AUG17.D
Sampled:	08/01/14 09:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 11:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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	10.410	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7900	97.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	222586	6.73	207549	6.73	
Chlorobenzene-d5 (IS)	71948	9.73	68069	9.73	
1,4-Difluorobenzene (IS)	274986	7.51	266479	7.52	

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-4

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-08	File ID:	05AUG18.D
Sampled:	08/01/14 10:20	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 12:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-4

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-08	File ID:	05AUG18.D
Sampled:	08/01/14 10:20	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 12:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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

9/27/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-4

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-08	File ID:	05AUG18.D
Sampled:	08/01/14 10:20	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 12:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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	10.540	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.300	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.5100	95.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	224961	6.73	207549	6.73	
Chlorobenzene-d5 (IS)	74407	9.73	68069	9.73	
1,4-Difluorobenzene (IS)	278630	7.52	266479	7.52	

9/5/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-3

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-09	File ID:	05AUG19.D
Sampled:	08/01/14 10:55	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 12:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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	0.54	
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

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-3

Laboratory: BC Laboratories | SDG: 14-17349
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417349-09 | File ID: 05AUG19.D
Sampled: 08/01/14 10:55 | Prepared: 08/05/14 06:00 | Analyzed: 08/05/14 12:37
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0177 | Sequence: 1410965 | Calibration: 1407027 | 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	0.45	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

9/29/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-3

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-09	File ID:	05AUG19.D
Sampled:	08/01/14 10:55	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 12:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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	10.970	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.310	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8000	98.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	224765	6.73	207549	6.73	
Chlorobenzene-d5 (IS)	74427	9.73	68069	9.73	
1,4-Difluorobenzene (IS)	282616	7.52	266479	7.52	

9/28/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-2

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-10	File ID:	05AUG20.D
Sampled:	08/01/14 11:30	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 13:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-2

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-10	File ID:	05AUG20.D
Sampled:	08/01/14 11:30	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 13:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence:	1410965	Calibration:	1407027
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	0.19	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

9/2/2014

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-2

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-10	File ID:	05AUG20.D
Sampled:	08/01/14 11:30	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 13:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence:	1410965	Calibration:	1407027
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	10.800	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.330	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8200	98.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	224075	6.73	207549	6.73	
Chlorobenzene-d5 (IS)	73600	9.73	68069	9.73	
1,4-Difluorobenzene (IS)	280479	7.51	266479	7.52	

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-4-3Q14

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-11	File ID:	05AUG21.D
Sampled:	08/01/14 11:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 13:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence:	1410965	Calibration:	1407027
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	0.16	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

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-4-3Q14

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-11	File ID:	05AUG21.D
Sampled:	08/01/14 11:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 13:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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	0.33	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

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-4-3Q14

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-11	File ID:	05AUG21.D
Sampled:	08/01/14 11:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 13:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence:	1410965	Calibration:	1407027
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	10.810	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.170	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7500	97.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	220436	6.73	207549	6.73	
Chlorobenzene-d5 (IS)	73182	9.73	68069	9.73	
1,4-Difluorobenzene (IS)	282177	7.51	266479	7.52	

9/29/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-1

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-12	File ID:	05AUG22.D
Sampled:	08/01/14 12:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 13:45
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.65	
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

8/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-1

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-12	File ID:	05AUG22.D
Sampled:	08/01/14 12:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 13:45
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence: 1410965	Calibration:	1407027	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	0.31	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	2.4	
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

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:02:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-1

Laboratory:	BC Laboratories		SDG:	14-17349	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417349-12	File ID:	05AUG22.D
Sampled:	08/01/14 12:40	Prepared:	08/05/14 06:00	Analyzed:	08/05/14 13:45
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0177	Sequence:	1410965	Calibration:	1407027
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 V5
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	10.880	109	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.340	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7000	97.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	222382	6.73	207549	6.73	
Chlorobenzene-d5 (IS)	73321	9.73	68069	9.73	
1,4-Difluorobenzene (IS)	279267	7.52	266479	7.52	

8/27/14 Q

LDC #: 32594A1
SDG #: 14-17349
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 9/11/14
Page: 1 of 1
Reviewer:
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: 8/1/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ≤ 20, r²
IV.	Continuing calibration/ICV	SW	CCV/ICV ≤ 30
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	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	SW	D = 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

W

1	TB-5-8/1/14	11	MW-25-1	21	BX140177-BL1	31	
2	EB-5-8/1/14	12	MW-23-3MS	22		32	
3	MW-23-3	13	MW-23-3MSD	23		33	
4	MW-23-2	14		24		34	
5	MW-23-1	15		25		35	
6	MW-25-5**	16		26		36	
7	MW-25-4	17		27		37	
8	MW-25-3	18		28		38	
9	MW-25-2	19		29		39	
10	DUP-4-3Q14	20		30		40	

LDC #: 32594A1

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: A
2nd Reviewer: CV

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 #: 32594A1

VALIDATION FINDINGS CHECKLIST

Reviewer: AC
2nd Reviewer: CT

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.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Methyl iodide
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 #: 32594A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer:
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
	8/5/14	05AUG02	B	52.1	All	J/UJ/P
	8/5/14	05AUG03	QQQQ	42.5	All	↓

LDC #: 32594A1

Validation Findings Worksheet
Field Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS VOA

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (ug/L)				
	9	10			
K	0.12U	0.16	200		
S	0.19	0.33	54		

~~Privileged and Confidential~~

LDC #: 32594A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

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
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (10 std)	Recalculated RRF (10 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	10AL	7/28/14	C (1st Internal Standard)	0.554541	0.554541	0.551524	0.551524	4.144573	4.144578
			S (2nd Internal Standard)	0.347432	0.347432	0.349326	0.349326	11.39791	11.39791
			DD (3rd Internal Standard)	2.998771	2.998771	3.030789	3.030189	10.99915	10.99915
2			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						
3			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						
4			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						

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 #: 32594A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: M
2nd Reviewer: [illegible]

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
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	05AM602	8/5/14	C (1st Internal Standard)	0.551541	0.5549726	0.5549726	0.6	0.6
			S (2nd Internal Standard)	0.329326	0.3265492	0.3265492	6.5	6.5
			DD (3rd Internal Standard)	3.030789	2.942614	2.942614	2.9	2.9
2			(1st Internal Standard)					
			(2nd Internal Standard)					
			(3rd Internal Standard)					
3			(1st Internal Standard)					
			(2nd Internal Standard)					
			(3rd Internal Standard)					
4			(1st Internal Standard)					
			(2nd Internal Standard)					
			(3rd Internal Standard)					

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 #: 32594A1

VALIDATION FINDINGS WORKSHEET

Surrogate Results Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

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: 6

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10	10.41	104	104	0
Bromofluorobenzene	↓	9.79	97.9	97.9	↓
1,2-Dichlorobenzene-d4	↓	10.65	106	106	↓
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 #: 32594A1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: MA
2nd Reviewer: CA

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 = | MSC - MSC | * 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
1,1-Dichloroethene	25	25	ND	25.50	23.81	102	102	95.2	95.2	6.85	6.85
Trichloroethene	↓	↓	↓	25.13	23.84	101	101	95.4	95.4	5.27	5.27
Benzene	↓	↓	↓	25.46	23.91	102	102	95.6	95.6	6.28	6.28
Toluene	↓	↓	↓	25.89	24.57	104	104	98.3	98.3	5.23	5.23
Chlorobenzene	↓	↓	↓	26.05	24.06	104	104	96.2	96.2	7.94	7.94

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 #: 32594A1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: MJ
2nd Reviewer: CL

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: BX40177LCS

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		24.34		97.4	97.4				
Trichloroethene	↓		23.90		95.6	95.6				
Benzene			24.23		96.9	96.9				
Toluene			24.92		99.7	99.7				
Chlorobenzene			24.88		99.5	99.5				

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 #: 32594J1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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:

Sample I.D. 6 , NB :

Conc. = ( ) ( ) ( ) / ( ) ( ) ( ) ( )

=

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 1, 2014

LDC Report Date: September 22, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17349

Sample Identification

EB-5-8/1/14
MW-23-4
MW-23-3
MW-23-2
MW-23-1
MW-25-5**
MW-25-4
MW-25-3
MW-25-2
DUP-4-3Q14
MW-25-1
EB-5-8/1/14MS
EB-5-8/1/14MSD
EB-5-8/1/14DUP

**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 Methods 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 constituent.

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. ICP/MS 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 with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Chromium	0.513 ug/L	MW-25-1

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 with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-25-1	Chromium	1.5 ug/L	1.5U ug/L

V. ICP Interference Check Sample (ICS) Analysis

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

VI. Matrix Spike Analysis

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-25-2 and DUP-4-3Q14 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-25-2	DUP-4-3Q14	
Chromium	3.0	2.7	11

XIV. Field Blanks

Sample EB-5-8/1/14 was identified as an equipment blank. No chromium was found.

NASA JPL, 3Q2014
Chromium - Data Qualification Summary - SDG 14-17349

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-17349

SDG	Sample	Analyte	Modified Final Concentration	A or P
14-17349	MW-25-1	Chromium	1.5U ug/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:56:17PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-5-8/1/14

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-02
File ID: PE_EL2_140807-092
Sampled: 08/01/14 06:30
Prepared: 08/07/14 08:10
Analyzed: 08/07/14 14:57
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0483
Sequence: 1411194
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

8/22/14 a

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:56:17PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-23-4

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-03
File ID: PE_EL2_140807-103
Sampled: 08/01/14 07:00
Prepared: 08/07/14 08:10
Analyzed: 08/07/14 15:34
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0483
Sequence: 1411194
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

9/5/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:56:17PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-23-3

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-04
File ID: PE_EL2_140807-104
Sampled: 08/01/14 07:40
Prepared: 08/07/14 08:10
Analyzed: 08/07/14 15:38
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0483
Sequence: 1411194
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.2	1		EPA-200.8

9/2/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:56:17PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-23-2

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-05
File ID: PE_EL2_140807-105
Sampled: 08/01/14 08:10
Prepared: 08/07/14 08:10
Analyzed: 08/07/14 15:41
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0483
Sequence: 1411194
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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:56:17PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-23-1

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-06
File ID: PE_EL2_140807-106
Sampled: 08/01/14 08:40
Prepared: 08/07/14 08:10
Analyzed: 08/07/14 15:45
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0483
Sequence: 1411194
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

9/22/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:56:17PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-5

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-07
File ID: PE_EL2_140807-107
Sampled: 08/01/14 09:40
Prepared: 08/07/14 08:10
Analyzed: 08/07/14 15:48
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0483
Sequence: 1411194
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

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:56:17PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-4

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-08
File ID: PE_EL2_140807-111
Sampled: 08/01/14 10:20
Prepared: 08/07/14 08:10
Analyzed: 08/07/14 16:01
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0483
Sequence: 1411194
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

9/2/14 CR

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:56:17PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-3

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-09
File ID: PE_EL2_140807-112
Sampled: 08/01/14 10:55
Prepared: 08/07/14 08:10
Analyzed: 08/07/14 16:05
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0483
Sequence: 1411194
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.5	1		EPA-200.8

9/5/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:56:17PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-2

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-10
File ID: PE_EL2_140807-113
Sampled: 08/01/14 11:30
Prepared: 08/07/14 08:10
Analyzed: 08/07/14 16:08
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0483
Sequence: 1411194
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

9/22/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:56:17PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

DUP-4-3Q14

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-11
File ID: PE_EL2_140807-114
Sampled: 08/01/14 11:40
Prepared: 08/07/14 08:10
Analyzed: 08/07/14 16:11
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0483
Sequence: 1411194
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

9/2/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:56:17PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-1

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-12
File ID: PE_EL2_140807-082
Sampled: 08/01/14 12:40
Prepared: 08/07/14 08:10
Analyzed: 08/07/14 14:20
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0484
Sequence: 1411195
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 U	EPA-200.8

9/22/14 Q

LDC #: 32594A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/4/14
SDG #: 14-17349 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: VR
2nd Reviewer: C

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: 8/1/14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	N	Not required
VI.	Matrix Spike Analysis	A	
VII.	Duplicate Sample Analysis	A	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	Not reviewed for Level 3
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	(9,10)
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

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

Notes:

LDC #: 32594A4

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: [illegible]
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 #: 32594A4

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: W
2nd Reviewer: 4

METHOD: Trace Metals (EPA 200.8) Soil preparation factor applied: ____
Sample Concentration units, unless otherwise noted: ug/L Associated Samples: 11

					Sample Identification										
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (mg/L)	Blank Action Limit	11										
Pb CV		0.513		2.565	1.5										

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#: 32594A4

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 200.8)

Analyte	Concentration (ug/L)		RPD	
	9	10		
Chromium	3.0	2.7	11	

V:\FIELD DUPLICATES\FD_inorganic\32594A4.wpd

LDC #: 32944

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

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	ICP/MS (Initial calibration)	Cr	50.8	50.0	102	102	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV	ICP/MS (Continuing calibration)	Cr	42.87	40.0	107	107	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 #: 34444

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 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 (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
MB	ICP interference check						
LCS	Laboratory control sample	Cr	42.865	40	107	107	Y
1x	Matrix spike	↓	(SSR-SR) 41.11	40	103	103	↓
1x/13	Duplicate	↓	41.88	41.11	1.86	1.84	↓
MA	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 #: 32594A4

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

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 6 (ND) were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$

Recalculation:

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

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 1, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17349

Sample Identification

EB-5-8/1/14	DUP-4-3Q14MS
MW-23-4	DUP-4-3Q14MSD
MW-23-3	DUP-4-3Q14DUP
MW-23-2	
MW-23-1	
MW-25-5**	
MW-25-4	
MW-25-3	
MW-25-2	
DUP-4-3Q14	
MW-25-1	
EB-5-8/1/14MS	
EB-5-8/1/14MSD	
EB-5-8/1/14DUP	
MW-23-2MS	
MW-23-2MSD	
MW-23-2DUP	
MW-25-5MS	
MW-25-5MSD	
MW-25-5DUP	

** 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 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. 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

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-25-2 and Dup-4-3Q14 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-25-2	Dup-4-3Q14	
Hexavalent Chromium	0.0025 mg/L	0.0024 mg/L	4
Perchlorate	15 ug/L	15 ug/L	0

XI. Field Blanks

Sample EB-5-8/1/14 was identified as an equipment blank. No contaminant concentrations were found.

NASA JPL, 3Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-17349

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-17349

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-5-8/1/14

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-02
File ID: F081914.seq-17.0000.txt
Sampled: 08/01/14 06:30
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 04:31
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1645
Sequence: 1412014
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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-23-3

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-04
File ID: F081914.seq-18.0000.txt
Sampled: 08/01/14 07:40
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 04:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1645
Sequence: 1412014
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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-23-2

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-05RE1
File ID: F082114.seq-42.0000.txt
Sampled: 08/01/14 08:10
Prepared: 08/21/14 17:00
Analyzed: 08/22/14 06:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2362
Sequence: 1412172
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.4	1		EPA-314.0

8/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-23-1

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-06RE2
File ID: F082114.seq-46.0000.txt
Sampled: 08/01/14 08:40
Prepared: 08/21/14 17:00
Analyzed: 08/22/14 07:39
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2362
Sequence: 1412172
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

4/27/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-5

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-07
File ID: F081914.seq-9.0000.txt
Sampled: 08/01/14 09:40
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 02:40
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1645
Sequence: 1412014
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

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-4

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-08
File ID: F081914.seq-21.0000.txt
Sampled: 08/01/14 10:20
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 05:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1645
Sequence: 1412014
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	11	1		EPA-314.0

9/22/14 QL

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-25-3

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-09
File ID: F081914.seq-22.0000.txt
Sampled: 08/01/14 10:55
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 05:40
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1645
Sequence: 1412014
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	12	1		EPA-314.0

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-2

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-10
File ID: F081914.seq-23.0000.txt
Sampled: 08/01/14 11:30
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 05:54
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1645
Sequence: 1412014
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	15	1		EPA-314.0

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

DUP-4-3Q14

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-11
File ID: F081914.seq-28.0000.txt
Sampled: 08/01/14 11:40
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 07:03
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1910
Sequence: 1412014
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	15	1		EPA-314.0

9/2/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-1

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-12
File ID: F081914.seq-32.0000.txt
Sampled: 08/01/14 12:40
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 07:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1910
Sequence: 1412014
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	11	1		EPA-314.0

9/22/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

EB-5-8/1/14

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-02
File ID: 140801 2126 CR6-005
Sampled: 08/01/14 06:30
Prepared: 08/01/14 21:26
Analyzed: 08/01/14 21:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0140
Sequence: 1411114
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

8/29/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-4

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-03
File ID: 140801 2126 CR6-009
Sampled: 08/01/14 07:00
Prepared: 08/01/14 21:26
Analyzed: 08/01/14 21:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0140
Sequence: 1411114
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0027	1		EPA-7196

9/22/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-3

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-04
File ID: 140801 2126 CR6-010
Sampled: 08/01/14 07:40
Prepared: 08/01/14 21:26
Analyzed: 08/01/14 21:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0140
Sequence: 1411114
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0031	1		EPA-7196

8/29/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-2

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-05
File ID: 140801 2126 CR6-011
Sampled: 08/01/14 08:10
Prepared: 08/01/14 21:26
Analyzed: 08/01/14 21:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0140
Sequence: 1411114
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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-1

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-06
File ID: 140801 2126 CR6-012
Sampled: 08/01/14 08:40
Prepared: 08/01/14 21:26
Analyzed: 08/01/14 21:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0140
Sequence: 1411114
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

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-5

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-07
File ID: 140801 2126 CR6-015
Sampled: 08/01/14 09:40
Prepared: 08/01/14 21:26
Analyzed: 08/01/14 21:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0140
Sequence: 1411114
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

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-4

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-08
File ID: 140801 2126 CR6-016
Sampled: 08/01/14 10:20
Prepared: 08/01/14 21:26
Analyzed: 08/01/14 21:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0140
Sequence: 1411114
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00085	1	J	EPA-7196

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-25-3

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-09
File ID: 140801 2126 CR6-017
Sampled: 08/01/14 10:55
Prepared: 08/01/14 21:26
Analyzed: 08/01/14 21:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0140
Sequence: 1411114
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0031	1		EPA-7196

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-2

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-10
File ID: 140801 2126 CR6-018
Sampled: 08/01/14 11:30
Prepared: 08/01/14 21:26
Analyzed: 08/01/14 21:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0140
Sequence: 1411114
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0025	1		EPA-7196

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

DUP-4-3Q14

Laboratory: BC Laboratories
SDG: 14-17349
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417349-11
File ID: 140801 2126 CR6-021
Sampled: 08/01/14 11:40
Prepared: 08/01/14 21:26
Analyzed: 08/01/14 21:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0430
Sequence: 1411114
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0024	1		EPA-7196

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:53:50PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-1

Laboratory: BC Laboratories
Client: Tidewater Inc.
Matrix: Water
Sampled: 08/01/14 12:40
Solids: 0.00
Batch: BXH0430 Sequence: 1411114

SDG: 14-17349
Project: JPL- GW Monitoring Wells
Laboratory ID: 1417349-12
Prepared: 08/01/14 21:26
Preparation: No Prep
Calibration: UNASSIGNED

File ID: 140801 2126 CR6-027
Analyzed: 08/01/14 21:36
Initial/Final: 20 ml / 20 ml
Instrument: KONE-1

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

9/2/14

LDC #: 32594A6
SDG #: 14-17349
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 9/4/14
Page: 1 of 1
Reviewer: ~
2nd Reviewer: ✓

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: 8/1/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	A	
VI.	Duplicates	A	
VII.	Laboratory control samples	A	LCSX
VIII.	Sample result verification	A	Not reviewed for Level III validation.
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	(9, 10)
XI	Field blanks	No	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

1 1	EB-5-8/1/14	11 2	MW-25-1	21 2	DUP-4-3Q14MS	31	MB
2	MW-23-4	12	EB-5-8/1/14MS	22 2	DUP-4-3Q14MSD	32	
3 1	MW-23-3	13	EB-5-8/1/14MSD	23 2	DUP-4-3Q14DUP	33	
4 3	MW-23-2	14	EB-5-8/1/14DUP	24		34	
5 3	MW-23-1	15 3	MW-23-2MS	25		35	
6 1	MW-25-5**	16 3	MW-23-2MSD	26		36	
7 1	MW-25-4	17 3	MW-23-2DUP	27		37	
8 1	MW-25-3	18 1	MW-25-5MS	28		38	
9 1	MW-25-2	19 1	MW-25-5MSD	29		39	
10 2	DUP-4-3Q14	20 1	MW-25-5DUP	30		40	

Notes:

LDC #: 32494A6

VALIDATION FINDINGS CHECKLIST

Reviewer: VC
2nd Reviewer: K

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%~~ 80-120% 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 #: 37514A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer:
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1, 3-11	AQ	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} [✓ ClO$_4$] ______ ______
1-11	↓	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC [✓ CR^{6+}] ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
12-14, 21, 23	AQ	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC [✓ CR^{6+}] ClO$_4$ ______ ______
15-23	↓	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} [✓ ClO$_4$] ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ ______ ______
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$

Comments:

LDC# 32594A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer:

2nd Reviewer:

Inorganics: Method See Cover

Analyte	Concentration (mg/L)		RPD	
	9	10		
Hexavalent Chromium	0.0025	0.0024	4	
Perchlorate (ug/L)	15	15	0	

V:\FIELD DUPLICATES\FD_inorganic\32594A6.wpd

LDC #: 32594A6

Validatin Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

Method: Inorganics, Method See cover

The correlation coefficient (r) for the calibration of ClO4 was recalculated.Calibration date: 8/11/14

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. (ug/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	ClO4	s1	2	0.0025	*0.99829*	0.99581	Y
		s2	4	0.0041			
		s3	6	0.0066			
		s4	10	0.0103			
		s5	20	0.0228			
ICV Calibration verification	ClO4	10	9.173		91.7	91.7	Y
CCV Calibration verification	ClO4	0.050	0.0535		106	106	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 #: 32951A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: [illegible]
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	Cr6+	0.0495	0.050	99.0	99.0	Y
18	Matrix spike sample	Cr6+	(SSR-SR) 9.474	10.101 [illegible]	93.8	93.8	
12/13	Duplicate sample	Cr6+	0.0512	0.0521	1.74	1.79	

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 #: 35694A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 6 (NO) reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 4, 2014

LDC Report Date: September 22, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17461

Sample Identification

TB-6-8/4/14
EB-6-8/4/14
MW-3-4
MW-3-3
Dup-5-3Q14
MW-3-2
MW-21-5
MW-21-4
Dup-6-3Q14
MW-21-3
MW-21-2**
MW-21-2MS
MW-21-2MSD

**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 at or above the stated limit.

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
8/5/14 (05AUG33)	Bromomethane	52.1	All samples in SDG 14-17461	J (all detects) UJ (all non-detects)	P
8/5/14 (05AUG34)	Methyl iodide Pentachloroethane	50.5 60.4	All samples in SDG 14-17461	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-3-3 and Dup-5-3Q14 and samples MW-21-4 and Dup-6-3Q14 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-3-3	Dup-5-3Q14	
1,1-Dichloroethane	0.22	0.22	0
Tetrachloroethene	0.19	0.20	5

Compound	Concentration (ug/L)		RPD
	MW-21-4	Dup-6-3Q14	
Chloroform	9.5	7.5	24
cis-1,2-Dichloroethene	0.14	0.10	33
Tetrachloroethene	1.2	0.87	32
Trichloroethene	0.20	0.13	42

XVII. Field Blanks

Sample TB-6-8/4/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-6-8/4/14 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL, 3Q2014
Volatiles - Data Qualification Summary - SDG 14-17461

SDG	Sample	Compound	Flag	A or P	Reason
14-17461	TB-6-8/4/14 EB-6-8/4/14 MW-3-4 MW-3-3 Dup-5-3Q14 MW-3-2 MW-21-5 MW-21-4 Dup-6-3Q14 MW-21-3 MW-21-2**	Bromomethane Methyl iodide Pentachloroethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-17461

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-6-8/4/14

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-01	File ID:	05AUG44.D
Sampled:	08/04/14 07:00	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 22:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-6-8/4/14

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-01	File ID:	05AUG44.D
Sampled:	08/04/14 07:00	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 22:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-6-8/4/14

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-01	File ID:	05AUG44.D
Sampled:	08/04/14 07:00	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 22:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	10.730	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.210	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)	225464	6.73	217455	6.73	
Chlorobenzene-d5 (IS)	74892	9.73	74143	9.73	
1,4-Difluorobenzene (IS)	285405	7.51	282885	7.51	

9/2/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-6-8/4/14

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-02	File ID:	05AUG45.D
Sampled:	08/04/14 07:20	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 22:24
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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

9/22/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-6-8/4/14

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-02	File ID:	05AUG45.D
Sampled:	08/04/14 07:20	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 22:24
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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

8/29/14 QC

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-6-8/4/14

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-02	File ID:	05AUG45.D
Sampled:	08/04/14 07:20	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 22:24
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	11.140	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.310	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4500	94.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	223395	6.73	217455	6.73	
Chlorobenzene-d5 (IS)	73984	9.73	74143	9.73	
1,4-Difluorobenzene (IS)	281876	7.51	282885	7.51	

9/2/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-4

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-03	File ID:	05AUG46.D
Sampled:	08/04/14 07:45	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 22:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-4

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-03	File ID:	05AUG46.D
Sampled:	08/04/14 07:45	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 22:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	0.21	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

9/2/14 O

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-4

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-03	File ID:	05AUG46.D
Sampled:	08/04/14 07:45	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 22:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	10.640	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.450	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2900	92.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	224647	6.73	217455	6.73	
Chlorobenzene-d5 (IS)	74527	9.73	74143	9.73	
1,4-Difluorobenzene (IS)	277758	7.51	282885	7.51	

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-3

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-04	File ID:	05AUG47.D
Sampled:	08/04/14 08:30	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 23:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	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	0.22	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	0.085	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

9/22/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-3

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-04	File ID:	05AUG47.D
Sampled:	08/04/14 08:30	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 23:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	0.19	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: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-3

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-04	File ID:	05AUG47.D
Sampled:	08/04/14 08:30	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 23:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	10.960	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.250	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4800	94.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	219503	6.73	217455	6.73	
Chlorobenzene-d5 (IS)	73245	9.73	74143	9.73	
1,4-Difluorobenzene (IS)	281910	7.51	282885	7.51	

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-5-3Q14

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-05	File ID:	05AUG48.D
Sampled:	08/04/14 08:40	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 23:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	0.22	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	0.085	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

9/22/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-5-3Q14

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-05	File ID:	05AUG48.D
Sampled:	08/04/14 08:40	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 23:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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

9/22/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-5-3Q14

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-05	File ID:	05AUG48.D
Sampled:	08/04/14 08:40	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 23:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	10.790	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.360	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6800	96.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	221418	6.73	217455	6.73	
Chlorobenzene-d5 (IS)	71498	9.73	74143	9.73	
1,4-Difluorobenzene (IS)	279307	7.51	282885	7.51	

9/2/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-2

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-06	File ID:	05AUG49.D
Sampled:	08/04/14 09:20	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 23:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	0.36	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	0.98	
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

9/22/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-2

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-06	File ID:	05AUG49.D
Sampled:	08/04/14 09:20	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 23:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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

8/29/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-3-2

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-06	File ID:	05AUG49.D
Sampled:	08/04/14 09:20	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 23:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	10.620	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.480	105	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4100	94.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	223670	6.73	217455	6.73	
Chlorobenzene-d5 (IS)	73179	9.73	74143	9.73	
1,4-Difluorobenzene (IS)	278854	7.52	282885	7.51	

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-5

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-07	File ID:	05AUG50.D
Sampled:	08/04/14 10:20	Prepared:	08/05/14 12:19	Analyzed:	08/06/14 00:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	7.0	
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

9/2/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-5

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-07	File ID:	05AUG50.D
Sampled:	08/04/14 10:20	Prepared:	08/05/14 12:19	Analyzed:	08/06/14 00:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	0.89	
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

9/3/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-5

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-07	File ID:	05AUG50.D
Sampled:	08/04/14 10:20	Prepared:	08/05/14 12:19	Analyzed:	08/06/14 00:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	10.840	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.370	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4400	94.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	217766	6.73	217455	6.73	
Chlorobenzene-d5 (IS)	72050	9.73	74143	9.73	
1,4-Difluorobenzene (IS)	278135	7.51	282885	7.51	

9/2/14 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-4

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-08	File ID:	05AUG51.D
Sampled:	08/04/14 11:00	Prepared:	08/05/14 12:19	Analyzed:	08/06/14 00:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	9.5	
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	0.14	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

9/2/14 R

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-4

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-08	File ID:	05AUG51.D
Sampled:	08/04/14 11:00	Prepared:	08/05/14 12:19	Analyzed:	08/06/14 00:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	1.2	
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

9/2/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-4

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-08	File ID:	05AUG51.D
Sampled:	08/04/14 11:00	Prepared:	08/05/14 12:19	Analyzed:	08/06/14 00:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	11.150	112	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.390	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3000	93.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	220271	6.73	217455	6.73	
Chlorobenzene-d5 (IS)	74593	9.73	74143	9.73	
1,4-Difluorobenzene (IS)	281363	7.52	282885	7.51	

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-6-3Q14

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-09	File ID:	05AUG52.D
Sampled:	08/04/14 11:10	Prepared:	08/05/14 12:19	Analyzed:	08/06/14 01:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	7.5	
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	0.10	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

9/2/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-6-3Q14

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-09	File ID:	05AUG52.D
Sampled:	08/04/14 11:10	Prepared:	08/05/14 12:19	Analyzed:	08/06/14 01:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	0.87	
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	0.13	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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-6-3Q14

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-09	File ID:	05AUG52.D
Sampled:	08/04/14 11:10	Prepared:	08/05/14 12:19	Analyzed:	08/06/14 01:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	10.890	109	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.130	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.5800	95.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	216016	6.73	217455	6.73	
Chlorobenzene-d5 (IS)	71186	9.73	74143	9.73	
1,4-Difluorobenzene (IS)	278248	7.51	282885	7.51	

9/29/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-3

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-10	File ID:	05AUG53.D
Sampled:	08/04/14 11:45	Prepared:	08/05/14 12:19	Analyzed:	08/06/14 01:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	0.86	
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	0.36	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

9/3/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-3

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-10	File ID:	05AUG53.D
Sampled:	08/04/14 11:45	Prepared:	08/05/14 12:19	Analyzed:	08/06/14 01:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	0.23	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	2.7	
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

8/29/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-3

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-10	File ID:	05AUG53.D
Sampled:	08/04/14 11:45	Prepared:	08/05/14 12:19	Analyzed:	08/06/14 01:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	11.010	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.110	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4600	94.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	220659	6.73	217455	6.73	
Chlorobenzene-d5 (IS)	73197	9.73	74143	9.73	
1,4-Difluorobenzene (IS)	283023	7.51	282885	7.51	

9/2/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-2

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-11	File ID:	05AUG38.D
Sampled:	08/04/14 13:10	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 19:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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 MJ
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	0.45	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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-2

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-11	File ID:	05AUG38.D
Sampled:	08/04/14 13:10	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 19:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	0.21	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	1.8	
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

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:14:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-2

Laboratory:	BC Laboratories		SDG:	14-17461	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417461-11	File ID:	05AUG38.D
Sampled:	08/04/14 13:10	Prepared:	08/05/14 12:19	Analyzed:	08/05/14 19:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0273	Sequence: 1410965	Calibration:	1407027	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	11.080	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.320	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7700	97.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	221412	6.73	217455	6.73	
Chlorobenzene-d5 (IS)	73017	9.73	74143	9.73	
1,4-Difluorobenzene (IS)	278206	7.51	282885	7.51	

9/22/14

LDC #: 32594B1

SDG #: 14-17461

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 9/11/14

Page: 1 of 1

Reviewer: A

2nd Reviewer: Q

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: 8/4/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ≤ 20.1%
IV.	Continuing calibration/ICV	SW	CCV/PV ≤ 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	D = 4+5, 8+9
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

W

1	TB-6-8/4/14	11	MW-21-2**	21	BXH0273-BLK1	31	
2	EB-6-8/4/14	12	MW-21-2MS	22		32	
3	MW-3-4	13	MW-21-2MSD	23		33	
4	MW-3-3	14		24		34	
5	UP Dup-5-3Q14	15		25		35	
6	MW-3-2	16		26		36	
7	MW-21-5	17		27		37	
8	MW-21-4	18		28		38	
9	UP Dup-6-3Q14	19		29		39	
10	MW-21-3	20		30		40	

LDC #: 32594B1

VALIDATION FINDINGS CHECKLIST

Reviewer: A
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/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.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Methyl is side
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 #: 32594B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: A
2nd Reviewer: CA

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
	8/5/14	05AUG33	B	48.1	All	J/UJ/P
	8/5/14	05AUG34	QQQQ	50.5	All	
			RRRR	60.4		

CONCAL.1S5

METHOD: GC/MS VOA

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (ug/L)				
	4	5			
I	0.22	0.22	0		
AA	0.19	0.20	5		

Analyte	Concentration (ug/L)				
	8	9			
K	9.5	7.5	24		
QQQ	0.14	0.10	33		
AA	1.2	0.87	32		
S	0.20	0.13	42		

~~Privileged and Confidential~~

LDC #: 32594B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer:
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
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (10 std)	Recalculated RRF (10 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/28/14	C (1st Internal Standard)	0.554541	0.554541	0.551524	0.551524	4.14573	4.14578
			S (2nd Internal Standard)	0.347432	0.347432	0.349326	0.349326	11.39791	11.39791
			DD (3rd Internal Standard)	2.998771	2.998771	3.030789	3.030189	10.99915	10.99915
2			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						
3			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						
4			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						

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 #: 32594B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	05AUG33	8/5/14	C (1st Internal Standard)	0.5515241	0.5183233	0.5783233	4.9	4.9
			S (2nd Internal Standard)	0.3493426	0.3330498	0.3330498	4.7	4.7
			DD (3rd Internal Standard)	3.030789	3.019272	3.019272	0.4	0.4
2			(1st Internal Standard)					
			(2nd Internal Standard)					
			(3rd Internal Standard)					
3			(1st Internal Standard)					
			(2nd Internal Standard)					
			(3rd Internal Standard)					
4			(1st Internal Standard)					
			(2nd Internal Standard)					
			(3rd Internal Standard)					

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 #: 3594B1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

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: 11

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10	10.32	103	103	0
Bromofluorobenzene	↓	9.77	97.7	97.7	↓
1,2-Dichlorobenzene-d4	↓	11.08	111	111	↓
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 #: 32596B1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: [illegible]
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 - 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
1,1-Dichloroethene	25	25	ND	23.99	25.47	96.0	96.0	102	102	5.98	5.98
Trichloroethene	↓	↓	0.34	24.45	25.80	96.4	96.4	102	102	5.37	5.37
Benzene	↓	↓	ND	24.69	26.25	98.8	98.8	105	105	6.12	6.12
Toluene	↓	↓	↓	24.90	26.63	99.6	99.6	107	107	6.71	6.71
Chlorobenzene	↓	↓	↓	25.08	26.49	100	100	106	106	5.47	5.47

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 #: 32594B1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: AA
2nd Reviewer: AA

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: BX40273LCS

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		24.02		96.1	96.1				
Trichloroethene	↓		23.61		94.4	94.4				
Benzene			24.67		98.7	98.7				
Toluene			24.66		98.6	98.6				
Chlorobenzene			24.49		98.0	98.0				

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 #: 32594B1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: M
2nd reviewer: K

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:

Sample I.D. 11 , K :

Conc. = $\frac{(7834)(10)(1)}{(2214)(0.79235)()}$

= 0.45 ug/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 4, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17461

Sample Identification

EB-6-8/4/14
MW-3-4
MW-3-3
Dup-5-3Q14
MW-3-2
MW-21-5
MW-21-4
Dup-6-3Q14
MW-21-3
MW-21-2**
EB-6-8/4/14MS
EB-6-8/4/14MSD
EB-6-8/4/14DUP

** 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 Methods 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 constituent.

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. ICP/MS 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 metals contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium	0.746 ug/L	All samples in SDG 14-17461
ICB/CCB	Chromium	0.833 ug/L	EB-6-8/4/14
ICB/CCB	Chromium	0.864 ug/L	MW-3-4 MW-3-3 Dup-5-3Q14 MW-3-2 MW-21-5 MW-21-4 Dup-6-3Q14 MW-21-3 MW-21-2**

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
EB-6-8/4/14	Chromium	0.93 ug/L	0.93U ug/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-3-3	Chromium	3.0 ug/L	3.0U ug/L
MW-3-2	Chromium	0.76 ug/L	0.76U ug/L
MW-21-5	Chromium	2.0 ug/L	2.0U ug/L
MW-21-4	Chromium	1.9 ug/L	1.9U ug/L
Dup-6-3Q14	Chromium	1.7 ug/L	1.7U ug/L
MW-21-3	Chromium	1.3 ug/L	1.3U ug/L
MW-21-2**	Chromium	0.91 ug/L	0.91U ug/L

V. ICP Interference Check Sample (ICS) Analysis

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

VI. Matrix Spike Analysis

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-3-3 and Dup-5-3Q14 and samples MW-21-4 and Dup-6-3Q14 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-3-3	Dup-5-3Q14	
Chromium	3.0	4.5	40

Analyte	Concentration (ug/L)		RPD
	MW-21-4	Dup-6-3Q14	
Chromium	1.9	1.7	11

XIV. Field Blanks

Sample EB-6-8/4/14 was identified as an equipment blank. No chromium was found with the following exception:

Blank ID	Analyte	Concentration (ug/L)
EB-6-8/4/14	Chromium	0.93

NASA JPL, 3Q2014
Chromium - Data Qualification Summary - SDG 14-17461

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-17461

SDG	Sample	Analyte	Modified Final Concentration	A or P
14-17461	EB-6-8/4/14	Chromium	0.93U ug/L	A
14-17461	MW-3-3	Chromium	3.0U ug/L	A
14-17461	MW-3-2	Chromium	0.76U ug/L	A
14-17461	MW-21-5	Chromium	2.0U ug/L	A
14-17461	MW-21-4	Chromium	1.9U ug/L	A
14-17461	Dup-6-3Q14	Chromium	1.7U ug/L	A
14-17461	MW-21-3	Chromium	1.3U ug/L	A
14-17461	MW-21-2**	Chromium	0.91U ug/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:00:33PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

EB-6-8/4/14

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-02
File ID: PE_EL2_140808-123
Sampled: 08/04/14 07:20
Prepared: 08/08/14 08:30
Analyzed: 08/08/14 16:23
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0679
Sequence: 1411280
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.93	1	J U	EPA-200.8

9/2/14 1

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:00:33PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-3-4

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-03
File ID: PE_EL2_140808-131
Sampled: 08/04/14 07:45
Prepared: 08/08/14 08:30
Analyzed: 08/08/14 16:49
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0679
Sequence: 1411280
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	6.9	1		EPA-200.8

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:00:33PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-3-3

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-04
File ID: PE_EL2_140808-132
Sampled: 08/04/14 08:30
Prepared: 08/08/14 08:30
Analyzed: 08/08/14 16:53
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0679
Sequence: 1411280
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.0	1	U	EPA-200.8

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:00:33PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

Dup-5-3Q14

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-05
File ID: PE_EL2_140808-133
Sampled: 08/04/14 08:40
Prepared: 08/08/14 08:30
Analyzed: 08/08/14 16:56
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0679
Sequence: 1411280
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	4.5	1		EPA-200.8

9/2>/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:00:33PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-3-2

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-06
File ID: PE_EL2_140808-134
Sampled: 08/04/14 09:20
Prepared: 08/08/14 08:30
Analyzed: 08/08/14 17:00
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0679
Sequence: 1411280
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.76	1	J U	EPA-200.8

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:00:33PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-21-5

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-07
File ID: PE_EL2_140808-135
Sampled: 08/04/14 10:20
Prepared: 08/08/14 08:30
Analyzed: 08/08/14 17:03
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0679
Sequence: 1411280
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 U	EPA-200.8

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:00:33PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-21-4

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-08
File ID: PE_EL2_140808-136
Sampled: 08/04/14 11:00
Prepared: 08/08/14 08:30
Analyzed: 08/08/14 17:06
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0679
Sequence: 1411280
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.9	1	J U	EPA-200.8

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:00:33PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

Dup-6-3Q14

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-09
File ID: PE_EL2_140808-137
Sampled: 08/04/14 11:10
Prepared: 08/08/14 08:30
Analyzed: 08/08/14 17:10
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0679
Sequence: 1411280
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.7	1	J U	EPA-200.8

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:00:33PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-21-3

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-10
File ID: PE_EL2_140808-138
Sampled: 08/04/14 11:45
Prepared: 08/08/14 08:30
Analyzed: 08/08/14 17:13
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0679
Sequence: 1411280
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 U	EPA-200.8

9/29/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 5:00:33PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-21-2

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-11
File ID: PE_EL2_140808-139
Sampled: 08/04/14 13:10
Prepared: 08/08/14 08:30
Analyzed: 08/08/14 17:16
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0679
Sequence: 1411280
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.91	1	J U	EPA-200.8

9/5/14

LDC #: 32594B4
SDG #: 14-17461
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 9/8/14
Page: 1 of 1
Reviewer:
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: 8/4/14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	N	Not required
VI.	Matrix Spike Analysis	A	
VII.	Duplicate Sample Analysis	A	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	Not reviewed for level 3
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	(3,4), (7,8)
XIV.	Field Blanks	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

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

Notes:

LDC #: 32494B4

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: [illegible]
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?	✓			

LDC #: 32514B4

VALIDATION FINDINGS CHECKLIST

Reviewer: VW
2nd Reviewer: AK

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 #: 32594B4

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA 200.8) Soil preparation factor applied:

Sample Concentration units, unless otherwise noted: ug/L Associated Samples: PB: All, ICB/CCB:1

					Sample Identification										
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	1										
Cr		0.746	0.833	4.165	0.93										

Sample Concentration units, unless otherwise noted: ug/L Associated Samples: PB: All, ICB/CCB:2-10

					Sample Identification										
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	3	5	6	7	8	9	10				
Cr		0.746	0.864	4.32	3.0	0.76	2.0	1.9	1.7	1.3	0.91				

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#: 32594B4

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 200.8)

Analyte	Concentration (ug/L)		RPD	
	3	4		
Chromium	3.0	4.5	40	

Analyte	Concentration (ug/L)		RPD	
	7	8		
Chromium	1.9	1.7	11	

V:\FIELD DUPLICATES\FD_inorganic\32594B4.wpd

LDC #: 32594B4

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: Trace Metals (EPA 200.8)

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

Sample: 1 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

Analyte	Concentration Units (ug/L)
Cr	0.93

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

Analyte	Concentration Units ( )

LDC #: 32594B4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 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 (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
~~N/A~~	ICP interference check						
LCS	Laboratory control sample	Cr	43.23 |	40.0	108	108	Y
11	Matrix spike	|	(SSR-SR) 43.19	40.0	108	108	|
11/12	Duplicate	|	42.90 |	44.12	2.8	2.8	|
MA	ICP serial dilution						

Comments: _____

LDC #: 32594B4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: IW
2nd Reviewer: CJ

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)						
IW	ICP/MS (Initial calibration)	Cr	51.89	50.0	104	104	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CW	ICP/MS (Continuing calibration)	Cr	43.17	40.0	108	108	Y
	CVAA (Continuing calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments: _____

LDC #: 32594B4

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

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 10 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:

From raw data
Cr = 0.91 ug/L

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
1	10	Cr	0.91	0.91	Y

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 4, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17461

Sample Identification

EB-6-8/4/14
MW-3-4
MW-3-3
Dup-5-3Q14
MW-3-2
MW-21-5
MW-21-4
Dup-6-3Q14
MW-21-3
MW-21-2**
EB-6-8/4/14MS
EB-6-8/4/14MSD
EB-6-8/4/14DUP
MW-21-2MS
MW-21-2MSD
MW-21-2DUP

** Indicates sample underwent EPA Level IV validation

Introduction

This data review covers 16 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 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. 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
MB	Hexavalent chromium	0.000937 mg/L	EB-6-8/4/14 MW-3-4 MW-3-3 Dup-5-3Q14 MW-3-2
ICB/CCB	Hexavalent chromium	0.000825 mg/L	EB-6-8/4/14 MW-3-4 MW-3-3 Dup-5-3Q14 MW-3-2
MB	Hexavalent chromium	0.000937 mg/L	MW-21-5 MW-21-4 Dup-6-3Q14 MW-21-3 MW-21-2**
ICB/CCB	Hexavalent chromium	0.000799 mg/L	MW-21-5 MW-21-4 Dup-6-3Q14 MW-21-3 MW-21-2**

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
EB-6-8/4/14	Hexavalent chromium	0.00090 mg/L	0.00090U mg/L
MW-3-4	Hexavalent chromium	0.00097 mg/L	0.00097U mg/L
MW-3-3	Hexavalent chromium	0.00096 mg/L	0.00096U mg/L
Dup-5-3Q14	Hexavalent chromium	0.00093 mg/L	0.00093U mg/L
MW-3-2	Hexavalent chromium	0.0011 mg/L	0.0011U mg/L
MW-21-5	Hexavalent chromium	0.0022 mg/L	0.0022U mg/L
MW-21-4	Hexavalent chromium	0.0019 mg/L	0.0019U mg/L
Dup-6-3Q14	Hexavalent chromium	0.0020 mg/L	0.0020U mg/L
MW-21-3	Hexavalent chromium	0.0014 mg/L	0.0014U mg/L
MW-21-2**	Hexavalent chromium	0.0013 mg/L	0.0013U 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.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG at level III.

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-3-3 and Dup-5-3Q14 and samples MW-21-4 and DUP-6-3Q14 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-3-3	Dup-5-3Q14	
Hexavalent Chromium	0.00096 mg/L	0.00093 mg/L	3
Perchlorate	1.3 ug/L	0.98 ug/L	28

Analyte	Concentration		RPD
	MW-21-4	Dup-6-3Q14	
Hexavalent Chromium	0.0019 mg/L	0.0020 mg/L	5
Perchlorate	2.7 ug/L	1.9 ug/L	35

XI. Field Blanks

Sample EB-6-8/4/14 was identified as an equipment blank. No contaminant concentrations were found with the following exceptions:

Blank ID	Compound	Concentration (mg/L)
EB-6-8/4/14	Hexavalent Chromium	0.00090 mg/L

NASA JPL, 3Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-17461

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-17461

SDG	Sample	Analyte	Modified Final Concentration	A or P
14-17461	EB-6-8/4/14	Hexavalent chromium	0.00090U mg/L	A
14-17461	MW-3-4	Hexavalent chromium	0.00097U mg/L	A
14-17461	MW-3-3	Hexavalent chromium	0.00096U mg/L	A
14-17461	Dup-5-3Q14	Hexavalent chromium	0.00093U mg/L	A
14-17461	MW-3-2	Hexavalent chromium	0.0011U mg/L	A
14-17461	MW-21-5	Hexavalent chromium	0.0022U mg/L	A
14-17461	MW-21-4	Hexavalent chromium	0.0019U mg/L	A
14-17461	Dup-6-3Q14	Hexavalent chromium	0.0020U mg/L	A
14-17461	MW-21-3	Hexavalent chromium	0.0014U mg/L	A
14-17461	MW-21-2**	Hexavalent chromium	0.0013U mg/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

EB-6-8/4/14

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-02
File ID: 140805 0026 CR6-005
Sampled: 08/04/14 07:20
Prepared: 08/05/14 00:26
Analyzed: 08/05/14 00:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0432
Sequence: 1411117
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00090	1	J U	EPA-7196

9/22/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-3-4

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-03
File ID: 140805 0026 CR6-009
Sampled: 08/04/14 07:45
Prepared: 08/05/14 00:26
Analyzed: 08/05/14 00:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0432
Sequence: 1411117
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00097	1	J U	EPA-7196

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-3-3

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-04
File ID: 140805 0026 CR6-010
Sampled: 08/04/14 08:30
Prepared: 08/05/14 00:26
Analyzed: 08/05/14 00:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0432
Sequence: 1411117
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00096	1	J U	EPA-7196

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

Dup-5-3Q14

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-05
File ID: 140805 0026 CR6-011
Sampled: 08/04/14 08:40
Prepared: 08/05/14 00:26
Analyzed: 08/05/14 00:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0432
Sequence: 1411117
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00093	1	J U	EPA-7196

8/29/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-3-2

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-06
File ID: 140805 0026 CR6-012
Sampled: 08/04/14 09:20
Prepared: 08/05/14 00:26
Analyzed: 08/05/14 00:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0432
Sequence: 1411117
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0011	1	J U	EPA-7196

9/30/14 Q

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-21-5

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-07
File ID: 140805 0026 CR6-015
Sampled: 08/04/14 10:20
Prepared: 08/05/14 00:26
Analyzed: 08/05/14 00:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0432
Sequence: 1411117
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0022	1	U	EPA-7196

9/22/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-21-4

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-08
File ID: 140805 0026 CR6-016
Sampled: 08/04/14 11:00
Prepared: 08/05/14 00:26
Analyzed: 08/05/14 00:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0432
Sequence: 1411117
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0019	1	J Y	EPA-7196

9/22/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

Dup-6-3Q14

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-09
File ID: 140805 0026 CR6-017
Sampled: 08/04/14 11:10
Prepared: 08/05/14 00:26
Analyzed: 08/05/14 00:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0432
Sequence: 1411117
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0020	1	U	EPA-7196

9/2/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-21-3

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-10
File ID: 140805 0026 CR6-018
Sampled: 08/04/14 11:45
Prepared: 08/05/14 00:26
Analyzed: 08/05/14 00:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0432
Sequence: 1411117
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014	1	J U	EPA-7196

9/22/14 A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-21-2

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-11
File ID: 140805 0026 CR6-019
Sampled: 08/04/14 13:10
Prepared: 08/05/14 00:26
Analyzed: 08/05/14 00:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0432
Sequence: 1411117
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0013	1	J U	EPA-7196

9/2/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-6-8/4/14

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-02
File ID: F081914.seq-34.0000.txt
Sampled: 08/04/14 07:20
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 08:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1910
Sequence: 1412014
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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-3-4

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-03
File ID: F081914.seq-35.0000.txt
Sampled: 08/04/14 07:45
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 08:40
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1910
Sequence: 1412014
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.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-3-3

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-04
File ID: F081914.seq-36.0000.txt
Sampled: 08/04/14 08:30
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 08:53
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1910
Sequence: 1412014
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	J	EPA-314.0

9/29/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

Dup-5-3Q14

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-05
File ID: F081914.seq-37.0000.txt
Sampled: 08/04/14 08:40
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 09:07
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1910
Sequence: 1412014
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.98	1	J	EPA-314.0

9/29/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-3-2

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-06RE1
File ID: F081914.seq-88.0000.txt
Sampled: 08/04/14 09:20
Prepared: 08/19/14 00:00
Analyzed: 08/21/14 03:01
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1910
Sequence: 1412014
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	31	2	D	EPA-314.0

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-21-5

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-07
File ID: F081914.seq-41.0000.txt
Sampled: 08/04/14 10:20
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 10:03
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1910
Sequence: 1412014
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

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-21-4

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-08
File ID: F081914.seq-42.0000.txt
Sampled: 08/04/14 11:00
Prepared: 08/19/14 00:00
Analyzed: 08/19/14 10:16
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH1910
Sequence: 1412014
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.7	1	J	EPA-314.0

9/29/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

Dup-6-3Q14

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-09
File ID: F082314.seq-9.0000.txt
Sampled: 08/04/14 11:10
Prepared: 08/23/14 10:00
Analyzed: 08/23/14 12:42
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2288
Sequence: 1412179
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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-21-3

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-10RE1
File ID: F082314.seq-26.0000.txt
Sampled: 08/04/14 11:45
Prepared: 08/23/14 10:00
Analyzed: 08/23/14 16:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2288
Sequence: 1412179
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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/29/2014 4:58:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-21-2

Laboratory: BC Laboratories
SDG: 14-17461
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417461-11
File ID: F082314.seq-11.0000.txt
Sampled: 08/04/14 13:10
Prepared: 08/23/14 10:00
Analyzed: 08/23/14 13:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2288
Sequence: 1412179
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.3	1	J	EPA-314.0

9/2/14 Q

LDC #: 32594B6
SDG #: 14-17461
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 9/8/14
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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: 8/4/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	SW	
V	Matrix Spike/Matrix Spike Duplicates	A	
VI.	Duplicates	A	
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	(3.4) (7.8)
XI	Field blanks	SW	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

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

Notes:

LDC #: 32594B6

VALIDATION FINDINGS CHECKLIST

Reviewer: VV
2nd Reviewer: K

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 #: 32194 B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-10	Aa	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC **CR^{6+}** (circled) **ClO_4** (circled) ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
11-13	Aa	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC **CR^{6+}** (circled) ClO_4 ______ ______
14-16	↓	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} **ClO_4** (circled) ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ______ ______
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4

Comments: ______________________________

LDC #: 32594B6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: CW
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 1-5

Analyte	Blank ID	Blank ID	Blank Action Limit												
[redacted]	MB	ICB/CCB		1	2	3	4	5							
Cr6+	0.000937	0.000825	0.004685	0.00090	0.00097	0.00096	0.00093	0.0011							

Conc. units: mg/L **Associated Samples:** 6-10

Analyte	Blank ID	Blank ID	Blank Action Limit												
[redacted]	MB	ICB/CCB		6	7	8	9	10							
Cr6+	0.000937	0.000799	0.004685	0.0022	0.0019	0.0020	0.0014	0.0013							

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# 32594B6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: [signature]
2nd Reviewer: [signature]

Inorganics: Method See Cover

Analyte	Concentration (mg/L)		RPD	
	3	4		
Hexavalent Chromium	0.00096	0.00093	3	
Perchlorate (ug/L)	1.3	0.98	28	

Analyte	Concentration (mg/L)		RPD	
	7	8		
Hexavalent Chromium	0.0019	0.0020	5	
Perchlorate (ug/L)	2.7	1.9	35	

V:\FIELD DUPLICATES\FD_inorganic\32594B6.wpd

LDC #: 32594B6

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd reviewer: _____

METHOD: Inorganics, EPA Method See Cover

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target anlytes detected in the field blanks?

Sample: 1 (EB) Field Blank / Trip Blank / Rinsate (circle one)

Analyte	Concentration Units (mg/L)
Cr6+	0.00090

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

Analyte	Concentration Units ( )

LDC #: 31946

Validatin Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: W
2nd Reviewer: 9

Method: Inorganics, Method See cover

The correlation coefficient (r) for the calibration of Cr6+ was recalculated.Calibration date: 6/26/14

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)	Abs	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr6+	s1	0	0.001	*0.999936*	0.999932	Y
		s2	0.002	0.002			
		s3	0.005	0.005			
		s4	0.025	0.02			
		s5	0.05	0.039			
		s6	0.1	0.077			
CCV Calibration verification	Cr6+	0.050	0.05075		102	102	Y
ICV Calibration verification	Cr6+	10	10.03		100	100	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 #: 37546B

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: [illegible]
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	Cd	8.68	10	86.8	86.8	Y
11	Matrix spike sample	Cd	(SSR-SR) 0.05196	0.0526	98.8	98.7	↓
16	Duplicate sample	Cd	2.095	2.32	10.2	10.3 ~~+6~~	↓

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 #: 32814 B6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
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 _____ reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

$$clO_4 = \frac{Area}{0.001109} \qquad clO_4 = \frac{0.003}{0.001109} = 2.705$$

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
1	10	clO_4 (mg/L)	2.3	2.70	Y
		Cyt (mg/L)	0.0013	0.0013	↓

Note: _____

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

September 26, 2014

SUBJECT: NASA JPL, 3Q2014, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on September 8, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32635:

SDG #	Fraction
14-17651, 14-17863, 14-18066	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 #32635 (Tidewater- Powell, OH / NASA JPL, 3Q2014)

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	14-17651	09/08/14	09/29/14	10	0	7	0	-	-	-	-	7	0	-	-	9	0																		
A	14-17651	09/08/14	09/29/14	1	0	1	0	-	-	-	-	1	0	-	-	1	0																		
B	14-17863	09/08/14	09/29/14	5	0	4	0	1	0	1	0	4	0	1	0	4	0																		
C	14-18066	09/08/14	09/29/14	4	0	4	0	3	0	3	0	4	0	3	0	3	0																		
Total	A/PG			20	0	16	0	4	0	4	0	16	0	4	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81

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, 3Q2014

Collection Date: August 5, 2014

LDC Report Date: September 17, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17651

Sample Identification

TB-7-8/5/14
SB-3-8/5/14
EB-7-8/5/14
MW-4-3
DUP-7-3Q14
MW-4-2
MW-4-1
MW-12-5
MW-12-4
MW-12-3**
MW-12-2
MW-4-1MS
MW-4-1MSD

**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 at or above the stated limit.

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
8/6/14	Methyl iodide	30.5	All samples in SDG 14-17651	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-4-3 and DUP-7-3Q14 were identified as field duplicates. No volatiles were detected in any of the samples.

XVII. Field Blanks

Sample TB-7-8/5/14 was identified as a trip blank. No volatile contaminants were found.

Sample EB-7-8/5/14 was identified as an equipment blank. No volatile contaminants were found.

Sample SB-3-8/5/14 was identified as a source blank. No volatile contaminants were found.

NASA JPL, 3Q2014
Volatiles - Data Qualification Summary - SDG 14-17651

SDG	Sample	Compound	Flag	A or P	Reason
14-17651	TB-7-8/5/14 SB-3-8/5/14 EB-7-8/5/14 MW-4-3 DUP-7-3Q14 MW-4-2 MW-4-1 MW-12-5 MW-12-4 MW-12-3** MW-12-2	Methyl iodide	J (all detects) UJ (all non-detects)	P	Continuing calibration (ICV %D)

NASA JPL, 3Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-17651

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-7-8/5/14

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-01	File ID:	06AUG13.D
Sampled:	08/05/14 07:00	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 10:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/5/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-7-8/5/14

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-01	File ID:	06AUG13.D
Sampled:	08/05/14 07:00	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 10:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-7-8/5/14

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-01	File ID:	06AUG13.D
Sampled:	08/05/14 07:00	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 10:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	10.500	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.300	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4300	94.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	224179	6.73	214826	6.73	
Chlorobenzene-d5 (IS)	70570	9.73	73012	9.73	
1,4-Difluorobenzene (IS)	280368	7.51	281945	7.52	

8/27/14 JT

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-3-8/5/14

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-02	File ID:	06AUG14.D
Sampled:	08/05/14 07:05	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 10:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-3-8/5/14

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-02	File ID:	06AUG14.D
Sampled:	08/05/14 07:05	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 10:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/27/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-3-8/5/14

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-02	File ID:	06AUG14.D
Sampled:	08/05/14 07:05	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 10:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	10.490	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.450	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2400	92.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	224688	6.73	214826	6.73	
Chlorobenzene-d5 (IS)	72602	9.73	73012	9.73	
1,4-Difluorobenzene (IS)	280294	7.52	281945	7.52	

9/28/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-7-8/5/14

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-03	File ID:	06AUG15.D
Sampled:	08/05/14 07:15	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 10:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/2/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-7-8/5/14

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-03	File ID:	06AUG15.D
Sampled:	08/05/14 07:15	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 10:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/27/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-7-8/5/14

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-03	File ID:	06AUG15.D
Sampled:	08/05/14 07:15	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 10:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	10.650	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.440	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3400	93.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	219996	6.73	214826	6.73	
Chlorobenzene-d5 (IS)	71406	9.73	73012	9.73	
1,4-Difluorobenzene (IS)	274126	7.51	281945	7.52	

9/22/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-3

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-04	File ID:	06AUG16.D
Sampled:	08/05/14 07:45	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 11:14
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060		Calibration: 1407027	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

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-3

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-04	File ID:	06AUG16.D
Sampled:	08/05/14 07:45	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 11:14
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/22/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-3

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-04	File ID:	06AUG16.D
Sampled:	08/05/14 07:45	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 11:14
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	10.390	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.510	105	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9700	89.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	217551	6.73	214826	6.73	
Chlorobenzene-d5 (IS)	71114	9.73	73012	9.73	
1,4-Difluorobenzene (IS)	271539	7.51	281945	7.52	

9/22/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-7-3Q14

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-05	File ID:	06AUG17.D
Sampled:	08/05/14 07:55	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 11:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-7-3Q14

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-05	File ID:	06AUG17.D
Sampled:	08/05/14 07:55	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 11:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/22/14 O

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-7-3Q14

Laboratory: BC Laboratories | SDG: 14-17651
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417651-05 | File ID: 06AUG17.D
Sampled: 08/05/14 07:55 | Prepared: 08/06/14 06:00 | Analyzed: 08/06/14 11:37
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0344 | Sequence: 1411060 | Calibration: 1407027 | 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	10.590	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.380	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4500	94.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	223602	6.73	214826	6.73	
Chlorobenzene-d5 (IS)	71995	9.73	73012	9.73	
1,4-Difluorobenzene (IS)	280293	7.51	281945	7.52	

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-2

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-06	File ID:	06AUG18.D
Sampled:	08/05/14 08:45	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 11:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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
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	0.86	
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	0.26	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

9/5/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-2

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-06	File ID:	06AUG18.D
Sampled:	08/05/14 08:45	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 11:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	1.1	
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	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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-2

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-06	File ID:	06AUG18.D
Sampled:	08/05/14 08:45	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 11:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	10.640	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.200	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3000	93.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	220954	6.73	214826	6.73	
Chlorobenzene-d5 (IS)	72469	9.73	73012	9.73	
1,4-Difluorobenzene (IS)	280385	7.51	281945	7.52	

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-1

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-07	File ID:	06AUG07.D
Sampled:	08/05/14 09:20	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 07:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-1

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-07	File ID:	06AUG07.D
Sampled:	08/05/14 09:20	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 07:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/5/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-1

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-07	File ID:	06AUG07.D
Sampled:	08/05/14 09:20	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 07:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	10.450	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.310	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1400	91.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	222776	6.73	214826	6.73	
Chlorobenzene-d5 (IS)	71395	9.73	73012	9.73	
1,4-Difluorobenzene (IS)	276446	7.51	281945	7.52	

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-5

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-08	File ID:	06AUG19.D
Sampled:	08/05/14 10:40	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 12:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	0.43	J
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.36	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: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-5

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-08	File ID:	06AUG19.D
Sampled:	08/05/14 10:40	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 12:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	0.090	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	0.16	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

9/5/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-5

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-08	File ID:	06AUG19.D
Sampled:	08/05/14 10:40	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 12:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	10.530	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.440	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0100	90.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	222993	6.73	214826	6.73	
Chlorobenzene-d5 (IS)	72784	9.73	73012	9.73	
1,4-Difluorobenzene (IS)	275453	7.51	281945	7.52	

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-4

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-09	File ID:	06AUG20.D
Sampled:	08/05/14 11:20	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 12:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	0.69	
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	0.11	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

8/7/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-4

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-09	File ID:	06AUG20.D
Sampled:	08/05/14 11:20	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 12:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/5/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-4

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-09	File ID:	06AUG20.D
Sampled:	08/05/14 11:20	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 12:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	10.590	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.490	105	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1600	91.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	221294	6.73	214826	6.73	
Chlorobenzene-d5 (IS)	71916	9.73	73012	9.73	
1,4-Difluorobenzene (IS)	275762	7.52	281945	7.52	

9/5/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-3

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-10	File ID:	06AUG21.D
Sampled:	08/05/14 12:00	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 13:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence:	1411060	Calibration:	1407027
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	0.55	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.51	
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

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-3

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-10	File ID:	06AUG21.D
Sampled:	08/05/14 12:00	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 13:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/5/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-3

Laboratory:	BC Laboratories			SDG:	14-17651		
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells		
Matrix:	Water	Laboratory ID:	1417651-10	File ID:	06AUG21.D		
Sampled:	08/05/14 12:00	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 13:07		
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml		
Batch:	BXH0344	Sequence:	1411060	Calibration:	1407027	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	10.690	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.450	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1700	91.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	223387	6.73	214826	6.73	
Chlorobenzene-d5 (IS)	73271	9.73	73012	9.73	
1,4-Difluorobenzene (IS)	279091	7.51	281945	7.52	

9/22/14 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-2

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-11	File ID:	06AUG22.D
Sampled:	08/05/14 13:00	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 13:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-2

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-11	File ID:	06AUG22.D
Sampled:	08/05/14 13:00	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 13:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:30:24AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-2

Laboratory:	BC Laboratories		SDG:	14-17651	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417651-11	File ID:	06AUG22.D
Sampled:	08/05/14 13:00	Prepared:	08/06/14 06:00	Analyzed:	08/06/14 13:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0344	Sequence: 1411060	Calibration:	1407027	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	10.880	109	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.290	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1900	91.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	225516	6.73	214826	6.73	
Chlorobenzene-d5 (IS)	74529	9.73	73012	9.73	
1,4-Difluorobenzene (IS)	285904	7.51	281945	7.52	

9/5/14 Q

LDC #: 32635A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/11/14
SDG #: 14-17651 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer:
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: 8/5/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ≤ 20.12
IV.	Continuing calibration/ICV	SW	CCV/ICV ≤ 30
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	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	ND	D = 4 + 5
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 W

1	TB-7-8/5/14	11	MW-12-2	21	BX40344-BLK1	31	
2	SB-3-8/5/14	12	MW-4-1MS	22		32	
3	EB-7-8/5/14	13	MW-4-1MSD	23		33	
4	MW-4-3	14		24		34	
5	Dup-7-3Q14 UP	15		25		35	
6	MW-4-2	16		26		36	
7	MW-4-1	17		27		37	
8	MW-12-5	18		28		38	
9	MW-12-4	19		29		39	
10	MW-12-3**	20		30		40	

LDC #: 32635A1

VALIDATION FINDINGS CHECKLIST

Reviewer: M
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 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?			✓	
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.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Methyl Iodide
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 #: 32675A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]
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
	8/6/14	06AUG03	QQQQ	30.5	All	J/UJ/P

LDC #: 32625A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer:
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
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (10 std)	Recalculated RRF (10 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/28/14	C (1st Internal Standard)	0.554541	0.554541	0.5515241	0.5515241	4.144573	4.144578
			S (2nd Internal Standard)	0.3474324	0.3474324	0.3493426	0.3493426	11.39791	11.39791
			DD (3rd Internal Standard)	2.998771	2.998771	3.030789	3.030789	10.99915	10.99915
2			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						
3			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						
4			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						

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 #: 32635A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JK
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
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	06AWG02	8/6/14	Q (1st Internal Standard)	0.551524	0.646785	0.646785	17.3	17.3
			S (2nd Internal Standard)	0.349346	0.378499	0.378499	8.3	8.3
			SD (3rd Internal Standard)	3.030789	3.340088	3.340088	10.2	10.2
2			(1st Internal Standard)					
			(2nd Internal Standard)					
			(3rd Internal Standard)					
3			(1st Internal Standard)					
			(2nd Internal Standard)					
			(3rd Internal Standard)					
4			(1st Internal Standard)					
			(2nd Internal Standard)					
			(3rd Internal Standard)					

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 #: 32635A1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

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: 10

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10	10.45	104	104	0
Bromofluorobenzene	↓	9.17	91.7	91.7	↓
1,2-Dichlorobenzene-d4	↓	10.69	107	107	↓
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 #: 32635A1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: A
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
1,1-Dichloroethene	25	25	ND	24.74	24.73	99.0	99.0	98.9	98.9	0.0404	0.0404
Trichloroethene	↓	↓	↓	24.19	24.22	96.8	96.8	96.9	96.9	0.124	0.124
Benzene	↓	↓	↓	25.08	24.78	100	100	99.1	99.1	1.20	1.20
Toluene	↓	↓	↓	25.19	25.19	101	101	101	101	0	0
Chlorobenzene	↓	↓	↓	25.20	24.91	101	101	99.6	99.6	1.16	1.16

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 #: 32625A1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

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: BXH0344LCS

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		24.06		96.2	96.2				
Trichloroethene	↓		23.93		95.7	95.7				
Benzene			24.48		97.9	97.9				
Toluene			25.15		101	101				
Chlorobenzene			25.05		100	100				

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 #: 32635A1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: M
2nd reviewer: A

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:

Sample I.D. 10 , K :

Conc. = $\frac{(9058)(10)(1)}{(222387)(0.7923509)(\quad)}$

= 0.51 ng/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 5, 2014

LDC Report Date: September 17, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17651

Sample Identification

SB-3-8/5/14
EB-7-8/5/14
MW-4-3
Dup-7-3Q14
MW-4-2
MW-4-1
MW-12-3**
MW-12-2
MW-4-1MS
MW-4-1MSD
MW-4-1DUP

**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 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% with the following exceptions:

Date	Lab. Reference/ID	Analyte	AMU	%RSD	Associated Samples	Affected Analyte	Flag	A or P
8/12/14	Tune (08:08)	Mg-24 for Chromium	-	5.8%	All samples in SDG 14-17651	Chromium	J (all detects) UJ (all non-detects)	P

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	0.9420 ug/L	All samples in SDG 14-17651

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
SB-3-8/5/14	Chromium	2.2 ug/L	2.2U ug/L
EB-7-8/5/14	Chromium	1.4 ug/L	1.4U ug/L
MW-4-3	Chromium	2.5 ug/L	2.5U ug/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
Dup-7-3Q14	Chromium	3.1 ug/L	3.1U ug/L
MW-4-2	Chromium	2.8 ug/L	2.8U ug/L
MW-12-3**	Chromium	1.1 ug/L	1.1U ug/L
MW-12-2	Chromium	2.6 ug/L	2.6U 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-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 14-17651

SDG	Sample	Analyte	Flag	A or P	Reason
14-17651	SB-3-8/5/14 EB-7-8/5/14 MW-4-3 Dup-7-3Q14 MW-4-2 MW-4-1 MW-12-3** MW-12-2	Chromium	J (all detects) UJ (all non-detects)	P	ICPMS Tune (%RSD)

NASA JPL, 3Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-17651

SDG	Sample	Analyte	Modified Final Concentration	A or P
14-17651	SB-3-8/5/14	Chromium	2.2U ug/L	A
14-17651	EB-7-8/5/14	Chromium	1.4U ug/L	A
14-17651	MW-4-3	Chromium	2.5U ug/L	A
14-17651	Dup-7-3Q14	Chromium	3.1U ug/L	A
14-17651	MW-4-2	Chromium	2.8U ug/L	A
14-17651	MW-12-3**	Chromium	1.1U ug/L	A
14-17651	MW-12-2	Chromium	2.6U ug/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:34:13AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

SB-3-8/5/14

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-02
File ID: PE_EL2_140812-174
Sampled: 08/05/14 07:05
Prepared: 08/11/14 09:00
Analyzed: 08/12/14 20:50
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0855
Sequence: 1411458
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 U	EPA-200.8

8/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:34:13AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

EB-7-8/5/14

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-03
File ID: PE_EL2_140812-175
Sampled: 08/05/14 07:15
Prepared: 08/11/14 09:00
Analyzed: 08/12/14 20:53
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0855
Sequence: 1411458
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 UJ	EPA-200.8

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:34:13AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-4-3

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-04
File ID: PE_EL2_140812-176
Sampled: 08/05/14 07:45
Prepared: 08/11/14 09:00
Analyzed: 08/12/14 20:57
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0855
Sequence: 1411458
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 U5	EPA-200.8

9/5/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:34:13AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

Dup-7-3Q14

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-05
File ID: PE_EL2_140812-177
Sampled: 08/05/14 07:55
Prepared: 08/11/14 09:00
Analyzed: 08/12/14 21:00
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0855
Sequence: 1411458
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.1	1	DJ	EPA-200.8

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:34:13AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-4-2

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-06
File ID: PE_EL2_140812-178
Sampled: 08/05/14 08:45
Prepared: 08/11/14 09:00
Analyzed: 08/12/14 21:03
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0855
Sequence: 1411458
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 UJ	EPA-200.8

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:34:13AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-4-1

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-07
File ID: PE_EL2_140812-166
Sampled: 08/05/14 09:20
Prepared: 08/11/14 09:00
Analyzed: 08/12/14 20:23
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0855
Sequence: 1411458
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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:34:13AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-12-3

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-10
File ID: PE_EL2_140812-179
Sampled: 08/05/14 12:00
Prepared: 08/11/14 09:00
Analyzed: 08/12/14 21:07
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0855
Sequence: 1411458
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 U5	EPA-200.8

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:34:13AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-12-2

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-11
File ID: PE_EL2_140812-180
Sampled: 08/05/14 13:00
Prepared: 08/11/14 09:00
Analyzed: 08/12/14 21:10
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH0855
Sequence: 1411458
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 U5	EPA-200.8

9/22/14

LDC #: 32635A4

SDG #: 14-17651

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 9-11-14

Page: 1 of 1

Reviewer: MG

2nd Reviewer: CV

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: 8-5-14
II.	ICP/MS Tune	SW	see Calibration worksheet
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	N	not required
VI.	Matrix Spike Analysis	A	MS/MSD
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	not reviewed for level III
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	D = 3+4
XIV.	Field Blanks	SW	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

all water

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

Notes:

LDC #: 32635A4

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: Q

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 #: 32635A4

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: MG
2nd Reviewer: [signature]

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 Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?

(Y) N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%) and cyanide (85-115%)?

LEVEL IV ONLY:

Y N (N/A) Was a midrange cyanide standard distilled?

(Y) N N/A Are all correlation coefficients ≥0.995?

(Y) N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.

#	Date	Calibration ID	Analyte	%RSD ~~%R~~ Limit	Associated Samples	Qualification of Data
1	8-12-14	tune (08:08)	Mg-24 for Cr	5.8 (≤5.0)	all	Qual. Cr: J/UJ/P

Comments: _____

CAL.4SW

LDC #: 32635A4
SDG #: See Cover
METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: ug/L

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: NA
Associated Samples: all

Reviewer: MG
2nd Reviewer:

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Action Limit	1	2	3	4	5	7	8			
Cr			0.9420	4.71	2.2	1.4	2.5	3.1	2.8	1.1	2.6			

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.

Analyte	Concentration (ug/L)		RPD	
	3	4		
Chromium	2.5	3.1	21	

LDC #: 32635A4

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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

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

Sample: 1 Field Blank / Trip Blank / Rinsate / Other SB (circle one)

Analyte	Concentration Units ( )
Cr	2.2 (ug/L)

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

Analyte	Concentration Units ( )
Cr	1.4 (ug/L)

LDC #: 32635A4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [signature]

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)						
1032 ICV	ICP/MS (Initial calibration)	Cr	49.240	50.00	98.5	98.5	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
2043 CCVH	ICP/MS (Continuing calibration)	Cr	44.012	40.00	110	110	
	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 #: 32635A4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: [signature]

METHOD: Trace Metals (EPA SW 846 Method 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 (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
—	ICP interference check	—	—	—	—	—	—
2016 LCS	Laboratory control sample	Cr	42.88 (mg/L)	40.00 (mg/L)	107	107	Y
2033 9	Matrix spike	Cr	(SSR-SR) 42.01 (mg/L)	40.00 (mg/L)	105	105	↓
2023/2026 11	Duplicate	Cr	ND (mg/L)	ND (mg/L)	0	—	↓
—	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 #: 32635A4

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 #7, 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:

$$\frac{(1.141\ mg/L)(0.050L)}{0.050L} = 1.141\ mg/L$$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
1	7	Cr	1.1	1.1	Y

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 5, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17651

Sample Identification

SB-3-8/5/14
EB-7-8/5/14
MW-4-3
Dup-7-3Q14
MW-4-2
MW-4-1
MW-12-5
MW-12-4
MW-12-3**
MW-12-2
MW-4-1MS
MW-4-1MSD
MW-4-1DUP

** 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 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 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. 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

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-4-3 and Dup-7-3Q14 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-4-3	Dup-7-3Q14	
Perchlorate	1.5	1.7	13

XI. Field Blanks

Sample EB-7-8/5/14 was identified as an equipment blank. No contaminant concentrations were found.

Sample SB-3-8/5/14 was identified as a source blank. No contaminant concentrations were found.

NASA JPL, 3Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-17651

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-17142

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

SB-3-8/5/14

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-02
File ID: F082314.seq-59.0000.txt
Sampled: 08/05/14 07:05
Prepared: 08/23/14 10:00
Analyzed: 08/24/14 00:59
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2289
Sequence: 1412179
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

8/27/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-7-8/5/14

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-03
File ID: F082314.seq-60.0000.txt
Sampled: 08/05/14 07:15
Prepared: 08/23/14 10:00
Analyzed: 08/24/14 01:13
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2289
Sequence: 1412179
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

8/27/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-4-3

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-04
File ID: F082314.seq-61.0000.txt
Sampled: 08/05/14 07:45
Prepared: 08/23/14 10:00
Analyzed: 08/24/14 01:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2289
Sequence: 1412179
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

9/27/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

Dup-7-3Q14

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-05
File ID: F082314.seq-79.0000.txt
Sampled: 08/05/14 07:55
Prepared: 08/23/14 10:00
Analyzed: 08/24/14 16:31
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2289
Sequence: 1412179
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.7	1	J	EPA-314.0

9/27/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-4-2

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-06RE1
File ID: F082314.seq-80.0000.txt
Sampled: 08/05/14 08:45
Prepared: 08/23/14 10:00
Analyzed: 08/24/14 16:45
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2289
Sequence: 1412179
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	28	2	D	EPA-314.0

9/27/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-4-1

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-07
File ID: F082314.seq-52.0000.txt
Sampled: 08/05/14 09:20
Prepared: 08/23/14 10:00
Analyzed: 08/23/14 23:22
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2289
Sequence: 1412179
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

9/23/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-12-5

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-08
File ID: F082314.seq-82.0000.txt
Sampled: 08/05/14 10:40
Prepared: 08/23/14 10:00
Analyzed: 08/24/14 17:13
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2289
Sequence: 1412179
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

9/28/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-12-4

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-09
File ID: F082314.seq-67.0000.txt
Sampled: 08/05/14 11:20
Prepared: 08/23/14 10:00
Analyzed: 08/24/14 02:49
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2289
Sequence: 1412179
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

8/27/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-12-3

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-10
File ID: F082314.seq-68.0000.txt
Sampled: 08/05/14 12:00
Prepared: 08/23/14 10:00
Analyzed: 08/24/14 03:03
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2289
Sequence: 1412179
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

9/27/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-12-2

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-11
File ID: F082414.seq-9.0000.txt
Sampled: 08/05/14 13:00
Prepared: 08/24/14 19:00
Analyzed: 08/24/14 21:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2290
Sequence: 1412185
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.3	1	J	EPA-314.0

9/22/14 D

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

SB-3-8/5/14

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-02
File ID: 140805 2249 CR6-029
Sampled: 08/05/14 07:05
Prepared: 08/05/14 22:49
Analyzed: 08/05/14 23:18
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0509
Sequence: 1411168
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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

EB-7-8/5/14

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-03
File ID: 140805 2249 CR6-030
Sampled: 08/05/14 07:15
Prepared: 08/05/14 22:49
Analyzed: 08/05/14 23:18
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0509
Sequence: 1411168
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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-4-3

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-04
File ID: 140805 2249 CR6-031
Sampled: 08/05/14 07:45
Prepared: 08/05/14 22:49
Analyzed: 08/05/14 23:18
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0509
Sequence: 1411168
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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

Dup-7-3Q14

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-05
File ID: 140805 2249 CR6-032
Sampled: 08/05/14 07:55
Prepared: 08/05/14 22:49
Analyzed: 08/05/14 23:18
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0509
Sequence: 1411168
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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-4-2

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-06
File ID: 140805 2249 CR6-035
Sampled: 08/05/14 08:45
Prepared: 08/05/14 22:49
Analyzed: 08/05/14 23:24
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0509
Sequence: 1411168
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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-4-1

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-07
File ID: 140805 2249 CR6-025
Sampled: 08/05/14 09:20
Prepared: 08/05/14 22:49
Analyzed: 08/05/14 23:18
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0509
Sequence: 1411168
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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-12-3

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-10
File ID: 140805 2249 CR6-036
Sampled: 08/05/14 12:00
Prepared: 08/05/14 22:49
Analyzed: 08/05/14 23:24
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0509
Sequence: 1411168
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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:32:17AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-12-2

Laboratory: BC Laboratories
SDG: 14-17651
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417651-11
File ID: 140805 2249 CR6-037
Sampled: 08/05/14 13:00
Prepared: 08/05/14 22:49
Analyzed: 08/05/14 23:24
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0509
Sequence: 1411168
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

9/5/14 Q

LDC #: 32635A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9-11-14
SDG #: 14-17651 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: MG
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: 8-5-14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
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	D = 3+4
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
all water

1	SB-3-8/5/14	11	MW-4-1MS	21		31	
2	EB-7-8/5/14	12	MW-4-1MSD	22		32	
3	MW-4-3	13	MW-4-1DUP	23		33	
4	Dup-7-3Q14	14		24		34	
5	MW-4-2	15		25		35	
6	MW-4-1	16		26		36	
7	MW-12-5	17		27		37	
8	MW-12-4	18		28		38	
9	MW-12-3**	19		29		39	PBW1
10	MW-12-2	20		30		40	PBW2

Notes:

LDC #: 32635A6

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

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 #: 32635A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1→6, 9,10	W	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC **CR^{6+}** **ClO_4** ___ ___
7,8	↓	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} **ClO_4** ___ ___
QC 11→13	↓	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC **CR^{6+}** **ClO_4** ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4

Comments:

Method: Inorganics (see cover)

Analyte	Concentration (ug/L)		RPD	
	3	4		
Perchlorate	1.5	1.7	13	

LDC #: 32635A6

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd Reviewer: 9

METHOD: Inorganics, Method See cover

The correlation coefficient (r) for the calibration of Cr VI was recalculated. Calibration date: 6-26-14

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 ID	Conc. Found (units)	Abs True (units)	Recalculated r or %R	Reported r or %R	Acceptable (Y/N)
Initial calibration	Cr VI	Blank	0.000 (mg/L)	0.001	r^2=0.999936	r^2=0.999932	Y
		Standard 1	0.002 ( )	0.002			
		Standard 2	0.005 ( )	0.005			
		Standard 3	0.025 ( )	0.020			
		Standard 4	0.050 ( )	0.039			
		Standard 5	0.100 ( )	0.077			
		Standard 6	-	-			
		Standard 7	-	-			
Calibration verification	ClO4	0222 CCV5	9.091 (µg/L)	10.00 (µg/L)	90.9	89.0	
Calibration verification	Cr VI	2324 CCV2	0.0514 (mg/L)	0.050 (mg/L)	103	103	
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 #: 32635A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
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)
2254 LCS	Laboratory control sample	ClO_4	9.091 (µg/L)	10.00 (µg/L)	90.9	92.8	Y
2318 11	Matrix spike sample	Cr VI	(SSR-SR) 0.0485 (mg/L)	0.052632 (mg/L)	92.1	93.8	↓
2323/0003 13	Duplicate sample	ClO_4	ND (µg/L)	ND (µg/L)	0	-	↓

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 #: 32635A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: ~~MG~~

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 #9, ClO4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $y = mx + b$

where
$m = 0.0011$
$b = 0.000$
dil = 1x

Recalculation:

$0.004 = 0.0011(x) + 0.000$

$3.636\ \mu g/L = x$

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration (µg/L)	Acceptable (Y/N)
1	9	ClO4	3.3	3.6	Y

Note: Method 7196 is N.D. for the level IV sample

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 6, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17863

Sample Identification

TB-8-8/6/14
MW-6
MW-10
MW-5
MW-16
MW-10MS
MW-10MSD
MW-16MS
MW-16MSD

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 at or above the stated limit.

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%.

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

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-8-8/6/14 was identified as a trip blank. No volatile contaminants were found

NASA JPL, 3Q2014
Volatiles - Data Qualification Summary - SDG 14-17863

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-17863

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

TB-8-8/6/14

Laboratory:	BC Laboratories			SDG:	14-17863
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1417863-01	File ID:	07AUG21.D
Sampled:	08/06/14 07:00	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 14:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence:	1411132	Calibration:	1407027
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

KK 9-16-14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-8-8/6/14

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-01	File ID:	07AUG21.D
Sampled:	08/06/14 07:00	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 14:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence: 1411132	Calibration:	1407027	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

TB-8-8/6/14

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-01	File ID:	07AUG21.D
Sampled:	08/06/14 07:00	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 14:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence: 1411132	Calibration:	1407027	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	10.530	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.170	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.270	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	223938	6.73	211036	6.73	
Chlorobenzene-d5 (IS)	73081	9.73	74301	9.73	
1,4-Difluorobenzene (IS)	281060	7.51	287715	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-02	File ID:	07AUG22.D
Sampled:	08/06/14 08:14	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 14:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence:	1411132	Calibration:	1407027
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	0.73	
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	0.23	J
156-59-2	cis-1,2-Dichloroethene	1	0.090	J
156-60-5	trans-1,2-Dichloroethene	1	0.20	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-02	File ID:	07AUG22.D
Sampled:	08/06/14 08:14	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 14:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence: 1411132	Calibration:	1407027	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	1.2	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-02	File ID:	07AUG22.D
Sampled:	08/06/14 08:14	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 14:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence: 1411132	Calibration:	1407027	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	10.970	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.300	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.140	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	223423	6.73	211036	6.73	
Chlorobenzene-d5 (IS)	74397	9.73	74301	9.73	
1,4-Difluorobenzene (IS)	282890	7.51	287715	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-03	File ID:	07AUG15.D
Sampled:	08/06/14 09:47	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 12:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence: 1411132	Calibration:	1407027	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	0.75	
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	0.25	J
156-60-5	trans-1,2-Dichloroethene	1	0.45	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-03	File ID:	07AUG15.D
Sampled:	08/06/14 09:47	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 12:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence: 1411132	Calibration:	1407027	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	0.83	
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	8.1	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory: BC Laboratories | SDG: 14-17863
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417863-03 | File ID: 07AUG15.D
Sampled: 08/06/14 09:47 | Prepared: 08/07/14 06:00 | Analyzed: 08/07/14 12:09
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0461 | Sequence: 1411132 | Calibration: 1407027 | 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	10.380	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.380	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8700	98.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	224447	6.73	211036	6.73	
Chlorobenzene-d5 (IS)	74142	9.73	74301	9.73	
1,4-Difluorobenzene (IS)	280202	7.51	287715	7.51	

kk 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-04	File ID:	07AUG23.D
Sampled:	08/06/14 11:33	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 15:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence: 1411132	Calibration:	1407027	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	0.81	
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

LK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories			SDG:	14-17863
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1417863-04	File ID:	07AUG23.D
Sampled:	08/06/14 11:33	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 15:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence:	1411132	Calibration:	1407027
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	0.47	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	2.7	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-04	File ID:	07AUG23.D
Sampled:	08/06/14 11:33	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 15:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence: 1411132	Calibration:	1407027	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	10.700	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.300	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.160	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	221408	6.73	211036	6.73	
Chlorobenzene-d5 (IS)	72976	9.73	74301	9.73	
1,4-Difluorobenzene (IS)	277762	7.51	287715	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-05	File ID:	07AUG28.D
Sampled:	08/06/14 13:00	Prepared:	08/07/14 07:14	Analyzed:	08/07/14 17:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0462	Sequence: 1411132	Calibration:	1407027	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	0.17	J
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

KF 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-05	File ID:	07AUG28.D
Sampled:	08/06/14 13:00	Prepared:	08/07/14 07:14	Analyzed:	08/07/14 17:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0462	Sequence: 1411132	Calibration:	1407027	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-05	File ID:	07AUG28.D
Sampled:	08/06/14 13:00	Prepared:	08/07/14 07:14	Analyzed:	08/07/14 17:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0462	Sequence:	1411132	Calibration:	1407027
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	10.630	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.310	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9400	99.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	220169	6.73	211036	6.73	
Chlorobenzene-d5 (IS)	71808	9.73	74301	9.73	
1,4-Difluorobenzene (IS)	270996	7.52	287715	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-8-8/6/14

Laboratory:	BC Laboratories			SDG:	14-17863
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1417863-01	File ID:	07AUG21.D
Sampled:	08/06/14 07:00	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 14:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence:	1411132	Calibration:	1407027
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

TB-8-8/6/14

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-01	File ID:	07AUG21.D
Sampled:	08/06/14 07:00	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 14:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence: 1411132	Calibration:	1407027	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-8-8/6/14

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-01	File ID:	07AUG21.D
Sampled:	08/06/14 07:00	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 14:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence:	1411132	Calibration:	1407027
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	10.530	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.170	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.270	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	223938	6.73	211036	6.73	
Chlorobenzene-d5 (IS)	73081	9.73	74301	9.73	
1,4-Difluorobenzene (IS)	281060	7.51	287715	7.51	

KH 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-02	File ID:	07AUG22.D
Sampled:	08/06/14 08:14	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 14:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence:	1411132	Calibration:	1407027
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	0.73	
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	0.23	J
156-59-2	cis-1,2-Dichloroethene	1	0.090	J
156-60-5	trans-1,2-Dichloroethene	1	0.20	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-02	File ID:	07AUG22.D
Sampled:	08/06/14 08:14	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 14:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence: 1411132	Calibration:	1407027	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	1.2	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-02	File ID:	07AUG22.D
Sampled:	08/06/14 08:14	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 14:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence:	1411132	Calibration:	1407027
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	10.970	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.300	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.140	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	223423	6.73	211036	6.73	
Chlorobenzene-d5 (IS)	74397	9.73	74301	9.73	
1,4-Difluorobenzene (IS)	282890	7.51	287715	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory: BC Laboratories | SDG: 14-17863
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417863-03 | File ID: 07AUG15.D
Sampled: 08/06/14 09:47 | Prepared: 08/07/14 06:00 | Analyzed: 08/07/14 12:09
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0461 | Sequence: 1411132 | Calibration: 1407027 | 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	0.75	
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	0.25	J
156-60-5	trans-1,2-Dichloroethene	1	0.45	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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory: BC Laboratories | SDG: 14-17863
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417863-03 | File ID: 07AUG15.D
Sampled: 08/06/14 09:47 | Prepared: 08/07/14 06:00 | Analyzed: 08/07/14 12:09
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0461 | Sequence: 1411132 | Calibration: 1407027 | 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	0.83	
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	8.1	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory: BC Laboratories | SDG: 14-17863
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417863-03 | File ID: 07AUG15.D
Sampled: 08/06/14 09:47 | Prepared: 08/07/14 06:00 | Analyzed: 08/07/14 12:09
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0461 | Sequence: 1411132 | Calibration: 1407027 | 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	10.380	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.380	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8700	98.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	224447	6.73	211036	6.73	
Chlorobenzene-d5 (IS)	74142	9.73	74301	9.73	
1,4-Difluorobenzene (IS)	280202	7.51	287715	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-04	File ID:	07AUG23.D
Sampled:	08/06/14 11:33	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 15:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence: 1411132	Calibration:	1407027	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	0.81	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories			SDG:	14-17863
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1417863-04	File ID:	07AUG23.D
Sampled:	08/06/14 11:33	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 15:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence:	1411132	Calibration:	1407027
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	0.47	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	2.7	
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-04	File ID:	07AUG23.D
Sampled:	08/06/14 11:33	Prepared:	08/07/14 06:00	Analyzed:	08/07/14 15:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0461	Sequence: 1411132	Calibration:	1407027	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	10.700	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.300	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.160	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	221408	6.73	211036	6.73	
Chlorobenzene-d5 (IS)	72976	9.73	74301	9.73	
1,4-Difluorobenzene (IS)	277762	7.51	287715	7.51	

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-05	File ID:	07AUG28.D
Sampled:	08/06/14 13:00	Prepared:	08/07/14 07:14	Analyzed:	08/07/14 17:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0462	Sequence:	1411132	Calibration:	1407027
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	0.17	J
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

kk 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory: BC Laboratories | SDG: 14-17863
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1417863-05 | File ID: 07AUG28.D
Sampled: 08/06/14 13:00 | Prepared: 08/07/14 07:14 | Analyzed: 08/07/14 17:03
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0462 | Sequence: 1411132 | Calibration: 1407027 | 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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:37:37AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories		SDG:	14-17863	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1417863-05	File ID:	07AUG28.D
Sampled:	08/06/14 13:00	Prepared:	08/07/14 07:14	Analyzed:	08/07/14 17:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0462	Sequence: 1411132	Calibration:	1407027	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	10.630	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.310	103	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9400	99.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	220169	6.73	211036	6.73	
Chlorobenzene-d5 (IS)	71808	9.73	74301	9.73	
1,4-Difluorobenzene (IS)	270996	7.52	287715	7.51	

KK 9.16.14

LDC #: 32635B1 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/11/14

SDG #: 14-17863 Level III Page: 1 of 1

Laboratory: BC Laboratories, Inc. Reviewer: A

2nd Reviewer: Q

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: 8/6/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ≤ 20, r²
IV.	Continuing calibration/ICV	A	Cev/Cv ≤ 30
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
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:*

1	TB-8-8/6/14	11	BX11046-BLK1	21		31	
2	MW-6	12	BX11046-BCK1	22		32	
3	MW-10	13		23		33	
4	MW-5	14		24		34	
5	MW-16	15		25		35	
6	MW-10MS	16		26		36	
7	MW-10MSD	17		27		37	
8	MW-16MS	18		28		38	
9	MW-16MSD	19		29		39	
10		20		30		40	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 6, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17863

Sample Identification

MW-6
MW-10
MW-5
MW-16
MW-10MS
MW-10MSD
MW-10DUP

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.

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 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 constituent.

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 Analysis

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 was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution analysis was not utilized in this SDG.

XI. Sample Result Verification

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, 3Q2014
Metals - Data Qualification Summary - SDG 14-17863

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Metals - Laboratory Blank Data Qualification Summary - SDG 14-17863

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:39:36AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-6

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-02
File ID: PE_EL2_140814-078
Sampled: 08/06/14 08:14
Prepared: 08/14/14 09:00
Analyzed: 08/14/14 15:36
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH1268
Sequence: 1411598
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	26	1		EPA-200.8

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:39:36AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-10

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-03
File ID: PE_EL2_140814-066
Sampled: 08/06/14 09:47
Prepared: 08/14/14 09:00
Analyzed: 08/14/14 14:55
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH1268
Sequence: 1411598
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	5.7	1		EPA-200.8

9/5/14 q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:39:36AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-5

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-04
File ID: PE_EL2_140814-079
Sampled: 08/06/14 11:33
Prepared: 08/14/14 09:00
Analyzed: 08/14/14 15:39
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH1268
Sequence: 1411598
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	7.8	1		EPA-200.8

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:39:36AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-16

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-05
File ID: PE_EL2_140814-096
Sampled: 08/06/14 13:00
Prepared: 08/14/14 09:00
Analyzed: 08/14/14 17:06
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH1268
Sequence: 1411598
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2900	5	D	EPA-200.8

9/22/14

LDC #: 32635B4 **VALIDATION COMPLETENESS WORKSHEET** Date: 9-11-14
SDG #: 14-17863 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: MG
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: 8-6-14
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/MSD
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:
all water

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

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 6, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-17863

Sample Identification

MW-6
MW-10
MW-5
MW-16
MW-10MS
MW-10MSD
MW-10DUP
MW-16MS
MW-16MSD
MW-16DUP

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 SW 846 Method 7196 for Hexavalent Chromium, EPA Method 353.2 for Nitrite as Nitrogen, EPA Method 365.1 for Ortho-Phosphate 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 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. 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	Orthophosphate as P	0.008282 mg/L	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 with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-16/MS/MSD (MW-16)	Nitrite as N- Orthophosphate as P	113 (90-110) -	112 (90-110) 111 (90-110)	- -	J (all detects) J (all 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

No field duplicates were identified in this SDG.

XI. Field Blanks

No field blanks were identified in this SDG.

NASA JPL, 2Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-17863

SDG	Sample	Analyte	Flag	A or P	Reason
14-17863	MW-16	Nitrite as N- Orthophosphate as P	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)

NASA JPL, 2Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-17863

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:38:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-300.0

MW-16

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-05
File ID: B080714A.seq-05
Sampled: 08/06/14 13:00
Prepared: 08/07/14 15:00
Analyzed: 08/07/14 15:52
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0563
Sequence: 1411291
Calibration: UNASSIGNED
Instrument: IC2

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	1.2	1		EPA-300.0
14808-79-8	Sulfate	42	1		EPA-300.0

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:38:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-6

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-02
File ID: F082514.seq-21.0000.txt
Sampled: 08/06/14 08:14
Prepared: 08/25/14 17:00
Analyzed: 08/25/14 22:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2724
Sequence: 1412375
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

9/27/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:38:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-10

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-03
File ID: F082514.seq-11.0000.txt
Sampled: 08/06/14 09:47
Prepared: 08/25/14 17:00
Analyzed: 08/25/14 19:53
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2724
Sequence: 1412375
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.7	1	J	EPA-314.0

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:38:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-5

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-04
File ID: F082514.seq-22.0000.txt
Sampled: 08/06/14 11:33
Prepared: 08/25/14 17:00
Analyzed: 08/25/14 22:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2724
Sequence: 1412375
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	9.4	1		EPA-314.0

9/25/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:38:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-16

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-05
File ID: F082514.seq-25.0000.txt
Sampled: 08/06/14 13:00
Prepared: 08/25/14 17:00
Analyzed: 08/25/14 23:07
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2725
Sequence: 1412375
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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:38:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-16

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-05
File ID: 140807 1008 NO2-099
Sampled: 08/06/14 13:00
Prepared: 08/07/14 10:08
Analyzed: 08/07/14 10:08
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0500
Sequence: 1411403
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

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:38:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-365.1

MW-16

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-05
File ID: 140807 0828 PO4-072
Sampled: 08/06/14 13:00
Prepared: 08/07/14 08:28
Analyzed: 08/07/14 09:31
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0521
Sequence: 1411406
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.25	1	J	EPA-365.1

9/5/14

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:38:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-6

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-02
File ID: 140807 0046 CR6-009
Sampled: 08/06/14 08:14
Prepared: 08/07/14 00:46
Analyzed: 08/07/14 00:46
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0523
Sequence: 1411184
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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:38:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-10

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-03
File ID: 140807 0046 CR6-005
Sampled: 08/06/14 09:47
Prepared: 08/07/14 00:46
Analyzed: 08/07/14 00:46
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0523
Sequence: 1411184
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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:38:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-5

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-04
File ID: 140807 0046 CR6-010
Sampled: 08/06/14 11:33
Prepared: 08/07/14 00:46
Analyzed: 08/07/14 00:46
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0523
Sequence: 1411184
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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:38:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-16

Laboratory: BC Laboratories
SDG: 14-17863
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1417863-05
File ID: 140807 0046 CR6-015
Sampled: 08/06/14 13:00
Prepared: 08/07/14 00:46
Analyzed: 08/07/14 00:52
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0569
Sequence: 1411184
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0025	1		EPA-7196

9/5/14

LDC #: 32635B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9-11-14

SDG #: 14-17863 Level III Page: 1 of 1

Laboratory: BC Laboratories, Inc. Reviewer: MG

2nd Reviewer: _____

9MG

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Hexavalent Chromium (EPA SW846 Method 7196), Nitrite-N (EPA Methdo 353.2), ~~Orthophosphate~~ ortho-Phosphate as P (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: 8-6-14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	SW	
V	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD
VI.	Duplicates	A	DUP
VII.	Laboratory control samples	A	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: all Water

1	MW-6	11		21		31	
2	MW-10	12		22		32	
3	MW-5	13		23		33	
4	MW-16	14		24		34	
5	MW-10MS	15		25		35	
6	MW-10MSD	16		26		36	
7	MW-10DUP	17		27		37	
8	MW-16MS	18		28		38	
9	MW-16MSD	19		29		39	PBW1
10	MW-16DUP	20		30		40	PBW2

Notes: _____

LDC #: 32635B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1→3	W	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC [✓ CR^{6+}] [✓ ClO$_4$] _____ _____
4	↓	pH TDS [✓ Cl] F [✓ NO$_3$] [✓ NO$_2$] [✓ SO$_4$] [✓ PO$_4$] ALK CN$^-$ NH$_3$ TKN TOC [✓ CR^{6+}] [✓ ClO$_4$] _____ _____
QC 5→7		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC [✓ CR^{6+}] [✓ ClO$_4$] _____ _____
↓ 8→10	↓	pH TDS [✓ Cl] F [✓ NO$_3$] [✓ NO$_2$] [✓ SO$_4$] [✓ PO$_4$] ALK CN$^-$ NH$_3$ TKN TOC [✓ CR^{6+}] [✓ ClO$_4$] _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$

Comments:

LDC #: 32635B6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer: d

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 4 (>5x)

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual.								
PO4-P		0.008282	0.041									

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 #: 32635B6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: MG
2nd Reviewer: 9

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
1	8/9	water	NO2-N	113 (90-110)	112 (90-110)		4	J dets /A
	↓	↓	PO4-P		111 (↓)		↓	↓

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 7, 2014

LDC Report Date: September 26, 2014

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-18066

Sample Identification

TB-9-8/7/14
MW-8
MW-13
MW-7
MW-13MS
MW-13MSD

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 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 at or above the stated limit.

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
8/9/14	trans-1,4-Dichloro-2-butene Pentachloroethane	36.0 100.0	All samples in SDG 14-18066	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

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

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-9-8/7/14 was identified as a trip blank. No volatile contaminants were found

NASA JPL, 3Q2014
Volatiles - Data Qualification Summary - SDG 14-18066

SDG	Sample	Compound	Flag	A or P	Reason
14-18066	TB-9-8/7/14 MW-8 MW-13 MW-7	trans-1,4-Dichloro-2-butene Pentachloroethane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Continuing calibration (ICV %D)

NASA JPL, 3Q2014
Volatiles - Laboratory Blank Data Qualification Summary - SDG 14-18066

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:40:22AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-9-8/7/14

Laboratory:	BC Laboratories		SDG:	14-18066	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1418066-01	File ID:	08AUG61.D
Sampled:	08/07/14 07:00	Prepared:	08/08/14 12:52	Analyzed:	08/09/14 05:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0681	Sequence: 1411208		Calibration: 1407027	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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:40:22AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-9-8/7/14

Laboratory:	BC Laboratories		SDG:	14-18066	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1418066-01	File ID:	08AUG61.D
Sampled:	08/07/14 07:00	Prepared:	08/08/14 12:52	Analyzed:	08/09/14 05:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0681	Sequence: 1411208	Calibration:	1407027	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

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:40:22AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-9-8/7/14

Laboratory:	BC Laboratories		SDG:	14-18066	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1418066-01	File ID:	08AUG61.D
Sampled:	08/07/14 07:00	Prepared:	08/08/14 12:52	Analyzed:	08/09/14 05:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0681	Sequence: 1411208	Calibration:	1407027	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 LS
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 LS
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	10.920	109	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.240	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)	208307	6.73	214551	6.73	
Chlorobenzene-d5 (IS)	69285	9.73	75155	9.73	
1,4-Difluorobenzene (IS)	268420	7.51	288393	7.52	

9/22/14 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:40:22AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-8

Laboratory:	BC Laboratories		SDG:	14-18066	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1418066-03	File ID:	08AUG62.D
Sampled:	08/07/14 11:13	Prepared:	08/08/14 12:52	Analyzed:	08/09/14 05:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0681	Sequence: 1411208	Calibration:	1407027	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	0.74	
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	0.24	J
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	5.1	
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	0.11	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

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:40:22AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-8

Laboratory:	BC Laboratories		SDG:	14-18066	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1418066-03	File ID:	08AUG62.D
Sampled:	08/07/14 11:13	Prepared:	08/08/14 12:52	Analyzed:	08/09/14 05:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0681	Sequence: 1411208	Calibration:	1407027	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	0.39	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

9/22/14 JK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:40:22AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-8

Laboratory:	BC Laboratories		SDG:	14-18066	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1418066-03	File ID:	08AUG62.D
Sampled:	08/07/14 11:13	Prepared:	08/08/14 12:52	Analyzed:	08/09/14 05:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0681	Sequence: 1411208	Calibration:	1407027	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
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	10.730	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.250	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3100	93.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	222706	6.73	214551	6.73	
Chlorobenzene-d5 (IS)	74525	9.73	75155	9.73	
1,4-Difluorobenzene (IS)	286418	7.51	288393	7.52	

9/22/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:40:22AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-13

Laboratory:	BC Laboratories		SDG:	14-18066	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1418066-04	File ID:	08AUG55.D
Sampled:	08/07/14 12:28	Prepared:	08/08/14 12:52	Analyzed:	08/09/14 03:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0681	Sequence: 1411208	Calibration:	1407027	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	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	0.37	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

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:40:22AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-13

Laboratory:	BC Laboratories		SDG:	14-18066	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1418066-04	File ID:	08AUG55.D
Sampled:	08/07/14 12:28	Prepared:	08/08/14 12:52	Analyzed:	08/09/14 03:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0681	Sequence: 1411208	Calibration:	1407027	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	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	1.7	
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	0.24	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

9/5/14 JK

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:40:22AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-13

Laboratory: BC Laboratories | SDG: 14-18066
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1418066-04 | File ID: 08AUG55.D
Sampled: 08/07/14 12:28 | Prepared: 08/08/14 12:52 | Analyzed: 08/09/14 03:04
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BXH0681 | Sequence: 1411208 | Calibration: 1407027 | 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
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	10.140	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1000	91.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	220353	6.73	214551	6.73	
Chlorobenzene-d5 (IS)	74404	9.73	75155	9.73	
1,4-Difluorobenzene (IS)	285824	7.51	288393	7.52	

9/5/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:40:22AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-7

Laboratory:	BC Laboratories		SDG:	14-18066	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1418066-05	File ID:	08AUG63.D
Sampled:	08/07/14 13:26	Prepared:	08/08/14 12:52	Analyzed:	08/09/14 06:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0681	Sequence: 1411208	Calibration:	1407027	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	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

9/5/14 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:40:22AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-7

Laboratory:	BC Laboratories		SDG:	14-18066	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1418066-05	File ID:	08AUG63.D
Sampled:	08/07/14 13:26	Prepared:	08/08/14 12:52	Analyzed:	08/09/14 06:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0681	Sequence: 1411208	Calibration:	1407027	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: 9/5/2014 10:40:22AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-7

Laboratory:	BC Laboratories		SDG:	14-18066	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1418066-05	File ID:	08AUG63.D
Sampled:	08/07/14 13:26	Prepared:	08/08/14 12:52	Analyzed:	08/09/14 06:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BXH0681	Sequence: 1411208	Calibration:	1407027	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
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	10.510	105	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1100	91.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	221153	6.73	214551	6.73	
Chlorobenzene-d5 (IS)	75592	9.73	75155	9.73	
1,4-Difluorobenzene (IS)	285160	7.51	288393	7.52	

9/22/14

LDC #: 32635C1

SDG #: 14-18066

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/22/14

Page: 1 of 1

Reviewer: SK

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: 8/7/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration		
IV.	Continuing calibration/ICV		
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards		
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	FB = 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:*

All H2Os

1	TB-9-8/7/14	11	BXH0681-BLC1	21		31	
2	MW-8	12		22		32	
3	MW-13	13		23		33	
4	MW-7	14		24		34	
5	MW-13MS	15		25		35	
6	MW-13MSD	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 08205C1
SDG #:

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 6 of 7
Reviewer:
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
	8/9/14	08AUG51	trans-1,4-Dichloro-2-butene	36.0	all	J+/UJ/A
			Pentachloroethane	100		J

CONCAL1S5

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 7, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-18066

Sample Identification

MW-15
MW-8
MW-13
MW-7
MW-13MS
MW-13MSD
MW-13DUP

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.

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 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 metal contaminants were found above the IDL in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium	2.164 ug/L	All samples in SDG 14-18066

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-15	Chromium	2.7 ug/L	2.7U 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)

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, 3Q2014
Chromium - Data Qualification Summary - SDG 14-18066

No Sample Data Qualified in this SDG

NASA JPL, 3Q2014
Chromium - Laboratory Blank Data Qualification Summary - SDG 14-18066

SDG	Sample	Analyte	Modified Final Concentration	A or P
14-18066	MW-15	Chromium	2.7U ug/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:42:30AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-15

Laboratory: BC Laboratories
Client: Tidewater Inc.
Matrix: Water
Sampled: 08/07/14 08:11
Solids: 0.00
Batch: BXH1671 Sequence: 1411835

Laboratory ID: 1418066-02
Prepared: 08/19/14 08:30
Preparation: EPA 200.2

SDG: 14-18066
Project: JPL- GW Monitoring Wells
File ID: PE_EL2_140819-151
Analyzed: 08/19/14 18:59
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	2.7	1	JB U	EPA-200.8

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:42:30AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-8

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-03
File ID: PE_EL2_140819-152
Sampled: 08/07/14 11:13
Prepared: 08/19/14 08:30
Analyzed: 08/19/14 19:02
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH1671
Sequence: 1411835
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	18	1	B	EPA-200.8

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:42:30AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-13

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-04
File ID: PE_EL2_140819-174
Sampled: 08/07/14 12:28
Prepared: 08/19/14 08:30
Analyzed: 08/19/14 20:31
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH1671
Sequence: 1411835
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	51000	125	BD	EPA-200.8

9/22/14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:42:30AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-7

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-05
File ID: PE_EL2_140819-189
Sampled: 08/07/14 13:26
Prepared: 08/19/14 08:30
Analyzed: 08/19/14 21:38
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BXH1671
Sequence: 1411835
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	9100	20	BD	EPA-200.8

9/5/14

LDC #: 32635C4
SDG #: 14-18066
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9-11-14
Page: 1 of 1
Reviewer: MG
2nd Reviewer: [signature]

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: 8-7-14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	N	not required
VI.	Matrix Spike Analysis	A	MS/MSD Cr-4x
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: all water

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

Notes:

LDC #: 32635C4
SDG #: See Cover
METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: ug/L

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: NA
Associated Samples: all

Reviewer: MG
2nd Reviewer:

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Action Limit	1									
Cr		2.164		10.82	2.7									

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.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2014

Collection Date: August 7, 2014

LDC Report Date: September 15, 2014

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 14-18066

Sample Identification

MW-15
MW-8
MW-13
MW-7
MW-13MS
MW-13MSD
MW-13DUP

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per Standard Method EPA Method 300.0 for Chloride, Nitrate as Nitrogen, Sulfate, EPA SW846 Method 7196 for Hexavalent Chromium, EPA Method 353.2 for Nitrite as Nitrogen, EPA Method 365.1 for Ortho-phosphate 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 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. 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 Sulfate	0.180 mg/L 0.184 mg/L	MW-8 MW-13 MW-7
ICB/CCB	Chloride Sulfate	0.191 mg/L 0.217 mg/L	MW-8 MW-13 MW-7

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-13MS/MSD (MW-8 MW-13 MW-7)	Nitrite as N	-	112 (90-110)	-	J (all 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.

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, 3Q2014
Wet Chemistry - Data Qualification Summary - SDG 14-18066

SDG	Sample	Analyte	Flag	A or P	Reason
14-18066	MW-8 MW-13 MW-7	Nitrite as N	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)

NASA JPL, 3Q2014
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 14-18066

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-300.0

MW-8

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-03
File ID: E080814.seq-12
Sampled: 08/07/14 11:13
Prepared: 08/08/14 19:00
Analyzed: 08/08/14 22:50
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0804
Sequence: 1412169
Calibration: UNASSIGNED
Instrument: IC5

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	50	1		EPA-300.0
14797-55-8	Nitrate as N	2.4	1		EPA-300.0
14808-79-8	Sulfate	44	1		EPA-300.0

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-300.0

MW-13

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-04
File ID: E080814.seq-24
Sampled: 08/07/14 12:28
Prepared: 08/08/14 19:00
Analyzed: 08/09/14 02:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0804
Sequence: 1412169
Calibration: UNASSIGNED
Instrument: IC5

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	10	1		EPA-300.0
14808-79-8	Sulfate	140	1		EPA-300.0

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-300.0

MW-7

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-05
File ID: E080814.seq-30
Sampled: 08/07/14 13:26
Prepared: 08/08/14 19:00
Analyzed: 08/09/14 04:03
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0804
Sequence: 1412169
Calibration: UNASSIGNED
Instrument: IC5

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	86	1		EPA-300.0
14797-55-8	Nitrate as N	0.56	1		EPA-300.0
14808-79-8	Sulfate	49	1		EPA-300.0

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-8

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-03
File ID: F082514.seq-56.0000.txt
Sampled: 08/07/14 11:13
Prepared: 08/25/14 17:00
Analyzed: 08/26/14 06:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2725
Sequence: 1412375
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	180	20	D	EPA-314.0

KL 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-13

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-04RE1
File ID: F082514.seq-79.0000.txt
Sampled: 08/07/14 12:28
Prepared: 08/25/14 17:00
Analyzed: 08/26/14 18:08
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2726
Sequence: 1412375
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	160	10	D	EPA-314.0

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-7

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-05
File ID: F082514.seq-43.0000.txt
Sampled: 08/07/14 13:26
Prepared: 08/25/14 17:00
Analyzed: 08/26/14 03:18
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH2726
Sequence: 1412375
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-8

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-03
File ID: 140808 0901 NO2-061
Sampled: 08/07/14 11:13
Prepared: 08/08/14 09:00
Analyzed: 08/08/14 09:01
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0622
Sequence: 1411433
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-13

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-04
File ID: 140808 0901 NO2-060
Sampled: 08/07/14 12:28
Prepared: 08/08/14 09:00
Analyzed: 08/08/14 09:01
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0622
Sequence: 1411433
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-7

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-05
File ID: 140808 0901 NO2-062
Sampled: 08/07/14 13:26
Prepared: 08/08/14 09:00
Analyzed: 08/08/14 09:01
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0622
Sequence: 1411433
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-365.1

MW-8

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-03
File ID: 140808 0748 PO4-049
Sampled: 08/07/14 11:13
Prepared: 08/08/14 07:48
Analyzed: 08/08/14 08:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0626
Sequence: 1411421
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.0040	1	U	EPA-365.1

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-365.1

MW-13

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-04
File ID: 140808 0748 PO4-048
Sampled: 08/07/14 12:28
Prepared: 08/08/14 07:48
Analyzed: 08/08/14 08:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0626
Sequence: 1411421
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.0041	1	J	EPA-365.1

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-365.1

MW-7

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-05
File ID: 140808 0748 PO4-050
Sampled: 08/07/14 13:26
Prepared: 08/08/14 07:48
Analyzed: 08/08/14 08:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0626
Sequence: 1411421
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.0040	1	U	EPA-365.1

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-15

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-02
File ID: 140808 0712 CR6-009
Sampled: 08/07/14 08:11
Prepared: 08/08/14 07:12
Analyzed: 08/08/14 07:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0625
Sequence: 1411417
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-8

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-03
File ID: 140808 0712 CR6-010
Sampled: 08/07/14 11:13
Prepared: 08/08/14 07:12
Analyzed: 08/08/14 07:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0625
Sequence: 1411417
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0028	1		EPA-7196

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-13

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-04
File ID: 140808 0712 CR6-005
Sampled: 08/07/14 12:28
Prepared: 08/08/14 07:12
Analyzed: 08/08/14 07:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0625
Sequence: 1411417
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

KK 9.16.14

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 9/5/2014 10:41:16AM
Project: JPL- GW Monitoring Wells
Project Number: 3rd Qtr.
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-7

Laboratory: BC Laboratories
SDG: 14-18066
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1418066-05
File ID: 140808 0712 CR6-011
Sampled: 08/07/14 13:26
Prepared: 08/08/14 07:12
Analyzed: 08/08/14 07:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BXH0625
Sequence: 1411417
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

KL 9.16.14

LDC #: 32635C6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9-11-14

SDG #: 14-18066 Level III Page: 1 of 1

Laboratory: BC Laboratories, Inc. Reviewer: MG

2nd Reviewer: _____

MY

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Hexavalent Chromium (EPA SW846 Method 7196), Nitrite-N (EPA Methdo 353.2), ~~Orthophosphate~~ ortho-Phosphate as P (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: 8-7-14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	SW	
V	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD (SDG: 14-17863)
VI.	Duplicates	A	DUP (↓)
VII.	Laboratory control samples	A	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: all Water

1	MW-15	11		21		31	
2	MW-8	12		22		32	
3	MW-13	13		23		33	
4	MW-7	14		24		34	
5	MW-13MS	15		25		35	
6	MW-13MSD	16		26		36	
7	MW-13DUP	17		27		37	
8		18		28		38	
9		19		29		39	PBW1
10		20		30		40	PBW2

Notes: _____

LDC #: 32635C6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: ________

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1	W	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC [✓ CR^{6+}] ClO$_4$ _____ _____
2→4	↓	pH TDS [✓ Cl] F [✓ NO$_3$] [✓ NO$_2$] [✓ SO$_4$] [✓ PO$_4$] ALK CN$^-$ NH$_3$ TKN TOC [✓ CR^{6+}] [✓ ClO$_4$] _____ _____
QC 5→7		pH TDS [✓ Cl] F [✓ NO$_3$] [✓ NO$_2$] [✓ SO$_4$] [✓ PO$_4$] ALK CN$^-$ NH$_3$ TKN TOC [✓ CR^{6+}] [✓ ClO$_4$] _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$ _____ _____
		pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ PO$_4$ ALK CN$^-$ NH$_3$ TKN TOC CR^{6+} ClO$_4$

Comments: ____

LDC #: 32635C6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 2-4 (>5x)

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual's.								
Cl	0.180	0.191	0.955									
SO4	0.184	0.217	1.085									

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 #: 32635C6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: MG
2nd Reviewer:

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
1	5/6	water	NO2-N		112 (90-110)		2→4	J dets / A

Comments: