

N3172B.AR.003121  
NASD VIEQUES  
5090.3a

VALIDATED LABORATORY DATA PACKAGE, R1407632, VIEQUES ISLAND PUERTO RICO  
09/24/2014  
DATAQUAL

# DataQual

## Environmental Services, LLC

CH2M HILL-VBO  
5701 Cleveland Street  
Suite 200  
Virginia Beach, VA 23462

December 31, 2014  
ALS Environmental – SR # R1407632  
CTO-037, NTR Vieques West SWMU 4 Groundwater Sampling

Dear Ms. Dean,

The following Data Validation report is provided as requested for the parameters noted in the table below for Service Request #s R1407632. The data validation was performed in accordance with EPA Method 6850, the laboratory SOP, professional judgment, the guidance offered in the DoD Quality Systems Manual for Environmental Laboratories Version 5.0 and the project specific SAP. There is no current Region II SOP for the perchlorate analysis. Worksheets tabulating the validation process including calculation verifications are included in the support documentation section of this report. All areas of concern are discussed in the body of the report and a summary of data qualifications are provided.

Sample ID	Lab ID	Matrix	Perchlorate
VWW04-MW07-14C	R1407632-001	water	X
VWW04-MW06-14C	R1407632-002	water	X
VWW04-EB01-092514	R1407632-003	water	X
VWW04-MW11-14C	R1407632-004	water	X
VWW04-MW02-14C	R1407632-005	water	X
VWW04-MW10-14C	R1407632-006	water	X
VWW04-MW18-14C	R1407632-007	water	X
VWW04-EB01-092614	R1407632-008	water	X
VWW04-MW08-14C	R1407632-009	water	X
VWW04-MW01-14C	R1407632-010	water	X
VWW04-MW05-14C	R1407632-011	water	X
VWW04-MW05P-14C	R1407632-012	water	X
VWW04-EB02-092614	R1407632-013	water	X
VWW04-MW09-14C	R1407632-014	water	X
VWW04-EB03-092614	R1407632-0015	water	X

The following quality control samples were provided with this SDG: sample VWW04-MW05P-14C-field duplicate of sample VWW04-MW05-14C; and samples VWW04-EB01-092514, VWW04-EB01-092614, VWW04-EB02-092614 & VWW04-EB03-092614-rinse blanks.

The samples were evaluated based on the following criteria:

- Data Completeness \*
- Sample Condition \*
- Technical Holding Times \*
- Initial/Continuing Calibrations \*
- Internal Standards \*
- Ion Ratio Criteria \*
- Blanks \*
- Laboratory Control Samples \*
- Matrix Spike Recoveries \*
- Field Duplicates \*
- Identification/Quantitation \*
- Reporting Limits \*

\* - indicates that qualifications were not required based on this criteria

### **Overall Evaluation of Data/Potential Usability Issues**

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. *If an issue is not addressed in this narrative there were no actions required based on unmet quality control criteria.*

No critical findings resulting in data rejections were noted. No major findings resulting in qualification of data as estimated were noted. The data in this data package is reported without qualification.

### **Perchlorate by 6850**

No qualification of the analytical data was required.

### **Specific Evaluation of Data**

#### **Data Completeness**

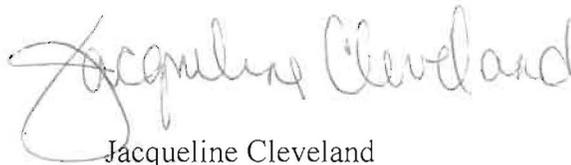
The SDG was received complete and intact. Resubmissions were not required.

### Technical Holding Times

According to chain of custody records, sampling was performed on 9/24-26/14 and samples were received at ALS Environmental lab on 9/27/14. All sample preparation and analysis was performed within method holding time requirements.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

A handwritten signature in cursive script that reads "Jacqueline Cleveland". The signature is written in dark ink and is positioned above the printed name and title.

Jacqueline Cleveland  
Vice President

## Summary of Data Qualifications

Perchlorate

Sample ID	Compound	Results	Q Flag	Q Code
No qualifications were required.				

## Glossary of Qualification Flags and Abbreviations

### Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
J+	estimated biased high
J-	estimated biased low
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

### Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

#### Organic Methods

NA	The sample result for the blank contaminant is greater than the LOD (2X sample LOD for common laboratory contaminants) when the blank value is less than the LOD. The sample result for the blank contaminant is not qualified with any blank qualifiers.
LOD	The sample result for the blank contaminant is less than the LOD (2X sample LOD for common laboratory contaminants) but greater than the MDL when the blank value is less than the LOD. The sample result for the blank contaminant is changed to the LOD and qualified as non-detect U.

#### Inorganic Methods

##### **ICB/CCB/PB Action:**

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the ICB/CCB/PB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the LOD.
J+ -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the LOD.
J/UJ -	Sample result is less than 10X LOD when blank result is below the negative LOD.

## Glossary of Qualification Flags and Abbreviations, continued

### Field QC Blank action:

*Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.*

*Do not use rinsate blank associated with soils to qualify water samples and vice versa.*

No Action - The sample result is greater than the LOD and greater than ten times (10X) the blank value.

U - The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD when the FB result is less or greater than the LOD.

R - Sample result is greater than the LOD and less than the FB value when the FB value is greater than the LOD.

J+ - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the LOD.

### General Abbreviations

MDL	method detection limit
IDL	instrument detection limit
LOD/RL	Level of Detection//Reporting Limit
LOQ	Level of Quantitation
+	positive result
-	non-detect result

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/24/14 1250  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 9/30/14 18:12

**Sample Name:** WW04-MW07-14C  
**Lab Code:** R1407632-001

**Units:** µg/L  
**Basis:** NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQUDATA\HPLC02\DATA\093014\B0032048.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	0.62		0.20	0.10	0.026	

*JCC*  
*12/20/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/24/14 1555  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 9/30/14 18:25

**Sample Name:** WW04-MW06-14C  
**Lab Code:** R1407632-002

**Units:** µg/L  
**Basis:** NA

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQU\DATA\HPLC02\DATA\093014\B0032049.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	0.070	J	0.20	0.10	0.026	

*JMC*  
*12/20/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/25/14 0645  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 9/30/14 18:39

**Sample Name:** WW04-EB01-092514  
**Lab Code:** R1407632-003

**Units:** µg/L  
**Basis:** NA

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQU\DATA\HPLC02\DATA\093014\B0032050.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND	U	0.20	0.10	0.026	

*JLC*  
*12/20/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/25/14 1040  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 9/30/14 19:06

**Sample Name:** WW04-MW11-14C  
**Lab Code:** R1407632-004

**Units:** µg/L  
**Basis:** NA

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQU\DATA\HPLC02\DATA\093014\B0032052.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	2.0		0.20	0.10	0.026	

*JAC*  
*12/20/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/25/14 1335  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 10/1/14 10:12

**Sample Name:** WW04-MW02-14C  
**Lab Code:** R1407632-005

**Units:** µg/L  
**Basis:** NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQU\DATA\HPLC02\DATA\100114\B0032074.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 10

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	13		2.0	1.0	0.26	

*JAC*  
*12/20/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/25/14 1520  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 9/30/14 19:32

**Sample Name:** WW04-MW10-14C  
**Lab Code:** R1407632-006

**Units:** µg/L  
**Basis:** NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQU\DATA\HPLC02\DATA\093014\B0032054.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	0.42		0.20	0.10	0.026	

*JAC*  
*10/20/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/25/14 1655  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 10/1/14 10:26

**Sample Name:** WW04-MW18-14C  
**Lab Code:** R1407632-007

**Units:** µg/L  
**Basis:** NA

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQUADATA\HPLC02\DATA\100114\B0032075.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 50

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	59		10	5.0	1.3	

*JAC  
12/20/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/25/14 1220  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 9/30/14 20:13

**Sample Name:** WW04-MW08-14C  
**Lab Code:** R1407632-009

**Units:** µg/L  
**Basis:** NA

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQU\DATA\HPLC02\DATA\093014\B0032057.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	0.52		0.20	0.10	0.026	

*JAC*  
*12/20/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/25/14 1730  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 9/30/14 20:53

**Sample Name:** WW04-MW05P-14C  
**Lab Code:** R1407632-012

**Units:** µg/L  
**Basis:** NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQU\DATA\HPLC02\DATA\093014\B0032060.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	0.050	J	0.20	0.10	0.026	

*JAC*  
*12/22/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/25/14 1725  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 9/30/14 20:40

**Sample Name:** WW04-MW05-14C  
**Lab Code:** R1407632-011

**Units:** µg/L  
**Basis:** NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQU\DATA\HPLC02\DATA\093014\B0032059.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 1

CAS No.	Analyte Name	Result Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND U	0.20	0.10	0.026	

*JAC*  
*12/20/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/26/14 0700  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 9/30/14 19:59

**Sample Name:** WW04-EB01-092614  
**Lab Code:** R1407632-008

**Units:** µg/L  
**Basis:** NA

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQU\DATA\HPLC02\DATA\093014\B0032056.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	0.040	J	0.20	0.10	0.026	

*JAC*  
*12/20/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/25/14 1450  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 9/30/14 20:26

**Sample Name:** WW04-MW01-14C  
**Lab Code:** R1407632-010

**Units:** µg/L  
**Basis:** NA

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQU\DATA\HPLC02\DATA\093014\B0032058.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	1.5		0.20	0.10	0.026	

*JC*  
*12/20/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/26/14 0800  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 9/30/14 21:07

**Sample Name:** WW04-EB02-092614  
**Lab Code:** R1407632-013

**Units:** µg/L  
**Basis:** NA

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQU\DATA\HPLC02\DATA\093014\B0032061.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND	U	0.20	0.10	0.026	

*JAC*  
*12/20/14*

Analytical Report

**Client:** CH2M Hill  
**Project:** Vieques West SWMU 4/CTO-037  
**Sample Matrix:** Ground Water

**Service Request:** R1407632  
**Date Collected:** 9/26/14 1130  
**Date Received:** 9/27/14  
**Date Extracted:** 9/30/14  
**Date Analyzed:** 10/1/14 10:39

**Sample Name:** WW04-MW09-14C  
**Lab Code:** R1407632-014

**Units:** µg/L  
**Basis:** NA

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850  
**Prep Method:** Method  
**Data File Name:** I:\ACQU\DATA\HPLC02\DATA\100114\B0032076.D\

**Analysis Lot:** 414053  
**Extraction Lot:** 219431  
**Instrument Name:** R-HPLC-02  
**Dilution Factor:** 100

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	95		20	10	2.6	

*JAC*  
*12/20/14*

Analytical Report

Client: CH2M Hill  
 Project: Vieques West SWMU 4/CTO-037  
 Sample Matrix: Ground Water

Service Request: R1407632  
 Date Collected: 9/26/14 1245  
 Date Received: 9/27/14  
 Date Extracted: 9/30/14  
 Date Analyzed: 10/1/14 09:59

Sample Name: WW04-EB03-092614  
 Lab Code: R1407632-015

Units: µg/L  
 Basis: NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850  
 Prep Method: Method  
 Data File Name: I:\ACQU\DATA\HPLC02\DATA\100114\B0032073.D\

Analysis Lot: 414053  
 Extraction Lot: 219431  
 Instrument Name: R-HPLC-02  
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND U	0.20	0.10	0.026	

*JAC*  
 12/29/14

CASE NARRATIVE

**Client:** CH2MHill  
**Project:** Vieques West SWMU  
**Sample Matrix:** Water

**Service Request No.:** R1407632  
**Project Number:**  
**Date Received:** 09/27/14

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV deliverables. When appropriate to the method, blank and LCS results have been reported with each analytical test.

**Sample Receipt**

Waterl samples were collected on 09/24-26/14 and received at ALS in good condition as noted on the cooler receipt and preservation check form at a cooler temperature of 5.8 °C. The samples were stored in a refrigerator at 1 - 6 °C upon receipt at the laboratory. See the CLP batching sheet for a cross reference between Client ID and ALS Lab ID #.

**Perchlorate Analysis - 6850**

Fifteen water samples were analyzed for Perchlorate by LC/MS method 6850. Values detected between the MDL and PQL have been flagged with a "J" as estimated.

All the initial and continuing calibration criteria were met for all analytes.

The Blank Spike/Blank Spike duplicate recoveries (LCS/LCSD) and LODV spike recoveries were all within QC limits.

The Matrix Spike/Matrix Spike duplicate recoveries (MS/MSD) from sample WW04-MW09-14C were within QC limits.

The Laboratory Blank associated with these samples was free of contamination.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package, has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

  
Janice Jaeger  
Project Manager

10/27/14  
Date

## ALS ASP/CLP Batching Form/Login Sheet

Client Proj #: CTO-037	Batch Complete: Yes	Date Revised:
Submission: R1407632	Diskette Requested: No	Date Due: 10/27/14
Client: CH2M Hill	Date: 10/2/14	Protocol: SW846
Client Rep: JJAEGER	Custody Seal: Present/Absent:	Shipping No.:
Project: Vieques West SWMU 4	Chain of Custody: Present/Absent:	SDG #: WW04-MW07-14C

CAS Job #	Client/EPA ID	Matrix	Requested Parameters	Date Sampled	Date Received	pH (Solids)	% Solids	Remarks Sample Condition
R1407632-001	WW04-MW07-14C	Ground Water	6850	9/24/14	9/27/14			
R1407632-002	WW04-MW06-14C	Ground Water	6850	9/24/14	9/27/14			
R1407632-003	WW04-EB01-092514	Ground Water	6850	9/25/14	9/27/14			
R1407632-004	WW04-MW11-14C	Ground Water	6850	9/25/14	9/27/14			
R1407632-005	WW04-MW02-14C	Ground Water	6850	9/25/14	9/27/14			
R1407632-006	WW04-MW10-14C	Ground Water	6850	9/25/14	9/27/14			
R1407632-007	WW04-MW18-14C	Ground Water	6850	9/25/14	9/27/14			
R1407632-008	WW04-EB01-092614	Ground Water	6850	9/26/14	9/27/14			
R1407632-009	WW04-MW08-14C	Ground Water	6850	9/25/14	9/27/14			
R1407632-010	WW04-MW01-14C	Ground Water	6850	9/25/14	9/27/14			
R1407632-011	WW04-MW05-14C	Ground Water	6850	9/25/14	9/27/14			
R1407632-012	WW04-MW05P-14C	Ground Water	6850	9/25/14	9/27/14			
R1407632-013	WW04-EB02-092614	Ground Water	6850	9/26/14	9/27/14			
R1407632-014QC	WW04-MW09-14C	Ground Water	6850	9/26/14	9/27/14			
R1407632-015	WW04-EB03-092614	Ground Water	6850	9/26/14	9/27/14			

00004

older Comments: DoD reporting

Printed 10/2/14 16:25

ALS-Rochester  
1565 Jefferson Road  
Building 300, Suite 360  
Rochester, NY

phone: 615-345-1115

ELECTRONIC CHAIN OF CUSTODY RECORD

C.O.C. 20140925-GW-EMP-01

Report to: PLEASE PRINT  
Company Name: CH2MHILL Phone: 703.376.5301  
Address: 15010 Conference Dr. ; 200 Chantilly, VA 20151 Fax: 703.376.5801  
Attn: Mike Zamboni

Invoice to: PLEASE PRINT  
Company Name: See Contact Phone: \_\_\_\_\_  
Address: \_\_\_\_\_ Fax: \_\_\_\_\_  
Attn: \_\_\_\_\_

Project Name/Number		Sampler (Print)				No. of Containers	Matrix				Analysis Requested/Method Number	Date Shipped: 9/26/14		
Terrestrial UXO Site Sampling/424191.FI.FK.04		not required					Aq	Sed.	Soil	G		Carrier: FedEx	Waybill No.: 7712893748	
Purchase Order Number		Sampler (Signature)											Comments:	
953316		not required												
Sample Identification	Location	Date Collected	Time Collected	Time Zone										
WW04-MW07-14C	MW-07	9/24/14	12:50	AST	1				✓	X			MW-07	
WW04-MW06-14C	MW-06	9/24/14	15:55	AST	1				✓	X			MW-06	
WW04-EB01-092514	QC	9/25/14	06:45	AST	1	✓				X	date collected for		equipment blank (9/24 sample)	
WW04-MW11-14C	MW-11	9/25/14	10:40	AST	1				✓	X	MW-05 is 9/25		MW-11 (team 1)	
WW04-MW02-14C	MW-02	9/25/14	13:35	AST	1				✓	X	as per		MW-02 (team 1)	
WW04-MW10-14C	MW-10	9/25/14	15:20	AST	1				✓	X	Juliana Dean		MW-10 (team 1)	
WW04-MW18-14C	MW-18	9/25/14	16:55	AST	1				✓	X	JMS 9/30/14		MW-18 (team 1)	
WW04-EB01-092614	QC	9/26/14	07:00	AST	1	✓				X			equipment blank (9/25 samples team)	
WW04-MW08-14C	MW-08	9/25/14	12:20	AST	1				✓	X			MW-08 (team 2)	
WW04-MW01-14C	MW-01	9/25/14	14:50	AST	1				✓	X			MW-01 (team 2)	
WW04-MW05-14C	MW-05	9/26/14	15:25	AST	1				✓	X			MW-05 (team 2)	

Shuttle Temperature: \_\_\_\_\_ Turnaround Requested: Check one  
 Stand 28 days  One week  24/48 Hrs.  Other  
 Sample Disposal:  Return to client  Disposal-by-Lab (30-day retention)  
 Relinquished by sampler: [Signature] Date 9/26/14 Time 1300 Received by: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_ Received by: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_ Received at lab by: [Signature]

ALS-Rochester  
1565 Jefferson Road  
Building 300, Suite 360

phone: 615-345-1115

ELECTRONIC CHAIN OF CUSTODY RECORD

C.O.C. 20140925-GW-EMP-01

Report to: PLEASE PRINT  
Company Name: **CH2MHILL** Phone: **703.376.5301**  
Address: **15010 Conference Dr. ; 200**  
**Chantilly, VA 20151** Fax: **703.376.5801**  
Attn: **Mike Zamboni**

Invoice to: PLEASE PRINT  
Company Name: **See Contact** Phone: \_\_\_\_\_  
Address: \_\_\_\_\_ Fax: \_\_\_\_\_  
Attn: \_\_\_\_\_

Project Name/Number	Sampler (Print)	Analysis Requested/Method Number				Date Shipped: 9/26/14
		Aq	Sed.	Soil	G	
Terrestrial UXO Site Sampling/424191.FI.FK.04	not required					Carrier: FedEx
Purchase Order Number	Sampler (Signature)					Waybill No.: 77128937487
<b>953316</b>	not required					Comments:
Sample Identification	Location	Date Collected	Time Collected	Time Zone	No. of Containers	
WW04-MW05P-14C		9/25/14	15:30	AST	1	(team 2)
WW04-EB02-092614	QC	9/26/14	08:00	AST	1	equipment blank (9/25 samples team)
WW04-MW09-14C	MW-09	9/26/14	11:30	AST	1	MW-19
WW04-MW09-14C-MD	QA/QC	9/26/14	11:30	AST	1	matrix spike
WW04-MW09-14C-SD	QA/QC	9/26/14	11:30	AST	1	matrix spike duplicat
WW04-EB03-092614	QC	9/26/14	12:45	AST	1	equipment blank (9/26 sample)

Shuttle Temperature: \_\_\_\_\_ Turnaround Requested: Check one  
 Stand  One week  24/48 Hrs.  Other  
 Relinquished by sampler: \_\_\_\_\_ Received by: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Received by: \_\_\_\_\_  
 Date: 9/26/14 1300 Date: 9/27/14 Time: 0925



# Cooler Receipt and Preservation Check Form

Project/Client CH2M Hill Folder Number 144-7632

Cooler received on 9/27/14 by: dm COURIER: ALS UPS ~~FEDEX~~ VELOCITY CLIENT

1	Were Custody seals on outside of cooler?	Y <input checked="" type="checkbox"/> N
2	Custody papers properly completed (ink, signed)?	<input checked="" type="checkbox"/> N
3	Did all bottles arrive in good condition (unbroken)?	<input checked="" type="checkbox"/> N
4	Circle: <del>Wet Ice</del> Dry Ice Gel packs present?	<input checked="" type="checkbox"/> N

5a	Perchlorate samples have required headspace?	<input checked="" type="checkbox"/> N NA
5b	Did VOA vials, Alk, or Sulfide have sig* bubbles?	Y N <input checked="" type="checkbox"/> NA
6	Where did the bottles originate?	<u>AKS/ROC</u> CLIENT
7	Soil VOA received as:	Bulk Encore 5035set <input checked="" type="checkbox"/> NA

8. Temperature Readings Date: 9/27/14 Time: 1021 ID: IR#3 IR#4 From: Temp Blank Sample Bottle

Observed Temp (°C)	<u>5.8<sup>0</sup></u>						
Correction Factor (°C)	<u>±0.0<sup>0</sup></u>						
Corrected Temp (°C)	<u>5.8<sup>0</sup></u>						
Within 0-6°C?	<input checked="" type="checkbox"/> N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: \_\_\_\_\_ Ice melted \_\_\_\_\_ Poorly Packed \_\_\_\_\_ Same Day Rule  
& Client Approval to Run Samples: \_\_\_\_\_ Standing Approval Client aware at drop-off Client notified by: \_\_\_\_\_

All samples held in storage location: Rooz by dm on 9/27/14 at 1021  
5035 samples placed in storage location: \_\_\_\_\_ by \_\_\_\_\_ on \_\_\_\_\_ at \_\_\_\_\_

PC Secondary Review: mm 9/30/14

Cooler Breakdown: Date: 9/28/14 Time: 1116 by: dfs  
1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO  
2. Did all bottle labels and tags agree with custody papers? YES NO  
3. Were correct containers used for the tests indicated? YES NO  
4. Air Samples: Cassettes / Tubes Intact \_\_\_\_\_ Canisters Pressurized \_\_\_\_\_ Tedlar® Bags Inflated NA

Explain any discrepancies:

pH	Reagent	Yes	No	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH	
≥12	NaOH									Yes=All samples OK
≤2	HNO <sub>3</sub>									No=Samples were preserved at the lab as listed
≤2	H <sub>2</sub> SO <sub>4</sub>									
<4	NaHSO <sub>4</sub>									PM OK to Adjust:
Residual Chlorine (-)	For CN Phenol and 522			If +, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (CN), ascorbic (phenol).						
	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	-	-							
	ZnAcetate	-	-							
	HCl	**	**							

\*\*Not to be tested before analysis – pH tested and recorded by VOAs on a separate worksheet

Bottle lot numbers: 075714-2900  
Other Comments:

**R1407632** 5  
CH2M Hill  
Vieques West SWMU 4

PC Secondary Review: mm 10/2/14 \*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

## DataQual

## Worksheets - Perchlorate

### Data Completeness

The data package was received complete and intact. Resubmissions were not required. (Method 6850 with DOD modifications using Lab SOP). There is no Region II SOP for this method. **Laboratory: ALS Rochester**

### Holding Times

Sampling Date: 9/24-26/14  
Received Date: 9/27  
Prep Date: 9/30  
Analysis Dates: 9/30-10/1  
Cooler Temp: acceptable

All prep and analysis holding time requirements were met. This SDG consists of groundwater samples and four rinse blanks.

### Calibrations and Verifications

Mass assignments were verified. The submitted ICALs, SSCVs, CCVs and LODVs were within criteria; no qualifications were required.

### Internal Standards

All criteria were met.

### Blank Summary

There were no qualifications required based on method or lab blank contamination. QC blanks associated for these samples did not exhibit contamination or the results in the associated field samples were well above the LOD. NO qualifications were required.

### Laboratory Control Sample

All criteria were met.

### Matrix Spike/Spike Duplicate Samples

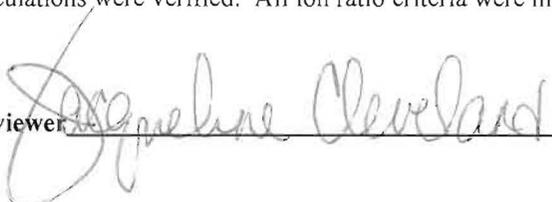
The MS/MSD pair of sample VWW04-MW09-14C exhibited recoveries that were non-compliant but they were out due to the abundance of the target compound in the native sample. The submitted LCS recoveries were acceptable. No qualifications were required.

### Field Duplicate Sample

The field duplicate pair of samples VWW04-MW05-14C and VWW04-MW05P-14C exhibited results that were less than the LOD in both aliquots (ND/0.050J). No qualifications were required.

### Specific Comments:

All sample results were reported within the calibration range of the instruments. Some dilutions were required to accurately quantitate the target compound in some samples. Detection limits were acceptable. Raw data and calculations were verified. The curves were verified and the values reported were accurate. Quantitation calculations were verified. All ion ratio criteria were met.

Reviewer: 

Date: 12/31/14

SR# R1407632  
NTR Vieques SWMU4  
Perchlorate  
Page 1

QA/QC Report

Client: CH2M Hill  
 Project: Vieques West SWMU 4/CTO-037  
 Sample Matrix: Ground Water

Service Request: R1407632  
 Date Collected: 9/26/14  
 Date Received: 9/27/14  
 Date Analyzed: 10/ 1/14

**Matrix Spike Summary**  
**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

Sample Name: WW04-MW09-14C Units: µg/L  
 Lab Code: R1407632-014 Basis: NA  
 Analytical Method: 6850  
 Prep Method: Method

Analyte Name	Sample Result	WW04-MW09-14CMS Matrix Spike RQ1411719-06			WW04-MW09-14CDMS Duplicate Matrix Spike RQ1411719-07			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Perchlorate	95	93.0	0.400	-500 #	93.0	0.400	-500 #	80 - 120	<1	15

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## Calculation Checks

### Perchlorate

ICAL 1/29/14 Instrument HPLCØ2

IS 0181P

✓ REF 0.2 ppb  $\frac{(38787)(1)}{(191426)(0.2)} = 1.013$  Lab Value - 1.013

%RSD =

mean = 1.074

✓ CCV 1.00 ppb 9/30/14 10:27pm Lab Value: 1.107 -2%Δ

REF  $\frac{215131(1)}{194276(1)} = 1.107$  %Δ  $\frac{1.085 - 1.107}{1.085} (100\%) = -2.03\%$

✓ • Sample Calc W004-mw02-14C Lab Value 13 µg/L

NF 10  $\frac{(294315)(1)(10)}{(193437)(1.085)} = 13.1 \mu\text{g/L}$  ✓

### Explosives

LR curves plotted: Regression curves provided  
2,4,6-TNT  $y = 3.15 \times 10^5 x$

✓ LCS KQ14122991-03 1.000g → 10ml 10/21/14 4:44:26am  
area = 6719100 amt =  $\frac{6719100}{3.15 \times 10^5} = 21.3 \mu\text{g/ml} \cdot \frac{10.0 \text{ mL}}{1\text{g}} \cdot \frac{1000\text{g}}{1\text{kg}}$

$\frac{1\mu\text{g}}{1000\text{ng}} = 213 \mu\text{g/Kg}$  ✓