



Weston Solutions, Inc.
1400 WESTON Way
West Chester, PA 19380
610-701-3000 • Fax 610-701-3186
www.westonsolutions.com

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29 June, 2015

U.S. Environmental Protection Agency Region III

Attn: Ms. Ruth Scharf

On-Scene Coordinator

1650 Arch Street

Philadelphia, Pennsylvania 19103

Subject: Final Trip Report – New Kent Wood Preservatives, Inc. February 2015 Removal Assessment

Project: New Kent Wood Preservatives, Inc. Site
EPA Contract No.: EP-S3-10-05
TDD No.: WS01-14-05-003
Document Control No.: W0233.1A.01158

Dear Ms. Scharf:

Weston Solutions, Inc. (WESTON®) is submitting the Final Trip Report for the New Kent Wood Preservatives Site. This Trip Report summarizes the removal assessment conducted at the New Kent Wood Preservatives, Inc. Site in February 2015. If you have any questions regarding this report, please call me at (757) 819-5306.

Sincerely,

WESTON SOLUTIONS, INC.

A handwritten signature in black ink that reads "Matt Fisher". The signature is written in a cursive, flowing style.

Matt Fisher
Project Task Lead

FINAL TRIP REPORT

NEW KENT WOOD PRESERVATIVES, INC FEBRUARY 2015 REMOVAL ASSESSMENT PROVIDENCE FORGE, VIRGINIA

**EPA CONTRACT NO.: EP-S3-10-05
TECHNICAL DIRECTION DOCUMENT NO.: WS01-14-05-003
DOCUMENT CONTROL NO.: W0233.1A.01158**

Prepared For:



**U.S. ENVIRONMENTAL PROTECTION AGENCY REGION III
HAZARDOUS SITE CLEANUP DIVISION
1650 ARCH STREET
PHILADELPHIA, PENNSYLVANIA 19103**

Prepared By



**WESTON SOLUTIONS, INC.
1400 WESTON WAY
WEST CHESTER, PA 19380**

WESTON PROJECT No.: 20403.012.001.0233.00

JUNE 2015

**FINAL
TRIP REPORT
NEW KENT WOOD PRESERVATIVES, INC. FEBRUARY 2015
REMOVAL ASSESSMENT
PROVIDENCE FORGE, NEW KENT COUNTY,
VIRGINIA**



WESTON – Project Task Lead
Matt Fisher

6/29/2015

Date



WESTON – START Removal SOW Manager
Erik Armistead

6/29/2015

Date

EPA – On-Scene Coordinator
Ruth Scharr

Date

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LIST OF ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
bgs	below ground surface
CCA	chromated copper arsenate
CLP	Contract Laboratory Program
DAS	Delivery of Analytical Services
Eco-SSL	Ecological Soil Screening Level
EPA	United States Environmental Protection Agency
GPS	Global Positioning System
ICP-MS	inductively coupled plasma-mass spectrometry
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
OSC	On-Scene Coordinator
QAPP	Quality Assurance Project Plan
RSL	Regional Screening Level
SOM01.2	Multi-Media, Multi-Concentration, Organic Analytical Service for Superfund
SOP	Standard Operating Procedure
SOW	Statement of Work
START	Superfund Technical Assessment and Response Team
SVOC	semivolatile organic compound
TAL	Target Analyte List
TDD	Technical Direction Document
TOC	total organic carbon
THQ	target hazard quotient
TR	target risk
UFP	Uniform Federal Policy
VADEQ	Virginia Department of Environmental Quality
WESTON®	Weston Solutions, Inc.
XRF	X-ray fluorescence

1.0 INTRODUCTION

Under the Eastern Area Superfund Technical Assessment and Response Team (START) Contract No. EP-S3-10-05, Technical Direction Document No. WS01-14-05-003, the U.S. Environmental Protection Agency (EPA) Region III tasked Weston Solutions, Inc. (WESTON®) to conduct field screening using x-ray fluorescence (XRF) technology, collect surface and subsurface soil samples, collect potable water samples, and collect groundwater monitoring well samples at the New Kent Wood Preservatives, Inc. site (Site) to supplement sampling results from June and September 2014. The objective of sampling was to verify the results of the September 2014 water samples and to further delineate the extent of the soil contamination around the former drip pad on the Site.

2.0 SITE INFORMATION

This section describes the site location, presents a description of the Site, and summarizes previous site investigation activities.

2.1 SITE LOCATION AND DESCRIPTION

The Site is located at 4101 South Mountcastle Road, Providence Forge, New Kent County, Virginia, and is depicted on **Figure 1**, Site Location Map. The geographic coordinates of the center of the Site are 37.4539° north latitude and 77.0910° west longitude (Blueskies, 2012). The Site is located approximately 1,500 feet south of the intersection of Route 60 and Route 615 in a primarily undeveloped/rural area.

The Site is currently occupied by two active businesses: McNeil Sales & Service Inc., providing refractory supplies and services; and Museum Resources, providing construction, design, and millwork services for historic sites, private owners, and commercial buildings.

As shown on **Figure 2**, Site Layout Map, directly surrounding the Site to the north are undeveloped forested land and wetlands, to the east are wetlands, to the south are active railroad tracks, and to the west is Mountcastle Road. An active tire recycling facility (Virginia Recycling Corporation) is located 0.14 mile north of the Site and an active asphalt manufacturer and

recycling plant (Lee Hwy Paving Corporation) is located on the south side of the railroad tracks that border the Site. The nearest residential property is located approximately 0.3 mile to the southwest. The nearest surface water is an unnamed tributary to Schiminoe Creek, located approximately 300 feet to the north and east of the Site from the property fence line. The unnamed tributary flows through the wetlands that border the Site and converges with Schiminoe Creek just upstream of the railroad tracks.

2.2 PREVIOUS SITE INVESTIGATIONS

The Site operated as a lumber company and pressure treated wood with a chromated copper arsenate (CCA) solution under various names and owners between 1977 and approximately 1993. **Figure 2**, Site Layout Map, depicts the Site and features used during lumber treatment operations. Throughout the operational history, the location of the drip pad, where CCA-treated wood was allowed to dry following treatment, remained in the center of the Site. A secondary drip pad was identified during the 1996 assessment by EPA south of the primary drip pad. Site drainage was reported to be a significant issue on-site over its history, with the Site often becoming inundated with mud. Drainage ditches were used throughout the Site to manage surface storm water flow (Blueskies, 2012).

The Virginia Department of Environmental Quality (VADEQ) and EPA have completed numerous assessments and inspections of the Site, documenting housekeeping issues, improper material handling, and employee complaints, which may be indicative of releases of hazardous materials to the environment. During the sampling assessment, conducted by EPA in 1996, arsenic, chromium, and copper were identified throughout site soils at maximum concentrations of 1,110 milligrams per kilogram (mg/kg), 900 mg/kg, and 602 mg/kg, respectively (Blueskies, 2012).

In June and September of 2014, WESTON conducted a removal assessment and an expanded site investigation at the Site. Information regarding site activities and results can be found in *The New Kent Wood Preservatives Inc. Removal Site Assessment Trip Report* (WESTON, 2015).

3.0 SITE ACTIVITIES

From February 24 to February 27, 2015, WESTON conducted in situ field screening using XRF technology and collected samples from the Site as outlined in the *Field Sampling and Analysis Plan* (WESTON, 2014a). Site activities were documented in accordance with WESTON Standard Operating Procedure (SOP) No. 101, Logbook Documentation (WESTON, 2014b). This section discusses sampling activities conducted during this assessment.

3.1 XRF SURFACE SOIL SCREENING

From February 25 to February 26, 2015, surface soils at the Site were analyzed in situ using an XRF field analyzer to screen potential sample locations as well as other locations of interest as directed by the EPA On-Scene Coordinator (OSC). All locations were field-screened for arsenic, chromium and copper. Approximately 25 locations were screened. Locations for field screening were primarily concentrated around the former drip pad area and just beyond the fence line on the east and northeast boundary of the Site. Global Positioning System (GPS) locational data were collected for each location that was field screened.

3.2 SURFACE SOIL SAMPLING

From February 25 to February 26, 2015, WESTON collected a total of 23 surface soil samples (locations 301 to 321), including two duplicate samples, from around the former drip pad and beyond the Site fence line to the east and northeast. Samples were collected from a depth of 0 to 6 inches below ground surface (bgs) in accordance with WESTON START SOP No. 302, Surface Soil Sampling (WESTON, 2011a) in order to further delineate the extent of contamination. Prior to sampling, the ground surface was loosened with shovels and any vegetation or debris was removed. The soil was first collected and homogenized in aluminum pans before being transferred into the appropriate sampling container. Each sample was analyzed for Target Analyte List (TAL) metals, hexavalent chromium, pH, and total organic carbon (TOC). Surface soil sample locations are provided on **Figure 3**, Soil Sampling Locations, February 2015.

3.3 SUBSURFACE SOIL SAMPLING

From February 25 to February 26, 2015, WESTON also collected a total of 18 subsurface soil samples from around the former drip pad and just outside the Site fence line bordering the wetlands area. These samples were collocated with the surface soil samples. Samples were collected at either 6 to 12 inches bgs or 12 to 18 inches bgs in accordance with WESTON SOP No. 304, Subsurface Soil Sampling (WESTON, 2011b) in order to delineate the depth of contamination. Prior to sampling, shovels were used to dig down to the designated depths. A jack hammer was used to loosen impenetrable soil material when encountered. The soil was first collected and homogenized in aluminum pans before being transferred into appropriate sample containers. Each sample was analyzed for TAL metals, hexavalent chromium, pH, and TOC. Subsurface soil sample locations are provided on **Figure 3**, Soil Sampling Locations February 2015

3.4 POTABLE WATER SAMPLING

From February 25 to February 27, 2015, six potable water samples, including one duplicate sample, were collected by WESTON from two adjacent business locations, two nearby residential properties, and from the bathroom sink at the Site office building. The potable water samples were collected to determine whether contamination associated with the Site was affecting potable water at the Site or nearby properties. Additionally, sampling was conducted to verify the sample results from the September 2014 sampling event. Potable water samples were collected directly from an outdoor spigot or from an inside cold water tap in accordance with WESTON SOP No. 202, Residential Groundwater Sampling (WESTON, 2011c). The potable well depths were reported to be between approximately 250 and 500 feet deep, according to the various property owners, with the exception of one residential potable well. Official water depth levels were not collected at any of the potable well sample locations.

Prior to sampling, the residential wells were purged from the sampling location for a minimum of 15 minutes into 5-gallon buckets to control dispersion of purge water. The purge water was then discharged directly to the ground surface at each property in a manner that would not cause ponding. Potable water samples were collected from the purge locations directly into the

appropriate sample containers. Each sample was analyzed for total and dissolved TAL metals by inductively coupled plasma-mass spectrometry (ICP-MS), as well as semivolatile organic compounds (SVOCs). Dissolved metal samples were filtered using a hand pump in the field and transferred to a separate sample container. Sample locations are shown on **Figure 4, Water Sample Locations Map**.

3.5 GROUNDWATER MONITORING WELL SAMPLING

On February 27, 2015, WESTON collected two groundwater samples from two existing monitoring wells located on the Site in accordance with WESTON SOP No. 201, Groundwater Well Sampling (WESTON, 2011d). The on-site monitoring well depths ranged from 20 to 25 feet bgs. The water level at the time of sampling was observed to be between 6 and 7 feet bgs. The two site monitoring wells were purged using 2-inch dedicated disposable polyethylene bailers. Approximately two well volumes were purged from each well prior to sampling. All purge water was stored in 5-gallon buckets and dispersed on-site in accordance with the direction of the OSC. Once the appropriate purge volume was removed, groundwater samples were collected directly from the bailers into the appropriate sample containers for total and dissolved TAL metals analysis by ICP-MS, and SVOC analysis.

3.6 SAMPLE MANAGEMENT

All samples collected during the February 2015 removal assessment were handled and packaged in accordance with the *Contract Laboratory Program Guidance for Field Samplers* (EPA, 2011), the EPA Region III START 4 Program-Wide Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) (WESTON, 2010a) and the WESTON Environmental Sample Shipment Checklist (WESTON, 2010b). All shipping containers were properly labeled with EPA chain-of-custody seals and delivered with signed chain-of-custody forms and appropriate hazard warnings for laboratory personnel. Copies of the chain-of-custody records are provided with the Validated Laboratory Results Packages in **Appendix A**. As appropriate, samples were preserved and all samples were kept on ice during delivery to the assigned laboratories.

4.0 ANALYTICAL RESULTS

This section summarizes the analytical results for the samples collected at the Site by WESTON during this assessment. Water samples were analyzed under the EPA Contract Laboratory Program (CLP) in accordance with the EPA CLP Statement of Work (SOW) SOM01.2 for SVOCs (EPA, 2007a), and SOW ISM01.3 for TAL metals using ICP-MS (EPA, 2010). Validation of analytical results for samples submitted to the CLP laboratory was completed by the EPA Environmental Services Assistance Team contractor. The validated analytical data packages are provided in **Appendix A**.

Additionally, soil samples and associated rinsate blanks were analyzed under Delivery of Analytical Services (DAS) case R34567 for analysis in accordance with EPA 6010 for TAL metals, EPA 3060A/7196A for hexavalent chromium, EPA 9045 for pH, and the Lloyd Kahn method for TOC. Validation of analytical results for samples submitted through DAS case R34567 was performed by WESTON. The validated analytical data packages are provided in **Appendix A**.

Soil sample results were compared to the EPA Regional Screening Levels (RSLs) for Residential and Industrial Soil (EPA, 2015) corresponding to 1E-05 risk level for carcinogens, as well as a non-cancer risk level calculated using a Target Hazard Quotient (THQ) of 1. Potable water and groundwater sample results were compared groundwater Maximum Contaminant Levels (MCLs) (EPA, 2009) **See Table 1**. Soil sample results were also compared to the Ecological Soil Screening Levels (Eco-SSLs) (EPA, 2005, 2007b, 2008) **See Table 2**. Eco-SSLs are concentrations of contaminants in soil that are protective of ecological receptors that commonly come into contact with and/or consume biota that live in or on soil. Eco-SSLs are derived for four groups of ecological receptors: plants, soil invertebrates, birds and mammals. The Eco-SSLs are soil screening numbers and are not designed to be used as cleanup levels. However, these values are presumed to provide adequate protection of terrestrial ecosystems.

4.1 SURFACE SOIL SAMPLE RESULTS – FEBRUARY 2015

Three background samples were collected from the residential property to the northwest of the Site in June 2014. The samples were collected from an undeveloped and undisturbed area west of the developed portion of the residential property beyond the tree line. Organic material, consisting mainly of leaves and roots, was removed from the sample. Arsenic concentrations in the background samples ranged from 1.8 mg/kg to 2.3 mg/kg. Total chromium concentrations in background samples ranged from 4.3 mg/kg to 4.6 mg/kg. Copper concentrations in background samples ranged from 2.9 mg/kg to 6.5 mg/kg.

A brief summary of the surface soil sample exceedances is presented below. The trivalent chromium results used, as shown in Table 3 are derived by subtracting the hexavalent chromium result from the total chromium result, with the assumption that trivalent chromium and hexavalent chromium make up 100% of the total chromium result.

Table 1 Regional Screening Levels and Maximum Contaminant Levels

Analysis	Residential Soil RSL(1E-05)	Industrial Soil RSL (1E-05)	MCL
Arsenic	6.8 mg/kg	30 mg/kg	10 µg/l
Chromium III	1.2 E+04 mg/kg	1.8E+05 mg/kg	NA
Chromium VI	3 mg/kg	63 mg/kg	NA
Total Chromium	NA	NA	10 µg/l
Copper	310 mg/kg	4700 mg/kg	1.3E+03

N/A = Not applicable.

Arsenic

- 21 of 23 samples exceeded the Residential RSL of 6.8 mg/kg
- 17 of 23 samples exceeded the Industrial RSL of 30 mg/kg

Hexavalent Chromium

- 12 of the 23 samples exceeded the Residential RSL of 3 mg/kg.
- None of the 23 samples exceeded the Industrial RSL of 63 mg/kg.

Trivalent Chromium

- None of the 23 samples exceeded the Residential RSL of 1.2 E+04 mg/kg or the Industrial RSL of 1.8E+05 mg/kg.

Copper

- None of the 23 samples exceeded the Residential RSL of 310 mg/kg or the Industrial RSL of 4,700 mg/kg.

Results of the surface soil samples indicate 19 of the 23 samples exceeded the most conservative Eco-SSL for arsenic, chromium, and/or copper. The Eco-SSLs used are provided in **Table 2** and a brief summary of the exceedances is presented below. The trivalent chromium results used, as shown in Table 3, are derived by subtracting the hexavalent chromium result from the total chromium result, with the assumption that trivalent chromium and hexavalent chromium make up 100% of the total chromium result.

Table 2 Eco-SSL Levels

Analysis	Wildlife		Plant
	Avian	Non-Avian	
Arsenic	43 mg/kg	34 mg/kg	18 mg/kg
Chromium III	26 mg/kg	34 mg/kg	N/A
Chromium VI	N/A	130 mg/kg	N/A
Copper	28 mg/kg	49 mg/kg	70 mg/kg

Note:

N/A = Not applicable.

Arsenic

- 15 of 23 samples exceeded the avian Eco-SSL of 43 mg/kg.
- 14 of 23 samples exceeded the non-avian Eco-SSL of 46 mg/kg.
- 19 of 23 samples exceeded the plant Eco-SSL of 18 mg/kg.

Trivalent Chromium

- 18 of 23 samples exceeded the avian Eco-SSL of 26 mg/kg.
- 16 of 23 samples exceeded the non-avian Eco-SSL of 34 mg/kg.

Copper

- 16 of 23 samples exceeded the avian Eco-SSL of 28 mg/kg.
- 13 of 23 samples exceeded the non-avian Eco-SSL of 49 mg/kg.
- 11 of 23 samples exceeded the plant Eco-SSL of 70 mg/kg.

None of the samples collected exceeded the Eco-SSL for hexavalent chromium.

The maximum concentrations identified in the surface soil samples were 246 mg/kg at location 305 for arsenic, 1,480 mg/kg at location 315 for total chromium, 23.4 mg/kg at location 321 for hexavalent chromium, 1,470 mg/kg at location 315 for trivalent chromium, and 282 mg/kg at location 310 for copper. TOC was analyzed at select locations, primarily along the edge of the property boundaries and wetland areas. TOC values ranged from 3,030 to 79,400 mg/kg. Additionally, pH was analyzed at every location and ranged from 4.71 to 8.45. Analytical results for TAL metals, hexavalent chromium, TOC, and pH are provided in **Table 3** below.

Table 3 Surface Soil Sample Results, February 2015

Table 3 Surface Soil Sample Results, February 2015 Sample Location	Depth (Inches)	Arsenic	Chromium	Copper	Total Organic Carbon	Hexavalent Chromium	Trivalent Chromium (Calculated)	pH
Eco-SSL Screening Value (most conservative)		18	N/A	28	N/A	130	26	N/A
301	0-6	39.0J	49.3J	30.3J	N/A	3.14UJ	46.16	7.19
302	0-6	8.72J-	12.6J	6.4J	N/A	.829J	11.771	7.61
303	0-6	84.7J	91.0J	64.7J	N/A	6.56UJ	84.44	6.61
303D	0-6	43.8J	60.1J	51.0J	N/A	6.04UJ	54.06	6.56
304	0-6	49.8J	195J	94.9J	51,500J-	3.4UJ	191.6	6.88
305	0-6	246J	331J	166J	73,400J+	4.24J	326.76	5.95
306	0-6	13.6J	13.5J	6.22J	77,40J+	4.1J	9.4	4.71
307	0-6	20.6J	28.5J	20.7J	5,670J+	4.43J	24.07	6.84
308	0-6	130J	90.4J	157J	10,500J+	5.55J	84.85	6.08
309	0-6	27.4J	33.7J	24.6J	15,700J+	7.61J	26.09	6.57
310	0-6	218J	214J	282J	20,800J+	6.82J	207.18	6.53
311	0-6	229J	218J	167J	14,800J+	1.61J	216.39	5.98
312	0-6	2.32J-	4.95J	2.83J	8,820J+	2.19UJ	2.76	5.77
313	0-6	128J+	121J+	158	8,950	2.06J	118.94	6.13
314	0-6	134J+	295J+	75.7	18,200	2.75J	295.25	5.55
314D	0-6	128J+	335J+	84.2	11,900	12.0J	323	6.31
315	0-6	168J+	1,480J+	131	79,400	9.78	1,470.22	5.75
316	0-6	23.8J+	35.5J+	19.2	N/A	1.51J	33.99	8.01
317	0-6	5.62J	9.11J+	4.54	N/A	2.15U	6.96	5.98
318	0-6	49.8J+	70.9J+	39	N/A	4.24	66.66	8.45
319	0-6	156J+	188J+	175	N/A	8.22	179.78	7.75
320	0-6	46.5J+	50.5J+	34.7	3,030J-	3.47	47.03	8.32
321	0-6	174J+	248J+	160	N/A	23.4	224.6	8.41

Notes:

All values other than pH are in milligrams per kilogram (mg/kg).

The value reported for trivalent chromium is a calculated value derived by subtracting the hexavalent chromium result from the chromium result.

Screening levels are based on the most conservative Eco-SSLs.

N/A = Not applicable.

D = Duplicate sample.

J = The result reported is an estimated quantity.

J+ = The result is an estimated quantity, but the result may be biased high.

J- = The analyte was positively detected, but the value of the result is an estimate and may be biased low.

U = The analyte was not detected at or above the Reporting Limit.

UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

4.2 SUBSURFACE SOIL SAMPLE RESULTS – FEBRUARY 2015

Results of the subsurface soil samples indicate hazardous substances from former CCA wood treating operations have migrated to at least 18 inches bgs. A brief summary of subsurface soil sample exceedances is presented below and the subsurface soil sample results are provided in **Table 4**. The trivalent chromium results used, as shown in Table 4, are derived by subtracting the hexavalent chromium result from the total chromium result, with the assumption that trivalent chromium and hexavalent chromium make up 100% of the total chromium result. The following results are for the samples collected from 6 to 12 inches bgs:

Arsenic

- 7 of 13 samples exceeded the avian Eco-SSL of 43 mg/kg.
- 6 of 13 samples exceeded the non-avian Eco-SSL of 46 mg/kg.
- 11 of 13 samples exceeded the plant Eco-SSL of 18 mg/kg.
- 12 of 13 samples exceeded the Residential RSL of 6.8 mg/kg.
- 9 of 13 samples exceeded the Industrial RSL of 30 mg/kg.

Trivalent Chromium

- 8 of 13 samples exceeded the avian Eco-SSL of 26 mg/kg.
- 10 of 13 samples exceeded the non-avian Eco-SSL of 34 mg/kg.
- None of the samples exceeded the Residential RSL of 1.2 E+04 mg/kg or the Industrial RSL of 1.8 E+0

Hexavalent Chromium

- 5 of 13 samples exceeded the Residential RSL of 3.0 mg/kg.
- None of the samples exceeded the Industrial Soil RSL of 63 mg/kg.

Copper

- 8 of 13 samples exceeded the avian Eco-SSL of 28 mg/kg.
- 3 of 13 samples exceeded the non-avian Eco-SSL of 49 mg/kg.
- 2 of 13 samples exceeded the plant Eco-SSL of 70 mg/kg.
- None of the samples exceeded the Residential RSL of 310 mg/kg or the Industrial RSL of 4700 mg/kg.

At the 6 to 12 inch bgs sampling interval the highest results were 157 mg/kg at location 321 for arsenic, 288 mg/kg at location 321 for total chromium, 12.6 mg/kg at location 306 for hexavalent chromium, 284 mg/kg at location 321 for trivalent chromium, and 85.8 mg/kg at location 319 for copper.

The following results are for the 5 samples that were collected from 12 to 18 inches bgs:

Arsenic

- 3 of 5 samples exceeded the avian Eco-SSL of 43 mg/kg.
- 3 of 5 samples exceeded the non-avian Eco-SSL of 46 mg/kg.
- 4 of 5 samples exceeded the plant Eco-SSL of 18 mg/kg.
- 4 of 5 samples exceeded the Residential RSL of 6.8 mg/kg
- 4 of the 5 samples exceeded the Industrial RSL of 30 mg/kg

Trivalent Chromium

- 4 of 5 samples exceeded the avian Eco-SSL of 26 mg/kg.
- 4 of 5 samples exceeded the non-avian Eco-SSL of 34 mg/kg.
- None of the samples exceeded the Residential RSL of 1.2+04
- None of the samples exceeded the Industrial RSL of 1.8 E+05

Hexavalent Chromium

- None of the samples exceeded the Eco-SSL of 130 mg/kg .
- 3 of the 5 samples exceeded the Residential RSL of 3.0 mg/kg.
- None of the 5 samples exceeded the Industrial RSL of 63 mg/kg

Copper

- 3 of 5 samples exceeded the avian Eco-SSL of 28 mg/kg.
- 2 of 5 samples exceeded the non-avian Eco-SSL of 49 mg/kg.
- 1 of 5 samples exceeded the plant Eco-SSL of 70 mg/kg.
- None of the samples exceeded the Residential RSL of 310 mg/kg.
- None of the samples exceeded the Industrial RSL of 4700 mg/kg.

14 samples were submitted for TOC analysis; the selected samples were primarily samples collected along the edge of the property boundaries and wetland areas. TOC values ranged from 2,810 to 12,200 mg/kg. Additionally, pH was analyzed at every location and ranged from 4.71 to 8.64. Analytical results for subsurface soil TAL metals, hexavalent chromium, TOC, and pH are provided in **Table 4** below.

Table 4 Subsurface Soil Sample Results, February 2015

Sample Location	Depth (Inches)	Arsenic	Chromium	Copper	Total Organic Carbon	Hexavalent Chromium	Trivalent Chromium (Calculated)	pH
Eco-SSL Screening Value *		18	N/A	28	N/A	130	26	N/A
305	6-12	43.0J	72.3J	45.8J	6250J+	11.8J	60.5	4.71
306	6-12	24.5J	20.1J	8.28J	4030J+	12.6J	7.5	4.72
307	6-12	14.5J	17.1J	11.8J	12200J+	5.34J	11.76	6.79
308	6-12	48.1J	33.1J	48.2J	3990J+	2.27J	30.83	6.13
310	6-12	48.9J	32.5J	51.0J	N/A	1.23J	31.27	6.48
311	6-12	21.2J	14.9J	20.3J	7100J+	2.84J	12.06	6.51
312	6-12	1.13J-	3.15J	1.97J	4840J+	2.16UJ	0.99	5.48
313	6-12	63.1J+	22.6J+	33	2810	2.17U	20.43	6.15
317	6-12	37.9J+	82.4J+	16.8	N/A	2.16UJ	80.24	6.96
	12-18	1.53J	4.38J+	1.84	N/A	2.13U	2.25	4.86
318	6-12	39.4J+	54.7J+	30	N/A	2.14	52.56	8.16
	12-18	33.0J+	48.3J+	23.5	N/A	5.37	42.93	7.96
319	6-12	102J+	106J+	85.8	N/A	4.67	101.33	7.89
	12-18	46.9J+	61.0J+	37	N/A	2.9	58.1	7.96
320	6-12	64.8J+	68.3J+	44.4	N/A	0.643J	67.657	8.28
	12-18	57.5J+	83.5J+	49.2	N/A	3.26	80.24	8.09
321	6-12	157J+	288J	186	N/A	3.12	284.88	8.54
	12-18	121J+	184J+	106J+	N/A	6.20J-	177.8	8.64

Notes:

*Most conservative Eco-SSL

All values other than pH are in milligrams per kilogram (mg/kg).

The value reported for trivalent chromium is a calculated value derived by subtracting the hexavalent chromium result from the chromium result.

Screening levels are based off of the most conservative Eco-SSLs.

N/A = Not applicable.

D = Duplicate sample.

J = The result reported is an estimated quantity.

J+ = The result is an estimated quantity, but the result may be biased high.

J- = The analyte was positively detected, but the value of the result is an estimate and may be biased low.

U = The analyte was not detected at or above the Reporting Limit.

UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

4.3 POTABLE WATER SAMPLE RESULTS –FEBRUARY 2015

Potable water analytical results were compared to their respective MCLs for drinking water. No results were detected at concentrations above applicable MCLs in any of the potable water samples. **Table 5 provides the Maximum Contaminant Levels.** Table 6 outlines the sample results of the February 2015 dissolved and total metals potable water sampling event.

Table 5 – Maximum Contaminant Levels

Analysis	MCL
Arsenic	10 µg/l
Chromium III	NA
Chromium VI	NA
Total Chromium	10 µg/l
Copper	1.3E+03

NA- not applicable

Table 6 Dissolved and Total Metals Potable Water Results, February 2015

Sample Location	Sample Matrix	Sample Date	Chemical Name	Result (Dissolved)	Result (Total)
DW01	Water	02/26/2015	Arsenic	1.0 U	1.0 U
DW01	Water	02/26/2015	Chromium	2.0 UJ	2.0 UJ
DW01	Water	02/26/2015	Copper	2.0 U	2.0 U
DW02	Water	02/27/2015	Arsenic	0.38 J	0.42 J
DW02	Water	02/27/2015	Chromium	2.0 UJ	2.0 UJ
DW02	Water	02/27/2015	Copper	0.53 J	0.68 J
DW03	Water	02/25/2015	Arsenic	0.37 J	0.46 J
DW03	Water	02/25/2015	Chromium	2.0 UJ	2.0 UJ
DW03	Water	02/25/2015	Copper	0.91 J	2.0 J
DW03	Water	02/25/2015	Arsenic	0.39 J	0.30 J
DW03	Water	02/25/2015	Chromium	2.0 UJ	2.0 UJ
DW03	Water	02/25/2015	Copper	0.91 J	0.90 J

Sample Location	Sample Matrix	Sample Date	Chemical Name	Result (Dissolved)	Result (Total)
DW04	Water	02/26/2015	Arsenic	1.0 U	1.0 U
DW04	Water	02/26/2015	Chromium	2.0 UJ	0.17 J-
DW04	Water	02/26/2015	Copper	2.5	0.87J
DW05	Water	02/26/2015	Arsenic	0.22 J	1.0 U
DW05	Water	02/26/2015	Chromium	2.0 UJ	2.0 UJ
DW05	Water	02/26/2015	Copper	0.91 J	1.1 J

Notes:

All values are presented in micrograms per liter (µg/L).

DW - Drinking (residential) Well.

MW = Monitoring Well.

J = The result reported is an estimated quantity.

J- = The analyte was positively detected, but the value of the result is an estimate and may be biased low.

U = The analyte was not detected at or above the Reporting Limit.

UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

4.4 GROUNDWATER MONITORING WELL SAMPLE RESULTS – FEBRUARY 2015

Concentrations of dissolved arsenic detected in groundwater samples collected from the on-site monitoring wells were 9.9 micrograms per liter (µg/L) and 14.4 µg/L at locations MW04 and MW05, respectively. The total metals results for arsenic were 11.1 µg/L and 16.8 µg/L at locations MW04 and MW05, respectively. Dissolved and total arsenic levels were reported at or above the MCL, which indicates that arsenic has impacted the shallow onsite groundwater. Chromium and copper results for both total and dissolved metals were below the screening levels or the reporting limit. **Table 6** outlines the sample results of the February 2015 dissolved and total metals groundwater sampling event.

Table 6 Dissolved and Total Metals Groundwater Results, February 2015

Sample Location	Sample Matrix	Sample Date	Chemical Name	Result (Dissolved)	Results (Total)
MW04	Water	02/27/2015	Arsenic	9.9	11.1
MW04	Water	02/27/2015	Chromium	0.14 J-	0.58 J
MW04	Water	02/27/2015	Copper	2.0 U	2.5
MW05	Water	02/27/2015	Arsenic	14.4	16.8
MW05	Water	02/27/2015	Chromium	1.7 J	4.2
MW05	Water	02/27/2015	Copper	2.0 U	1.1 J

Notes:

All values are presented in micrograms per liter (µg/L).

DW - Drinking (residential) Well.

MW = Monitoring Well.



J = The result reported is an estimated quantity.

J- = The analyte was positively detected, but the value of the result is an estimate and may be biased low.

U = The analyte was not detected at or above the Reporting Limit.

UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

5.0 REFERENCES

- Blueskies (Blueskies Environmental Associates, Inc.) 2012. *Final Site Reassessment Report for the New Kent Wood Preservatives, Inc. Site*. May
- EPA (United States Environmental Protection Agency). 2005. *Ecological Soil Screening Levels for Arsenic. Interim Final*. March
- EPA (United States Environmental Protection Agency). 2007a. *USEPA Contract Laboratory Program Analytical Methods for Organic Analysis*. Organic Superfund Method 01.2. April.
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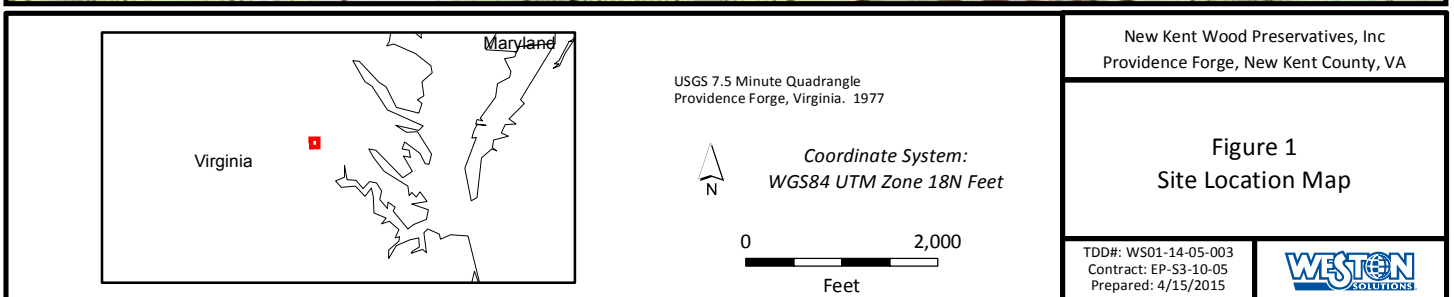
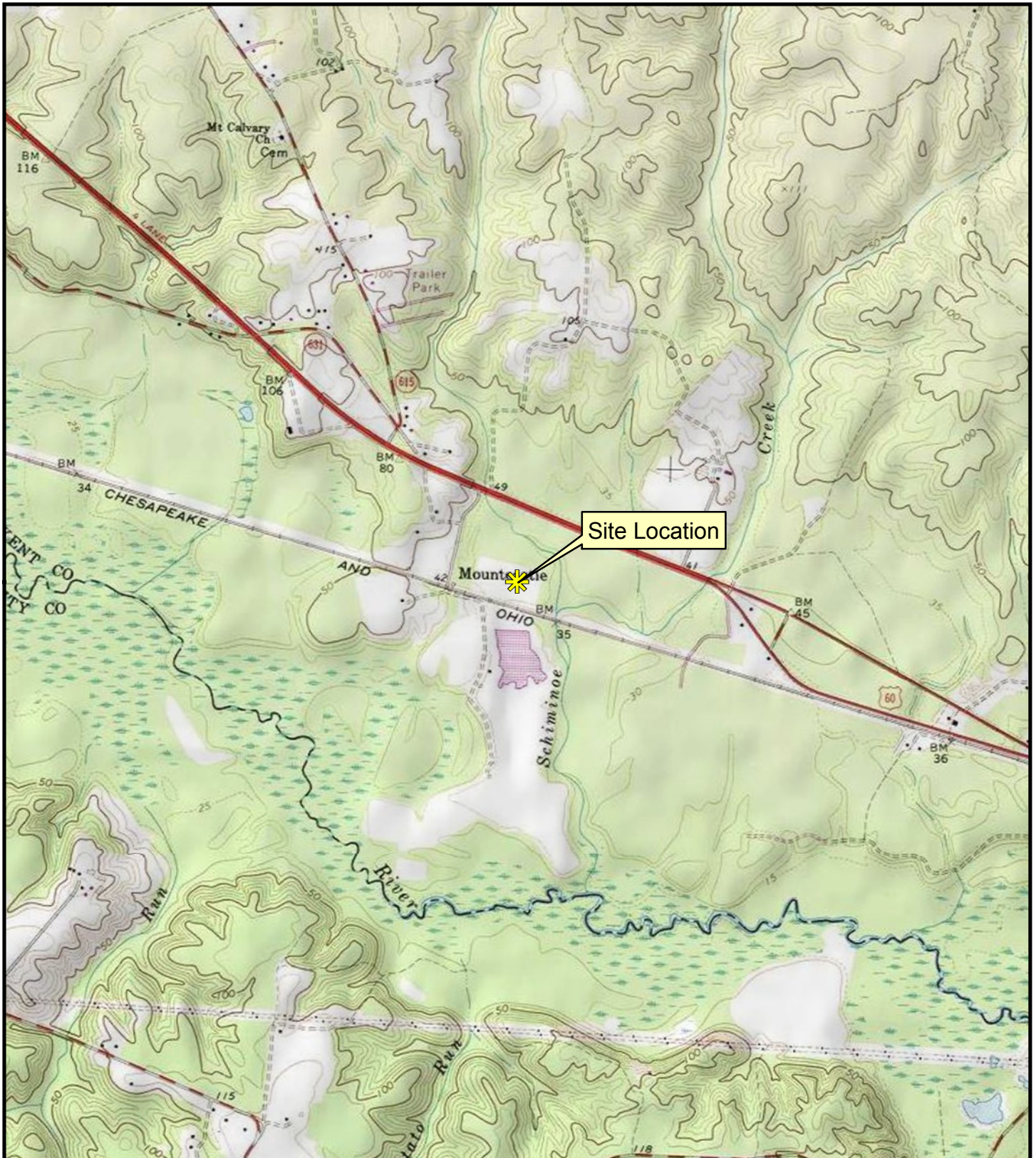


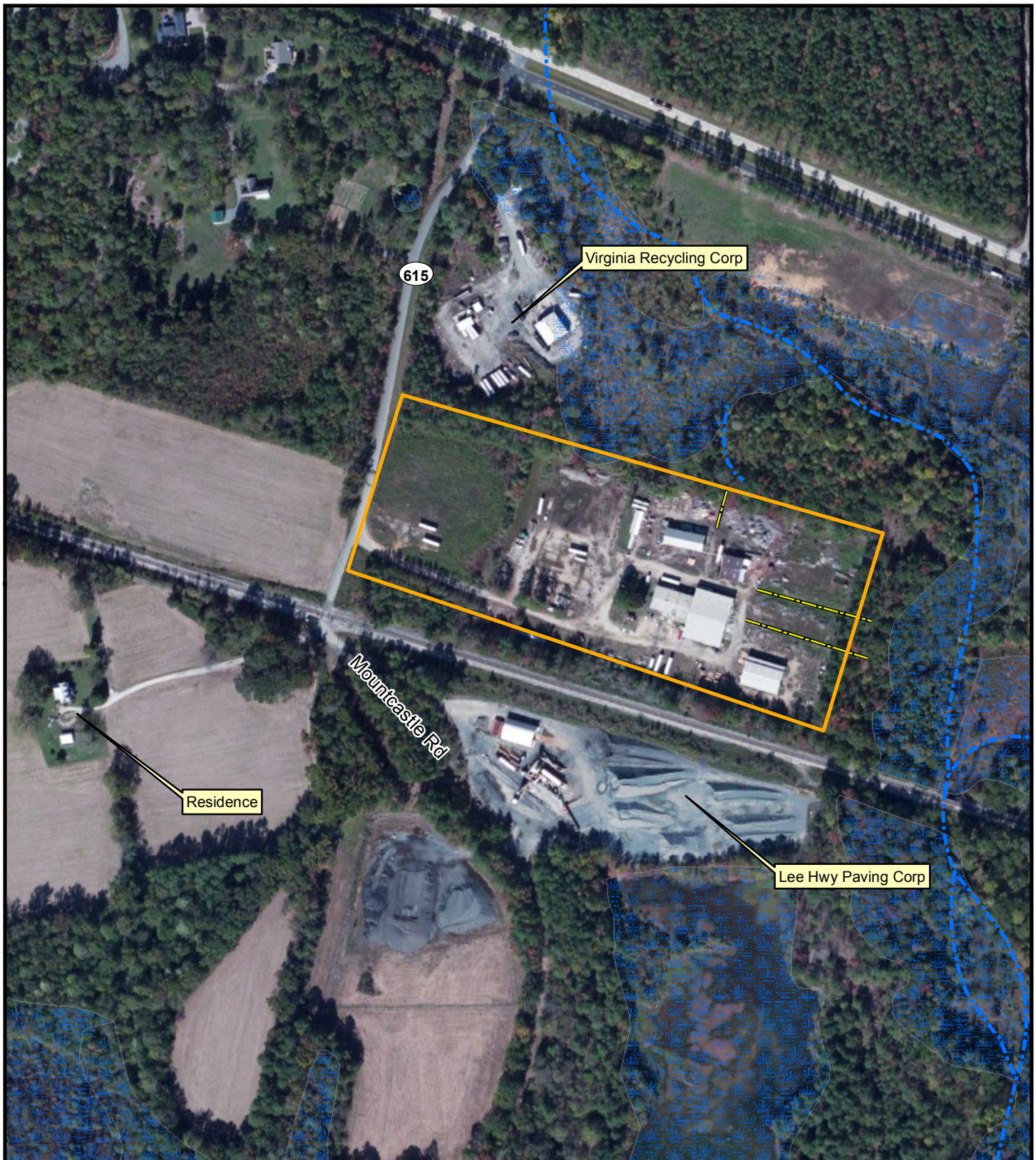
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WESTON (Weston Solutions, Inc.). 2015. *The New Kent Wood Preservatives Inc. Removal Site Assessment Trip Report*.

FIGURES





Legend

- Site Boundary
- NWI Wetlands
- Inferred stream channel from Topographic Map
- Drainage Ditch

USGS 7.5 Minute Quadrangle
Providence Forge, Virginia. 1977



Coordinate System:
WGS84 UTM Zone 18N Feet

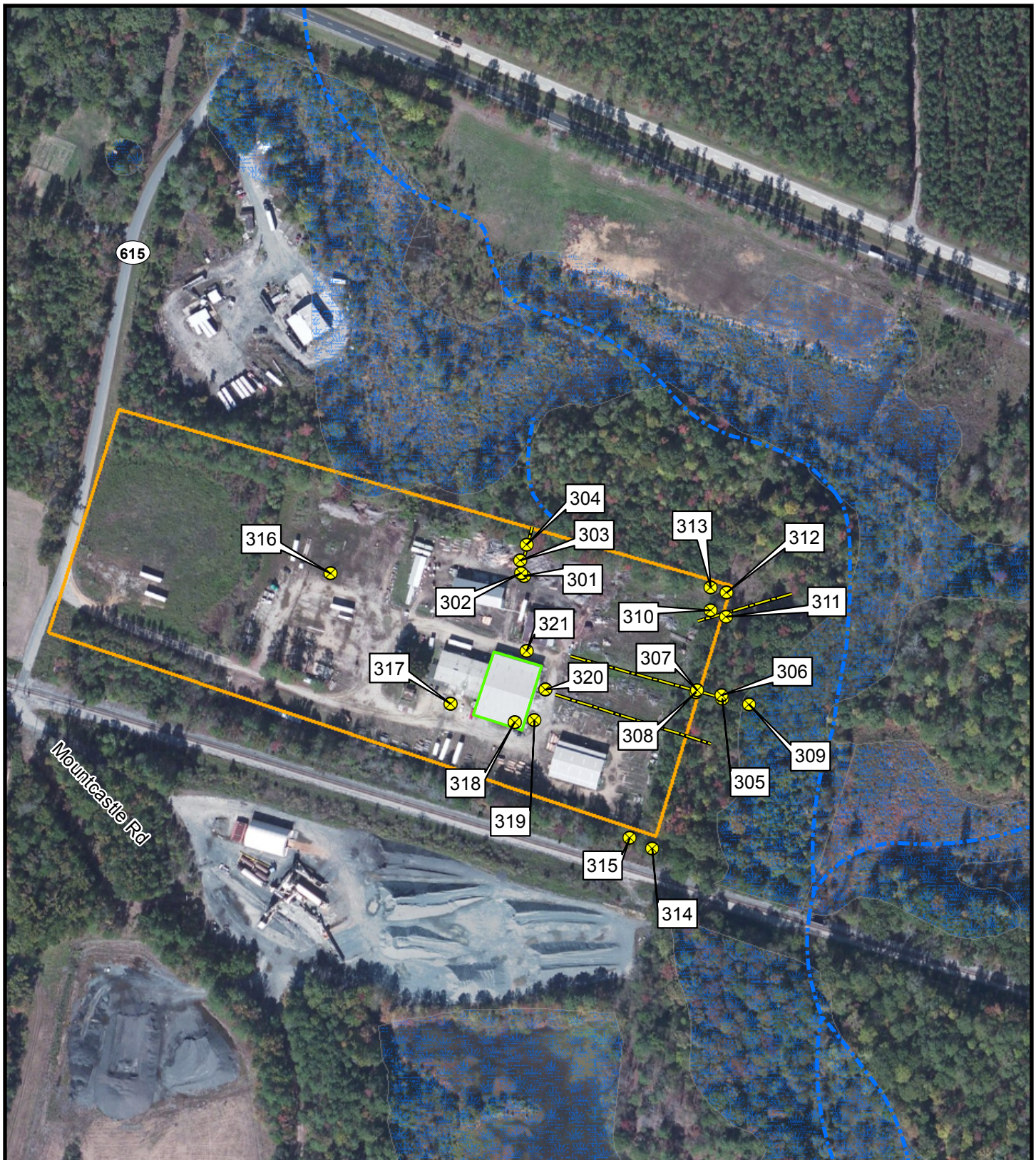
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New Kent Wood Preservatives, Inc
Providence Forge, New Kent County, VA

Figure 2
Site O Map

TDD#: WS01-14-05-003
Contract: EP-S3-10-05
Prepared: 4/15/2015





Legend

- Site Boundary
- NWI Wetlands
- Former Drip Pad
- Inferred stream channel from Topographic Map
- Drainage Ditch
- Sample Locations Feb 2015

Imagery: ESRI, USGS
Mapping Service, 2010



Coordinate System:
WGS84 UTM Zone 18N Feet

0 200
Feet

New Kent Wood Preservatives, Inc
Providence Forge, New Kent County, VA

Figure 3
Soil Sampling Locations
February 2015

TDD#: WS01-14-05-003
Contract: EP-S3-10-05
Prepared: 6/25/2015





Legend

- Site Boundary
- NWI Wetlands
- Inferred stream channel from Topographic Map
- Drainage Ditch
- X Sampling Locations

Imagery: ESRI, USGS
Mapping Service, 2010



Coordinate System:
WGS84 UTM Zone 18N Feet

0 400
Feet

New Kent Wood Preservatives, Inc
Providence Forge, New Kent County, VA

Figure 4
Groundwater Sample
Location Map

TDD#: WS01-14-05-003
Contract: EP-S3-10-05
Prepared: 4/15/2015



APPENDIX A

DATA VALIDATION REPORTS AND VALIDATED ANALYTICAL RESULTS PACKAGES



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: April 1, 2015

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald 
Region III ESAT PO (3EA22)

TO: Ruth Scharr
On-Scene Coordinator (3HS31)

Attached is the metals data validation report for the New Kent Wood Preservatives, Inc. site for Case 45112; SDG#:MC0AA1 completed by the Region III Environmental Services Assistance Team (ESAT), ICF International, contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2607.

Attachment

cc: Laura Mathew (WESTON)

TO: #0002 TDF: #0315032

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE





ICF International
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3011

Date: March 30, 2015

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Kurt Roby
Data Reviewer

Kenneth W. Curry
Oversight Chemist

Subject: Inorganic Data Validation (S4VEM)
Site: New Kent Wood Preservatives, Inc.
Case: 45112 SDG: MC0AA1

Overview

Case 45112, Sample Delivery Group (SDG) MC0AA1, consisted of one (1) field blank, two (2) ground water samples and six (6) potable water samples including one (1) field duplicate pair analyzed for dissolved metals by ICP-MS. Analyses were performed by ChemTech Consulting Group (CHEM) according to Contract Laboratory Program (CLP) Statement of Work (SOW) ISM01.3 (modified) through the Routine Analytical Services (RAS) program.

Summary

Data were validated according to inorganic National Functional Guidelines, utilizing Environmental Data Exchange and Evaluation System (EXES) and is assigned the Superfund Data Validation Label S4VEM (Stage_4_Validation_Electronic_Manual). The following validation narrative is an evaluation of laboratory reported data for the purpose of usability.

No drinking water sample in this SDG reported a result which exceeded the National Primary Drinking Water Regulations (NPDWRs) Maximum Contaminant Level (MCL), nor did they exceed the Numeric Removal Action Levels for Drinking Water promulgated by the Office of Solid Waste and Emergency Response (OSWER).

Minor Problem

Laboratory instrumentation reported negative values for chromium (Cr), iron (Fe), manganese (Mn), potassium (K), vanadium (V) and zinc (Zn) greater than absolute values of the Method Detection Limits (MDLs) in blank analyses. Positive results reported for Cr and Zn which were less than two times ($<2X$) the absolute values of the blank concentrations may be biased low and has been qualified “J-”. Quantitation limits for these analytes are estimated and qualified “UJ”. Results reported for these analytes attributed to positive blank contamination were not qualified based on these outliers.

Notes

Analytes detected below Contract Required Quantitation Limits (CRQLs) not attributed to blank contamination are qualified “J”.

Calcium (Ca), magnesium (Mg), Mn and silver (Ag) have been positively identified in laboratory and field blanks associated with the samples in this SDG. Potable water samples which reported positive results for these analytes less than CRQLs have been qualified “B” as possible blank contamination. Field blank sample MC0AB7, which reported a positive result for Ag less than the CRQL, was reported at the CRQL and qualified “U”.

The concentration for sodium (Na) exceeded the calibration range in the initial analysis for sample MC0AB1. This sample was re-analyzed at a ten-fold (10X) dilution to bring the concentration of the analyte within the calibration range. The result for this analyte was reported from the dilution noted.

Results reported for field duplicate pair MC0AA5/MC0AA7 were within twenty (20) Relative Percent Difference (RPD), \pm CRQL for all analytes. No data were qualified based on field duplicate pair precision.

Glossary of Data Qualifier Codes (INORGANIC)

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
B	The result is presumed a blank contaminant. This qualifier is used only for drinking water samples.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Sample Summary Report

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: LCS	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location:	pH:	Sample Date: 03/05/2015	Sample Time: 18:06:50
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Spike	46.2		ug/L	46.2		1	Yes	S4VEM
Antimony	Spike	3.9		ug/L	3.9		1	Yes	S4VEM
Arsenic	Spike	2.3		ug/L	2.3		1	Yes	S4VEM
Barium	Spike	19.6		ug/L	19.6		1	Yes	S4VEM
Beryllium	Spike	2.0		ug/L	2.0		1	Yes	S4VEM
Cadmium	Spike	2.0		ug/L	2.0		1	Yes	S4VEM
Calcium	Spike	986		ug/L	986		1	Yes	S4VEM
Chromium	Spike	3.9		ug/L	3.9		1	Yes	S4VEM
Cobalt	Spike	2.0		ug/L	2.0		1	Yes	S4VEM
Copper	Spike	4.3		ug/L	4.3		1	Yes	S4VEM
Iron	Spike	409		ug/L	409		1	Yes	S4VEM
Lead	Spike	2.0		ug/L	2.0		1	Yes	S4VEM
Manganese	Spike	2.0		ug/L	2.0		1	Yes	S4VEM
Nickel	Spike	2.1		ug/L	2.1		1	Yes	S4VEM
Selenium	Spike	10.5		ug/L	10.5		1	Yes	S4VEM
Silver	Spike	1.9		ug/L	1.9		1	Yes	S4VEM
Thallium	Spike	2.1		ug/L	2.1		1	Yes	S4VEM
Magnesium	Spike	1010		ug/L	1010		1	Yes	S4VEM
Vanadium	Spike	9.8		ug/L	9.8		1	Yes	S4VEM
Zinc	Spike	4.4		ug/L	4.4		1	Yes	S4VEM
Potassium	Spike	1020		ug/L	1020		1	Yes	S4VEM
Sodium	Spike	1020		ug/L	1020		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: MC0AA1	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: DW01	pH: 2	Sample Date: 02/26/2015	Sample Time: 14:05:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Barium	Target	1.0	J	ug/L	1.0	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	27100		ug/L	27100		1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Iron	Target	139	J	ug/L	139	J	1	Yes	S4VEM
Lead	Target	0.058	J	ug/L	0.058	J	1	Yes	S4VEM
Magnesium	Target	13600		ug/L	13600		1	Yes	S4VEM
Manganese	Target	2.2		ug/L	2.2		1	Yes	S4VEM
Nickel	Target	0.19	J	ug/L	0.19	J	1	Yes	S4VEM
Potassium	Target	12800		ug/L	12800		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	15000		ug/L	15000		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	25.2		ug/L	25.2		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: MC0AA1D	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: G1406-02	pH: 2	Sample Date: 02/26/2015	Sample Time: 14:05:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Barium	Target	1.0	J	ug/L	1.0	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	26900		ug/L	26900		1	Yes	S4VEM
Chromium	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Iron	Target	133	J	ug/L	133	J	1	Yes	S4VEM
Lead	Target	0.060	J	ug/L	0.06	J	1	Yes	S4VEM
Magnesium	Target	13500		ug/L	13500		1	Yes	S4VEM
Manganese	Target	2.1		ug/L	2.1		1	Yes	S4VEM
Nickel	Target	0.16	J	ug/L	0.16	J	1	Yes	S4VEM
Potassium	Target	12700		ug/L	12700		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	14900		ug/L	14900		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	25.5		ug/L	25.5		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: MC0AA1S	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: G1406-03	pH: 2	Sample Date: 02/26/2015	Sample Time: 14:05:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	96.0		ug/L	96.0		1	Yes	S4VEM
Arsenic	Spike	39.5		ug/L	39.5		1	Yes	S4VEM
Barium	Spike	1970		ug/L	1970		1	Yes	S4VEM
Beryllium	Spike	48.3		ug/L	48.3		1	Yes	S4VEM
Cadmium	Spike	49.7		ug/L	49.7		1	Yes	S4VEM
Chromium	Spike	187		ug/L	187		1	Yes	S4VEM
Cobalt	Spike	471		ug/L	471		1	Yes	S4VEM
Copper	Spike	233		ug/L	233		1	Yes	S4VEM
Lead	Spike	19.8		ug/L	19.8		1	Yes	S4VEM
Manganese	Spike	492		ug/L	492		1	Yes	S4VEM
Nickel	Spike	478		ug/L	478		1	Yes	S4VEM
Selenium	Spike	99.8		ug/L	99.8		1	Yes	S4VEM
Silver	Spike	47.7		ug/L	47.7		1	Yes	S4VEM
Thallium	Spike	49.7		ug/L	49.7		1	Yes	S4VEM
Vanadium	Spike	463		ug/L	463		1	Yes	S4VEM
Zinc	Spike	508		ug/L	508		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: MC0AA3	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: DW02	pH: 2	Sample Date: 02/27/2015	Sample Time: 09:51:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	2.8	J	ug/L	2.8	J	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	0.38	J	ug/L	0.38	J	1	Yes	S4VEM
Barium	Target	1.6	J	ug/L	1.6	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	429	B	ug/L	429	J	1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	0.21	J	ug/L	0.21	J	1	Yes	S4VEM
Copper	Target	0.53	J	ug/L	0.53	J	1	Yes	S4VEM
Iron	Target	38.6	J	ug/L	38.6	J	1	Yes	S4VEM
Lead	Target	0.059	J	ug/L	0.059	J	1	Yes	S4VEM
Magnesium	Target	158	B	ug/L	158	J	1	Yes	S4VEM
Manganese	Target	0.75	B	ug/L	0.75	J	1	Yes	S4VEM
Nickel	Target	0.24	J	ug/L	0.24	J	1	Yes	S4VEM
Potassium	Target	3360		ug/L	3360		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	0.047	B	ug/L	0.047	J	1	Yes	S4VEM
Sodium	Target	76500		ug/L	76500		1	Yes	S4VEM
Thallium	Target	0.077	J	ug/L	0.077	J	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	16.0		ug/L	16.0		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: MC0AA5	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: DW03	pH: 2	Sample Date: 02/25/2015	Sample Time: 10:35:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	3.8	J	ug/L	3.8	J	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	0.37	J	ug/L	0.37	J	1	Yes	S4VEM
Barium	Target	0.96	J	ug/L	0.96	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	546		ug/L	546		1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	0.91	J	ug/L	0.91	J	1	Yes	S4VEM
Iron	Target	200	UJ	ug/L	200	U	1	Yes	S4VEM
Lead	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Magnesium	Target	105	B	ug/L	105	J	1	Yes	S4VEM
Manganese	Target	0.62	B	ug/L	0.62	J	1	Yes	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Potassium	Target	2920		ug/L	2920		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	78500		ug/L	78500		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	55.8		ug/L	55.8		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: MC0AA7	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: DW03	pH: 2	Sample Date: 02/25/2015	Sample Time: 10:38:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	3.3	J	ug/L	3.3	J	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	0.39	J	ug/L	0.39	J	1	Yes	S4VEM
Barium	Target	0.99	J	ug/L	0.99	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	483	B	ug/L	483	J	1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	0.91	J	ug/L	0.91	J	1	Yes	S4VEM
Iron	Target	200	UJ	ug/L	200	U	1	Yes	S4VEM
Lead	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Magnesium	Target	100	B	ug/L	100	J	1	Yes	S4VEM
Manganese	Target	0.54	B	ug/L	0.54	J	1	Yes	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Potassium	Target	2880		ug/L	2880		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	77100		ug/L	77100		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	52.6		ug/L	52.6		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: MC0AA9	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: DW04	pH: 2	Sample Date: 02/26/2015	Sample Time: 14:00:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Barium	Target	1.1	J	ug/L	1.1	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	22800		ug/L	22800		1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	2.5		ug/L	2.5		1	Yes	S4VEM
Iron	Target	48.0	J	ug/L	48.0	J	1	Yes	S4VEM
Lead	Target	0.29	J	ug/L	0.29	J	1	Yes	S4VEM
Magnesium	Target	12700		ug/L	12700		1	Yes	S4VEM
Manganese	Target	0.55	B	ug/L	0.55	J	1	Yes	S4VEM
Nickel	Target	0.15	J	ug/L	0.15	J	1	Yes	S4VEM
Potassium	Target	11900		ug/L	11900		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	17300		ug/L	17300		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	19.3		ug/L	19.3		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: MC0AB1	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: DW05	pH: 2	Sample Date: 02/26/2015	Sample Time: 14:25:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	0.22	J	ug/L	0.22	J	1	Yes	S4VEM
Barium	Target	1.8	J	ug/L	1.8	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	1290		ug/L	1290		1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	0.91	J	ug/L	0.91	J	1	Yes	S4VEM
Iron	Target	42.8	J	ug/L	42.8	J	1	Yes	S4VEM
Lead	Target	1.5		ug/L	1.5		1	Yes	S4VEM
Magnesium	Target	455	B	ug/L	455	J	1	Yes	S4VEM
Manganese	Target	1.6		ug/L	1.6		1	Yes	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Potassium	Target	7030		ug/L	7030		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	137000		ug/L	137000	D	10	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	17.4		ug/L	17.4		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: MC0AB3	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: MW04	pH: 2	Sample Date: 02/27/2015	Sample Time: 08:40:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	13.2	J	ug/L	13.2	J	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	9.9		ug/L	9.9		1	Yes	S4VEM
Barium	Target	20.2		ug/L	20.2		1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	11800		ug/L	11800		1	Yes	S4VEM
Chromium	Target	0.14	J-	ug/L	0.14	J	1	Yes	S4VEM
Cobalt	Target	6.5		ug/L	6.5		1	Yes	S4VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Iron	Target	5780		ug/L	5780		1	Yes	S4VEM
Lead	Target	0.054	J	ug/L	0.054	J	1	Yes	S4VEM
Magnesium	Target	2740		ug/L	2740		1	Yes	S4VEM
Manganese	Target	548		ug/L	548		1	Yes	S4VEM
Nickel	Target	0.74	J	ug/L	0.74	J	1	Yes	S4VEM
Potassium	Target	1570		ug/L	1570		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	2990		ug/L	2990		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	0.52	J	ug/L	0.52	J	1	Yes	S4VEM
Zinc	Target	3.2		ug/L	3.2		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: MC0AB5	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: MW05	pH: 2	Sample Date: 02/27/2015	Sample Time: 09:30:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	8.3	J	ug/L	8.3	J	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	14.4		ug/L	14.4		1	Yes	S4VEM
Barium	Target	5.9	J	ug/L	5.9	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	10800		ug/L	10800		1	Yes	S4VEM
Chromium	Target	1.7	J	ug/L	1.7	J	1	Yes	S4VEM
Cobalt	Target	3.7		ug/L	3.7		1	Yes	S4VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Iron	Target	12300		ug/L	12300		1	Yes	S4VEM
Lead	Target	0.20	J	ug/L	0.20	J	1	Yes	S4VEM
Magnesium	Target	1480		ug/L	1480		1	Yes	S4VEM
Manganese	Target	516		ug/L	516		1	Yes	S4VEM
Nickel	Target	0.38	J	ug/L	0.38	J	1	Yes	S4VEM
Potassium	Target	1130		ug/L	1130		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	3170		ug/L	3170		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	0.47	J	ug/L	0.47	J	1	Yes	S4VEM
Zinc	Target	3.4		ug/L	3.4		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: MC0AB7	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: FB01	pH: 2	Sample Date: 02/27/2015	Sample Time: 09:10:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Barium	Target	10.0	U	ug/L	10.0	U	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	40.1	J	ug/L	40.1	J	1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Iron	Target	200	UJ	ug/L	200	U	1	Yes	S4VEM
Lead	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Magnesium	Target	3.7	J	ug/L	3.7	J	1	Yes	S4VEM
Manganese	Target	1.0	UJ	ug/L	1.0	U	1	Yes	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Potassium	Target	500	UJ	ug/L	500	U	1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	0.066	J	1	Yes	S4VEM
Sodium	Target	56.5	J	ug/L	56.5	J	1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	0.51	J-	ug/L	0.51	J	1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA1	Lab Code: CHEM
Sample Number: PBW04	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location:	pH:	Sample Date: 03/05/2015	Sample Time: 17:59:04
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Barium	Target	10.0	U	ug/L	10.0	U	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	500	U	ug/L	500	U	1	Yes	S4VEM
Chromium	Target	-0.12	J	ug/L	-0.12	J	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Iron	Target	-5.7	J	ug/L	-5.7	J	1	Yes	S4VEM
Lead	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Magnesium	Target	500	U	ug/L	500	U	1	Yes	S4VEM
Manganese	Target	-0.070	J	ug/L	-0.07	J	1	Yes	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Potassium	Target	-8.8	J	ug/L	-8.8	J	1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	500	U	ug/L	500	U	1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	-0.26	J	ug/L	-0.26	J	1	Yes	S4VEM



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: April 1, 2015

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald 
Region III ESAT PO (3EA22)

TO: Ruth Scharr
On-Scene Coordinator (3HS31)

Attached is the inorganic data validation report for the New Kent Wood Preservatives, Inc. site for Case 45112; SDG#:MC0AA0 completed by the Region III Environmental Services Assistance Team (ESAT), ICF International, contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2607.

Attachment

cc: Laura Mathew (WESTON)

TO: #0002 TDF: #0315031

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE





ICF International
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3011

Date: March 30, 2015

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Kenneth W. Curry
Senior Data Reviewer

Kurt Roby
Oversight Chemist

Subject: Inorganic Data Validation (S4VEM)
Site: New Kent Wood Preservatives Incorporated
Case: 45112, SDG: MC0AA0

OVERVIEW

Case 45112, Sample Delivery Group (SDG) MC0AA0, consisted of six (6) potable water samples including one (1) field duplicate pair in addition to two (2) ground water samples and one (1) aqueous field blank analyzed for total metals by ICP-MS. Analyses were performed by ChemTech Consulting Group (CHEM) according to Contract Laboratory Program (CLP) Statement of Work (SOW) ISM01.3 through the Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to inorganic National Functional Guidelines, utilizing Environmental Data Exchange and Evaluation System (EXES) and is assigned the Superfund Data Validation Label S4VEM (Stage_4_Validation_Electronic_Manual). The following validation narrative is an evaluation of laboratory reported data for the purpose of usability.

No drinking water sample in this SDG reported a result which exceeded the National Primary Drinking Water Regulations (NPDWRs) Maximum Contaminant Level (MCL), nor did they exceed the Numeric Removal Action Levels for Drinking Water promulgated by the Office of Solid Waste and Emergency Response (OSWER).

MINOR PROBLEMS

The Percent Difference (%D) in the ICP serial dilution analysis exceeded the control limit (%D >10%) for iron (Fe) due to possible physical or chemical interference. Positive results and quantitation limits reported for this analyte are estimated and have been qualified "J" and "UJ", respectively.

Laboratory instrumentation reported negative values for chromium (Cr), Fe, manganese (Mn), potassium (K), vanadium (V) and zinc (Zn) greater than absolute values of the Method Detection Limits (MDLs) in blank analyses. Positive results less than two times (2X) the absolute value of the blank and quantitation limits for these analytes have been qualified “J-” and “UJ”, respectively.

NOTES

Analytes detected below Contract Required Quantitation Limits (CRQLs) not attributed to blank contamination are qualified “J”.

Silver has been positively identified in laboratory blanks associated with the samples in this SDG. Potable water sample MC0AA2, which reported a positive result for this analyte less than the CRQL, has been qualified “B”.

The concentration of sodium (Na) in sample MC0AB0 exceeded the calibration range in the initial analysis. This sample was re-analyzed at a ten-fold (10X) dilution to bring the concentration of this analyte within the calibration range. The result for this analyte is reported from the dilution noted.

Reported results for field duplicate pair MC0AA4/MC0AA6 were within twenty (20) Relative Percent Difference (RPD, \pm CRQL) for all analytes. No data were qualified based on these findings.

Glossary of Data Qualifier Codes (INORGANIC)

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
B	The result is presumed a blank contaminant. This qualifier is used only for drinking water samples.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Sample Summary Report

Case No:	45112	Contract:	EPW09038	SDG No:	MC0AA0	Lab Code:	CHEM
Sample Number:	LCS	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:		pH:		Sample Date:	03/05/2015	Sample Time:	16:33:33
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Spike	46.7		ug/L	46.7		1	Yes	S4VEM
Antimony	Spike	3.9		ug/L	3.9		1	Yes	S4VEM
Arsenic	Spike	2.4		ug/L	2.4		1	Yes	S4VEM
Barium	Spike	20.1		ug/L	20.1		1	Yes	S4VEM
Beryllium	Spike	2.1		ug/L	2.1		1	Yes	S4VEM
Cadmium	Spike	2.0		ug/L	2.0		1	Yes	S4VEM
Calcium	Spike	984		ug/L	984		1	Yes	S4VEM
Chromium	Spike	3.8		ug/L	3.8		1	Yes	S4VEM
Cobalt	Spike	2.0		ug/L	2.0		1	Yes	S4VEM
Copper	Spike	4.1		ug/L	4.1		1	Yes	S4VEM
Iron	Spike	411		ug/L	411		1	Yes	S4VEM
Lead	Spike	2.0		ug/L	2.0		1	Yes	S4VEM
Manganese	Spike	2.0		ug/L	2.0		1	Yes	S4VEM
Nickel	Spike	2.1		ug/L	2.1		1	Yes	S4VEM
Selenium	Spike	11.1		ug/L	11.1		1	Yes	S4VEM
Silver	Spike	1.9		ug/L	1.9		1	Yes	S4VEM
Thallium	Spike	2.1		ug/L	2.1		1	Yes	S4VEM
Sodium	Spike	1020		ug/L	1020		1	Yes	S4VEM
Vanadium	Spike	9.8		ug/L	9.8		1	Yes	S4VEM
Magnesium	Spike	1020		ug/L	1020		1	Yes	S4VEM
Zinc	Spike	4.4		ug/L	4.4		1	Yes	S4VEM
Potassium	Spike	1020		ug/L	1020		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA0	Lab Code: CHEM
Sample Number: MC0AA0	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: DW01	pH: 2	Sample Date: 02/26/2015	Sample Time: 14:05:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Barium	Target	1.1	J	ug/L	1.1	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	26300		ug/L	26300		1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	0.037	J	ug/L	0.037	J	1	Yes	S4VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Iron	Target	249	J	ug/L	249	E	1	Yes	S4VEM
Lead	Target	0.19	J	ug/L	0.19	J	1	Yes	S4VEM
Magnesium	Target	13200		ug/L	13200		1	Yes	S4VEM
Manganese	Target	1.8		ug/L	1.8		1	Yes	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Potassium	Target	12400		ug/L	12400		1	Yes	S4VEM
Selenium	Target	0.60	J	ug/L	0.60	J	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	14700		ug/L	14700		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	39.0		ug/L	39.0		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA0	Lab Code: CHEM
Sample Number: MC0AA0D	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: G1403-02	pH: 2	Sample Date: 02/26/2015	Sample Time: 14:05:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Barium	Target	1.1	J	ug/L	1.1	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	26400		ug/L	26400		1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Iron	Target	242		ug/L	242		1	Yes	S4VEM
Lead	Target	0.19	J	ug/L	0.19	J	1	Yes	S4VEM
Magnesium	Target	13300		ug/L	13300		1	Yes	S4VEM
Manganese	Target	1.8		ug/L	1.8		1	Yes	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Potassium	Target	12500		ug/L	12500		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	14700		ug/L	14700		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	38.9		ug/L	38.9		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA0	Lab Code: CHEM
Sample Number: MC0AA0S	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: G1403-03	pH: 2	Sample Date: 02/26/2015	Sample Time: 14:05:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	97.4		ug/L	97.4		1	Yes	S4VEM
Arsenic	Spike	39.0		ug/L	39.0		1	Yes	S4VEM
Barium	Spike	1990		ug/L	1990		1	Yes	S4VEM
Beryllium	Spike	49.7		ug/L	49.7		1	Yes	S4VEM
Cadmium	Spike	50.2		ug/L	50.2		1	Yes	S4VEM
Chromium	Spike	188		ug/L	188		1	Yes	S4VEM
Cobalt	Spike	473		ug/L	473		1	Yes	S4VEM
Copper	Spike	234		ug/L	234		1	Yes	S4VEM
Lead	Spike	20.2		ug/L	20.2		1	Yes	S4VEM
Manganese	Spike	491		ug/L	491		1	Yes	S4VEM
Nickel	Spike	483		ug/L	483		1	Yes	S4VEM
Selenium	Spike	99.7		ug/L	99.7		1	Yes	S4VEM
Silver	Spike	48.2		ug/L	48.2		1	Yes	S4VEM
Thallium	Spike	50.3		ug/L	50.3		1	Yes	S4VEM
Vanadium	Spike	461		ug/L	461		1	Yes	S4VEM
Zinc	Spike	525		ug/L	525		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA0	Lab Code: CHEM
Sample Number: MC0AA2	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: DW02	pH: 2	Sample Date: 02/27/2015	Sample Time: 09:51:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	5.7	J	ug/L	5.7	J	1	Yes	S4VEM
Antimony	Target	0.063	J	ug/L	0.063	J	1	Yes	S4VEM
Arsenic	Target	0.42	J	ug/L	0.42	J	1	Yes	S4VEM
Barium	Target	2.0	J	ug/L	2.0	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	336	J	ug/L	336	J	1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	0.29	J	ug/L	0.29	J	1	Yes	S4VEM
Copper	Target	0.68	J	ug/L	0.68	J	1	Yes	S4VEM
Iron	Target	200	UJ	ug/L	200	UE	1	Yes	S4VEM
Lead	Target	0.096	J	ug/L	0.096	J	1	Yes	S4VEM
Magnesium	Target	107	J	ug/L	107	J	1	Yes	S4VEM
Manganese	Target	0.85	J	ug/L	0.85	J	1	Yes	S4VEM
Nickel	Target	0.38	J	ug/L	0.38	J	1	Yes	S4VEM
Potassium	Target	3290		ug/L	3290		1	Yes	S4VEM
Selenium	Target	0.64	J	ug/L	0.64	J	1	Yes	S4VEM
Silver	Target	0.073	B	ug/L	0.073	J	1	Yes	S4VEM
Sodium	Target	76600		ug/L	76600		1	Yes	S4VEM
Thallium	Target	0.063	J	ug/L	0.063	J	1	Yes	S4VEM
Vanadium	Target	0.11	J-	ug/L	0.11	J	1	Yes	S4VEM
Zinc	Target	18.5		ug/L	18.5		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA0	Lab Code: CHEM
Sample Number: MC0AA4	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: DW03	pH: 2	Sample Date: 02/25/2015	Sample Time: 10:35:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	5.7	J	ug/L	5.7	J	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	0.46	J	ug/L	0.46	J	1	Yes	S4VEM
Barium	Target	1.2	J	ug/L	1.2	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	501		ug/L	501		1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	0.039	J	ug/L	0.039	J	1	Yes	S4VEM
Copper	Target	2.0	J	ug/L	2.0	J	1	Yes	S4VEM
Iron	Target	200	UJ	ug/L	200	UE	1	Yes	S4VEM
Lead	Target	0.097	J	ug/L	0.097	J	1	Yes	S4VEM
Magnesium	Target	101	J	ug/L	101	J	1	Yes	S4VEM
Manganese	Target	0.71	J	ug/L	0.71	J	1	Yes	S4VEM
Nickel	Target	0.76	J	ug/L	0.76	J	1	Yes	S4VEM
Potassium	Target	2890		ug/L	2890		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	77400		ug/L	77400		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	55.5		ug/L	55.5		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA0	Lab Code: CHEM
Sample Number: MC0AA6	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: DW03	pH: 2	Sample Date: 02/25/2015	Sample Time: 10:38:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	13.7	J	ug/L	13.7	J	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	0.30	J	ug/L	0.30	J	1	Yes	S4VEM
Barium	Target	0.97	J	ug/L	0.97	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	485	J	ug/L	485	J	1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	0.90	J	ug/L	0.90	J	1	Yes	S4VEM
Iron	Target	200	UJ	ug/L	200	UE	1	Yes	S4VEM
Lead	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Magnesium	Target	96.7	J	ug/L	96.7	J	1	Yes	S4VEM
Manganese	Target	0.65	J	ug/L	0.65	J	1	Yes	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Potassium	Target	2920		ug/L	2920		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	78000		ug/L	78000		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	54.4		ug/L	54.4		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA0	Lab Code: CHEM
Sample Number: MC0AA8	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: DW04	pH: 2	Sample Date: 02/26/2015	Sample Time: 14:00:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	9.9	J	ug/L	9.9	J	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Barium	Target	1.2	J	ug/L	1.2	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	23100		ug/L	23100		1	Yes	S4VEM
Chromium	Target	0.17	J-	ug/L	0.17	J	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	0.87	J	ug/L	0.87	J	1	Yes	S4VEM
Iron	Target	64.6	J	ug/L	64.6	JE	1	Yes	S4VEM
Lead	Target	0.18	J	ug/L	0.18	J	1	Yes	S4VEM
Magnesium	Target	12800		ug/L	12800		1	Yes	S4VEM
Manganese	Target	0.69	J	ug/L	0.69	J	1	Yes	S4VEM
Nickel	Target	0.23	J	ug/L	0.23	J	1	Yes	S4VEM
Potassium	Target	11900		ug/L	11900		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	17300		ug/L	17300		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	22.0		ug/L	22.0		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA0	Lab Code: CHEM
Sample Number: MC0AB0	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: DW05	pH: 2	Sample Date: 02/26/2015	Sample Time: 14:25:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Barium	Target	1.8	J	ug/L	1.8	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	1240		ug/L	1240		1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	1.1	J	ug/L	1.1	J	1	Yes	S4VEM
Iron	Target	48.9	J	ug/L	48.9	JE	1	Yes	S4VEM
Lead	Target	1.7		ug/L	1.7		1	Yes	S4VEM
Magnesium	Target	448	J	ug/L	448	J	1	Yes	S4VEM
Manganese	Target	1.5		ug/L	1.5		1	Yes	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Potassium	Target	7030		ug/L	7030		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	140000		ug/L	140000	D	10	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	19.1		ug/L	19.1		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA0	Lab Code: CHEM
Sample Number: MC0AB2	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: MW04	pH: 2	Sample Date: 02/27/2015	Sample Time: 08:40:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	459		ug/L	459		1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	11.1		ug/L	11.1		1	Yes	S4VEM
Barium	Target	33.9		ug/L	33.9		1	Yes	S4VEM
Beryllium	Target	0.14	J	ug/L	0.14	J	1	Yes	S4VEM
Cadmium	Target	0.044	J	ug/L	0.044	J	1	Yes	S4VEM
Calcium	Target	12100		ug/L	12100		1	Yes	S4VEM
Chromium	Target	0.58	J	ug/L	0.58	J	1	Yes	S4VEM
Cobalt	Target	7.2		ug/L	7.2		1	Yes	S4VEM
Copper	Target	2.5		ug/L	2.5		1	Yes	S4VEM
Iron	Target	7160	J	ug/L	7160	E	1	Yes	S4VEM
Lead	Target	1.1		ug/L	1.1		1	Yes	S4VEM
Magnesium	Target	2840		ug/L	2840		1	Yes	S4VEM
Manganese	Target	587		ug/L	587		1	Yes	S4VEM
Nickel	Target	0.92	J	ug/L	0.92	J	1	Yes	S4VEM
Potassium	Target	1640		ug/L	1640		1	Yes	S4VEM
Selenium	Target	0.57	J	ug/L	0.57	J	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	2950		ug/L	2950		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	3.7	J	ug/L	3.7	J	1	Yes	S4VEM
Zinc	Target	6.3		ug/L	6.3		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA0	Lab Code: CHEM
Sample Number: MC0AB4	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: MW05	pH: 2	Sample Date: 02/27/2015	Sample Time: 09:30:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	88.3		ug/L	88.3		1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	16.8		ug/L	16.8		1	Yes	S4VEM
Barium	Target	6.7	J	ug/L	6.7	J	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	10800		ug/L	10800		1	Yes	S4VEM
Chromium	Target	4.2		ug/L	4.2		1	Yes	S4VEM
Cobalt	Target	3.7		ug/L	3.7		1	Yes	S4VEM
Copper	Target	1.1	J	ug/L	1.1	J	1	Yes	S4VEM
Iron	Target	13400	J	ug/L	13400	E	1	Yes	S4VEM
Lead	Target	0.38	J	ug/L	0.38	J	1	Yes	S4VEM
Magnesium	Target	1490		ug/L	1490		1	Yes	S4VEM
Manganese	Target	521		ug/L	521		1	Yes	S4VEM
Nickel	Target	0.40	J	ug/L	0.40	J	1	Yes	S4VEM
Potassium	Target	1120		ug/L	1120		1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	2710		ug/L	2710		1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	1.0	J	ug/L	1.0	J	1	Yes	S4VEM
Zinc	Target	3.2		ug/L	3.2		1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA0	Lab Code: CHEM
Sample Number: MC0AB6	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: FB01	pH: 2	Sample Date: 02/27/2015	Sample Time: 09:10:00
% Moisture :	% Solids :		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Barium	Target	10.0	U	ug/L	10.0	U	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	500	U	ug/L	500	U	1	Yes	S4VEM
Chromium	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Iron	Target	200	UJ	ug/L	200	UE	1	Yes	S4VEM
Lead	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Magnesium	Target	500	U	ug/L	500	U	1	Yes	S4VEM
Manganese	Target	1.0	UJ	ug/L	1.0	U	1	Yes	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Potassium	Target	500	UJ	ug/L	500	U	1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	500	U	ug/L	500	U	1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	2.0	UJ	ug/L	2.0	U	1	Yes	S4VEM

Case No: 45112	Contract: EPW09038	SDG No: MC0AA0	Lab Code: CHEM
Sample Number: PBW04	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location:	pH:	Sample Date: 03/05/2015	Sample Time: 16:25:50
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	Yes	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Barium	Target	10.0	U	ug/L	10.0	U	1	Yes	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Calcium	Target	500	U	ug/L	500	U	1	Yes	S4VEM
Chromium	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	Yes	S4VEM
Iron	Target	-6.6	J	ug/L	-6.6	J	1	Yes	S4VEM
Lead	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Magnesium	Target	500	U	ug/L	500	U	1	Yes	S4VEM
Manganese	Target	-0.090	J	ug/L	-0.09	J	1	Yes	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Potassium	Target	500	U	ug/L	500	U	1	Yes	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Sodium	Target	500	U	ug/L	500	U	1	Yes	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S4VEM
Vanadium	Target	5.0	U	ug/L	5.0	U	1	Yes	S4VEM
Zinc	Target	-0.21	J	ug/L	-0.21	J	1	Yes	S4VEM



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Date: March 16, 2015

To: Ruth Scharr
EPA Region 3 On-Scene Coordinator

From: Linda M. Adams *Linda M. Adams*
WESTON START Chemist

Gretchen Fodor *Gretchen M. Fodor*
WESTON START Chemist

Subject: Inorganic Data Validation (S4VM)
Site: New Kent Wood Preservatives, Inc., Providence Forge, New Kent County, VA
TDD: WS01-14-05-003
Case: R34567 SDG: MC0AC0
DCN: W0233.4B.01192

Overview

Case R34567, Sample Delivery Group (SDG) MC0AC0, consisted of 20 soil samples analyzed for metals by inductively-coupled plasma-atomic emission spectroscopy (ICP-AES). Analyses were performed by CompuChem according to U.S. Environmental Protection Agency (EPA) Method 6010C.

Summary

Sample data were validated for Target Analyte List (TAL) metals by the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (EPA, 2010) and were assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual). Validated TAL metals results are presented in Table 1.

At the request of the EPA On-Scene Coordinator, samples were submitted to a Weston Solutions, Inc. (WESTON®)-subcontracted laboratory. WESTON has been tasked to evaluate laboratory reported data for the purpose of usability. No results were rejected. Minor qualification of the data was required for several data results. The data are valid as qualified and may be used for decision making purposes.

Major Problems

No major problems were noted during the validation of the metals analyses.

Minor Problems

Laboratory Blanks

Several target analytes were detected in the method preparation blank (PB) and/or in the initial and continuing calibration blanks (ICBs and CCBs) above the method detection limit (MDL). Negative concentrations of antimony, arsenic, and sodium were detected above the negative MDL in several of the CCBs. A negative concentration of lead was detected above the negative MDL in the PB. The table below summarizes the highest level of blank contamination for the analytes detected in the PBs, ICBs, and/or CCBs along with the sample results affected by laboratory blank contamination.

Blank	Analyte	Concentration	Samples Affected
Preparation Blank (PB)	copper *	0.29 J mg/kg	None. (No data qualifications were required.)
	iron	2.21 J mg/kg	None. (No data qualifications were required.)
	lead	-0.393 J mg/kg	MC0AC1, MC0AC2, MC0AC3, MC0AC4, MC0AC5, MC0AC6, MC0AC7, MC0AD0, MC0AD2, MC0AD3, MC0AD4, MC0AD6, MC0AD7, MC0AD9, MC0AE0, MC0AE1: Detected results were estimated with a low bias (J-).
Continuing Calibration Blanks (CCB)	antimony	-5.67 J µg/L	MC0AC0, MC0AC7, MC0AC8, MC0AC9, MC0AD5, MC0AD7: Detected results were estimated with a low bias (J-). MC0AC1, MC0AC2, MC0AC3, MC0AC4, MC0AC5, MC0AC6, MC0AD0, MC0AD2, MC0AD3, MC0AD4, MC0AD6, MC0AD9, MC0AE0, MC0AE1: The detection limits for non-detected sample results were estimated (UJ).
	arsenic	-3.56 J µg/L	MC0AD0, MC0AD3, MC0AE1: Detected results were estimated with a low bias (J-).
	nickel	1.58 J µg/L	None. (No data qualifications were required.)
	silver	1.77 J µg/L	MC0AD2 and MC0AD4: The detected result that was less than the RL was raised to the RL and qualified as non-detected (U).
	vanadium	1.29 J µg/L	None. (No data qualifications were required.)
	sodium	-957 J µg/L	MC0AD5, MC0AD6: Detected results were estimated with a low bias (J-). MC0AC0, MC0AC1, MC0AC2, MC0AC3, MC0AC4, MC0AC5, MC0AC6, MC0AC7, MC0AC8, MC0AC9, MC0AD0, MC0AD2, MC0AD3, MC0AD4, MC0AD7, MC0AD9, MC0AE0, MC0AE1: The detection limits for non-detected sample results were estimated (UJ).

* Analyte was detected in both the PB and CCB; the higher concentration is listed on the table.

Data qualifier codes are defined later in this report.

µg/L = micrograms per kilogram

mg/kg = milligrams per kilogram

RL = Reporting Limit

Field Blanks

Two equipment blanks were collected on February 26, 2015. Results for the rinsate blanks were evaluated in Case R34567, SDG MC0AB8. After qualifiers were applied based on laboratory blank contamination, the contaminants below were reported in the two rinsate blank samples associated with this sampling event.

Blank	Analyte	Concentration	Samples Affected
MC0AB8 (Equipment Blank)	zinc	981 µg/L	MC0AC0, MC0AC1, MC0AC2, MC0AC3, MC0AC4, MC0AC5, MC0AC6, MC0AC7, MC0AC8, MC0AC9, MC0AD0, MC0AD2, MC0AD3, MC0AD4, MC0AD5, MC0AD6, MC0AD7, MC0AD9, MC0AE0, MC0AE1: Detected results were qualified as estimated with a high bias (J+).
MC0AB9 (Equipment Blank)	iron	69.4 J µg/L	None.
	zinc	11.4 J µg/L	Refer to zinc blank actions above.

Zinc was detected in both equipment rinsate blanks associated with the sampling event. Equipment blank MC0AB8 contained zinc at a concentration approximately 33 times higher than the reporting limit (RL), whereas the concentration of zinc in equipment blank MC0AB9 was less than the RL. All soil zinc sample concentrations were less than the equivalent zinc concentration in equipment blank MC0AB8. The validator used professional judgment in qualifying all soil sample results for zinc as estimated with a high bias (J+). The source of zinc contamination in the rinsate blank is under investigation, but appears to be associated with the sampling process. The J+ qualifier was applied to the zinc sample results to alert the data user that the sample results may be biased high due to field contamination; the reported value may be considered an upper concentration for the sample.

Iron was detected in one of the two equipment blank samples, MC0AB9, at a concentration less than the RL. Sample concentrations for iron were greater than 10 times the RL, so no impact is expected to soil sample results based on the concentration of iron in the equipment blank.

Matrix Spike/Matrix Spike Duplicates (MS/MSD)

MS/MSD and post-digestion spike (PDS) analyses were performed on soil sample MC0AD7. With the following exceptions, all MS/MSD and PDS percent recoveries (%Rs) and relative percent differences (RPDs) were within the Quality Control (QC) limit indicated in the table below.

Analyte	MS %R	MSD %R	RPD	PDS %R	QC Limits		Actions
					%R	RPD	
aluminum	284	284	--	63.5	75-125%	20	None required (4)
arsenic	73.9	68.2	--	--	75-125%	--	J (Pos)
copper	--	65.6	42.6	67.3	75-125%	20	J (Pos)
iron	--	71.4	--	56.6	75-125%	--	None required (4)
manganese	--	--	--	74.6	75-125%	--	None required

-- criteria met

(4) Qualifiers were not applied to sample results because the native sample concentration was more than 4 times the spike added concentration.

J (Pos) = Estimate positive sample results

Validation actions apply to all soil samples in this SDG.

Laboratory Duplicate Analysis

Laboratory duplicate analysis was performed on soil sample MC0AD7. With the following exceptions, the RPDs of all analytes having concentrations greater than 5 times the RL were within the acceptance criteria of less than 20%.

Analyte	Sample Concentration (mg/kg)	Duplicate Concentration (mg/kg)	RPD	QC Limit RPD	Actions
arsenic	48.1	20.8	79.4	20	J (Pos)
chromium	33.1	13.7	83.0	20	J (Pos)
copper	48.2	20.5	80.7	20	J (Pos)
manganese	47.5	38.0	22.1	20	J (Pos)

J (Pos) = Estimate positive sample results

Validation actions apply to all soil samples in this SDG.

Serial Dilution Analyses

Serial dilution analyses were performed on soil sample MC0AD7. With the following exceptions, the percent differences (%Ds) of all serial dilution analyses were within the acceptance criteria of less than or equal to 10% for sample concentrations greater than or equal to 50 times the MDL. Validation actions apply to all soil samples in this SDG.

Analyte	Initial Sample Result (µg/L)	Serial Dilution Concentration (µg/L)	%D	Actions
aluminum	27737	32075	15.6	J (Pos)
arsenic	425	487	14.5	J (Pos)
chromium	292	339	15.9	J (Pos)
copper	426	482	13.2	J (Pos)
iron	23199	27303	17.7	J (Pos)
manganese	419	484	15.4	J (Pos)

J (Pos) = Estimate positive sample results

ICP-AES Interference Check Standard Analysis

Spike recoveries in the Interference Check Sample AB (ICSAB) solution met method acceptance criteria. The Interference Check Sample A (ICSA) solution associated with all sample analyses contained positive interference for cadmium, copper, and nickel greater than the MDL and negative interference for cobalt, lead, and vanadium greater than the absolute value of the MDL. Only one soil sample, MC0AC8, had comparable or higher levels of the interferent iron as compared to the concentration detected in the ICSA solution. However, because the analyte concentrations of these analytes in soil sample MC0AC8 were significantly higher than the positive and negative concentrations detected in the ICSA solutions, qualification of the data on this basis was not required. Chromium was noted to be a trace impurity of the ICSA solution and no validation action was taken on this basis.

Field Duplicate Analysis

Soil samples MC0AD4 and MC0AD6 were submitted as field duplicate samples. The USEPA National Functional Guidelines have not established acceptance criteria for field duplicate precision. Based on professional judgment, an RPD acceptance criterion of less than or equal to 50% was used when both soil sample results are greater than the RL. Additionally, based on professional judgment, the control limit used when either or both field duplicate samples contained analytes at concentrations less than 5 times the RL was $\pm 2x$ RL.

With the following exception, the RPDs of all analytes were within the soil precision acceptance criterion of less than 50%. Precision is evaluated by calculating the RPD between the field duplicate results.

Analyte	Sample Concentration (mg/kg)	Duplicate Concentration (mg/kg)	RPD	QC Limit RPD	Actions
arsenic	84.7	43.8	63.7	50	J (Pos)

J (Pos) = Estimate positive sample results

Validation actions apply to soil samples MC0AD4 and MC0AD6.

Notes

Target analytes detected below the Reporting Limit (RLs) are qualified "J." Sample dilutions were not performed, so no adjustment of the RLs was necessary.

Glossary of Data Qualifier Codes (Inorganic)

- U The analyte was analyzed, but was not detected at a level above the level of the reported sample quantitation limit (RL).
- J The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample (because of the quality of the data generated and/or certain quality control criteria were not met, or the concentration of the analyte was below the RL).
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- UJ The analyte was not detected at a level greater than or equal to the sample RL. However, the reported RL is approximate and may be inaccurate or imprecise.
- R The sample results are unusable because certain criteria were not met, which impacts the quality of the data generated. The analyte may or may not be present in the sample.

TABLE

DAS Case No.: R34567
SDG No.: MC0AC0
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-301-06-022515	NK-SS-302-06-022515	NK-SS-303-06-022515	NK-SS-303D-06-022515	NK-SS-304-06-022515
Sample ID:	MC0AD2	MC0AD3	MC0AD4	MC0AD6	MC0AD5
Lab Sample No.:	1502062-12	1502062-13	1502062-14	1502062-16	1502062-15
Sampling Date:	2/25/2015	2/25/2015	2/25/2015	2/25/2015	2/25/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Duplicate of MC0AD4	Field Sample
Percent Solids:	63.7	86.8	30.5	33.1	58.6
ANALYTE (mg/kg)					
Aluminum	5450 J	3940 J	4000 J	4540 J	7760 J
Antimony	4.53 UJ	3.35 UJ	9.37 UJ	8.62 UJ	1.27 J-
Arsenic	39.0 J	8.72 J-	84.7 J	43.8 J	49.8 J
Barium	41.2	21.7 J	73.1	73.1	70.5
Beryllium	0.146 J	0.104 J	0.121 J	0.118 J	0.275 J
Cadmium	0.110 J	0.0282 J	0.239 J	0.224 J	0.408 J
Calcium	1500	459 J	5520	5060	3660
Chromium	49.3 J	12.6 J	91.0 J	60.1 J	195 J
Cobalt	2.68 J	0.994 J	3.17 J	3.10 J	4.54
Copper	30.3 J	6.40 J	64.7 J	51.0 J	94.9 J
Iron	7680 J	4190 J	7320 J	8070 J	13200 J
Lead	9.75 J-	4.06 J-	27.5 J-	25.1 J-	34.5
Magnesium	764	321 J	1140 J	1240 J	1150
Manganese	89.2 J	34.7 J	119 J	113 J	110 J
Nickel	4.07	2.07	5.42	5.59	7.86
Potassium	655 J	211 J	987 J	1080 J	907
Selenium	1.51 U	1.12 U	3.12 U	1.45 J	1.64 U
Silver	0.755 U	0.559 U	1.56 U	1.44 U	0.820 U
Sodium	755 UJ	559 UJ	1560 UJ	93.9 J-	54.2 J-
Thallium	4.53 U	3.35 U	9.37 U	8.62 U	4.92 U
Vanadium	11.0	7.00	9.20	10.6	15.8
Zinc	34.4 J+	8.85 J+	121 J+	115 J+	159 J+

NOTES:

Metals analysis method: EPA 6010C.
mg/kg = milligrams per kilogram

Qualifiers

- J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- U The analyte was not detected at or above the Reporting Limit (RL).
- UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.

DAS Case No.: R34567
SDG No.: MC0AC0
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-305-06-022515	NK-SS-305-612-022515	NK-SS-306-06-022515	NK-SS-306-612-022515	NK-SS-307-06-022515
Sample ID:	MC0AC0	MC0AC1	MC0AC2	MC0AC3	MC0AC5
Lab Sample No.:	1502062-01	1502062-02	1502062-03	1502062-04	1502062-06
Sampling Date:	2/25/2015	2/25/2015	2/25/2015	2/25/2015	2/25/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Percent Solids:	61.3	71.5	85.8	78.3	82.2
ANALYTE (mg/kg)					
Aluminum	7650 J	3030 J	3400 J	2660 J	2180 J
Antimony	2.24 J-	4.07 UJ	3.46 UJ	3.72 UJ	3.58 UJ
Arsenic	246 J	43.0 J	13.6 J	24.5 J	20.6 J
Barium	56.7	21.9 J	17.1 J	14.1 J	16.6 J
Beryllium	0.334 J	0.102 J	0.125 J	0.0668 J	0.0627 J
Cadmium	0.388 J	0.0923 J	0.0238 J	0.0243 J	0.0626 J
Calcium	1140	308 J	49.7 J	46.5 J	303 J
Chromium	331 J	72.3 J	13.5 J	20.1 J	28.5 J
Cobalt	5.75	1.74 J	0.648 J	0.533 J	1.03 J
Copper	166 J	45.8 J	6.22 J	8.28 J	20.7 J
Iron	15600 J	4490 J	2420 J	2490 J	2900 J
Lead	26.6	7.95 J-	4.23 J-	3.65 J-	5.57 J-
Magnesium	649 J	243 J	189 J	174 J	201 J
Manganese	199 J	52.6 J	48.1 J	17.3 J	36.3 J
Nickel	6.97	2.27	1.60	1.27	1.59
Potassium	475 J	165 J	101 J	93.0 J	148 J
Selenium	1.61 U	1.36 U	1.15 U	1.24 U	1.19 U
Silver	0.807 U	0.679 U	0.577 U	0.620 U	0.597 U
Sodium	807 UJ	679 UJ	577 UJ	620 UJ	597 UJ
Thallium	4.84 U	4.07 U	3.46 U	3.72 U	3.58 U
Vanadium	14.7	5.94	3.93	3.80	4.20
Zinc	95.4 J+	26.6 J+	6.88 J+	6.46 J+	28.9 J+

NOTES:

Metals analysis method: EPA 6010C.
mg/kg = milligrams per kilogram

Qualifiers

- J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.
J+ The result is an estimated quantity, but the result may be biased high.
J- The result is an estimated quantity, but the result may be biased low.
U The analyte was not detected at or above the Reporting Limit (RL).
UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.

DAS Case No.: R34567
SDG No.: MC0AC0
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-307-612-022515	NK-SS-308-06-022515	NK-SS-308-612-022515	NK-SS-310-06-022515	NK-SS-310-612-022515
Sample ID:	MC0AC6	MC0AC7	MC0AD7	MC0AC9	MC0AD9
Lab Sample No.:	1502062-07	1502062-08	1502062-17	1502062-10	1502062-18
Sampling Date:	2/25/2015	2/25/2015	2/25/2015	2/25/2015	2/25/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Percent Solids:	79.4	86.5	88.3	86.2	87.5
ANALYTE (mg/kg)					
Aluminum	1620 J	3420 J	3140 J	4190 J	2900 J
Antimony	3.74 UJ	1.83 J-	1.41 J-	1.78 J-	3.27 UJ
Arsenic	14.5 J	130 J	48.1 J	218 J	48.9 J
Barium	11.0 J	20.0 J	15.9 J	33.6	20.6 J
Beryllium	0.0640 J	0.129 J	0.111 J	0.143 J	0.0826 J
Cadmium	0.0397 J	0.187 J	0.0901 J	0.145 J	0.0440 J
Calcium	227 J	371 J	198 J	511 J	254 J
Chromium	17.1 J	90.4 J	33.1 J	214 J	32.5 J
Cobalt	0.528 J	0.659 J	0.607 J	1.37 J	0.799 J
Copper	11.8 J	157 J	48.2 J	282 J	51.0 J
Iron	3630 J	3060 J	2630 J	5100 J	2880 J
Lead	3.45 J-	9.76 J-	4.78 J-	13.2	4.20 J-
Magnesium	163 J	261 J	243 J	360 J	264 J
Manganese	18.0 J	81.9 J	47.5 J	100 J	44.0 J
Nickel	1.13 J	2.09	1.84	3.11	1.67
Potassium	119 J	166 J	140 J	272 J	189 J
Selenium	1.25 U	1.11 U	1.13 U	1.16 U	1.09 U
Silver	0.624 U	0.556 U	0.566 U	0.580 U	0.544 U
Sodium	624 UJ	556 UJ	566 UJ	580 UJ	544 UJ
Thallium	3.74 U	3.33 U	3.40 U	3.48 U	3.27 U
Vanadium	3.74	4.89	4.35	7.47	5.12
Zinc	19.3 J+	24.7 J+	10.2 J+	35.8 J+	25.1 J+

NOTES:

Metals analysis method: EPA 6010C.

mg/kg = milligrams per kilogram

Qualifiers

J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

U The analyte was not detected at or above the Reporting Limit (RL).

UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.

DAS Case No.: R34567
SDG No.: MC0AC0
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-311-06-022515	NK-SS-311-612-022515	NK-SS-312-06-022515	NK-SS-312-612-022515	NK-WS-309-06-022515
Sample ID:	MC0AC8	MC0AE0	MC0AD0	MC0AE1	MC0AC4
Lab Sample No.:	1502062-09	1502062-19	1502062-11	1502062-20	1502062-05
Sampling Date:	2/25/2015	2/25/2015	2/25/2015	2/25/2015	2/25/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Percent Solids:	74.8	83.2	91.2	92.7	66.3
ANALYTE (mg/kg)					
Aluminum	11500 J	2530 J	2930 J	2150 J	3100 J
Antimony	2.18 J-	3.43 UJ	3.22 UJ	3.08 UJ	4.35 UJ
Arsenic	229 J	21.2 J	2.32 J-	1.13 J-	27.4 J
Barium	66.0	19.9 J	17.6 J	14.0 J	21.1 J
Beryllium	0.417 J	0.0584 J	0.121 J	0.0928 J	0.115 J
Cadmium	0.258 J	0.0426 J	0.0252 J	0.514 U	0.0785 J
Calcium	1620	253 J	77.4 J	46.6 J	620 J
Chromium	218 J	14.9 J	4.95 J	3.15 J	33.7 J
Cobalt	12.0	0.709 J	0.472 J	0.377 J	1.20 J
Copper	167 J	20.3 J	2.83 J	1.97 J	24.6 J
Iron	24400 J	2930 J	2490 J	1970 J	3280 J
Lead	27.4	3.45 J-	5.17 J-	2.40 J-	6.96 J-
Magnesium	640 J	252 J	221 J	168 J	270 J
Manganese	391 J	30.3 J	84.4 J	56.6 J	83.6 J
Nickel	11.4	1.38	1.55	1.17	2.00
Potassium	638 J	164 J	142 J	100 J	135 J
Selenium	1.30 U	1.14 U	1.07 U	1.03 U	1.45 U
Silver	0.649 U	0.572 U	0.537 U	0.514 U	0.725 U
Sodium	649 UJ	572 UJ	537 UJ	514 UJ	725 UJ
Thallium	3.90 U	3.43 U	3.22 U	3.08 U	4.35 U
Vanadium	25.8	5.05	3.75	2.89	4.83
Zinc	51.8 J+	6.51 J+	8.00 J+	5.52 J+	29.5 J+

NOTES:

Metals analysis method: EPA 6010C.
mg/kg = milligrams per kilogram

Qualifiers

- J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- U The analyte was not detected at or above the Reporting Limit (RL).
- UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.



Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19380
610-701-3000 • Fax 610-701-3186
www.westonsolutions.com

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Date: March 16, 2015

To: Ruth Scharr
EPA Region 3 On-Scene Coordinator

From: Linda M. Adams *Linda M Adams*
WESTON START Chemist

Gretchen Fodor *Gretchen M. Fodor*
WESTON START Chemist

Subject: Inorganic Data Validation (S4VM)
Site: New Kent Wood Preservatives, Inc., Providence Forge, New Kent County, VA
TDD: WS01-14-05-003
Case: R34567 SDG: MC0AD1
DCN: W0233.4B.01193

Overview

Case R34567, Sample Delivery Group (SDG) MC0AD1, consisted of 20 soil samples analyzed for metals by inductively-coupled plasma-atomic emission spectroscopy (ICP-AES). Analyses were performed by CompuChem according to U.S. Environmental Protection Agency (EPA) Method 6010C.

Summary

Sample data were validated for Target Analyte List (TAL) metals by the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (EPA, 2010) and were assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual). Validated TAL metals results are presented in Table 1.

At the request of the EPA On-Scene Coordinator, samples were submitted to a Weston Solutions, Inc. (WESTON[®])-subcontracted laboratory. WESTON has been tasked to evaluate laboratory reported data for the purpose of usability.

No results were rejected. Minor qualification of the data was required for several data results. The data are valid as qualified and may be used for decision making purposes.

Major Problems

No major problems were noted during the validation of the metals analyses.

Minor Problems

Laboratory Blanks

Several target analytes were detected in the method preparation blank (PB) and/or in the initial and continuing calibration blanks (ICBs and CCBs) above the method detection limit (MDL). Negative concentrations of antimony, arsenic, and sodium were detected above the negative MDL in several of the CCBs. The table below summarizes the highest levels of blank contamination for the analytes detected in the PBs, ICBs, and/or CCBs along with the sample results affected by laboratory blank contamination.

Blank	Analyte	Concentration	Samples Affected
Preparation Blank (PB)	copper *	0.300 J mg/kg	None. (No data qualifications were required.)
	selenium	0.504 J mg/kg	MC0AE8, MC0AF7, MC0AF8: The detected result that was less than (<) RL was raised to the RL and qualified as undetected (U).
Continuing Calibration Blank (CCB)	antimony	-6.47 J µg/L	MC0AE2, MC0AE7, MC0AE9, MC0AF0, MC0AF1, MC0AF8: The detection limit for non-detected sample results were estimated (UJ). MC0AD1, MC0AE3, MC0AE4, MC0AE5, MC0AE6, MC0AE8, MC0AF2, MC0AF3, MC0AF4, MC0AF5, MC0AF6, MC0AF7, MC0AF9, MC0AG0: Detected results were estimated with a low bias (J-).
	arsenic	-3.56 J µg/L	MC0AE7, MC0AE9: Detected results would be estimated with a low bias (J-) based on the CCB; however, the J- and matrix spike qualifier J+ conflict in direction of bias. A J qualifier was applied. Refer to the Notes section for further explanation.
	lead	2.26 J µg/L	None. (No data qualifications were required.)
	nickel	1.58 J µg/L	None. (No data qualifications were required.)
	silver *	1.77 J µg/L	MC0AF3: The detected result that was <RL was raised to the RL and qualified as undetected (U).
	sodium	-957 J µg/L	MC0AD1, MC0AE2, MC0AE3, MC0AE4, MC0AE5, MC0AE6, MC0AE7, MC0AE9, MC0AF1, MC0AF2, MC0AF4, MC0AF5, MC0AF6, MC0AF7: The detection limit for non-detected sample results was estimated (UJ). MC0AE8, MC0AF0, MC0AF3, MC0AF8, MC0AF9, MC0AG0: Detected results were estimated with a low bias (J-).
	vanadium *	1.34 J µg/L	None. (No data qualifications were required.)

* Analyte was detected in both the PB and CCB; the higher concentration is listed on the table.

Data qualifier codes are defined later in this report.

µg/L = micrograms per kilogram

mg/kg = milligrams per kilogram

RL = Reporting Limit

Field Blanks

Two equipment blanks were collected on February 26, 2015. Results for the rinsate blanks were evaluated in Case R34567, SDG MC0AB8. After qualifiers were applied based on laboratory blank contamination, the contaminants listed below were reported in the two rinsate blank samples associated with this sampling event.

Blank	Analyte	Concentration	Samples Affected
MC0AB8 (Equipment Blank)	Zinc	981 µg/L	MC0AD1, MC0AE2, MC0AE3, MC0AE4, MC0AE5, MC0AE6, MC0AE7, MC0AE8, MC0AE9, MC0AF0, MC0AF1, MC0AF2, MC0AF3, MC0AF4, MC0AF5, MC0AF6, MC0AF7, MC0AF8, MC0AF9, MC0AG0: Detected results were qualified as estimated with a high bias (J+).
MC0AB9 (Equipment Blank)	Iron	69.4 J µg/L	None.
		11.4 J µg/L	Refer to zinc blank actions above.

Zinc was detected in both equipment rinsate blanks associated with the sampling event. Equipment blank MC0AB8 contained zinc at a concentration approximately 33 times higher than the Reporting Limit (RL), whereas the concentration of zinc in equipment blank MC0AB9 was less than the RL. All soil zinc sample concentrations were less than the equivalent zinc concentration in equipment blank MC0AB8. The validator used professional judgment in qualifying all soil sample results for zinc as estimated with a high bias (J+). The source of zinc contamination in the rinsate blank is under investigation, but appears to be associated with the sampling process. The J+ qualifier was applied to the zinc sample results to alert the data user that the sample results may be biased high due to field contamination; the reported value may be considered an upper concentration for the sample.

Iron was detected in one of the two equipment blank samples, MC0AB9, at a concentration less than the RL. Sample concentrations for iron were greater than (>) 10 times the RL, so no impact is expected to soil sample results based on the concentration of iron in the equipment blank.

Matrix Spike/Matrix Spike Duplicates (MS/MSD)

MS/MSD and post-digestion spike (PDS) analyses were performed on soil sample MC0AE3. With the following exceptions, all MS/MSD, PDS percent recoveries (%Rs), and relative percent differences (RPDs) were within the Quality Control (QC) limits indicated in the table below.

Analyte	MS %R	MSD %R	RPD	PDS %R	QC Limits		Actions
					%R	RPD	
aluminum	688	710	--	48.6	75-125%	--	None required (4)
antimony	63.8	62.2	--	--	75-125%	--	J (Pos)/UJ (ND)
arsenic	154	--	29.7	60.5	75-125%	20	J+ (Pos)
chromium	208	189	--	17.1	75-125%	--	J+ (Pos)
copper	--	--	--	52.4	75-125%	--	None required (4)
iron	310	273	--	9.32			None required (4)
manganese	--	--	--	73.6	75-125%	--	None required (4)

-- criteria met

(4) Qualifiers were not applied to sample results because the native sample concentration was more than 4 times the spike added concentration.

J (Pos) = Estimate positive sample results

J+ (Pos) = Estimate with a high bias the positive sample results.

UJ (ND) = Estimate the non-detected sample results.

Validation actions were applied to all soil sample results for antimony, arsenic, and chromium.

The MS and MSD spike recoveries for aluminum and iron fell outside the QC limit but the spike added concentrations were less than 4 times the native sample concentration. In addition, the PDS recoveries for aluminum, arsenic, chromium, copper, iron, and manganese fell outside the acceptance criteria but the spike added concentrations were less than 4 times the sample concentration. Under these circumstances, data qualification is not required.

Laboratory Duplicate Analysis

Laboratory duplicate analysis was performed on soil sample MC0AE3. With the following exception, the RPDs of all analytes having concentrations > 5x RL were within the acceptance criteria of less than (<)20%.

Analyte	Sample Conc. (mg/kg)	Duplicate Conc. (mg/kg)	RPD	QC Limit RPD	Actions
chromium	295	412	33	20	J (Pos)

J (Pos) = Estimate positive sample results.

Validation actions were applied to all soil sample results.

Serial Dilution Analyses

Serial dilution analysis was performed on soil sample MC0AE3. With the following exception, the percent differences (%Ds) of all serial dilution analyses were within the acceptance criteria of less than or equal to (≤)10% for sample results ≤50x the MDL.

Analyte	Initial Sample Result (µg/L)	Serial Dilution Concentration (µg/L)	%D	Actions
iron	47,158	52,949	12.3	J (Pos)

J (Pos) = Estimate positive sample results

Validation actions were applied to all soil sample results

ICP-AES Interference Check Standard Analysis

Spike recoveries in the Interference Check Sample AB (ICSAB) solution met method acceptance criteria. The Interference Check Sample A (ICSA) solution associated with all sample analyses contained positive interference for cadmium, copper, and nickel were greater than the MDL and negative interference for cobalt, lead, and vanadium were greater than the absolute value of the MDL.

Four soil samples, MC0AE5, MC0AE6, MC0AF1, and MC0AF3, had comparable or higher levels of the interferent iron as compared to the concentration detected in the ICSA solution. The detected results for cadmium in soil samples MC0AE5, MC0AE6, and MC0AF1 were previously qualified as estimated (J) due to quantitation below the RL. Further qualification of the data was not required. The concentrations of the remaining analytes in soil samples MC0AE5, MC0AE6, MC0AF1, and MC0AF3 were significantly higher than the positive and negative concentrations detected in the ICSA solutions; thus, qualification of the data on this basis was not required. Chromium was noted to be a trace impurity of the ICSA solution and as such, no validation action was taken on this basis.

Field Duplicate Analysis

Soil samples MC0AE3 and MC0AE4 were submitted as field duplicate samples. Precision is evaluated by calculating the RPD between the field duplicate results. The USEPA National Functional Guidelines have not established acceptance criteria for field duplicate precision. Based on professional judgment, an RPD acceptance criterion of $\leq 50\%$ was used when both soil sample results are greater than the reporting limit (RL). Additionally, based on professional judgment, the control limit used when either or both field duplicate samples contained analytes at concentrations less than 5 times the RL was $\pm 2x$ RL. Precision criteria were met for all analytes in the field duplicate analyses; therefore, no qualifications were required.

Notes

Target analytes detected below the RL are qualified "J." Sample dilutions were not performed; thus, no adjustment of the RLs was necessary.

It should be noted that the blank action for arsenic in samples MC0AE7 and MC0AE9 was J- due to negative calibration blanks and the validation action for the arsenic MS was J+ due to elevated spike recoveries. Due to the uncertainty between these actions, the arsenic results were estimated (J) with no overall directional bias.

Glossary of Data Qualifier Codes (Inorganic)

- U The analyte was analyzed, but was not detected at a level above the level of the reported sample quantitation limit (RL).
- J The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample (because of the quality of the data generated and/or certain quality control criteria were not met, or the concentration of the analyte was below the RL).
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- UJ The analyte was not detected at a level greater than or equal to the sample RL. However, the reported RL is approximate and may be inaccurate or imprecise.
- R The sample results are unusable because certain criteria were not met, which impacts the quality of the data generated. The analyte may or may not be present in the sample.

DAS Case No.: R34567
SDG No.: MC0AD1
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-313-06-022515	NK-SS-313-612-022515	NK-SS-314-06-022515	NK-SS-314-06D-022515	NK-SS-315-06-022515
Sample ID:	MC0AD1	MC0AE2	MC0AE3	MC0AE4	MC0AE5
Lab Sample No.:	1502063-01	1502063-02	1502063-03	1502063-04	1502063-05
Sampling Date:	2/25/2015	2/25/2015	2/25/2015	2/25/2015	2/25/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Duplicate of MC0AE3	Field Sample
Percent Solids:	91.3	92.1	68.3	70.8	48.3
ANALYTE (mg/kg)					
Aluminum	3370	3710	4390	4350	12700
Antimony	1.63 J-	2.83 UJ	1.46 J-	1.60 J-	2.47 J-
Arsenic	128 J+	63.1 J+	134 J+	128 J+	168 J+
Barium	20.3 J	20.9	22.0 J	24.0	73.4
Beryllium	0.156 J	0.180 J	0.180 J	0.174 J	0.718 J
Cadmium	0.0817 J	0.0417 J	0.0569 J	0.0745 J	0.203 J
Calcium	270 J	176 J	541 J	700	1640
Chromium	121 J+	22.6 J+	295 J+	335 J+	1480 J+
Cobalt	0.539 J	0.525 J	1.67 J	1.72 J	3.95
Copper	158	33.0	75.7	84.2	131
Iron	2660 J	2560 J	6510 J	6440 J	20500 J
Lead	7.83	4.37	13.4	15.2	38.1
Magnesium	241 J	252 J	340 J	337 J	987
Manganese	156	140	40.7	39.1	53.9
Nickel	2.05	1.99	3.09	3.01	10.6
Potassium	135 J	134 J	263 J	252 J	775 J
Selenium	1.03 U	0.944 U	1.38 U	1.19 U	1.64 U
Silver	0.517 U	0.472 U	0.690 U	0.593 U	0.822 U
Sodium	517 UJ	472 UJ	690 UJ	593 UJ	822 UJ
Thallium	3.10 U	2.83 U	4.14 U	3.56 U	4.93 U
Vanadium	4.12	3.94	8.32	8.31	25.8
Zinc	25.8 J+	15.4 J+	19.2 J+	20.3 J+	49.7 J+

NOTES:

Metals analysis method: EPA 6010C.
mg/kg = milligrams per kilogram

Qualifiers

- J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- U The analyte was not detected at or above the Reporting Limit (RL).
- UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.

DAS Case No.: R34567
SDG No.: MC0AD1
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-316-06-022615	NK-SS-317-06-022615	NK-SS-317-612-022615	NK-SS-317-1218-022615	NK-SS-318-06-022615
Sample ID:	MC0AE6	MC0AE7	MC0AE8	MC0AE9	MC0AF0
Lab Sample No.:	1502063-06	1502063-07	1502063-08	1502063-09	1502063-10
Sampling Date:	2/26/2015	2/26/2015	2/26/2015	2/26/2015	2/26/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Percent Solids:	76.6	93.1	92.5	93.9	92.4
ANALYTE (mg/kg)					
Aluminum	3550	3930	3560	3730	5150
Antimony	1.10 J-	3.07 UJ	0.442 J-	3.13 UJ	3.25 UJ
Arsenic	23.8 J+	5.62 J	37.9 J+	1.53 J	49.8 J+
Barium	22.4	18.0 J	25.0	16.2 J	28.2
Beryllium	0.178 J	0.145 J	0.369 J	0.0846 J	0.143 J
Cadmium	0.0827 J	0.0569 J	0.144 J	0.522 U	0.0701 J
Calcium	1160	533	15700	89.8 J	2510
Chromium	35.5 J+	9.11 J+	82.4 J+	4.38 J+	70.9 J+
Cobalt	5.95	0.593 J	2.22	0.438 J	1.84 J
Copper	19.2	4.54	16.8	1.84	39.0
Iron	10700 J	3500 J	6180 J	3210 J	6740 J
Lead	13.0	6.73	25.8	2.69	9.94
Magnesium	260 J	309 J	2450	269 J	847
Manganese	119	39.5	78.7	23.1	55.4
Nickel	5.28	1.94	5.97	1.60	3.90
Potassium	187 J	148 J	328 J	115 J	420 J
Selenium	1.02 U	1.02 U	1.01 U	1.04 U	1.08 U
Silver	0.510 U	0.512 U	0.505 U	0.522 U	0.541 U
Sodium	510 UJ	512 UJ	247 J-	522 UJ	51.5 J-
Thallium	3.06 U	3.07 U	3.03 U	3.13 U	3.25 U
Vanadium	7.41	5.66	7.11	5.17	8.96
Zinc	15.1 J+	9.04 J+	46.4 J+	6.36 J+	22.7 J+

NOTES:

Metals analysis method: EPA 6010C.
mg/kg = milligrams per kilogram

Qualifiers

- J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- U The analyte was not detected at or above the Reporting Limit (RL).
- UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.

DAS Case No.: R34567
SDG No.: MC0AD1
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-318-612-022615	NK-SS-318-1218-022615	NK-SS-319-06-022615	NK-SS-319-612-022615	NK-SS-319-1218-022615
Sample ID:	MC0AF1	MC0AF2	MC0AF3	MC0AF4	MC0AF5
Lab Sample No.:	1502063-11	1502063-12	1502063-13	1502063-14	1502063-15
Sampling Date:	2/26/2015	2/26/2015	2/26/2015	2/26/2015	2/26/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Percent Solids:	93.4	94.5	83.2	88.2	89.7
ANALYTE (mg/kg)					
Aluminum	4880	3430	13000	8380	6470
Antimony	3.18 UJ	0.758 J-	3.37 J-	1.65 J-	0.923 J-
Arsenic	39.4 J+	33.0 J+	156 J+	102 J+	46.9 J+
Barium	71.3	22.5	52.6	35.9	38.6
Beryllium	0.231 J	0.126 J	0.194 J	0.256 J	0.226 J
Cadmium	0.189 J	0.0871 J	1.54	0.222 J	0.178 J
Calcium	1210	645	5410	2300	1240
Chromium	54.7 J+	48.3 J+	188 J+	106 J+	61.0 J+
Cobalt	9.72	3.77	3.19	2.42	4.68
Copper	30.0	23.5	175	85.8	37.0
Iron	12100 J	8530 J	10200 J	10500 J	12800 J
Lead	14.3	7.72	73.5	14.9	22.1
Magnesium	487 J	278 J	876	998	416 J
Manganese	417	110	100	73.9	162
Nickel	6.12	3.32	32.3	6.97	7.59
Potassium	285 J	218 J	513 J	697	360 J
Selenium	1.06 U	0.953 U	1.20 U	1.12 U	1.12 U
Silver	0.530 U	0.477 U	0.601 U	0.561 U	0.558 U
Sodium	530 UJ	477 UJ	82.9 J-	561 UJ	558 UJ
Thallium	3.18 U	2.86 U	3.60 U	3.37 U	3.35 U
Vanadium	9.68	7.51	14.7	15.6	10.7
Zinc	18.6 J+	11.1 J+	161 J+	44.4 J+	23.3 J+

NOTES:

Metals analysis method: EPA 6010C.
mg/kg = milligrams per kilogram

Qualifiers

- J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- U The analyte was not detected at or above the Reporting Limit (RL).
- UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.

DAS Case No.: R34567
SDG No.: MC0AD1
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-320-06-022615	NK-SS-320-612-022615	NK-SS-320-1218-022615	NK-SS-321-06-022615	NK-SS-321-612-022615
Sample ID:	MC0AF6	MC0AF7	MC0AF8	MC0AF9	MC0AG0
Lab Sample No.:	1502063-16	1502063-17	1502063-18	1502063-19	1502063-20
Sampling Date:	2/26/2015	2/26/2015	2/26/2015	2/26/2015	2/26/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Percent Solids:	92.3	93.4	90.8	86.8	95.0
ANALYTE (mg/kg)					
Aluminum	3140	4210	4660	3200	1910
Antimony	1.04 J-	0.716 J-	3.15 UJ	0.596 J-	0.463 J-
Arsenic	46.5 J+	64.8 J+	57.5 J+	174 J+	157 J+
Barium	13.0 J	32.0	27.1	22.9	12.7 J
Beryllium	0.0946 J	0.161 J	0.245 J	0.127 J	0.0806 J
Cadmium	0.0542 J	0.0554 J	0.103 J	0.112 J	0.495 J
Calcium	1320	2660	10700	7810	4990
Chromium	50.5 J+	68.3 J+	83.5 J+	248 J+	288 J
Cobalt	1.53 J	4.15	2.24	1.96 J	0.629 J
Copper	34.7	44.4	49.2	160	186
Iron	5050 J	8330 J	8320 J	5590 J	3070 J
Lead	4.78	12.8	12.9	10.4	8.45
Magnesium	645	575	1350	843	642
Manganese	47.1	105	75.3	52.4	31.9
Nickel	2.59	4.02	4.36	3.36	1.93
Potassium	376 J	290 J	370 J	260 J	170 J
Selenium	1.08 U	1.05 U	1.05 U	1.13 U	1.02 U
Silver	0.542 U	0.525 U	0.524 U	0.565 U	0.511 U
Sodium	542 UJ	525 UJ	161 J-	115 J-	55.0 J-
Thallium	3.25 U	3.15 U	3.15 U	3.39 U	3.07 U
Vanadium	6.91	8.97	9.69	6.38	4.10
Zinc	15.2 J+	16.2 J+	21.8 J+	26.4 J+	20.1 J+

NOTES:

Metals analysis method: EPA 6010C.
mg/kg = milligrams per kilogram

Qualifiers

- J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- U The analyte was not detected at or above the Reporting Limit (RL).
- UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.



Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19380
610-701-3000 • Fax 610-701-3186
www.westonsolutions.com

The Trusted Integrator for Sustainable Solutions

Date: March 17, 2015

To: Ruth Scharr
EPA Region 3 On-Scene Coordinator

From: Linda M. Adams *Linda M. Adams*
WESTON START Chemist

Gretchen Fodor *Gretchen M. Fodor*
WESTON START Chemist

Subject: Inorganic Data Validation (S4VM)
Site: New Kent Wood Preservatives, Inc., Providence Forge, New Kent County, VA
TDD: WS01-14-05-003
Case: R34567 SDG: MC0AG1
DCN: W0233.4B.01195

Overview

Case R34567, Sample Delivery Group (SDG) MC0AG1, consisted of 1 soil sample analyzed for metals by inductively-coupled plasma-atomic emission spectroscopy (ICP-AES). Analyses were performed by CompuChem according to United States Environmental Protection Agency (EPA) Method 6010C.

Summary

Sample data were validated for Target Analyte List (TAL) metals by the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (EPA, 2010) and were assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual). Validated TAL metals results are presented in Table 1.

At the request of the EPA On-Scene Coordinator, the sample was submitted to a Weston Solutions, Inc. (WESTON®)-subcontracted laboratory. WESTON has been tasked to evaluate laboratory reported data for the purpose of usability.

No results were rejected. Minor qualification of the data was required for several data results. The data are valid as qualified and may be used for decision making purposes.

Major Problems

No major problems were noted during the validation of the metals analyses.

Minor Problems

Laboratory Blanks

Several target analytes were detected in the method preparation blank (PB) and/or in the initial and continuing calibration blanks (ICBs and CCBs) above the method detection limit (MDL). Negative concentrations of antimony, arsenic, and selenium were detected above the negative MDL in several of the CCBs. The table below summarizes the highest level of blank contamination for the analytes detected in the PBs, ICBs, and/or CCBs along with the sample results affected by laboratory blank contamination.

Blank	Analyte	Concentration	Samples Affected
Preparation Blank (PB)	copper*	0.365 J mg/kg	None. (No data qualifications were required.)
Initial Calibration Blank (ICB)	beryllium*	0.511 J µg/L	MC0AG1: The detected result that was less than the RL was raised to the RL and qualified as undetected (U).
Continuing Calibration Blank (CCB)	antimony	-5.13 J µg/L	MC0AG1: Detected results were estimated with a low bias (J-).
	arsenic	-2.81 J µg/L	None. (No data qualifications were required.)
	cobalt*	1.43 J µg/L	None. (No data qualifications were required.)
	silver*	1.57 J µg/L	None. (No data qualifications were required.)
	selenium	-5.99 J µg/L	MC0AG1: Detected results were estimated with a low bias (J-).
	thallium	4.15 J µg/L	None. (No data qualifications were required.)
	vanadium*	2.24 J µg/L	None. (No data qualifications were required.)

* Analyte was detected in both the PB and ICB/CCB; the higher concentration is listed on the table.

Data qualifier codes are defined later in this report.

µg/L = micrograms per kilogram

mg/kg = milligrams per kilogram

RL = Reporting Limit

Field Blanks

Two equipment blanks were collected on February 26, 2015. Results for the rinsate blanks were evaluated in Case R34567, SDG MC0AB8. After qualifiers were applied based on laboratory blank contamination, the contaminants listed below were reported in the two rinsate blank samples associated with this sampling event.

Blank	Analyte	Concentration	Samples Affected
MC0AB8 (Equipment Blank)	zinc	981 µg/L	MC0AG1: Detected results were qualified as estimated with a high bias (J+).
MC0AB9 (Equipment Blank)	iron	69.4 J µg/L	None.
		11.4 J µg/L	Refer to zinc blank actions above.

Zinc was detected in both equipment rinsate blanks associated with the sampling event. Equipment blank MC0AB8 contained zinc at a concentration approximately 33 times higher than the Reporting Limit (RL), whereas the concentration of zinc in equipment blank MC0AB9 was less than the RL. The soil zinc sample concentration was less than the equivalent zinc concentration in equipment blank MC0AB8. The validator used professional judgment in qualifying the soil sample result for zinc as estimated with a high bias (J+). The source of zinc contamination in the rinsate blank is under investigation, but appears to be associated with the sampling process. The J+ qualifier was applied to the zinc sample result to alert the data user that the sample result may be biased high due to field contamination; the reported value may be considered an upper concentration for the sample.

Iron was detected in one of the two equipment blank samples, MC0AB9, at a concentration less than the RL. The sample concentration for iron was greater than 10 times the RL, so no impact is expected to the soil sample result based on the concentration of iron in the equipment blank.

Matrix Spike/Matrix Spike Duplicates (MS/MSD)

MS/MSD and post-digestion spike (PDS) analyses were performed on soil sample MC0AG1. With the following exceptions, all MS/MSD and PDS percent recoveries (%Rs) along with the MS/MSD relative percent differences (RPDs) were within the Quality Control (QC) limits indicated in the table below.

Analyte	MS %R	MSD %R	RPD	PDS %R	QC Limits		Actions
					%R	RPD	
aluminum	637#	328#	63.9#	--	75-125%	20	None required (4)
antimony	52.7	62.9	--	--	75-125%	20	J- (Pos)
arsenic	--	135	28	--	75-125%	20	J+ (Pos)
calcium	628#	828#	27#	--	75-125%	20	None required (4)
chromium	133	279#	71#	68#	75-125%	20	J+ (Pos)
copper	--	160	42	--	75-125%	20	J+ (Pos)
iron	37.4#	-73.6#	-613#	57#	75-125%	20	None required (4)
magnesium	48.0	--	59	--	75-125%	20	J- (Pos)
manganese	55.3	--	41	--	75-125%	20	J- (Pos)
sodium	132	--	21	--	75-125%	20	J+ (Pos)

-- = criteria met

= Spike Recovery was calculated from a concentration more than 4 times the spike added concentration; therefore, the recovery or RPD flagged with the # was not used to qualify the sample data.

(4) = Qualifiers were not applied to sample results because the native sample concentration was more than 4 times the spike added concentration.

J+ (Pos) = Positive sample results were estimated with a high bias.

J- (Pos) = Positive sample results were estimated with a low bias.

Laboratory Duplicate Analysis

Laboratory duplicate analysis was performed on soil sample MC0AG1. With the following exception, the RPDs of all analytes having concentrations greater than 5 times the RL were within the acceptance criteria of less than 20%.

Analyte	Sample Concentration (mg/kg)	Duplicate Concentration (mg/kg)	RPD	QC Limit RPD	Actions
aluminum	2,580	2,100	20.4	20	J (Pos)
calcium	17,800	27,900	44.2	20	J (Pos)
iron	5,180	3,760	31.6	20	J (Pos)
lead	12.8	8.49	40.2	20	J (Pos)
magnesium	2,300	20,700	160	20	@ J- (Pos)
manganese	79.0	58.6	29.6	20	@ J- (Pos)
zinc	26.7	19.5	31.1	20	@ J+ (Pos)

J (Pos) = Positive sample results were estimated.

@ J- (Pos) = The data qualifier based on laboratory duplicates would be to estimate (J) positive sample results; however, the overall data qualifier for this analyte is J-, based on low MS or MSD recovery.

@ J+ (Pos) = The data qualifier based on laboratory duplicates would be to estimate (J) positive sample results; however, the overall data qualifier for this analyte is J+, based on high MS or MSD recovery or, for zinc, due to its presence in the equipment blank.

Serial Dilution Analyses

Serial dilution analysis was performed on soil sample MC0AG1. With the following exceptions, the percent differences (%Ds) of all serial dilution analyses were within the acceptance criteria of less than or equal to 10% for sample results greater than or equal to 50 times the MDL.

Analyte	Initial Sample Result (µg/L)	Serial Dilution Concentration (µg/L)	%D	Actions
aluminum	25,624	28,793	12.4	J (Pos)
arsenic	1,197	1,318	10.1	@ J+ (Pos)
calcium	176,790	201,855	14.2	J (Pos)
chromium	1,822	2,020	10.9	@ J+ (Pos)
copper	1,050	1,180	12.4	@ J+ (Pos)
iron	51,383	59,451	15.7	J (Pos)
lead	127	147	16.1	J (Pos)
manganese	785	879	12.0	@ J- (Pos)
zinc	265	301	13.3	@ J+ (Pos)

J (Pos) = Positive sample results were estimated.

@ J- (Pos) = The data qualifier based on serial dilution would be to estimate (J) positive sample results; however, the overall data qualifier for this analyte is J-, based on low MS or MSD recovery.

@ J+ (Pos) = The data qualifier based on serial dilution would be to estimate (J) positive sample results; however, the overall data qualifier for this analyte is J+, based on high MS or MSD recovery or, for zinc, due to its presence in the equipment blank.

Field Duplicate Analysis

Field duplicate samples were not submitted with this SDG. No validation action was taken on this basis.

Notes

Target analytes detected below the RLs are qualified "J." Sample dilutions were not performed, so no adjustment of the RLs was necessary.

Arsenic, chromium, and copper were qualified as J+ due to elevated recoveries in the MS and/or MSD. Elevated %Ds in the serial dilution analysis would have resulted in a J qualifier, which is non-directional with respect to bias. The overall qualifier applied to the arsenic, chromium, and copper results in sample MC0AG1 was J+.

Magnesium was qualified as J- due to low recovery in the MS. The elevated RPD in the laboratory duplicate would have resulted in a J qualifier, which is non-directional with respect to bias. The overall qualifier applied to the magnesium in sample MC0AG1 was J-.

Manganese was qualified as J- due to low recovery in the MS. The elevated RPD in the laboratory duplicate and the elevated %D in the serial dilution analysis would each have resulted in a J qualifier, which is non-directional with respect to bias. The overall qualifier applied to the manganese in sample MC0AG1 was J-.

Due to its presence in the equipment blank, the zinc result was qualified as J+. An elevated %D in the serial dilution analysis was also encountered for zinc and would have resulted in a J qualifier, which is non-directional with respect to bias. The overall qualifier applied to the zinc result in sample MC0AG1 was J+.

Glossary of Data Qualifier Codes (Inorganic)

- U The analyte was analyzed, but was not detected at a level above the level of the reported sample quantitation limit (RL).
- J The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample (because of the quality of the data generated and/or certain quality control criteria were not met, or the concentration of the analyte was below the RL).
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- UJ The analyte was not detected at a level greater than or equal to the sample RL. However, the reported RL is approximate and may be inaccurate or imprecise.
- R The sample results are unusable because certain criteria were not met, which impacts the quality of the data generated. The analyte may or may not be present in the sample.

TABLE

DAS Case No.: R34567
SDG No.: MC0AG1
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-321-618-022615				
Sample ID:	MC0AG1				
Lab Sample No.:	1502064-01				
Sampling Date:	2/26/2015				
Matrix:	Soil				
Sample Type:	Field Sample				
Percent Solids:	95.5				
ANALYTE (mg/kg)					
Aluminum	2580 J				
Antimony	0.902 J-				
Arsenic	121 J+				
Barium	18.3 J				
Beryllium	0.504 U				
Cadmium	0.0991 J				
Calcium	17800 J				
Chromium	184 J+				
Cobalt	2.14				
Copper	106 J+				
Iron	5180 J				
Lead	12.8 J				
Magnesium	2300 J-				
Manganese	79.0 J-				
Nickel	4.03				
Potassium	240 J				
Selenium	0.719 J-				
Silver	0.504 U				
Sodium	292 J+				
Thallium	3.02 U				
Vanadium	6.65				
Zinc	26.7 J+				

NOTES:

Metals analysis method: EPA 6010C.
mg/kg = milligrams per kilogram

Qualifiers

- J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- U The analyte was not detected at or above the Reporting Limit (RL).
- UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.



Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19380
610-701-3000 • Fax 610-701-3186
www.westonsolutions.com

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Date: March 13, 2015

To: Ruth Scharr
EPA Region 3 On-Scene Coordinator

From: Gretchen Fodor *Gretchen M. Fodor*
WESTON START Chemist

Linda M. Adams *Linda M. Adams*
WESTON START Chemist

Subject: Inorganic Data Validation (S4VM)
Site: New Kent Wood Preservatives, Inc., Providence Forge, New Kent County, VA
TDD: WS01-14-05-003
Case: R34567 SDG: MC0AC0
DCN: W0233.4B.01188

Overview

Case R34567, Sample Delivery Group (SDG) MC0AC0, consisted of 20 soil samples analyzed for hexavalent chromium by colorimetry and 14 soil samples analyzed for Total Organic Carbon (TOC). Hexavalent chromium analyses were performed by CompuChem according to U.S Environmental Protection Agency (EPA) Methods 3060A and 7196A. TOC analyses were performed by the Lloyd Kahn Method. Samples were also analyzed for pH by EPA Method 9045D.

Summary

Sample data were validated for hexavalent chromium and TOC in general accordance with the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (EPA, 2010) and were assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual). Data validation was not performed for the pH analyses. Validated hexavalent chromium and TOC results and non-validated pH results are presented in Table 1.

At the request of the EPA On-Scene Coordinator, samples were submitted to a Weston Solutions, Inc. (WESTON®)-subcontracted laboratory. WESTON has been tasked to evaluate laboratory reported data for the purpose of usability. The data are valid as qualified and may be used for decision making purposes.

Major Problems

Hexavalent Chromium

No major problems were noted during the validation of the hexavalent chromium analyses.

TOC

No major problems were noted during the validation of the TOC analyses.

Minor Problems

Hexavalent Chromium

Soluble pre-digestion matrix spike (MS) and matrix spike duplicate (MSD) samples were prepared from MC0AD7, and the percent recovery (%R) of hexavalent chromium in the MS (63%R) and MSD (69%R) samples were less than the lower spike recovery limit of 75%. Validation actions would be to qualify detected results as estimated (J) and non-detected results as estimated (UJ). Insoluble pre-digestion MS and MSD samples were also prepared from MC0AD7, and the recovery of hexavalent chromium in the insoluble MS (138%R) and MSD (142%R) samples exceeded the upper spike recovery limit of 125%. Validation actions based on the insoluble spike recoveries would be to qualify only detected results as estimated with a high bias (J+). The associated laboratory control sample (LCS) recovery was within QC limits and the post-digestion spike recovery for sample MC0AD7 (100%R) was within the 75-125% recovery limit. No overall high or low bias was indicated; therefore, all detected hexavalent chromium results were estimated (J), and the non-detected hexavalent chromium results (i.e., the reporting limit [RL]) were estimated (UJ).

TOC

Soil sample MC0AD7 was used to prepare the MS and MSD samples. The percent recovery of TOC in the MSD (134%R) exceeded the 75-125%R control limits. All detected TOC results were estimated with a high bias (J+).

TOC results for four soil samples exceeded the instrument calibration range: MC0AC0, MC0AC4, MC0AC8, and MC0AC9. The sample results were already qualified as estimated with a high bias; therefore, no further qualifications were necessary.

Notes

Hexavalent Chromium

The method blank associated with the soil samples in the SDG was free of contamination. No field blanks were collected in association with these samples.

The LCS spike recovery was within acceptance limits. No qualifiers were necessary.

Samples MC0AD4 and MC0AD6 were submitted as the field duplicate pair with this sample set. Both samples were non-detected for hexavalent chromium; therefore, precision was deemed acceptable for the hexavalent chromium.

Analytes detected below laboratory RLs are qualified "J."

Sample dilutions were not performed, so no adjustment of the RLs was necessary.

TOC

The method blank associated with the soil samples in the SDG was free from contamination. No field blanks were submitted with this sample set.

The LCS spike recovery was within acceptance limits. No qualifiers were necessary.

No field duplicate pairs were submitted with this sample set.

All sample results exceeded the RLs.

Sample dilutions were not performed; therefore, no adjustment of the RLs was necessary.

Glossary of Data Qualifier Codes (Inorganic)

- U The analyte was analyzed, but was not detected at a level above the level of the reported sample quantitation limit (RL).
- J The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (because of the quality of the data generated and/or certain quality control criteria were not met, or the concentration of the analyte was below the RL).
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- UJ The analyte was not detected at a level greater than or equal to the sample RL. However, the reported RL is approximate and may be inaccurate or imprecise.
- R The sample results are unusable because certain criteria were not met, which impacts the quality of the data generated. The analyte may or may not be present in the sample.

TABLE

DAS Case No.: R34567
SDG No.: MC0AC0
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-301-06-022515	NK-SS-302-06-022515	NK-SS-303-06-022515	NK-SS-303D-06-022515	NK-SS-304-06-022515
Sample ID:	MC0AD2	MC0AD3	MC0AD4	MC0AD6	MC0AD5
Lab Sample No.:	1502062-12	1502062-13	1502062-14	1502062-16	1502062-15
Sampling Date:	2/25/2015	2/25/2015	2/25/2015	2/25/2015	2/25/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Duplicate of MC0AD4	Field Sample
Percent Solids:	63.7	86.8	30.5	33.1	58.6
ANALYTE (units)					
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA
Hexavalent Chromium (mg/kg)	3.14 UJ	0.829 J	6.56 UJ	6.04 UJ	3.41 UJ
pH (pH units)	7.19	7.61	6.61	6.56	6.88

NOTES:

Data for hexavalent chromium and Total Organic Carbon were validated. No data validation was performed on pH data.

Total Organic Carbon analysis method: Lloyd Kahn.

Hexavalent chromium preparation/analysis methods: EPA 3060A/7196A.

pH method: EPA 9045D.

NA = Not analyzed

mg/kg = milligrams per kilogram

Qualifiers

J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

U The analyte was not detected at or above the Reporting Limit (RL).

UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.

DAS Case No.: R34567
SDG No.: MC0AC0
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-305-06-022515	NK-SS-305-612-022515	NK-SS-306-06-022515	NK-SS-306-612-022515	NK-SS-307-06-022515
Sample ID:	MC0AC0	MC0AC1	MC0AC2	MC0AC3	MC0AC5
Lab Sample No.:	1502062-01	1502062-02	1502062-03	1502062-04	1502062-06
Sampling Date:	2/25/2015	2/25/2015	2/25/2015	2/25/2015	2/25/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Percent Solids:	61.3	71.5	85.8	78.3	82.2
ANALYTE (units)					
Total Organic Carbon (mg/kg)	73400 J+	6250 J+	7740 J+	4030 J+	5670 J+
Hexavalent Chromium (mg/kg)	4.24 J	11.8 J	4.10 J	12.6 J	4.43 J
pH (pH units)	5.95	5.74	4.71	4.72	6.84

NOTES:

Data for hexavalent chromium and Total Organic Carbon were validated. No data validation was performed on pH data.

Total Organic Carbon analysis method: Lloyd Kahn.

Hexavalent chromium preparation/analysis methods: EPA 3060A/7196A.

pH method: EPA 9045D.

NA = Not analyzed

mg/kg = milligrams per kilogram

Qualifiers

J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

U The analyte was not detected at or above the Reporting Limit (RL).

UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.

DAS Case No.: R34567
SDG No.: MC0AC0
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-307-612-022515	NK-SS-308-06-022515	NK-SS-308-612-022515	NK-SS-310-06-022515	NK-SS-310-612-022515
Sample ID:	MC0AC6	MC0AC7	MC0AD7	MC0AC9	MC0AD9
Lab Sample No.:	1502062-07	1502062-08	1502062-17	1502062-10	1502062-18
Sampling Date:	2/25/2015	2/25/2015	2/25/2015	2/25/2015	2/25/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Percent Solids:	79.4	86.7	88.3	86.2	87.5
ANALYTE (units)					
Total Organic Carbon (mg/kg)	12200 J+	10500 J+	3990 J+	20800 J+	NA
Hexavalent Chromium (mg/kg)	5.34 J	5.55 J	2.27 J	6.82 J	1.23 J
pH (pH units)	6.79	6.08	6.13	6.53	6.48

NOTES:

Data for hexavalent chromium and Total Organic Carbon were validated. No data validation was performed on pH data.

Total Organic Carbon analysis method: Lloyd Kahn.

Hexavalent chromium preparation/analysis methods: EPA 3060A/7196A.

pH method: EPA 9045D.

NA = Not analyzed

mg/kg = milligrams per kilogram

Qualifiers

J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

U The analyte was not detected at or above the Reporting Limit (RL).

UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.

DAS Case No.: R34567
SDG No.: MC0AC0
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-311-06-022515	NK-SS-311-612-022515	NK-SS-312-06-022515	NK-SS-312-612-022515	NK-WS-309-06-022515
Sample ID:	MC0AC8	MC0AE0	MC0AD0	MC0AE1	MC0AC4
Lab Sample No.:	1502062-09	1502062-19	1502062-11	1502062-20	1502062-05
Sampling Date:	2/25/2015	2/25/2015	2/25/2015	2/25/2015	2/25/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Percent Solids:	74.8	83.2	91.2	92.7	66.3
ANALYTE (units)					
Total Organic Carbon (mg/kg)	14800 J+	7100 J+	8820 J+	4840 J+	15700 J+
Hexavalent Chromium (mg/kg)	1.61 J	2.84 J	2.19 UJ	2.16 UJ	7.61 J
pH (pH units)	5.98	6.51	5.77	5.48	6.57

NOTES:

Data for hexavalent chromium and Total Organic Carbon were validated. No data validation was performed on pH data.

Total Organic Carbon analysis method: Lloyd Kahn.

Hexavalent chromium preparation/analysis methods: EPA 3060A/7196A.

pH method: EPA 9045D.

NA = Not analyzed

mg/kg = milligrams per kilogram

Qualifiers

J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

U The analyte was not detected at or above the Reporting Limit (RL).

UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.



Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19380
610-701-3000 • Fax 610-701-3186
www.westonsolutions.com

The Trusted Integrator for Sustainable Solutions

Date: March 13, 2015

To: Ruth Scharr
EPA Region 3 On-Scene Coordinator

From: Gretchen Fodor *Gretchen M. Fodor*
WESTON START Chemist

Linda M. Adams *Linda M. Adams*
WESTON START Chemist

Subject: Inorganic Data Validation (S4VM)
Site: New Kent Wood Preservatives, Inc., Providence Forge, New Kent County, VA
TDD: WS01-14-05-003
Case: R34567 SDG: MC0AD1
DCN: W0233.4B.01187

Overview

Case R34567, Sample Delivery Group (SDG) MC0AD1, consisted of 20 soil samples analyzed for hexavalent chromium by colorimetry and 5 soil samples analyzed for Total Organic Carbon (TOC). Hexavalent chromium analyses were performed by CompuChem according to U.S. Environmental Protection Agency (EPA) Methods 3060A and 7196A. TOC analyses were performed by the Lloyd Kahn Method. Samples were also analyzed for pH by EPA Method 9045D.

Summary

Sample data were validated for hexavalent chromium and TOC in general accordance with the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (EPA, 2010) and were assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual). Data validation was not performed for the pH analyses. Validated hexavalent chromium and TOC results and non-validated pH results are presented in Table 1.

At the request of the EPA On-Scene Coordinator, samples were submitted to a Weston Solutions, Inc. (WESTON®)-subcontracted laboratory. WESTON has been tasked to evaluate laboratory reported data for the purpose of usability. The data are valid as qualified and may be used for decision making purposes.

Major Problems

Hexavalent Chromium

No major problems were noted during the validation of the hexavalent chromium analyses.

TOC

No major problems were noted during the validation of the TOC analyses.

Minor Problems

Hexavalent Chromium

The relative percent difference (RPD) between field duplicate samples MC0AE3 and MC0AE4 was 125%, exceeding the 50% RPD criteria used to assess field duplicate precision. The concentration of sample MC0AE3 was 2.75 milligrams per kilogram (mg/kg) and was flagged by the laboratory with a “J” qualifier because the result was less than the reporting limit (RL). The concentration of sample MC0AE4 was 12.0 mg/kg. Because the reported concentration of one field duplicate was less than the RL, the validator used the control limit of the absolute value of 2 times the RL (mathematically expressed as “ $|2 \times \text{RL}|$ ”), which was 5.86 mg/kg. Both field duplicate sample results were qualified as estimated (J) because the absolute difference between the two field duplicate sample results exceeded the $|2 \times \text{RL}|$ control limit.

TOC

No minor problems were noted during the validation of the TOC analyses.

Notes

Hexavalent Chromium

The method blank associated with the soil samples in the SDG was free of contamination. No field blanks were collected in association with these samples.

The laboratory control sample (LCS) spike recovery was within acceptance limits. No qualifiers were necessary.

Soluble and insoluble pre-digestion matrix spike (MS) and matrix spike duplicate (MSD) samples were prepared from MC0AE3, and the percent recoveries (%Rs) and RPDs were within acceptance limits. A post-digestion spike was not required, but was performed as a contingency. The post-digestion spike recovery of 98%R was also within acceptance limits. No validation qualifiers were necessary.

Analytes detected below laboratory RLs are qualified “J”.

Sample dilutions were not performed; therefore, no adjustment of the RLs was necessary.

TOC

The method blank associated with the soil samples in the SDG was free from contamination. No field blanks were submitted with this sample set.

The LCS spike recovery was within acceptance limits. No qualifiers were necessary.

Samples MC0AE3 and MC0AE4 were submitted as the field duplicate pair with this sample set, and the RPD was 42%, which is less than the upper QC limit of 50%. No qualifiers were necessary.

All sample results exceeded the RLs.

Sample dilutions were not performed; therefore, no adjustment of the RLs was necessary.

Glossary of Data Qualifier Codes (Inorganic)

- U The analyte was analyzed, but was not detected at a level above the level of the reported sample quantitation limit (RL).
- J The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample (because of the quality of the data generated and/or certain quality control criteria were not met, or the concentration of the analyte was below the RL).
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- UJ The analyte was not detected at a level greater than or equal to the sample RL. However, the reported RL is approximate and may be inaccurate or imprecise.
- R The sample results are unusable because certain criteria were not met, which impacts the quality of the data generated. The analyte may or may not be present in the sample.

TABLE

DAS Case No.: R34567
SDG No.: MC0AD1
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-313-06-022515	NK-SS-313-612-022515	NK-SS-314-06-022515	NK-SS-314-06D-022515	NK-SS-315-06-022515
Sample ID:	MC0AD1	MC0AE2	MC0AE3	MC0AE4	MC0AE5
Lab Sample No.:	1502063-01	1502063-02	1502063-03	1502063-04	1502063-05
Sampling Date:	2/25/2015	2/25/2015	2/25/2015	2/25/2015	2/25/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Duplicate of MC0AE3	Field Sample
Percent Solids:	91.3	92.1	68.3	70.8	48.3
ANALYTE (units)					
Total Organic Carbon (mg/kg)	8950	2810	18200	11900	79400
Hexavalent Chromium (mg/kg)	2.06 J	2.17 U	2.75 J	12.0 J	9.78
pH (pH units)	6.13	6.15	5.55	6.31	5.75

NOTES:

Data for hexavalent chromium and Total Organic Carbon were validated. No data validation was performed on pH data.

Total Organic Carbon analysis method: Lloyd Kahn.

Hexavalent chromium preparation/analysis methods: EPA 3060A/7196A.

pH method: EPA 9045D.

NA = Not analyzed

mg/kg = milligrams per kilogram

Qualifiers

J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

U The analyte was not detected at or above the Reporting Limit (RL).

UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.

DAS Case No.: R34567
SDG No.: MC0AD1
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-316-06-022615	NK-SS-317-06-022615	NK-SS-317-612-022615	NK-SS-317-1218-022615	NK-SS-318-06-022615
Sample ID:	MC0AE6	MC0AE7	MC0AE8	MC0AE9	MC0AF0
Lab Sample No.:	1502063-05	1502063-07	1502063-08	1502063-09	1502063-10
Sampling Date:	2/26/2015	2/26/2015	2/26/2015	2/26/2015	2/26/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Percent Solids:	76.6	93.1	92.5	93.9	92.4
ANALYTE (units)					
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA
Hexavalent Chromium (mg/kg)	1.51 J	2.15 U	2.16 U	2.13 U	4.24
pH (pH units)	8.01	5.98	6.96	4.86	8.45

NOTES:

Data for hexavalent chromium and Total Organic Carbon were validated. No data validation was performed on pH data.

Total Organic Carbon analysis method: Lloyd Kahn.

Hexavalent chromium preparation/analysis methods: EPA 3060A/7196A.

pH method: EPA 9045D.

NA = Not analyzed

mg/kg = milligrams per kilogram

Qualifiers

J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

U The analyte was not detected at or above the Reporting Limit (RL).

UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.

DAS Case No.: R34567
SDG No.: MC0AD1
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-318-612-022615	NK-SS-318-1218-022615	NK-SS-319-06-022615	NK-SS-319-612-022615	NK-SS-319-1218-022615
Sample ID:	MC0AF1	MC0AF2	MC0AF3	MC0AF4	MC0AF5
Lab Sample No.:	1502063-11	1502063-12	1502063-13	1502063-14	1502063-15
Sampling Date:	2/26/2015	2/26/2015	2/26/2015	2/26/2015	2/26/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Percent Solids:	93.4	94.5	83.2	88.2	89.7
ANALYTE (units)					
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA
Hexavalent Chromium (mg/kg)	2.14	5.37	8.22	4.67	2.90
pH (pH units)	8.16	7.96	7.75	7.89	7.96

NOTES:

Data for hexavalent chromium and Total Organic Carbon were validated. No data validation was performed on pH data.

Total Organic Carbon analysis method: Lloyd Kahn.

Hexavalent chromium preparation/analysis methods: EPA 3060A/7196A.

pH method: EPA 9045D.

NA = Not analyzed

mg/kg = milligrams per kilogram

Qualifiers

J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

U The analyte was not detected at or above the Reporting Limit (RL).

UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.

DAS Case No.: R34567
SDG No.: MC0AD1
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-320-06-022615	NK-SS-320-612-022615	NK-SS-320-1218-022615	NK-SS-321-06-022615	NK-SS-321-612-022615
Sample ID:	MC0AF6	MC0AF7	MC0AF8	MC0AF9	MC0AG0
Lab Sample No.:	1502063-16	1502063-17	1502063-18	1502063-19	1502063-20
Sampling Date:	2/26/2015	2/26/2015	2/26/2015	2/26/2015	2/26/2015
Matrix:	Soil	Soil	Soil	Soil	Soil
Sample Type:	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Percent Solids:	92.3	93.4	90.8	86.8	95.0
ANALYTE (units)					
Total Organic Carbon (mg/kg)	NA	NA	NA	NA	NA
Hexavalent Chromium (mg/kg)	3.47	0.643 J	3.26	23.4	3.12
pH (pH units)	8.32	8.28	8.09	8.41	8.54

NOTES:

Data for hexavalent chromium and Total Organic Carbon were validated. No data validation was performed on pH data.

Total Organic Carbon analysis method: Lloyd Kahn.

Hexavalent chromium preparation/analysis methods: EPA 3060A/7196A.

pH method: EPA 9045D.

NA = Not analyzed

mg/kg = milligrams per kilogram

Qualifiers

J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

U The analyte was not detected at or above the Reporting Limit (RL).

UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.



Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19380
610-701-3000 • Fax 610-701-3186
www.westonsolutions.com

The Trusted Integrator for Sustainable Solutions

Date: March 13, 2015

To: Ruth Scharr
EPA Region 3 On-Scene Coordinator

From: Gretchen Fodor *Gretchen M. Fodor*
WESTON START Chemist

Linda M. Adams *Linda M. Adams*
WESTON START Chemist

Subject: Inorganic Data Validation (S4VM)
Site: New Kent Wood Preservatives, Inc., Providence Forge, New Kent County, VA
TDD: WS01-14-05-003
Case: R34567 SDG: MC0AG1
DCN: W0233.4B.01190

Overview

Case R34567, Sample Delivery Group (SDG) MC0AG1, consisted of one (1) soil sample analyzed for hexavalent chromium by colorimetry. The hexavalent chromium analysis was performed by CompuChem according to EPA Methods 3060A and 7196A. The sample was also analyzed for pH by EPA Method 9045D.

Summary

Sample data were validated for hexavalent chromium in general accordance with the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (EPA, 2010) and were assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual). Data validation was not performed for the pH analysis. The validated hexavalent chromium result and non-validated pH result are presented in Table 1.

At the request of the EPA On-Scene Coordinator, samples were submitted to a Weston Solutions, Inc. (WESTON®)-subcontracted laboratory. WESTON has been tasked to evaluate laboratory reported data for the purpose of usability. The data are valid as qualified, and may be used for decision making purposes.

Major Problems

Hexavalent Chromium

No major problems were noted during the validation of the hexavalent chromium analysis.

Minor Problems

Hexavalent Chromium

Soluble pre-digestion matrix spike (MS) and matrix spike duplicate (MSD) samples were prepared from MC0AG1, and the percent recovery (%R) of hexavalent chromium in the MS (40%R) and MSD (38%R) were less than the lower spike recovery limit of 75%. Validation actions would be to qualify the detected result as estimated (J). Insoluble pre-digestion MS and MSD samples were also prepared from MC0AG1, and the recoveries of hexavalent chromium in the insoluble MS (80%R) and MSD (83%) were within the 75-125%R acceptance range. The associated laboratory control sample (LCS) recovery was within quality control (QC) limits. The post-digestion spike recovery for sample MC0AG1 (15%R) was very low. Based on this information, the detected hexavalent chromium result for sample MC0AG1 was estimated with a low bias (J-) due to the poor soluble MS and MSD recoveries and the very poor post-digestion spike recovery.

Notes

Hexavalent Chromium

The method blank associated with the soil sample in this SDG was free of contamination. No field blanks were collected in association with these samples.

The LCS spike recovery was within acceptance limits. No qualifiers were necessary.

Field duplicate samples were not included in this SDG. No validation qualifiers were necessary.

Sample dilutions were not performed, so no adjustment of the reporting limit (RL) was necessary.

Glossary of Data Qualifier Codes (Inorganic)

- U The analyte was analyzed, but was not detected at a level above the level of the reported sample quantitation limit (RL).
- J The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample (because of the quality of the data generated and/or certain quality control criteria were not met, or the concentration of the analyte was below the RL).
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- UJ The analyte was not detected at a level greater than or equal to the sample RL. However, the reported RL is approximate and may be inaccurate or imprecise.
- R The sample results are unusable because certain criteria were not met, which impacts the quality of the data generated. The analyte may or may not be present in the sample.

DAS Case No.: R34567
SDG No.: MC0AG1
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-SS-321-1218-022615				
Sample ID:	MC0AG1				
Lab Sample No.:	1502064-01				
Sampling Date:	2/26/2015				
Matrix:	Soil				
Sample Type:	Field Sample				
Percent Solids:	95.5				
ANALYTE (units)					
Total Organic Carbon (mg/kg)	NA				
Hexavalent Chromium (mg/kg)	6.20 J-				
pH (pH units)	8.64				

NOTES:

Data for hexavalent chromium were validated. No data validation was performed on pH data.
Total Organic Carbon analysis method: Lloyd Kahn.
Hexavalent chromium preparation/analysis methods: EPA 3060A/7196A.
pH method: EPA 9045D.
NA = Not analyzed
mg/kg = milligrams per kilogram

Qualifiers

- J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- U The analyte was not detected at or above the Reporting Limit (RL).
- UJ The analyte was not detected at a level greater than or equal to the RL; however the RL is estimated.



Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19380
610-701-3000 • Fax 610-701-3186
www.westonsolutions.com

The Trusted Integrator for Sustainable Solutions

Date: March 16, 2015

To: Ruth Scharr
EPA Region 3 On-Scene Coordinator

From: Linda M. Adams *Linda M Adams*
WESTON START Chemist

Gretchen Fodor *Gretchen M. Fodor*
WESTON START Chemist

Subject: Inorganic Data Validation (S2BVM)
Site: New Kent Wood Preservatives, Inc., Providence Forge, New Kent County, VA
TDD: WS01-14-05-003
Case: R34567 SDG: MC0AB8
DCN: W0233.4B.01191

Overview

Case R34567, Sample Delivery Group (SDG) MC0AB8, consisted of 2 equipment blanks analyzed for metals by inductively-coupled plasma-atomic emission spectroscopy (ICP-AES). Analyses were performed by CompuChem according to EPA Method 6010C.

Summary

Sample data were validated for Target Analyte List (TAL) metals by the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (EPA, 2010) and were assigned the Superfund Data Validation Label S2BVM (Stage_2B_Validation_Manual). Validated TAL metals results are presented in Table 1.

At the request of the EPA On-Scene Coordinator, samples were submitted to a Weston Solutions, Inc. (WESTON®)-subcontracted laboratory. EPA tasked WESTON to evaluate laboratory reported data for the purpose of usability.

No results were rejected. Minor qualification of the data due to laboratory blank contamination was required for several data results. The data are valid as qualified and may be used for decision making purposes.

Major Problems

No major problems were noted during the validation of the metals analyses.

Minor Problems

Blanks

Several target analytes were detected in the method preparation blank (PB) and/or in the initial and continuing calibration blanks (ICBs and CCBs) above the method detection limit (MDL). A negative concentration of arsenic was detected above the negative MDL in one of the CCBs. The following table summarizes the highest level of blank contamination for the analytes detected in the PBs, ICBs and/or CCBs and validation actions:

Blank	Analyte	Concentration	Samples Affected
Preparation Blank PBWTI	manganese	0.135 J µg/L	MC0AB8, MC0AB9: the detected result that was less than the RL was raised to the RL and qualified as undetected (U).
Preparation Blank PBWTU*	zinc	7.04 J µg/L	None. (No data qualifications were required.)
ICB	beryllium	0.511 J µg/L	MC0AB8, MC0AB9: the detected result that was less than the RL was raised to the RL and qualified as undetected (U).
CCB	arsenic	-2.81 J µg/L	MC0AB8, MC0AB9: the non-detected result was qualified as estimated (UJ).
	copper	2.63 J µg/L	MC0AB8, MC0AB9: the detected results greater than the RL were qualified as non-detected at the reported concentration (U).
	vanadium	2.24 J µg/L	None. (No data qualifications were required.)

* Preparation blank PBWTU only applies to sample MC0AB8.

RL = Reporting limit.

µg/L = micrograms per liter

Data qualifier codes are defined later in this report.

Copper results were detected above the RL in both equipment blanks. In accordance with the U.S. EPA National Functional Guidelines, the data validator used professional judgment to qualify the sample results that exceeded the RL that were less than 5 times the blank concentration as non-detected (U).

Notes

The original analysis of rinsate blank MC0AB8 contained zinc at a concentration of 1,150 µg/L, significantly exceeding the Reporting Limit (RL). To confirm the high concentration of zinc in the rinsate blank, WESTON requested that the laboratory re-digest the equipment blank. Zinc in the re-digested equipment blank was detected at a concentration of 981 µg/L, confirming the initial detection of zinc in the equipment blank. The laboratory reported the zinc concentration from the re-digested sample. The concentration of zinc in equipment blank MC0AB9 were greater than the RL.

Target analytes detected below the RLs are qualified "J". Sample dilutions were not performed, so no adjustment of the RLs was necessary.

Glossary of Data Qualifier Codes (Inorganic)

- U The analyte was analyzed, but was not detected at a level above the level of the reported sample quantitation limit (RL).
- J The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample (because of the quality of the data generated and/or certain quality control criteria were not met, or the concentration of the analyte was below the RL).
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- UJ The analyte was not detected at a level greater than or equal to the sample RL. However, the reported RL is approximate and may be inaccurate or imprecise.
- R The sample results are unusable because certain criteria were not met, which impacts the quality of the data generated. The analyte may or may not be present in the sample.

DAS Case No.: R34567
SDG No.: MC0AB8
Lab: CompuChem

TABLE 1
DATA SUMMARY TABLE
NEW KENT WOOD PRESERVATIVES, INC. SITE

Station Location:	NK-RB-01-022615	NK-RB-02-022615			
Sample ID:	MC0AB8	MC0AB9			
Lab Sample No.:	1503003-01	1503003-02			
Sampling Date:	2/26/2015	2/26/2015			
Matrix:	Water	Water			
Sample Type:	Rinsate Blank	Rinsate Blank			
ANALYTE (µg/L)					
Aluminum	200 U	200 U			
Antimony	30.0 U	30.0 U			
Arsenic	10.0 UJ	10.0 UJ			
Barium	200 U	200 U			
Beryllium	5.00 U	5.00 U			
Cadmium	5.00 U	5.00 U			
Calcium	5000 U	5000 U			
Chromium	10.0 U	10.0 U			
Cobalt	20.0 U	20.0 U			
Copper	7.53 U	6.77 U			
Iron	200 U	69.4 J			
Lead	10.0 U	10.0 U			
Magnesium	5000 U	5000 U			
Manganese	10.0 U	10.0 U			
Nickel	10.0 U	10.0 U			
Potassium	5000 U	5000 U			
Selenium	10.0 U	10.0 U			
Silver	5.00 U	5.00 U			
Sodium	5000 U	5000 U			
Thallium	30.0 U	30.0 U			
Vanadium	20.0 U	20.0 U			
Zinc	981	11.4 J			

NOTES:

Metals analysis method: EPA 6010C.

µg/L = micrograms per liter

Qualifiers

J The analyte was positively identified, and the numerical value is the approximate analyte concentration in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

U The analyte was not detected at or above the Reporting Limit (RL).

UJ The analyte was not detected at a level greater than or equal to the RL; however, the RL is estimated.