



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION 5 CHICAGO REGIONAL LABORATORY
 536 SOUTH CLARK STREET
 CHICAGO, ILLINOIS 60605



Date: 7/24/2014

Subject: Review of Region 5 Data for SE Chicago Petcoke

From: Amanda Wroble, Chemist
 Region 5 Chicago Regional Laboratory

Amanda Wroble 07.24.14

To: Air Division, US EPA Region 5
 77 West Jackson Boulevard
 Chicago, IL 60605

The data being transmitted under this cover memo successfully passed CRL's internal data review procedures as documented in our current Quality Management Plan (QMP) and appropriate Standard Operating Procedures (SOPs). Please be aware that CRL does not perform data validation which is based on your data quality objectives. This function must be performed independently of the laboratory generating the data.

Results in this report represent only the samples analyzed.

Please have the U.S. EPA Project Manager/Officer call the CRL Sample Coordinator at (312) 353-0375 for any comments or questions.

Attached are Results for: SE Chicago Petcoke

/ /

Data Management Coordinator and Date Received

Date Transmitted: ____ / ____ / ____

Analyses included in this report:

Metals full ICP (W)



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Phone:(312)353-8370 Fax:(312)886-2591

Air Division, US EPA Region 5
77 West Jackson Boulevard
Chicago IL, 60605

Project: SE Chicago Petcoke
Project Number: [none]
Project Manager: Motria Caudill

Reported:
Jul-24-14 11:42

ANALYSIS CASE NARRATIVE

GENERAL INFORMATION

CRL received 14 wipes and 2 HVAC air filter samples for trace metals analysis by inductively coupled plasma-atomic emission spectroscopy on 1 July 2014 for work order 1407001. This report contains results for the HVAC filters only. The wipes have been analyzed and reported separately. The filters were collected by the Air Division on 1 July 2014. The designated analyst for these samples, Amanda Wroble, can be reached at 312.353.0375. There is no established holding time for filters in the reference methods.

Two brands of HVAC filters corresponding to the brands of filters received for work order 1407001 were purchased from local hardware stores. These filters were logged into LIMS on 9 July 2014 under work order 1407004 for comparison to the field samples and to perform a precision and accuracy (P&A) study.

Refer to CRL Pen&Ink No. METALS002 R2.0-PI01 for SOP deviations made to the filter sonication procedure. The filter samples were assigned a matrix of "wipe" in LIMS to facilitate reporting in units of mg/wipe, which is equivalent to mg/filter.

All supporting data are archived with work order 1407001.

SAMPLE ANALYSIS AND RESULTS

Samples from work order 1407004 were digested in batch B407048 on 14 July 2014, and samples from work order 1407001 were digested in batch B407050 on 15 July 2014 using CRL SOP Metals 002, Revision 2 (ERG No. 0.143.04.005). The filter dimensions for each sample retained by CRL are shown below. One sixth of the total filter was taken as an aliquot. Results are reported in terms of the filter retained by CRL.

<u>LIMS ID (Field ID)</u>	<u>Filter Dimension (inches x inches)</u>
1407001-15 (15)	6 3/4 x 3 7/8
1407001-16 (16)	5 x 4 1/8
1407004-01 (3M Filtrete Allergy Defense Filter)	6 3/4 x 3 1/4
1407004-02 (True Blue BASIC protection MERV 7)	7 x 3 3/16

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The digests were analyzed on 15 July 2014 using CRL SOP Metals 003, Revision 6.13 (EPA Method 200.7/SW-846 Method 6010C).

The data reported herein meets the data quality objectives referenced in Quality Assurance Project Plan v1.1 Southeast Chicago Petroleum Coke Dust Investigation dated February 21, 2014 and HVAC filter update communicated via email on June 30, 2014.

QUALITY CONTROL

All quality control (QC) audits were within CRL limits for the requested analytes or did not result in qualification of the data except for the following:

Duplicate (DUP): Relative Percent Difference Limit $\leq 20\%$.

Based on the duplicate criteria regarding the spiked blank filters: Cadmium (21.3%), iron (35.4%), and zinc (30.0%) for comparison of B407048-MS1 and -MS5; and iron (195%), manganese (45.8%), and zinc (116%) for comparison of B407048-MS6 and -MSA were outside the audit limit.

Based on the duplicate criteria regarding the filter field samples: Aluminum (21.9%), cadmium (51.0%), chromium (60.7%), iron (177%), manganese (44.9%), sodium (36.0%) and zinc (88.3%) for B407050-DUP2 (source 1407001-16) were outside the audit limit.

Matrix Spike (MS): Recovery Limit = $100 \pm 25\%$. Although matrix spikes are not performed on filter field samples, spiked blank filter recoveries from the P&A study were included for informational purposes and evaluated against the matrix spike audit limit. Cadmium (127%), iron (904%), and zinc (176%) for B407048-MS1 (source 1407004-01) and thallium (61.2%) for B407048-MS6 (source 1407004-02) were outside the audit recovery limits. Elevated recoveries for iron and zinc were not suspected to be spectral in nature but rather from the cutting tool or metal mesh filter backing although removed prior to extraction.

All cadmium, iron, thallium, and zinc results if above their respective reporting limits were flagged "J" estimated based on the duplicate and matrix spike audits in addition to P&A data generated from spiked blank filters. Aluminum, chromium, manganese, and sodium results for sample 1407001-16 were flagged "J" estimated based on the duplicate audit.

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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
15	1407001-15	Wipe	Jul-01-14 14:16	Jul-01-14 15:25
16	1407001-16	Wipe	Jul-01-14 14:26	Jul-01-14 15:25
3M Filtrete Allergy Defense Filter	1407004-01	Wipe	Jul-09-14 08:15	Jul-09-14 08:15
True Blue BASIC protection MERV 7 Filter	1407004-02	Wipe	Jul-09-14 08:15	Jul-09-14 08:15

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Metals by ICP using EPA 200.7 (modified) US EPA Region 5 Chicago Regional Laboratory

15 (1407001-15) Wipe Sampled: Jul-01-14 14:16 Received: Jul-01-14 15:25

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Aluminum	1.15			0.0600	mg/Wipe	1	B407050	Jul-15-14	Jul-15-14
Antimony	U			0.006	"	"	"	"	"
Arsenic	U			0.0120	"	"	"	"	"
Barium	0.0941			0.0009	"	"	"	"	"
Beryllium	U			0.0006	"	"	"	"	"
Cadmium	0.00511	J		0.0006	"	"	"	"	"
Calcium	13.6			0.0600	"	"	"	"	"
Chromium	0.0115			0.0015	"	"	"	"	"
Cobalt	U			0.0018	"	"	"	"	"
Copper	0.0970			0.006	"	"	"	"	"
Iron	1.75	J		0.0240	"	"	"	"	"
Lead	0.205			0.009	"	"	"	"	"
Magnesium	2.02			0.0600	"	"	"	"	"
Manganese	0.163			0.0024	"	"	"	"	"
Nickel	0.00677			0.0018	"	"	"	"	"
Potassium	1.73			0.240	"	"	"	"	"
Selenium	U			0.0150	"	"	"	"	"
Silver	U			0.003	"	"	"	"	"
Sodium	11.6			0.120	"	"	"	"	"
Thallium	U			0.0180	"	"	"	"	"
Vanadium	0.00446			0.0015	"	"	"	"	"
Zinc	2.72	J		0.009	"	"	"	"	"

16 (1407001-16) Wipe Sampled: Jul-01-14 14:26 Received: Jul-01-14 15:25

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Aluminum	0.0623	J		0.0600	mg/Wipe	1	B407050	Jul-15-14	Jul-15-14
Antimony	U			0.006	"	"	"	"	"
Arsenic	U			0.0120	"	"	"	"	"
Barium	0.00698			0.0009	"	"	"	"	"
Beryllium	U			0.0006	"	"	"	"	"
Cadmium	0.00228	J		0.0006	"	"	"	"	"
Calcium	0.575			0.0600	"	"	"	"	"
Chromium	0.00157	J		0.0015	"	"	"	"	"
Cobalt	U			0.0018	"	"	"	"	"

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Metals by ICP using EPA 200.7 (modified) US EPA Region 5 Chicago Regional Laboratory

16 (1407001-16) Wipe Sampled: Jul-01-14 14:26 Received: Jul-01-14 15:25

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Copper	0.00835			0.006	mg/Wipe	1	B407050	Jul-15-14	Jul-15-14
Iron	2.80	J		0.0240	"	"	"	"	"
Lead	U			0.009	"	"	"	"	"
Magnesium	0.125			0.0600	"	"	"	"	"
Manganese	0.0160	J		0.0024	"	"	"	"	"
Nickel	U			0.0018	"	"	"	"	"
Potassium	0.615			0.240	"	"	"	"	"
Selenium	U			0.0150	"	"	"	"	"
Silver	U			0.003	"	"	"	"	"
Sodium	0.427	J		0.120	"	"	"	"	"
Thallium	U			0.0180	"	"	"	"	"
Vanadium	U			0.0015	"	"	"	"	"
Zinc	0.222	J		0.009	"	"	"	"	"

3M Filtrete Allergy Defense Filter (1407004-01) Wipe Sampled: Jul-09-14 08:15 Received: Jul-09-14 08:15

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Aluminum	U			0.0600	mg/Wipe	1	B407048	Jul-14-14	Jul-15-14
Antimony	U			0.006	"	"	"	"	"
Arsenic	U			0.0120	"	"	"	"	"
Barium	U			0.0009	"	"	"	"	"
Beryllium	U			0.0006	"	"	"	"	"
Cadmium	0.00075	J		0.0006	"	"	"	"	"
Calcium	0.0842			0.0600	"	"	"	"	"
Chromium	U			0.0015	"	"	"	"	"
Cobalt	U			0.0018	"	"	"	"	"
Copper	U			0.006	"	"	"	"	"
Iron	U			0.0240	"	"	"	"	"
Lead	U			0.009	"	"	"	"	"
Magnesium	U			0.0600	"	"	"	"	"
Manganese	U			0.0024	"	"	"	"	"
Nickel	U			0.0018	"	"	"	"	"
Potassium	U			0.240	"	"	"	"	"
Selenium	U			0.0150	"	"	"	"	"
Silver	U			0.003	"	"	"	"	"
Sodium	U			0.120	"	"	"	"	"

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Metals by ICP using EPA 200.7 (modified)

US EPA Region 5 Chicago Regional Laboratory

3M Filtrete Allergy Defense Filter (1407004-01) Wipe Sampled: Jul-09-14 08:15 Received: Jul-09-14 08:15

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Thallium	U			0.0180	mg/Wipe	1	B407048	Jul-14-14	Jul-15-14
Vanadium	U			0.0015	"	"	"	"	"
Zinc	0.0166	J		0.009	"	"	"	"	"

True Blue BASIC protection MERV 7 Filter (1407004-02) Wipe Sampled: Jul-09-14 08:15 Received: Jul-09-14 08:15

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Aluminum	U			0.0600	mg/Wipe	1	B407048	Jul-14-14	Jul-15-14
Antimony	U			0.006	"	"	"	"	"
Arsenic	U			0.0120	"	"	"	"	"
Barium	U			0.0009	"	"	"	"	"
Beryllium	U			0.0006	"	"	"	"	"
Cadmium	0.00075	J		0.0006	"	"	"	"	"
Calcium	0.174			0.0600	"	"	"	"	"
Chromium	U			0.0015	"	"	"	"	"
Cobalt	U			0.0018	"	"	"	"	"
Copper	U			0.006	"	"	"	"	"
Iron	U			0.0240	"	"	"	"	"
Lead	U			0.009	"	"	"	"	"
Magnesium	U			0.0600	"	"	"	"	"
Manganese	U			0.0024	"	"	"	"	"
Nickel	U			0.0018	"	"	"	"	"
Potassium	U			0.240	"	"	"	"	"
Selenium	U			0.0150	"	"	"	"	"
Silver	U			0.003	"	"	"	"	"
Sodium	0.330			0.120	"	"	"	"	"
Thallium	U			0.0180	"	"	"	"	"
Vanadium	U			0.0015	"	"	"	"	"
Zinc	0.0153	J		0.009	"	"	"	"	"

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Metals by ICP using EPA 200.7 (modified) - Quality Control US EPA Region 5 Chicago Regional Laboratory

Batch B407048 - Ultrasonic Extraction

Blank (B407048-BLK1) Prepared: Jul-14-14 Analyzed: Jul-15-14

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit
Aluminum	U			0.0100	mg/Wipe					
Antimony	U			0.001	"					
Arsenic	U			0.002	"					
Barium	U			0.00015	"					
Beryllium	U			0.0001	"					
Cadmium	U			0.0001	"					
Calcium	U			0.0100	"					
Chromium	U			0.00025	"					
Cobalt	U			0.0003	"					
Copper	U			0.001	"					
Iron	U			0.004	"					
Lead	U			0.0015	"					
Magnesium	U			0.0100	"					
Manganese	U			0.0004	"					
Nickel	U			0.0003	"					
Potassium	U			0.0400	"					
Selenium	U			0.0025	"					
Silver	U			0.0005	"					
Sodium	U			0.0200	"					
Thallium	U			0.003	"					
Vanadium	U			0.00025	"					
Zinc	U			0.0015	"					

LCS (B407048-BS1) Prepared: Jul-14-14 Analyzed: Jul-15-14

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit
Aluminum	0.0521			0.0100	mg/Wipe	5.000E-2		104 85-115		
Antimony	0.02595			0.001	"	2.500E-2		104 85-115		
Arsenic	0.00496			0.002	"	5.000E-3		99.2 85-115		
Barium	0.0103			0.00015	"	1.000E-2		103 85-115		
Beryllium	0.00052			0.0001	"	5.000E-4		103 85-115		
Cadmium	0.00258			0.0001	"	2.500E-3		103 85-115		
Calcium	2.547			0.0100	"	2.500		102 85-115		

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Metals by ICP using EPA 200.7 (modified) - Quality Control US EPA Region 5 Chicago Regional Laboratory

Batch B407048 - Ultrasonic Extraction

LCS (B407048-BS1)

Prepared: Jul-14-14 Analyzed: Jul-15-14

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Chromium	0.00519			0.00025	mg/Wipe	5.000E-3		104	85-115		
Cobalt	0.0049			0.0003	"	5.000E-3		98.0	85-115		
Copper	0.00523			0.001	"	5.000E-3		105	85-115		
Iron	0.05162			0.004	"	5.000E-2		103	85-115		
Lead	0.02552			0.0015	"	2.500E-2		102	85-115		
Magnesium	1.024			0.0100	"	1.000		102	85-115		
Manganese	0.01027			0.0004	"	1.000E-2		103	85-115		
Nickel	0.01043			0.0003	"	1.000E-2		104	85-115		
Potassium	1.287			0.0400	"	1.250		103	85-115		
Selenium	0.02546			0.0025	"	2.500E-2		102	85-115		
Silver	0.00134			0.0005	"	1.250E-3		107	85-115		
Sodium	2.515			0.0200	"	2.500		101	85-115		
Thallium	0.02679			0.003	"	2.500E-2		107	85-115		
Vanadium	0.00518			0.00025	"	5.000E-3		104	85-115		
Zinc	0.05352			0.0015	"	5.000E-2		107	85-115		

Matrix Spike (B407048-MS1)

Source: 1407004-01

Prepared: Jul-14-14 Analyzed: Jul-15-14

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Aluminum	0.3220			0.0600	mg/Wipe	0.2999	U	107	75-125		
Antimony	0.1556			0.006	"	0.1500	U	104	75-125		
Arsenic	0.03003			0.0120	"	2.999E-2	U	100	75-125		
Barium	0.0624			0.0009	"	5.999E-2	U	104	75-125		
Beryllium	0.00313			0.0006	"	2.999E-3	U	104	75-125		
Cadmium	0.01984			0.0006	"	1.500E-2	7.50E-4	127	75-125		
Calcium	15.45			0.0600	"	15.00	0.08423	102	75-125		
Chromium	0.03172			0.0015	"	2.999E-2	U	106	75-125		
Cobalt	0.02931			0.0018	"	2.999E-2	U	97.7	75-125		
Copper	0.03255			0.006	"	2.999E-2	U	109	75-125		
Iron	2.732			0.0240	"	0.2999	0.02047	904	75-125		
Lead	0.1529			0.009	"	0.1500	U	102	75-125		
Magnesium	6.198			0.0600	"	5.999	U	103	75-125		
Manganese	0.0673			0.0024	"	5.999E-2	2.20E-4	112	75-125		

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Metals by ICP using EPA 200.7 (modified) - Quality Control US EPA Region 5 Chicago Regional Laboratory

Batch B407048 - Ultrasonic Extraction

Matrix Spike (B407048-MS1)		Source: 1407004-01		Prepared: Jul-14-14 Analyzed: Jul-15-14							
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Nickel	0.06409			0.0018	mg/Wipe	5.999E-2	7.80E-4	106	75-125		
Potassium	7.799			0.240	"	7.498	U	104	75-125		
Selenium	0.1505			0.0150	"	0.1500	U	100	75-125		
Silver	0.00813			0.003	"	7.498E-3	U	108	75-125		
Sodium	15.20			0.120	"	15.00	U	101	75-125		
Thallium	0.1584			0.0180	"	0.1500	U	106	75-125		
Vanadium	0.03146			0.0015	"	2.999E-2	U	105	75-125		
Zinc	0.5455			0.009	"	0.2999	0.01659	176	75-125		

Matrix Spike (B407048-MS5)		Source: 1407004-01		Prepared: Jul-14-14 Analyzed: Jul-15-14							
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Aluminum	0.3213			0.0600	mg/Wipe	0.2999	U	107	75-125		
Antimony	0.1585			0.006	"	0.1500	U	106	75-125		
Arsenic	0.0315			0.0120	"	2.999E-2	U	105	75-125		
Barium	0.06253			0.0009	"	5.999E-2	U	104	75-125		
Beryllium	0.00314			0.0006	"	2.999E-3	U	105	75-125		
Cadmium	0.01602			0.0006	"	1.500E-2	7.50E-4	102	75-125		
Calcium	15.69			0.0600	"	15.00	0.08423	104	75-125		
Chromium	0.03199			0.0015	"	2.999E-2	U	107	75-125		
Cobalt	0.02989			0.0018	"	2.999E-2	U	99.7	75-125		
Copper	0.03259			0.006	"	2.999E-2	U	109	75-125		
Iron	1.911			0.0240	"	0.2999	0.02047	630	75-125		
Lead	0.1565			0.009	"	0.1500	U	104	75-125		
Magnesium	6.297			0.0600	"	5.999	U	105	75-125		
Manganese	0.06542			0.0024	"	5.999E-2	2.20E-4	109	75-125		
Nickel	0.0647			0.0018	"	5.999E-2	7.80E-4	107	75-125		
Potassium	7.857			0.240	"	7.498	U	105	75-125		
Selenium	0.1546			0.0150	"	0.1500	U	103	75-125		
Silver	0.00811			0.003	"	7.498E-3	U	108	75-125		
Sodium	15.41			0.120	"	15.00	U	103	75-125		
Thallium	0.1597			0.0180	"	0.1500	U	106	75-125		
Vanadium	0.03176			0.0015	"	2.999E-2	U	106	75-125		

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Environmental Protection Agency Region 5 Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
Phone: (312)353-8370 Fax: (312)886-2591

Air Division, US EPA Region 5
77 West Jackson Boulevard
Chicago IL, 60605

Project: SE Chicago Peteoke
Project Number: [none]
Project Manager: Motria Caudill

Reported:
Jul-24-14 11:42

Metals by ICF using EPA 200.7 (modified) - Quality Control US EPA Region 5 Chicago Regional Laboratory

Batch B407048 - Ultrasonic Extraction

Matrix Spike (B407048-MS5)		Source: 1407004-01		Prepared: Jul-14-14		Analyzed: Jul-15-14					
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Zinc	0.4031			0.009	mg/Wipe	0.2999	0.01659	129	75-125		

Matrix Spike (B407048-MS6)		Source: 1407004-02		Prepared: Jul-14-14		Analyzed: Jul-15-14					
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Aluminum	0.3040			0.0600	mg/Wipe	0.2999	U	101	75-125		
Antimony	0.1547			0.006	"	0.1500	U	103	75-125		
Arsenic	0.0313			0.0120	"	2.999E-2	U	104	75-125		
Barium	0.06012			0.0009	"	5.999E-2	U	100	75-125		
Beryllium	0.003			0.0006	"	2.999E-3	U	100	75-125		
Cadmium	0.01602			0.0006	"	1.500E-2	7.50E-4	102	75-125		
Calcium	15.26			0.0600	"	15.00	0.1735	101	75-125		
Chromium	0.03036			0.0015	"	2.999E-2	U	101	75-125		
Cobalt	0.02862			0.0018	"	2.999E-2	U	95.4	75-125		
Copper	0.03194			0.006	"	2.999E-2	U	106	75-125		
Iron	0.3152			0.0240	"	0.2999	0.01982	98.5	75-125		
Lead	0.1502			0.009	"	0.1500	U	100	75-125		
Magnesium	6.094			0.0600	"	5.999	0.01758	101	75-125		
Manganese	0.06001			0.0024	"	5.999E-2	2.80E-4	99.6	75-125		
Nickel	0.06163			0.0018	"	5.999E-2	5.30E-4	102	75-125		
Potassium	7.553			0.240	"	7.498	U	101	75-125		
Selenium	0.1455			0.0150	"	0.1500	U	97.0	75-125		
Silver	0.00785			0.003	"	7.498E-3	U	105	75-125		
Sodium	15.17			0.120	"	15.00	0.3296	99.0	75-125		
Thallium	0.09244			0.0180	"	0.1500	U	61.6	75-125		
Vanadium	0.03048			0.0015	"	2.999E-2	U	102	75-125		
Zinc	0.3276			0.009	"	0.2999	0.01531	104	75-125		

Matrix Spike (B407048-MSA)		Source: 1407004-02		Prepared: Jul-14-14		Analyzed: Jul-15-14					
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Aluminum	0.3243			0.0600	mg/Wipe	0.2999	U	108	75-125		
Antimony	0.1567			0.006	"	0.1500	U	104	75-125		
Arsenic	0.03028			0.0120	"	2.999E-2	U	101	75-125		

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Environmental Protection Agency Region 5 Chicago Regional Laboratory

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Air Division, US EPA Region 5 77 West Jackson Boulevard Chicago IL, 60605	Project: SE Chicago Petcoke Project Number: [none] Project Manager: Motria Caudill	Reported: Jul-24-14 11:42
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Metals by ICP using EPA 200.7 (modified) - Quality Control US EPA Region 5 Chicago Regional Laboratory

Batch B407048 - Ultrasonic Extraction

Matrix Spike (B407048-MSA)	Source: 1407004-02			Prepared: Jul-14-14 Analyzed: Jul-15-14							
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Barium	0.06178			0.0009	mg/Wipe	5.999E-2	U	103	75-125		
Beryllium	0.00311			0.0006	"	2.999E-3	U	104	75-125		
Cadmium	0.01633			0.0006	"	1.500E-2	7.50E-4	104	75-125		
Calcium	15.36			0.0600	"	15.00	0.1735	101	75-125		
Chromium	0.03249			0.0015	"	2.999E-2	U	108	75-125		
Cobalt	0.02901			0.0018	"	2.999E-2	U	96.7	75-125		
Copper	0.03353			0.006	"	2.999E-2	U	112	75-125		
Iron	23.38			0.0240	"	0.2999	0.01982	NR	75-125		
Lead	0.1517			0.009	"	0.1500	U	101	75-125		
Magnesium	6.139			0.0600	"	5.999	0.01758	102	75-125		
Manganese	0.09563			0.0024	"	5.999E-2	2.80E-4	159	75-125		
Nickel	0.06323			0.0018	"	5.999E-2	5.30E-4	105	75-125		
Potassium	7.748			0.240	"	7.498	U	103	75-125		
Selenium	0.1415			0.0150	"	0.1500	U	94.4	75-125		
Silver	0.00816			0.003	"	7.498E-3	U	109	75-125		
Sodium	15.30			0.120	"	15.00	0.3296	99.8	75-125		
Thallium	0.1074			0.0180	"	0.1500	U	71.6	75-125		
Vanadium	0.03022			0.0015	"	2.999E-2	U	101	75-125		
Zinc	1.228			0.009	"	0.2999	0.01531	404	75-125		

Reference (B407048-SRM1)	Prepared: Jul-14-14 Analyzed: Jul-15-14										
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Arsenic	0.00942			0.002	mg/Wipe	1.000E-2		94.2	80-120		
Barium	0.00252			0.00015	"	2.500E-3		101	80-120		
Beryllium	0.00102			0.0001	"	1.000E-3		102	80-120		
Cadmium	0.001			0.0001	"	1.000E-3		99.7	80-120		
Chromium	0.00252			0.00025	"	2.500E-3		101	80-120		
Cobalt	0.00248			0.0003	"	2.500E-3		99.1	80-120		
Copper	0.00232			0.001	"	2.500E-3		92.8	80-120		
Iron	0.00273			0.004	"	2.500E-3		109	80-120		
Lead	0.0024			0.0015	"	2.500E-3		95.8	80-120		
Manganese	0.001			0.0004	"	1.000E-3		100	80-120		

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Environmental Protection Agency Region 5 Chicago Regional Laboratory

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Project: SE Chicago Petcoke
Project Number: [none]
Project Manager: Motria Caudill

Reported:
Jul-24-14 11:42

Metals by ICF using EPA 200.7 (modified) - Quality Control US EPA Region 5 Chicago Regional Laboratory

Batch B407048 - Ultrasonic Extraction

Reference (B407048-SRM1)

Prepared: Jul-14-14 Analyzed: Jul-15-14

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	Limit	RPD	RPD Limit
Nickel	0.00257			0.0003	mg/Wipe	2.500E-3		103	80-120		
Silver	0.00095			0.0005	"	1.000E-3		95.3	80-120		
Thallium	0.00225			0.003	"	2.500E-3		90.1	80-120		
Vanadium	0.00245			0.00025	"	2.500E-3		98.2	80-120		
Zinc	0.00266			0.0015	"	2.500E-3		106	80-120		

Batch B407050 - Ultrasonic Extraction

Blank (B407050-BLK1)

Prepared & Analyzed: Jul-15-14

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	Limit	RPD	RPD Limit
Aluminum	U			0.0100	mg/Wipe						
Antimony	U			0.001	"						
Arsenic	U			0.002	"						
Barium	U			0.00015	"						
Beryllium	U			0.0001	"						
Cadmium	U			0.0001	"						
Calcium	U			0.0100	"						
Chromium	U			0.00025	"						
Cobalt	U			0.0003	"						
Copper	U			0.001	"						
Iron	U			0.004	"						
Lead	U			0.0015	"						
Magnesium	U			0.0100	"						
Manganese	U			0.0004	"						
Nickel	U			0.0003	"						
Potassium	U			0.0400	"						
Selenium	U			0.0025	"						
Silver	U			0.0005	"						
Sodium	U			0.0200	"						
Thallium	U			0.003	"						
Vanadium	U			0.00025	"						
Zinc	U			0.0015	"						

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Environmental Protection Agency Region 5 Chicago Regional Laboratory

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Air Division, US EPA Region 5 77 West Jackson Boulevard Chicago IL, 60605	Project: SE Chicago Petcoke Project Number: [none] Project Manager: Motria Caudill	Reported: Jul-24-14 11:42
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Metals by ICP using EPA 200.7 (modified) - Quality Control US EPA Region 5 Chicago Regional Laboratory

Batch B407050 - Ultrasonic Extraction

LCS (B407050-BS1)

Prepared & Analyzed: Jul-15-14

Analyte	Result	Flags / Qualifiers	MDL	Reporting		Spike Level	Source		%REC Limits	RPD	RPD Limit
				Limit	Units		Result	%REC			
Aluminum	0.05142			0.0100	mg/Wipe	5.000E-2		103	85-115		
Antimony	0.02538			0.001	"	2.500E-2		102	85-115		
Arsenic	0.00521			0.002	"	5.000E-3		104	85-115		
Barium	0.0101			0.00015	"	1.000E-2		101	85-115		
Beryllium	0.00051			0.0001	"	5.000E-4		102	85-115		
Cadmium	0.00251			0.0001	"	2.500E-3		100	85-115		
Calcium	2.516			0.0100	"	2.500		101	85-115		
Chromium	0.00505			0.00025	"	5.000E-3		101	85-115		
Cobalt	0.00475			0.0003	"	5.000E-3		95.0	85-115		
Copper	0.00514			0.001	"	5.000E-3		103	85-115		
Iron	0.05131			0.004	"	5.000E-2		103	85-115		
Lead	0.02485			0.0015	"	2.500E-2		99.4	85-115		
Magnesium	1.011			0.0100	"	1.000		101	85-115		
Manganese	0.01006			0.0004	"	1.000E-2		101	85-115		
Nickel	0.01019			0.0003	"	1.000E-2		102	85-115		
Potassium	1.278			0.0400	"	1.250		102	85-115		
Selenium	0.02479			0.0025	"	2.500E-2		99.2	85-115		
Silver	0.00133			0.0005	"	1.250E-3		106	85-115		
Sodium	2.488			0.0200	"	2.500		99.5	85-115		
Thallium	0.02589			0.003	"	2.500E-2		104	85-115		
Vanadium	0.00509			0.00025	"	5.000E-3		102	85-115		
Zinc	0.05277			0.0015	"	5.000E-2		106	85-115		

Duplicate (B407050-DUP1)

Source: 1407001-15

Prepared & Analyzed: Jul-15-14

Analyte	Result	Flags / Qualifiers	MDL	Reporting		Spike Level	Source		%REC Limits	RPD	RPD Limit
				Limit	Units		Result	%REC			
Aluminum	1.222			0.0600	mg/Wipe			1.154		5.75	20
Antimony	0.00559			0.006	"			5.79E-3		3.57	20
Arsenic	0.00392			0.0120	"			4.64E-3		16.9	20
Barium	0.09768			0.0009	"			0.09414		3.69	20
Beryllium	0.00007			0.0006	"			U			20
Cadmium	0.00601			0.0006	"			5.11E-3		16.3	20
Calcium	14.58			0.0600	"			13.60		6.96	20

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Environmental Protection Agency Region 5 Chicago Regional Laboratory

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Chicago IL, 60605

Project: SE Chicago Petcoke
Project Number: [none]
Project Manager: Motria Caudill

Reported:
Jul-24-14 11:42

Metals by ICP using EPA 200.7 (modified) - Quality Control US EPA Region 5 Chicago Regional Laboratory

Batch B407050 - Ultrasonic Extraction

Duplicate (B407050-DUP1)		Source: 1407001-15			Prepared & Analyzed: Jul-15-14						
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Chromium	0.01051			0.0015	mg/Wipe		0.01149			8.89	20
Cobalt	0.00072			0.0018	"		7.60E-4			5.66	20
Copper	0.1046			0.006	"		0.09703			7.47	20
Iron	1.795			0.0240	"		1.752			2.47	20
Lead	0.2237			0.009	"		0.2055			8.47	20
Magnesium	2.177			0.0600	"		2.024			7.26	20
Manganese	0.1749			0.0024	"		0.1634			6.81	20
Nickel	0.00711			0.0018	"		6.77E-3			4.97	20
Potassium	1.865			0.240	"		1.731			7.46	20
Selenium	U			0.0150	"		U				20
Silver	0.00072			0.003	"		U				20
Sodium	12.48			0.120	"		11.56			7.58	20
Thallium	U			0.0180	"		U				20
Vanadium	0.00469			0.0015	"		4.46E-3			4.91	20
Zinc	2.968			0.009	"		2.725			8.55	20

Duplicate (B407050-DUP2)		Source: 1407001-16			Prepared & Analyzed: Jul-15-14						
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Aluminum	0.04999			0.0600	mg/Wipe		0.06227			21.9	20
Antimony	U			0.006	"		U				20
Arsenic	U			0.0120	"		U				20
Barium	0.006			0.0009	"		6.98E-3			15.1	20
Beryllium	U			0.0006	"		U				20
Cadmium	0.00384			0.0006	"		2.28E-3			51.0	20
Calcium	0.4732			0.0600	"		0.5750			19.4	20
Chromium	0.00084			0.0015	"		1.57E-3			60.7	20
Cobalt	U			0.0018	"		U				20
Copper	0.00706			0.006	"		8.35E-3			16.8	20
Iron	0.1699			0.0240	"		2.797			177	20
Lead	0.00523			0.009	"		0.00537			2.63	20
Magnesium	0.1032			0.0600	"		0.1253			19.4	20
Manganese	0.01016			0.0024	"		0.01604			44.9	20

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Environmental Protection Agency Region 5 Chicago Regional Laboratory

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Air Division, US EPA Region 5
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Project: SE Chicago Petcoke
Project Number: [none]
Project Manager: Motria Caudill

Reported:
Jul-24-14 11:42

Metals by ICP using EPA 200.7 (modified) - Quality Control US EPA Region 5 Chicago Regional Laboratory

Batch B407050 - Ultrasonic Extraction

Duplicate (B407050-DUP2)		Source: 1407001-16			Prepared & Analyzed: Jul-15-14						
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Nickel	0.00091			0.0018	mg/Wipe		1.10E-3			18.5	20
Potassium	0.5386			0.240	"		0.6153			13.3	20
Selenium	U			0.0150	"		U				20
Silver	U			0.003	"		U				20
Sodium	0.2963			0.120	"		0.4267			36.1	20
Thallium	U			0.0180	"		U				20
Vanadium	U			0.0015	"		U				20
Zinc	0.08606			0.009	"		0.2222			88.3	20

Reference (B407050-SRM1)		Prepared: Jul-14-14 Analyzed: Jul-15-14									
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Arsenic	0.00954			0.002	mg/Wipe	1.000E-2		95.4	80-120		
Barium	0.00246			0.00015	"	2.500E-3		98.6	80-120		
Beryllium	0.001			0.0001	"	1.000E-3		99.8	80-120		
Cadmium	0.001			0.0001	"	1.000E-3		99.5	80-120		
Chromium	0.00249			0.00025	"	2.500E-3		99.5	80-120		
Cobalt	0.00249			0.0003	"	2.500E-3		99.6	80-120		
Copper	0.0023			0.001	"	2.500E-3		91.8	80-120		
Iron	0.00268			0.004	"	2.500E-3		107	80-120		
Lead	0.00239			0.0015	"	2.500E-3		95.7	80-120		
Manganese	0.001			0.0004	"	1.000E-3		100	80-120		
Nickel	0.00258			0.0003	"	2.500E-3		103	80-120		
Silver	0.00094			0.0005	"	1.000E-3		94.1	80-120		
Thallium	0.00248			0.003	"	2.500E-3		99.3	80-120		
Vanadium	0.00245			0.00025	"	2.500E-3		98.2	80-120		
Zinc	0.00262			0.0015	"	2.500E-3		105	80-120		

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Environmental Protection Agency Region 5 Chicago Regional Laboratory

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Air Division, US EPA Region 5
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Project: SE Chicago Petcoke
Project Number: [none]
Project Manager: Motria Caudill

Reported:
Jul-24-14 11:42

Notes and Definitions

- J The identification of the analyte is acceptable; the reported value is an estimate.
- U Not Detected
- NR Not Reported

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