LABORATORY DATA CONSULTANTS, INC.
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ERM
5761 N. Church Street
Glen Rock, PA 17327
ATTN: Mr. Jeff Boggs

June 26, 2014

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on June 24, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32028:

SDG	Fraction
4061913/4062007	Hexavalent Chromium

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

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

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

Sincerely,

Christina Rink
Project Manager/Chemist

108 pages-SF 3 DAY TAT Attachment 1

Level IV

LDC #32028 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																	
Matrix:	Air/Water/Soil			A	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	4061913/4062007	06/24/14	06/27/14	18	0																																
Total	T/CR			18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18

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

32028ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: June 17 through June 18, 2014

LDC Report Date: June 25, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4061913/4062007

Sample Identification

OAM 1 (06/17/14)
OAM 2 (06/17/14)
PAM-1 (06/17/14)
PAM-1D (06/17/14)
PAM-2 (06/17/14)
PAM-3 (06/17/14)
PAM-4 (06/17/14)
PAM-21 (06/17/14)
PAM-31 (06/17/14)
OAM 1 (06/18/14)
OAM 2 (06/18/14)
PAM-1 (06/18/14)
PAM-1D (06/18/14)
PAM-2 (06/18/14)
PAM-3 (06/18/14)
PAM-4 (06/18/14)
PAM-21 (06/18/14)
PAM-31 (06/18/14)
PAM-1 (06/17/14)DUP
PAM-1D (06/17/14)DUP
PAM-1 (06/18/14)DUP
PAM-1D (06/18/14)DUP

The date was appended to the sample ID to differentiate between samples.

Introduction

This data review covers 22 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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

The following are definitions of the data qualifiers:

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

J Indicates an estimated value.

R Quality control indicates the data is not usable.

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

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

A Indicates the finding is based upon technical validation criteria.

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

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31 (06/17/14) and PAM-31 (06/18/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (06/17/14) and PAM-21 (06/18/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
PAM-1D (06/17/14)DUP (PAM-1D (06/17/14))	Hexavalent chromium	25.2 (≤20)	-	J (all detects) UJ (all non-detects)	A

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (06/17/14) and PAM-1D (06/17/14) and samples PAM-1 (06/18/14) and PAM-1D (06/18/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (06/17/14)	PAM-1D (06/17/14)			
Hexavalent chromium	0.0226	0.0147	42 (≤20)	NQ	-

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (06/18/14)	PAM-1D (06/18/14)			
Hexavalent chromium	0.0205	0.0149	32 (≤20)	NQ	-

NQ = One or both results were < 5X the reporting limit, therefore no data were qualified.

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 4061913/4062007

SDG	Sample	Analyte	Flag	A or P	Reason
4061913/ 4062007	PAM-1D (06/17/14)	Hexavalent chromium	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD)

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4061913/4062007

No Sample Data Qualified Due to Laboratory Blank Contamination in this SDG

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG 4061913/4062007

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 32028A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 06/25/14
SDG #: 4061913/4062007 Level IV Page: 1 of 1
Laboratory: Eastern Research Group Reviewer: JO
2nd Reviewer: AL

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 06/17-18/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	SW	Dup
VII.	Laboratory control samples	A	LCS/D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	(3,4) (12,13)
XI	Field blanks	A^ND	(8,17=FB) (9,18 = TB)

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

Validated Samples: Airs

1	OAM 1 (06/17/14)	11	OAM 2 (06/18/14)	21	PAM-1 (06/18/14)DUP	31	
2	OAM 2 (06/17/14)	12	PAM-1 (06/18/14)	22	PAM-1D (06/18/14)DUP	32	
3	PAM-1 (06/17/14)	13	PAM-1D (06/18/14)	23		33	
4	PAM-1D (06/17/14)	14	PAM-2 (06/18/14)	24		34	
5	PAM-2 (06/17/14)	15	PAM-3 (06/18/14)	25		35	
6	PAM-3 (06/17/14)	16	PAM-4 (06/18/14)	26		36	
7	PAM-4 (06/17/14)	17	PAM-21 (06/18/14)	27		37	
8	PAM-21 (06/17/14)	18	PAM-31 (06/18/14)	28		38	
9	PAM-31 (06/17/14)	19	PAM-1 (06/17/14)DUP	29		39	
10	OAM 1 (06/18/14)	20	PAM-1D (06/17/14)DUP	30		40	

Notes: Dates appeared too different between FDs

LDC #: 32028A6

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
2nd Reviewer: 0L

Method: Inorganics (EPA Method See Cover)

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

LDC #: 32023A6

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: SD
2nd Reviewer: AL

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

LDC #: 32028A6

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: 3D
2nd Reviewer: 9

METHOD: Hexavalent Chromium (ASTM D7614)

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

(Y) N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for air samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

(Y) N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD (≤ 20%)	Difference (Limits)	Associated Samples	Qualifications
		20	Air	Cr+6	25.2		~~All~~ 4*	J/UJ/A

Comments: * other client Dup in batch within limits

LDC# 32028A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: JD
2nd Reviewer: QR

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual. Parent Only
	3	4		
Hexavalent Chromium	0.0226	0.0147	42	NQ

Analyte	Concentration (ng/m3)		RPD (≤20)	Qual. Parent Only
	12	13		
Hexavalent Chromium	0.0205	0.0149	32	~~no qual~~ NQ

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NQ= Not Qualified because one or both results are < 5x reporting limit

LDC #: 32028A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd Reviewer: [illegible]

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 06/23/14

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

%R = Found X 100 / True

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

Type of analysis	Analyte	Standard	Conc. (ng/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.05	0.0000199	*0.99996*	0.99936	Y
		s2	0.10	0.0000372			
		s3	0.20	0.0000811			
		s4	0.50	0.0002069			
		s5	1.00	0.0004186			
		s6	2.00	0.0008533			
ICV (11:16) Calibration verification	Cr^{+6}		Found 0.4898 ng/ml	True 0.5000 ng/ml	98%R	97.9%R	Y
CCV (14:51) Calibration verification	Cr^{+6}		Found 0.4877 ng/ml	True 0.5000 ng/ml	97.5%R	97.5%R	Y
Calibration verification							

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

LDC #: 32028A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: JO
2nd Reviewer: OL

METHOD: Inorganics, Method See Cover

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

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

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS (11:46)	Laboratory control sample	Cr^{+6}	0.9870ng/ml	1ng/ml	98.7%R	98.7%R	Y
N	Matrix spike sample		(SSR-SR)				
DUP (13:21)	Duplicate sample	Cr^{+6}	0.02220 ng/m3	0.0220ng/m3	1.79%RPD	1.87%RPD	Y

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

LDC #: 32028A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 3O
2nd reviewer: 07

METHOD: Inorganics, Method See Cover

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

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

Compound (analyte) results for Cr+6 (3) reported with a positive detect were recalculated and verified using the following equation:

Concentration = $[(\text{area} - (\text{co})]\ /\ C_1$ (ng/ml)

area = 0.0000157 mAU*min
Co = (-5.11 E-06)
C_1 = 0.0004280

Recalculation:

$\frac{(\text{ng/ml})(\text{vf})}{m^3} = \text{ng/m}^3$

vf = 10ml:1
m^3 = 21.52

$\frac{[(0.0000157\ \text{mAU*min}) - (-5.11\text{E-}06)]}{.0004280} = 0.0487\ \text{ng/l}$

$\frac{(0.0487\ \text{ng/ml})(10\text{ml})}{21.52\ m^3} = 0.0226\ \text{ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	1	Cr+6	0.0160	0.0161	y
	2		0.0132	0.0131	y
	3		0.0226	0.0226	y
	4		0.0147	0.0147	y
	5		0.0177	0.0177	y
	6		0.0185	0.0185	y
	7		0.0134	0.0134	y
	8		ND	ND	y
	9		ND	ND	y
	10		0.0129	0.0129	y
	11		0.0134	0.0134	y
	12		0.0205	0.0205	y
	13		0.0149	0.0150	y
	14		0.0145	0.0146	y
	15		0.0174	0.0174	y
	16		0.0183	0.0183	y
	17		ND	ND	y
	18		ND	ND	y

Note:

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4061913-01 **Sampled:** 06/17/14 16:08
Matrix: Air **Sample Volume:** 21.56 m^3 **Received:** 06/19/14 11:12
Comments: Start Time 6/16/14 16:16 **Analysis Date:** 06/23/14 14:31

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0160		0.0036

06/25/14

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FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4061913-02 **Sampled:** 06/17/14 16:37
Matrix: Air **Sample Volume:** 21.59 m^3 **Received:** 06/19/14 11:12
Comments: Start Time 6/16/14 16:42 **Analysis Date:** 06/23/14 14:41

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0132		0.0036

06/25/14

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FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4061913-03 **Sampled:** 06/17/14 18:19
Matrix: Air **Sample Volume:** 21.52 m^3 **Received:** 06/19/14 11:12
Comments: Col 1 Start Time 6/16/14 18:25 **Analysis Date:** 06/23/14 13:11

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0226		0.0036

06/25/14

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FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4061913-04 **Sampled:** 06/17/14 18:30
Matrix: Air **Sample Volume:** 22.58 m^3 **Received:** 06/19/14 11:12
Comments: Col 2 Start Time 6/16/14 18:36 **Analysis Date:** 06/23/14 13:31

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0147	J	0.0036

06/25/14

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FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4061913-05 **Sampled:** 06/17/14 17:52
Matrix: Air **Sample Volume:** 21.27 m^3 **Received:** 06/19/14 11:12
Comments: Start Time 6/16/14 18:05 **Analysis Date:** 06/23/14 15:11

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0177		0.0036

6/26/14

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FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4061913-06 **Sampled:** 06/17/14 17:36
Matrix: Air **Sample Volume:** 20.52 m^3 **Received:** 06/19/14 11:12
Comments: Start Time 6/16/14 17:50 **Analysis Date:** 06/23/14 15:21

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0185		0.0038

CRC 6/25/14

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FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4061913-07 **Sampled:** 06/17/14 17:11
Matrix: Air **Sample Volume:** 21.3 m^3 **Received:** 06/19/14 11:12
Comments: Start Time 6/16/14 17:20 **Analysis Date:** 06/23/14 15:31

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0134		0.0036

06/25/14

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FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4061913-08 **Sampled:** 06/17/14 00:00
Matrix: Air **Sample Volume:** 21.27 m^3 **Received:** 06/19/14 11:12
Comments: **Analysis Date:** 06/23/14 15:41

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

C2 6/25/14

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PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4061913-09 **Sampled:** 06/17/14 00:00
Matrix: Air **Sample Volume:** 20.52 m^3 **Received:** 06/19/14 11:12
Comments: **Analysis Date:** 06/23/14 15:51

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0038

06/25/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4062007-01 **Sampled:** 06/18/14 16:32
Matrix: Air **Sample Volume:** 21.94 m^3 **Received:** 06/20/14 11:42
Comments: Start Time 6/17/14 16:14 **Analysis Date:** 06/23/14 16:01

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0129		0.0036

6/25/14

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ATTN: Mr. Jeff Boggs
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FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4062007-02 **Sampled:** 06/18/14 17:04
Matrix: Air **Sample Volume:** 22.02 m^3 **Received:** 06/20/14 11:42
Comments: Start Time 6/17/14 16:41 **Analysis Date:** 06/23/14 16:11

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0134		0.0036

C2 6/25/14

CERTIFICATE OF ANALYSIS

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FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4062007-03 **Sampled:** 06/18/14 18:28
Matrix: Air **Sample Volume:** 21.66 m^3 **Received:** 06/20/14 11:42
Comments: Col 1 Start Time 6/17/14 18:24 **Analysis Date:** 06/23/14 13:50

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0205		0.0036

06/25/14

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FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4062007-04 **Sampled:** 06/18/14 18:35
Matrix: Air **Sample Volume:** 22.7 m^3 **Received:** 06/20/14 11:42
Comments: Col 2 Start Time 6/17/14 18:34 **Analysis Date:** 06/23/14 14:10

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0149		0.0034

CE 6/25/14

CERTIFICATE OF ANALYSIS

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ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4062007-05 **Sampled:** 06/18/14 18:11
Matrix: Air **Sample Volume:** 20.78 m^3 **Received:** 06/20/14 11:42
Comments: Start Time 6/17/14 18:08 **Analysis Date:** 06/23/14 16:20

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0145		0.0036

CS 6/25/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4062007-06 **Sampled:** 06/18/14 17:53
Matrix: Air **Sample Volume:** 20.88 m^3 **Received:** 06/20/14 11:42
Comments: Start Time 6/17/14 17:42 **Analysis Date:** 06/23/14 16:30

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0174		0.0036

CS 6/25/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4062007-07 **Sampled:** 06/18/14 17:35
Matrix: Air **Sample Volume:** 21.67 m^3 **Received:** 06/20/14 11:42
Comments: Start Time 6/17/14 17:19 **Analysis Date:** 06/23/14 16:40

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0183		0.0036

06/25/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4062007-08 **Sampled:** 06/18/14 00:00
Matrix: Air **Sample Volume:** 20.78 m^3 **Received:** 06/20/14 11:42
Comments: **Analysis Date:** 06/23/14 17:10

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

CR 6/25/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/24/14 13:49
SUBMITTED: 06/19/14 to 06/20/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4062007-09 **Sampled:** 06/18/14 00:00
Matrix: Air **Sample Volume:** 20.88 m^3 **Received:** 06/20/14 11:42
Comments: **Analysis Date:** 06/23/14 17:20

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

6/26/25/14

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

ERM
5761 N. Church Street
Glen Rock, PA 17327
ATTN: Mr. Jeff Boggs

June 27, 2014

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on June 26, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32044:

SDG	Fraction
4062427	Hexavalent Chromium

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

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

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

Sincerely,

Christina Rink
Project Manager/Chemist

97 pages-SF 3 DAY TAT Attachment 1

Level IV

LDC #32044 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																	
Matrix:	Air/Water/Soil			A	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	4062427	06/26/14	07/01/14	17	0																																
Total	T/CR			17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: June 19 through June 20, 2014

LDC Report Date: June 27, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4062427

Sample Identification

OAM 1 (06/19/14)
OAM 2 (06/19/14)
PAM-1 (06/19/14)
PAM-1D (06/19/14)
PAM-2 (06/19/14)
PAM-3 (06/19/14)
PAM-21 (06/19/14)
PAM-31 (06/19/14)
OAM 1 (06/20/14)
OAM 2 (06/20/14)
PAM-1 (06/20/14)
PAM-1D (06/20/14)
PAM-2 (06/20/14)
PAM-3 (06/20/14)
PAM-4 (06/20/14)
PAM-21 (06/20/14)
PAM-31 (06/20/14)
PAM-1 (06/19/14)DUP
PAM-1D (06/19/14)DUP
PAM-1 (06/20/14)DUP
PAM-1D (06/20/14)DUP

The date was appended to the sample ID to differentiate between samples.

Introduction

This data review covers 21 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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

The following are definitions of the data qualifiers:

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

J Indicates an estimated value.

R Quality control indicates the data is not usable.

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

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

A Indicates the finding is based upon technical validation criteria.

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

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31 (06/19/14) and PAM-31 (06/20/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (06/19/14) and PAM-21 (06/20/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (06/17/14) and PAM-1D (06/19/14) and samples PAM-1 (06/20/14) and PAM-1D (06/20/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (06/19/14)	PAM-1D (06/19/14)			
Hexavalent chromium	0.0244	0.0233	5 (≤20)	-	-

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (06/20/14)	PAM-1D (06/20/14)			
Hexavalent chromium	0.0140	0.0118	17 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 4062427

No Sample Data Qualified Due to QA/QC Exceedences in this SDG

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4062427

No Sample Data Qualified Due to Laboratory Blank Contamination in this SDG

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG 4062427

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 32044A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 06/26/14
SDG #: 4062427 Level IV Page: 1 of 1
Laboratory: Eastern Research Group Reviewer: SD
2nd Reviewer: [illegible]

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 06/19-20/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	Dup
VII.	Laboratory control samples	A	LCS/D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD= (3.4) (11,12)
XI.	Field blanks	A	(FB= 7 & 16) (TB= 8 & 17)

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

Validated Samples: Airs

1	OAM 1 (06/19/14)	11	PAM-1 (06/20/14)	21	PAM-1D (06/20/14)DUP	31	
2	OAM 2 (06/19/14)	12	PAM-1D (06/20/14)	22		32	
3	PAM-1 (06/19/14)	13	PAM-2 (06/20/14)	23		33	
4	PAM-1D (06/19/14)	14	PAM-3 (06/20/14)	24		34	
5	PAM-2 (06/19/14)	15	PAM-4 (06/20/14)	25		35	
6	PAM-3 (06/19/14)	16	PAM-21 (06/20/14)	26		36	
7	PAM-21 (06/19/14)	17	PAM-31 (06/20/14)	27		37	
8	PAM-31 (06/19/14)	18	PAM-1 (06/19/14)DUP	28		38	
9	OAM 1 (06/20/14)	19	PAM-1D (06/19/14)DUP	29		39	
10	OAM 2 (06/20/14)	20	PAM-1 (06/20/14)DUP	30		40	

Notes: ~~Date~~ appended to ID to differentiate between sampled

LDC #: 32044A6

VALIDATION FINDINGS CHECKLIST

Reviewer: SO
2nd Reviewer: a

Method: Inorganics (EPA Method see cover)

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

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

LDC# 32044A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: JD
2nd Reviewer: AL

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)
	3	4	
Hexavalent Chromium	0.0244	0.0233	5

Analyte	Concentration (~~mg/L~~ or ng/m3)		RPD (≤20)
	11	12	
Hexavalent Chromium	0.0140	0.0118	17

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LDC #: 32044A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd Reviewer: CL

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 06/25/14

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

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

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

Type of analysis	Analyte	Standard	Conc. (ng/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.05	0.0000148	*0.99989*	0.99936	y
		s2	0.10	0.0000366			
		s3	0.20	0.0000832			
		s4	0.50	0.0002028			
		s5	1.00	0.000419			
		s6	2.00	0.0008205			
ICV (10:04) Calibration verification	Cr^{+6}	Found 0.4781 ng/ml	True 0.5000 ng/ml		95.6%R	95.6%R	y
CCV (13:06) Calibration verification	Cr^{+6}	Found 0.5025	True 0.5000 ng/ml		100.5%R	100.5%R	y
Calibration verification							

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

LDC #: 32044A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: JD
2nd Reviewer: AL

METHOD: Inorganics, Method See Cover

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

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

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS (10:34)	Laboratory control sample	Cr+6	1.0130ng/ml	1.000ng/ml	101%R	101%R	Y
N	Matrix spike sample		(SSR-SR)				
Dup (11:33)	Duplicate sample	Cr+6	0.0227ng/m³	0.0244ng/m³	7.22%RPD	6.94%RPD	Y

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

LDC #: 32044A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd reviewer: ar

METHOD: Inorganics, Method See Cover

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

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

Compound (analyte) results for Cr^{+6} (15) reported with a positive detect were recalculated and verified using the following equation:

Concentration = [(area) − (CO)] / C_1 (ng/ml)

area = 0.0000113 mAU*min
CO = 2.40E-06
C_1 = 0.0004133

$\frac{(ng/ml)(uf)}{m^3} = ng/m^3$

uf = 10ml
m^3 = 21.93 m^3

Recalculation: $\frac{[(0.0000113\ mAU*min) - (2.40E-06)]}{0.0004133} = 0.0331\ ng/ml$

$\frac{(0.0331\ ng/ml)(10\ ml)}{21.93\ m^3} = 0.0151\ ng/m^3$

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	1	Cr^{+6}	ND	ND	y
	2		0.0150	0.0150	y
	3		0.0244	0.0244	y
	4		0.0233	0.0233	y
	5		0.0139	0.0138	y
	6		0.0151	0.0151	y
	7		ND	ND	y
	8		ND	ND	y
	9		0.0109	0.0108	y
	10		0.0126	0.0126	y
	11		0.0140	0.0140	y
	12		0.0118	0.0118	y
	13		0.0353	0.0353	y
	14		0.0116	0.0116	y
	15		0.0151	0.0151	y
	16		ND	ND	y
	17		ND	ND	y

Note:

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4062427-01 **Sampled:** 06/19/14 15:44
Matrix: Air **Sample Volume:** 20.88 m^3 **Received:** 06/24/14 11:02
Comments: Start Time 6/18/14 16:37 **Analysis Date:** 06/25/14 12:46

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

CR 6/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4062427-02 **Sampled:** 06/19/14 16:11
Matrix: Air **Sample Volume:** 20.8 m^3 **Received:** 06/24/14 11:02
Comments: Start Time 6/18/14 17:09 **Analysis Date:** 06/25/14 12:56

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0150		0.0036

0226/14

CERTIFICATE OF ANALYSIS

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PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4062427-03 **Sampled:** 06/19/14 17:54
Matrix: Air **Sample Volume:** 20.79 m^3 **Received:** 06/24/14 11:02
Comments: Col 1 Start Time 6/18/14 18:47 **Analysis Date:** 06/25/14 11:23

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0244		0.0036

06/27/14

CERTIFICATE OF ANALYSIS

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FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4062427-04 **Sampled:** 06/19/14 17:45
Matrix: Air **Sample Volume:** 21.8 m^3 **Received:** 06/24/14 11:02
Comments: Col 2 Start Time 6/18/14 18:41 **Analysis Date:** 06/25/14 11:43

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0233		0.0036

06/27/14

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PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4062427-05 **Sampled:** 06/19/14 17:24
Matrix: Air **Sample Volume:** 19.97 m^3 **Received:** 06/24/14 11:02
Comments: Start Time 6/18/14 18:17 **Analysis Date:** 06/25/14 13:26

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0139		0.0039

06/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4062427-06 **Sampled:** 06/19/14 17:00
Matrix: Air **Sample Volume:** 19.67 m^3 **Received:** 06/24/14 11:02
Comments: Start Time 6/18/14 18:00 **Analysis Date:** 06/25/14 13:35

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0151		0.0040

06/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4062427-07 **Sampled:** 06/19/14 00:00
Matrix: Air **Sample Volume:** 19.97 m^3 **Received:** 06/24/14 11:02
Comments: **Analysis Date:** 06/25/14 13:45

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	ND	U	0.0039

06/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4062427-08 **Sampled:** 06/19/14 00:00
Matrix: Air **Sample Volume:** 19.67 m^3 **Received:** 06/24/14 11:02
Comments: **Analysis Date:** 06/25/14 13:55

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0040

06/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
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ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4062427-09 **Sampled:** 06/20/14 16:25
Matrix: Air **Sample Volume:** 22.14 m^3 **Received:** 06/24/14 11:02
Comments: Start Time 6/19/14 15:49 **Analysis Date:** 06/25/14 14:05

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0109		0.0036

CR6 | 27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4062427-10 **Sampled:** 06/20/14 16:49
Matrix: Air **Sample Volume:** 22.08 m^3 **Received:** 06/24/14 11:02
Comments: Start Time 6/19/14 16:17 **Analysis Date:** 06/25/14 14:15

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0126		0.0036

06/27/14

CERTIFICATE OF ANALYSIS

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ATTN: Mr. Jeff Boggs
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FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4062427-11 **Sampled:** 06/20/14 17:42
Matrix: Air **Sample Volume:** 21.36 m^3 **Received:** 06/24/14 11:02
Comments: Col 1 Start Time 6/19/14 17:58 **Analysis Date:** 06/25/14 12:03

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0140		0.0036

06/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4062427-12 **Sampled:** 06/20/14 17:45
Matrix: Air **Sample Volume:** 21.52 m^3 **Received:** 06/24/14 11:02
Comments: Col 2 Start Time 6/19/14 17:50 **Analysis Date:** 06/25/14 12:23

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0118		0.0036

06/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4062427-13 **Sampled:** 06/20/14 17:56
Matrix: Air **Sample Volume:** 21.98 m^3 **Received:** 06/24/14 11:02
Comments: Start Time 6/19/14 17:31 **Analysis Date:** 06/25/14 14:25

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0353		0.0036

CR 6/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4062427-14 **Sampled:** 06/20/14 17:24
Matrix: Air **Sample Volume:** 21.78 m^3 **Received:** 06/24/14 11:02
Comments: Start Time 6/19/14 17:12 **Analysis Date:** 06/25/14 14:35

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0116		0.0036

CR 6/27/14

CERTIFICATE OF ANALYSIS

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ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4062427-15 **Sampled:** 06/20/14 17:06
Matrix: Air **Sample Volume:** 21.93 m^3 **Received:** 06/24/14 11:02
Comments: Start Time 6/19/14 16:44 **Analysis Date:** 06/25/14 14:45

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0151		0.0036

C26/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4062427-16 **Sampled:** 06/20/14 00:00
Matrix: Air **Sample Volume:** 21.98 m^3 **Received:** 06/24/14 11:02
Comments: **Analysis Date:** 06/25/14 14:55

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

CR 6/27/14

CERTIFICATE OF ANALYSIS

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PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/26/14 15:35
SUBMITTED: 06/24/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4062427-17 **Sampled:** 06/20/14 00:00
Matrix: Air **Sample Volume:** 21.78 m^3 **Received:** 06/24/14 11:02
Comments: **Analysis Date:** 06/25/14 15:24

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

06/27/14

LABORATORY DATA CONSULTANTS, INC.

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

ERM
5761 N. Church Street
Glen Rock, PA 17327
ATTN: Mr. Jeff Boggs

July 2, 2014

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on June 30, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32053:

SDG	Fraction
4062511	Hexavalent Chromium

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

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

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

Sincerely,

Christina Rink
Project Manager/Chemist

72 pages-SF 3 DAY TAT Attachment 1

Level IV

LDC #32053 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																															
Matrix:	Air/Water/Soil			A	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	4062511	06/30/14	07/03/14	9	0																														
Total	T/CR			9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	June 23, 2014
LDC Report Date:	July 1, 2014
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	4062511

Sample Identification

OAM 1
OAM 2
PAM-1
PAM-1D
PAM-2
PAM-3
PAM-4
PAM-21
PAM-31
PAM-1DUP
PAM-1DDUP

Introduction

This data review covers 11 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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

The following are definitions of the data qualifiers:

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

J Indicates an estimated value.

R Quality control indicates the data is not usable.

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

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

A Indicates the finding is based upon technical validation criteria.

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

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Sample PAM-31 was identified as a trip blank. No hexavalent chromium was found.

Sample PAM-21 was identified as a field blank. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 and PAM-1D were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1	PAM-1D			
Hexavalent chromium	0.0663	0.0701	6 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 4062511

No Sample Data Qualified Due to QA/QC Exceedences in this SDG

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4062511

No Sample Data Qualified Due to Laboratory Blank Contamination in this SDG

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG 4062511

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 32053A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 06/30/14
SDG #: 4062511 Level IV Page: 1 of 1
Laboratory: Eastern Research Group Reviewer: SD
2nd Reviewer: a

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 06/23/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	Dup
VII.	Laboratory control samples	A	LCS/D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	(3,4)
XI	Field blanks	ND	FB=(8), TB=(9)

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

Validated Samples: Airs

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

Notes:

LDC #: 32053A6

VALIDATION FINDINGS CHECKLIST

Reviewer: SS
2nd Reviewer: CL

Method: Inorganics (EPA Method See cover)

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

LDC #: 32053P80

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: SC
2nd Reviewer:

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

LDC# 32053A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: SO

2nd Reviewer:

Inorganics: Method See Cover

Analyte	Concentration (~~mg/L~~ ng/m3)		RPD (≤20)
	3	4	
Hexavalent Chromium	0.0663	0.0701	6

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32053A6.wpd

LDC #: 32053A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 06/26/14

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

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

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

Type of analysis	Analyte	Standard	Conc. (ng/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.05	0.0000147	*0.99996*	0.99936	Y
		s2	0.10	0.0000369			
		s3	0.20	0.0000805			
		s4	0.50	0.0002004			
		s5	1.00	0.0004191			
		s6	2.00	0.0008437			
ICV 10:02 Calibration verification	Cr^{+6}		Found 0.4804 ng/ml	True 0.5000 ng/ml	96.2%R	96.2%R	Y
CCV 11:01 Calibration verification	Cr^{+6}		Found 0.4701 ng/ml	True 0.5000 ng/ml	94%R	94%R	Y
Calibration verification							

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

LDC #: 32053A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: JD
2nd Reviewer: _____

METHOD: Inorganics, Method See Cover

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

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

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

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

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 10:32	Laboratory control sample	Cr^{+6}	0.9986 ng/ml	1.00 ng/ml	99.9%R	99.9%R	Y
N	Matrix spike sample		(SSR-SR)				
Dup	Duplicate sample	Cr^{+6}	0.0672	0.0663 ng/m³	1.35%RPD	1.43%RPD	Y

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

LDC #: 32053A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: SD
2nd reviewer: _____

METHOD: Inorganics, Method See Cover

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

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

Compound (analyte) results for Cr+6 (7) reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{[(\text{area}) - (C_0)]}{C_1}$ $\frac{(\text{ng/ml})(\text{vf})}{\text{m}^3} = \text{ng/m}^3$

area = 0.0002064 mAU*min
C_0 = -6.79E-06
C_1 = 0.0004250

vf = 10 ml
m^3 = 21.57

Recalculation: $\frac{[(0.0002064 - (-6.79E\text{-}06)]}{0.0004250} = 0.501$ ng

$\frac{(0.5016 \text{ ng/ml})(10 \text{ ml})}{21.57 \text{ m}^3} = 0.233 \text{ ng/m}^3$

#	Sample ID	Analyte	Reported Concentration (ng/m³)	Calculated Concentration (ng/m³)	Acceptable (Y/N)
	1	Cr+6	0.0569	0.0569	Y
	2		0.0245	0.0246	
	3		0.0663	0.0663	
	4		0.0701	0.0700	
	5		0.0664	0.0664	
	6		0.115	0.115	
	7		0.233	0.233	
	8		ND	ND	
	9		ND	ND	

Note: _____

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/30/14 09:21
SUBMITTED: 06/25/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4062511-01 **Sampled:** 06/23/14 15:51
Matrix: Air **Sample Volume:** 21.35 m^3 **Received:** 06/25/14 10:56
Comments: Start Time 6/22/14 16:07 **Analysis Date:** 06/26/14 12:22

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0569		0.0036

CSZ 7/1/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/30/14 09:21
SUBMITTED: 06/25/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4062511-02 **Sampled:** 06/23/14 16:11
Matrix: Air **Sample Volume:** 21.45 m^3 **Received:** 06/25/14 10:56
Comments: Start Time 6/22/14 16:21 **Analysis Date:** 06/26/14 12:31

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0245		0.0036

02/1/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/30/14 09:21
SUBMITTED: 06/25/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4062511-03 **Sampled:** 06/23/14 17:26
Matrix: Air **Sample Volume:** 21.98 m^3 **Received:** 06/25/14 10:56
Comments: Col 1 Start Time 6/22/14 17:00 **Analysis Date:** 06/26/14 11:37

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0663		0.0036

02/1/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/30/14 09:21
SUBMITTED: 06/25/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D
Matrix: Air
Comments: Col 2 Start Time 6/22/14 17:03

Lab ID: 4062511-04
Sample Volume: 22.04 m^3

Sampled: 06/23/14 17:32
Received: 06/25/14 10:56
Analysis Date: 06/26/14 11:57

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0701		0.0036

07/1/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/30/14 09:21
SUBMITTED: 06/25/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4062511-05 **Sampled:** 06/23/14 17:08
Matrix: Air **Sample Volume:** 21.85 m^3 **Received:** 06/25/14 10:56
Comments: Start Time 6/22/14 16:51 **Analysis Date:** 06/26/14 12:41

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0664		0.0036

6/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/30/14 09:21
SUBMITTED: 06/25/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4062511-06 **Sampled:** 06/23/14 16:58
Matrix: Air **Sample Volume:** 21.78 m^3 **Received:** 06/25/14 10:56
Comments: Start Time 6/22/14 16:46 **Analysis Date:** 06/26/14 12:51

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.115		0.0036

6/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/30/14 09:21
SUBMITTED: 06/25/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4062511-07 **Sampled:** 06/23/14 16:34
Matrix: Air **Sample Volume:** 21.57 m^3 **Received:** 06/25/14 10:56
Comments: Start Time 6/22/14 16:36 **Analysis Date:** 06/26/14 13:01

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.233		0.0036

CS 7/1/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/30/14 09:21
SUBMITTED: 06/25/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4062511-08 **Sampled:** 06/23/14 00:00
Matrix: Air **Sample Volume:** 21.85 m^3 **Received:** 06/25/14 10:56
Comments: **Analysis Date:** 06/26/14 14:13

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

02/1/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 06/30/14 09:21
SUBMITTED: 06/25/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4062511-09 **Sampled:** 06/23/14 00:00
Matrix: Air **Sample Volume:** 21.78 m^3 **Received:** 06/25/14 10:56
Comments: **Analysis Date:** 06/26/14 13:41

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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

ERM
5761 N. Church Street
Glen Rock, PA 17327
ATTN: Mr. Jeff Boggs

July 2, 2014

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on July 1, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32068:

SDG	Fraction
4062614/4062711	Hexavalent Chromium

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

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

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

Sincerely,

Christina Rink
Project Manager/Chemist

106 pages-SF 3 DAY TAT

Attachment 1

Level IV LDC #32068 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																			
Matrix: Air/Water/Soil				A	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	4062614/4062711	07/01/14	07/07/14	18	0																																		
Total	T/CR			18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: June 24 through June 25, 2014

LDC Report Date: July 1, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4062614/4062711

Sample Identification

OAM 1 (06/24/14)
OAM 2 (06/24/14)
PAM-1 (06/24/14)
PAM-1D (06/24/14)
PAM-2 (06/24/14)
PAM-3 (06/24/14)
PAM-4 (06/24/14)
PAM-21 (06/24/14)
PAM-31 (06/24/14)
OAM 1 (06/25/14)
OAM 2 (06/25/14)
PAM-1 (06/25/14)
PAM-1D (06/25/14)
PAM-2 (06/25/14)
PAM-3 (06/25/14)
PAM-4 (06/25/14)
PAM-21 (06/25/14)
PAM-31 (06/25/14)
PAM-1 (06/24/14)DUP
PAM-1D (06/24/14)DUP
PAM-1 (06/25/14)DUP
PAM-1D (06/25/14)DUP

The date was appended to the sample ID to differentiate between samples.

Introduction

This data review covers 22 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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

The following are definitions of the data qualifiers:

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

J Indicates an estimated value.

R Quality control indicates the data is not usable.

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

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

A Indicates the finding is based upon technical validation criteria.

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

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31 (06/24/14) and PAM-31 (06/25/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (06/24/14) and PAM-21 (06/25/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (06/24/14) and PAM-1D (06/24/14) and samples PAM-1 (06/25/14) and PAM-1D (06/25/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (06/24/14)	PAM-1D (06/24/14)			
Hexavalent chromium	0.0311	0.0348	11 (≤20)	-	-

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (06/25/14)	PAM-1D (06/25/14)			
Hexavalent chromium	0.0688	0.0651	6 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 4062614/4062711

No Sample Data Qualified Due to QA/QC Exceedences in this SDG

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4062614/4062711

No Sample Data Qualified Due to Laboratory Blank Contamination in this SDG

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG 4062614/4062711

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 32068A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/01/14
SDG #: 4062614/4062711 Level IV Page: 1 of 1
Laboratory: Eastern Research Group Reviewer: SD
2nd Reviewer: CL

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 06/24-25/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Req.
VI.	Duplicates	A	Dup
VII.	Laboratory control samples	A	LCS/D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD= (3,4), (12,13)
XI	Field blanks	ND	FB= (8), (17) TB=(9), (18)

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

Validated Samples: Air

1	OAM 1 (06/24/14)	11	OAM 2 (06/25/14)	21	PAM-1 (06/25/14)DUP	31	
2	OAM 2 (06/24/14)	12	PAM-1 (06/25/14)	22	PAM-1D (06/25/14)DUP	32	
3	PAM-1 (06/24/14)	13	PAM-1D (06/25/14)	23		33	
4	PAM-1D (06/24/14)	14	PAM-2 (06/25/14)	24		34	
5	PAM-2 (06/24/14)	15	PAM-3 (06/25/14)	25		35	
6	PAM-3 (06/24/14)	16	PAM-4 (06/25/14)	26		36	
7	PAM-4 (06/24/14)	17	PAM-21 (06/25/14)	27		37	
8	PAM-21 (06/24/14)	18	PAM-31 (06/25/14)	28		38	
9	PAM-31 (06/24/14)	19	PAM-1 (06/24/14)DUP	29		39	
10	OAM 1 (06/25/14)	20	PAM-1D (06/24/14)DUP	30		40	

Notes: _____

LDC #: 32068A0

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: AL

Method: Inorganics (EPA Method See Cover)

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

A-5

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

LDC# 32068A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: JD

2nd Reviewer: A

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)
	3	4	
Hexavalent Chromium	0.0311	0.0348	11

Analyte	Concentration (ng/m3)		RPD (≤20)
	12	13	
Hexavalent Chromium	0.0688	0.0651	6

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LDC #: 32068A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd Reviewer: a

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 06/30/14

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

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

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

Type of analysis	Analyte	Standard	Conc. (ng/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.05	0.0000203	*0.99980*	0.99936	y
		s2	0.10	0.0000428			
		s3	0.20	0.0000824			
		s4	0.50	0.0002062			
		s5	1.00	0.0004042			
		s6	2.00	0.0008412			
ICV 11:20 Calibration verification	Cr^{+6}		Found 0.4792 ng/ml	True 0.5000 ng/ml	95.8%R	95.9%R	y
CCV 14:25 Calibration verification	Cr^{+6}		0.5033 ng/ml	0.5000 ng/ml	100.7%R	100.7%R	y
Calibration verification							

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

LDC #: 32068A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: SD
2nd Reviewer: EZ

METHOD: Inorganics, Method See Lower

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

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

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Cr^{+6}	0.9861	1.00 ng/ml	98.6%R	98.6%R	Y
N	Matrix spike sample		(SSR-SR)				
D.P	Duplicate sample	Cr^{+6}	0.0706	0.0688 ng/ml	2.58%RPD	2.65%RPD	Y

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

LDC #: 32068A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

METHOD: Inorganics, Method See Cover

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

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

Compound (analyte) results for Cr^{+6} (4) reported with a positive detect were recalculated and verified using the following equation:

Concentration = [(area) - (Co)] / C1

area = 0.0000297 mAU*min
Co = -2.69E-06
C1 = 0.0004190
Dil = 1

Vf = 10 ml
m^3 = 22.19

$\frac{(ng/ml)(vf)}{m^3} = ng/m^3$

Recalculation:

$\frac{[(0.0000297\ mAU*min) - (-2.69E-06)]}{0.0004190} = 0.0773\ ng/ml$

$\frac{(0.0773)(10)}{22.19} = 0.0348\ ng/m^3$

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	1	Cr^{+6}	0.0120	0.0118	Y
	2	↓	0.0137	0.0138	↓
	3		0.0311	0.0311	
	4		0.0348	0.0348	
	5		0.0286	0.0287	
	6		0.0265	0.0266	
	7		0.114	0.114	
	8		ND	ND	
	9		ND	ND	
	10		0.0313	0.0313	
	11		0.0322	0.0322	
	12		0.0688	0.0688	
	13		0.0651	0.0651	
	14		0.110	0.110	
	15		0.0959	0.0959	
	16		0.103	0.0999	
	17		ND	ND	
	18	↓	ND	ND	↓

Note:

RECALC.6

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4062614-01 **Sampled:** 06/24/14 16:07
Matrix: Air **Sample Volume:** 21.74 m^3 **Received:** 06/26/14 12:57
Comments: Start Time 6/23/14 15:58 **Analysis Date:** 06/30/14 14:05

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0120		0.0036

02/12/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4062614-02 **Sampled:** 06/24/14 16:44
Matrix: Air **Sample Volume:** 21.99 m^3 **Received:** 06/26/14 12:57
Comments: Start Time 6/23/14 16:19 **Analysis Date:** 06/30/14 14:15

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0137		0.0036

7/2/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4062614-03 **Sampled:** 06/24/14 18:08
Matrix: Air **Sample Volume:** 22.16 m^3 **Received:** 06/26/14 12:57
Comments: Col 1 Start Time 6/23/14 17:31 **Analysis Date:** 06/30/14 12:45

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0311		0.0036

CERTIFICATE OF ANALYSIS

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FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4062614-04 **Sampled:** 06/24/14 18:16
Matrix: Air **Sample Volume:** 22.19 m^3 **Received:** 06/26/14 12:57
Comments: Col 2 Start Time 6/23/14 17:37 **Analysis Date:** 06/30/14 17:06

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0348		0.0036

07/2/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4062614-05 **Sampled:** 06/24/14 17:51
Matrix: Air **Sample Volume:** 22.15 m^3 **Received:** 06/26/14 12:57
Comments: Start Time 6/23/14 17:14 **Analysis Date:** 06/30/14 14:45

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0286		0.0036

02/12/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4062614-06 **Sampled:** 06/24/14 17:35
Matrix: Air **Sample Volume:** 22.09 m^3 **Received:** 06/26/14 12:57
Comments: Start Time 6/23/14 17:03 **Analysis Date:** 06/30/14 14:55

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0265		0.0036

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4062614-07 **Sampled:** 06/24/14 17:13
Matrix: Air **Sample Volume:** 22.05 m^3 **Received:** 06/26/14 12:57
Comments: Start Time 6/23/14 16:43 **Analysis Date:** 06/30/14 15:05

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.114		0.0036

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4062614-08 **Sampled:** 06/24/14 00:00
Matrix: Air **Sample Volume:** 22.15 m^3 **Received:** 06/26/14 12:57
Comments: **Analysis Date:** 06/30/14 15:15

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

6/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4062614-09 **Sampled:** 06/24/14 00:00
Matrix: Air **Sample Volume:** 22.09 m^3 **Received:** 06/26/14 12:57
Comments: **Analysis Date:** 06/30/14 15:24

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

07/2/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4062711-01 **Sampled:** 06/25/14 16:16
Matrix: Air **Sample Volume:** 21.51 m^3 **Received:** 06/27/14 11:16
Comments: Start Time 6/24/14 16:22 **Analysis Date:** 06/30/14 15:34

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0313		0.0036

07/2/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
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ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4062711-02 **Sampled:** 06/25/14 16:36
Matrix: Air **Sample Volume:** 21.4 m^3 **Received:** 06/27/14 11:16
Comments: Start Time 6/24/14 16:50 **Analysis Date:** 06/30/14 15:44

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0322		0.0036

02/12/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4062711-03 **Sampled:** 06/25/14 17:39
Matrix: Air **Sample Volume:** 21.09 m^3 **Received:** 06/27/14 11:16
Comments: Col 1 Start Time 6/24/14 18:13 **Analysis Date:** 06/30/14 13:25

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0688		0.0036

7/2/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4062711-04 **Sampled:** 06/25/14 17:44
Matrix: Air **Sample Volume:** 20.94 m^3 **Received:** 06/27/14 11:16
Comments: Col 2 Start Time 6/24/14 18:28 **Analysis Date:** 06/30/14 13:45

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0651		0.0036

02/12/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4062711-05 **Sampled:** 06/25/14 17:23
Matrix: Air **Sample Volume:** 21.15 m^3 **Received:** 06/27/14 11:16
Comments: Start Time 6/24/14 17:53 **Analysis Date:** 06/30/14 15:54

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.110		0.0036

7/2/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4062711-06 **Sampled:** 06/25/14 17:14
Matrix: Air **Sample Volume:** 21.22 m^3 **Received:** 06/27/14 11:16
Comments: Start Time 6/24/14 17:40 **Analysis Date:** 06/30/14 16:04

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0959		0.0036

06/27/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4062711-07 **Sampled:** 06/25/14 16:58
Matrix: Air **Sample Volume:** 21.33 m^3 **Received:** 06/27/14 11:16
Comments: Start Time 6/24/14 17:16 **Analysis Date:** 06/30/14 16:14

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.103		0.0036

07/1/14

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4062711-08 **Sampled:** 06/25/14 00:00
Matrix: Air **Sample Volume:** 21.15 m^3 **Received:** 06/27/14 11:16
Comments: **Analysis Date:** 06/30/14 16:44

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc
75 Valley Stream Parkway, Suite 400
Malvern, PA 19355
ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/01/14 14:06
SUBMITTED: 06/26/14 to 06/27/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4062711-09 **Sampled:** 06/25/14 00:00
Matrix: Air **Sample Volume:** 21.22 m^3 **Received:** 06/27/14 11:16
Comments: **Analysis Date:** 06/30/14 16:54

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

07/2/14

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

ERM
5761 N. Church Street
Glen Rock, PA 17327
ATTN: Mr. Jeff Boggs

July 9, 2014

SUBJECT: Harbor Point, MD, Hexavalent Chromium Monitoring, Data Validation

Dear Mr. Boggs,

Enclosed is the final validation report for the fraction listed below. This SDG was received on July 7, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32103:

SDG	Fraction
4070130/41070213	Hexavalent Chromium

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

- Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland, March 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

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

Sincerely,

Christina Rink
Project Manager/Chemist

205 pages-SF 3 DAY TAT

Attachment 1

LDC #32103 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring)

Level IV

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (D7614)																																			
Matrix: Air/Water/Soil				A	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	4070130/4070213	07/07/14	07/10/14	36	0																																		
Total	T/CR			36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36

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

32103ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: June 26 through June 30, 2014

LDC Report Date: July 8, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4070130/4070213

Sample Identification

OAM 1 (06/26/14)
OAM 2 (06/26/14)
PAM-1 (06/26/14)
PAM-1D (06/26/14)
PAM-2 (06/26/14)
PAM-3 (06/26/14)
PAM-4 (06/26/14)
PAM-21 (06/26/14)
PAM-31 (06/26/14)
OAM 1 (06/27/14)
OAM 2 (06/27/14)
PAM-1 (06/27/14)
PAM-1D (06/27/14)
PAM-2 (06/27/14)
PAM-3 (06/27/14)
PAM-4 (06/27/14)
PAM-21 (06/27/14)
PAM-31 (06/27/14)
OAM 1 (06/28/14)
OAM 2 (06/28/14)
PAM-1 (06/28/14)
PAM-1D (06/28/14)
PAM-2 (06/28/14)
PAM-3 (06/28/14)
PAM-4 (06/28/14)
PAM-21 (06/28/14)
PAM-31 (06/28/14)
OAM 1 (06/30/14)
OAM 2 (06/30/14)
PAM-1 (06/30/14)
PAM-1D (06/30/14)
PAM-2 (06/30/14)
PAM-3 (06/30/14)
PAM-4 (06/30/14)
PAM-21 (06/30/14)
PAM-31 (06/30/14)
PAM-1 (06/26/14)DUP
PAM-1D (06/26/14)DUP
PAM-1 (06/27/14)DUP
PAM-1D (06/27/14)DUP
PAM-1 (06/28/14)DUP
PAM-1D (06/28/14)DUP
PAM-1 (06/30/14)DUP
PAM-1D (06/30/14)DUP

The date was appended to the sample ID to differentiate between samples.

Introduction

This data review covers 44 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ASTM D7614 for Hexavalent Chromium.

This review follows the Air Monitoring Program Quality Assurance Project Plan, Area 1, Phase 1 Development, Version 1, Baltimore Works Site, Baltimore, Maryland (March 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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

The following are definitions of the data qualifiers:

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

J Indicates an estimated value.

R Quality control indicates the data is not usable.

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

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

A Indicates the finding is based upon technical validation criteria.

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

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

I. Technical Holding Times

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the method blanks.

Samples PAM-31 (06/26/14), PAM-31 (06/27/14), PAM-31 (06/28/14), and PAM-31 (06/30/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (06/26/14), PAM-21 (06/27/14), PAM-21 (06/28/14), and PAM-21 (06/30/14) were identified as field blanks. No hexavalent chromium was found.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analysis was not required by the method.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples

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

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

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

X. Field Duplicates

Samples PAM-1 (06/26/14) and PAM-1D (06/26/14), samples PAM-1 (06/27/14) and PAM-1D (06/27/14), samples PAM-1 (06/28/14) and PAM-1D (06/28/14), and samples PAM-1 (06/30/14) and PAM-3 (06/30/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (06/26/14)	PAM-1D (06/26/14)			
Hexavalent chromium	0.0586	0.0583	1 (≤20)	-	-

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (06/27/14)	PAM-1D (06/27/14)			
Hexavalent chromium	0.0219	0.0218	0 (≤20)	-	-

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (06/28/14)	PAM-1D (06/28/14)			
Hexavalent chromium	0.0129	0.0155	18 (≤20)	-	-

Analyte	Concentration (ng/m^3)		RPD (Limits)	Flags	A or P
	PAM-1 (06/30/14)	PAM-3 (06/30/14)			
Hexavalent chromium	0.0526	0.0559	6 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Data Qualification Summary - SDG 4070130/4070213

No Sample Data Qualified Due to QA/QC Exceedences in this SDG

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4070130/4070213

No Sample Data Qualified Due to Laboratory Blank Contamination in this SDG

Harbor Point, MD, Hexavalent Chromium Monitoring
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG 4070130/4070213

No Sample Data Qualified Due to Field Blank Contamination in this SDG

LDC #: 32103A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 07/07/14
SDG #: 4070130/4070213 Level IV Page: 1 of 2
Laboratory: Eastern Research Group Reviewer: JD
2nd Reviewer: CL

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 06/26-28/14, 06/30/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Req.
VI.	Duplicates	A	Dup
VII.	Laboratory control samples	A	LCS/D
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD= (3,4) (12,13) (21,22) (30,33)
XI	Field blanks	ND	FB= (18)(17)(26)(35) TB= (9)(18)(27)(36)

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

Validated Samples: ~~WA~~ All

1	OAM 1 (06/26/14)	11	OAM 2 (06/27/14)	21	PAM-1 (06/28/14)	31	PAM-1D (06/30/14)
2	OAM 2 (06/26/14)	12	PAM-1 (06/27/14)	22	PAM-1D (06/28/14)	32	PAM-2 (06/30/14)
3	PAM-1 (06/26/14)	13	PAM-1D (06/27/14)	23	PAM-2 (06/28/14)	33	PAM-3 (06/30/14)
4	PAM-1D (06/26/14)	14	PAM-2 (06/27/14)	24	PAM-3 (06/28/14)	34	PAM-4 (06/30/14)
5	PAM-2 (06/26/14)	15	PAM-3 (06/27/14)	25	PAM-4 (06/28/14)	35	PAM-21 (06/30/14)
6	PAM-3 (06/26/14)	16	PAM-4 (06/27/14)	26	PAM-21 (06/28/14)	36	PAM-31 (06/30/14)
7	PAM-4 (06/26/14)	17	PAM-21 (06/27/14)	27	PAM-31 (06/28/14)	37	PAM-1 (06/26/14)DUP
8	PAM-21 (06/26/14)	18	PAM-31 (06/27/14)	28	OAM 1 (06/30/14)	38	PAM-1D (06/26/14)DUP
9	PAM-31 (06/26/14)	19	OAM 1 (06/28/14)	29	OAM 2 (06/30/14)	39	PAM-1 (06/27/14)DUP
10	OAM 1 (06/27/14)	20	OAM 2 (06/28/14)	30	PAM-1 (06/30/14)	40	PAM-1D (06/27/14)DUP

Notes: ~~Dat~~ appended to sample # D to differentiate

LDC #: 32103A6

SDG #: 4070130/4070213

Laboratory: Eastern Research Group

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 07/07/14

Reviewer: SR

2nd Reviewer: AR

METHOD: Hexavalent Chromium (ASTM D7614)

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

	Validation Area		Comments
I.	Technical holding times		Sampling dates:
II	Initial calibration		
III.	Calibration verification		
IV	Blanks		
V	Matrix Spike/Matrix Spike Duplicates		
VI.	Duplicates		
VII.	Laboratory control samples		
VIII.	Sample result verification		
IX.	Overall assessment of data		
X.	Field duplicates		
XI.	Field blanks		

See Page 1

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

Validated Samples:

41	PAM-1 (06/28/14)DUP	51		61		71	
42	PAM-1D (06/28/14)DUP	52		62		72	
43	PAM-1 (06/30/14)DUP	53		63		73	
44	PAM-1D (06/30/14)DUP	54		64		74	
45		55		65		75	
46		56		66		76	
47		57		67		77	
48		58		68		78	
49		59		69		79	
50		60		70		80	

Notes: _____

LDC #: 32103A6

VALIDATION FINDINGS CHECKLIST

Reviewer: JO
2nd Reviewer: CL

Method: Inorganics (EPA Method See cover)

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

Airs

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

LDC# 32103A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 3D
2nd Reviewer: CR

Inorganics: Method See Cover

Analyte	Concentration (ng/m3)		RPD (≤20)
	3	4	
Hexavalent Chromium	0.0586	0.0583	1

Analyte	Concentration (ng/m3)		RPD (≤20)
	12	13	
Hexavalent Chromium	0.0219	0.0218	0

Analyte	Concentration (ng/m3)		RPD (≤20)
	21	22	
Hexavalent Chromium	0.0129	0.0155	18

Analyte	Concentration (ng/m3)		RPD (≤20)
	30	33	
Hexavalent Chromium	0.0526	0.0559	6

LDC #: 32103A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd Reviewer: 9

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 07/02/14

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

%R = Found X 100 / True

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

True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. ng/ml (~~ng/L~~)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.05	0.0000157	*1.00000*	0.99936	Y
7/02/14		s2	0.10	0.0000347			
		s3	0.20	0.0000715			
		s4	0.50	0.0001887			
		s5	1.00	0.0003815			
		s6	2.00	0.0007675			
ICV 7/3/14 10:08 Calibration verification		Found 0.5097 ng/ml	True 0.5000 ng/ml		101.9%R	101.9%R	
CCV 7/2/14 11:49 Calibration verification		0.5264 ng/ml	0.5000 ng/ml		105.3%R	105.3%R	
Calibration verification							

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

LDC #: 32103A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: 3D
2nd Reviewer: AL

METHOD: Inorganics, Method See Cover

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

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

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 7/2/14 11:19	Laboratory control sample	Cr^{+6}	1.047 ng/ml	1.00 ng/ml	105%R	105%R	Y
N	Matrix spike sample		(SSR-SR)				
Dup 7/2/14 12:09	Duplicate sample	Cr^{+6}	0.05399 ng/m³	0.0587 ng/m³	8.4%RPD	8.2%RPD	Y

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

LDC #: 32103A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 2
Reviewer: SD
2nd reviewer: CM

METHOD: Inorganics, Method See Cover

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

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

Compound (analyte) results for Cr^{+6} (IS) reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{[(a_{ver}) - (C_0)]}{C_1}$ (ng/L)

$C_0 = (-4.35E-6)$
$C_1 = 0.0003859$
$a_{ver} = 0.0001827$ mAU*min

$\frac{(ng/ml)(vf)}{m^3} = ng/m^3$
vf = 10 ml
$m^3 = 20.79$

Recalculation: $\frac{[(0.0001827\ mAU*min) - (-4.35E-6)]}{0.0003859} = 0.4847\ ng/ml$

$\frac{(10ml)(0.4847\ ng/ml)}{20.79\ m^3} = 0.233\ ng/m^3$

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	1	Cr^{+6}	0.0507	0.0508	Y
	2		0.0780	0.0780	
	3		0.0586	0.0587	
	4		0.0583	0.0583	
	5		0.113	0.113	
	6		0.0636	0.0635	
	7		0.101	0.101	
	8		ND	ND	
	9		ND	ND	
	10		0.0183	0.0183	
	11		0.0175	0.0176	
	12		0.0219	0.0219	
	13		0.0218	0.0218	
	14		0.0174	0.0174	
	15		0.233	0.233	
	16		0.0354	0.0354	
	17		ND	ND	
	18		ND	ND	
	19		0.0164	0.0164	
	20		0.0171	0.0171	

Note:

LDC #: 32103A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 2 of 2
Reviewer: SD
2nd reviewer: ar

METHOD: Inorganics, Method See Cover

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

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

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

Concentration = Recalculation:

#	Sample ID	Analyte	Reported Concentration (ng/m^3)	Calculated Concentration (ng/m^3)	Acceptable (Y/N)
	21	Cr+6	0.0129	0.0129	Y
	22		0.0155	0.0156	
	23		0.0133	0.0133	
	24		0.0163	0.0162	
	25		0.0127	0.0127	
	26		ND	ND	
	27		ND	ND	
	28		0.0141	0.0141	
	29		0.0195	0.0195	
	30		0.0526	0.0525	
	31		0.0559	0.0559	
	32		0.0526	0.0526	
	33		0.0320	0.0320	
	34		0.0795	0.0795	
	35		ND	ND	
	36		ND	ND	

Note: _____

CERTIFICATE OF ANALYSIS

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ATTN: Mr. Jeff Boggs
PHONE: (443) 803-8495 **FAX:** (410) 266-8912

FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4070130-01 **Sampled:** 06/26/14 17:06
Matrix: Air **Sample Volume:** 21.21 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/25/14 16:20 **Analysis Date:** 07/02/14 13:30

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0507		0.0036

7/7/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4070130-02 **Sampled:** 06/26/14 17:48
Matrix: Air **Sample Volume:** 22.67 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/25/14 16:40 **Analysis Date:** 07/02/14 13:40

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0780		0.0036

07/7/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4070130-03 **Sampled:** 06/26/14 18:03
Matrix: Air **Sample Volume:** 21.67 m^3 **Received:** 07/01/14 11:56
Comments: Col 1 Start Time 6/25/14 17:43 **Analysis Date:** 07/02/14 12:09

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0586		0.0036

7/7/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4070130-04 **Sampled:** 06/26/14 18:03
Matrix: Air **Sample Volume:** 21.81 m^3 **Received:** 07/01/14 11:56
Comments: Col 2 Start Time 6/25/14 17:49 **Analysis Date:** 07/02/14 12:29

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0583		0.0036

07/7/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4070130-05 **Sampled:** 06/26/14 17:48
Matrix: Air **Sample Volume:** 21.89 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/25/14 17:29 **Analysis Date:** 07/02/14 14:10

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.113		0.0036

7/7/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4070130-06 **Sampled:** 06/26/14 17:45
Matrix: Air **Sample Volume:** 22.01 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/25/14 17:18 **Analysis Date:** 07/02/14 14:19

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0636		0.0036

02/7/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4070130-07 **Sampled:** 06/26/14 17:37
Matrix: Air **Sample Volume:** 22.12 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/25/14 17:03 **Analysis Date:** 07/02/14 14:29

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.101		0.0036

07/7/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4070130-08 **Sampled:** 06/26/14 00:00
Matrix: Air **Sample Volume:** 21.89 m^3 **Received:** 07/01/14 11:56
Comments: **Analysis Date:** 07/02/14 14:39

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

07/7/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4070130-09 **Sampled:** 06/26/14 00:00
Matrix: Air **Sample Volume:** 22.01 m^3 **Received:** 07/01/14 11:56
Comments: **Analysis Date:** 07/02/14 14:49

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

07/7/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4070130-10 **Sampled:** 06/27/14 16:09
Matrix: Air **Sample Volume:** 20.7 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/26/14 17:09 **Analysis Date:** 07/02/14 14:59

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0183		0.0036

02/7/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4070130-11 **Sampled:** 06/27/14 16:55
Matrix: Air **Sample Volume:** 20.7 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/26/14 17:55 **Analysis Date:** 07/02/14 15:09

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0175		0.0036

07/7/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4070130-12 **Sampled:** 06/27/14 18:58
Matrix: Air **Sample Volume:** 21.4 m^3 **Received:** 07/01/14 11:56
Comments: Col 1 Start Time 6/26/14 19:52 **Analysis Date:** 07/02/14 12:49

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0219		0.0036

7/7/14

CERTIFICATE OF ANALYSIS

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4070130-13 **Sampled:** 06/27/14 18:32
Matrix: Air **Sample Volume:** 20.75 m^3 **Received:** 07/01/14 11:56
Comments: Col 2 Start Time 6/26/14 19:29 **Analysis Date:** 07/02/14 13:08

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0218		0.0036

7/2/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4070130-14 **Sampled:** 06/27/14 18:14
Matrix: Air **Sample Volume:** 20.78 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/26/14 19:08 **Analysis Date:** 07/02/14 15:19

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0174		0.0036

07/7/14

CERTIFICATE OF ANALYSIS

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4070130-15 **Sampled:** 06/27/14 17:51
Matrix: Air **Sample Volume:** 20.79 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/26/14 19:08 **Analysis Date:** 07/02/14 15:29

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.233		0.0036

07/7/14

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4070130-16 **Sampled:** 06/27/14 17:21
Matrix: Air **Sample Volume:** 20.7 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/26/14 18:21 **Analysis Date:** 07/02/14 15:39

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0354		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4070130-17 **Sampled:** 06/27/14 00:00
Matrix: Air **Sample Volume:** 20.78 m^3 **Received:** 07/01/14 11:56
Comments: **Analysis Date:** 07/02/14 16:08

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4070130-18 **Sampled:** 06/27/14 00:00
Matrix: Air **Sample Volume:** 20.79 m^3 **Received:** 07/01/14 11:56
Comments: **Analysis Date:** 07/02/14 16:18

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4070130-19 **Sampled:** 06/28/14 16:02
Matrix: Air **Sample Volume:** 21.49 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/27/14 16:10 **Analysis Date:** 07/03/14 15:49

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0164		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4070130-20 **Sampled:** 06/28/14 16:27
Matrix: Air **Sample Volume:** 21.17 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/27/14 16:56 **Analysis Date:** 07/03/14 13:00

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0171		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4070130-21 **Sampled:** 06/28/14 18:04
Matrix: Air **Sample Volume:** 21.32 m^3 **Received:** 07/01/14 11:56
Comments: Col 1 Start Time 6/27/14 19:04 **Analysis Date:** 07/03/14 11:29

Hexavalent Chromium

Analyte	CAS Number	Results ng/m^3 Air	Flag	MDL ng/m^3 Air
Hexavalent Chromium	1854-02-99	0.0129		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4070130-22 **Sampled:** 06/28/14 17:53
Matrix: Air **Sample Volume:** 20.71 m^3 **Received:** 07/01/14 11:56
Comments: Col 2 Start Time 6/27/14 18:52 **Analysis Date:** 07/03/14 11:48

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0155		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4070130-23 **Sampled:** 06/28/14 17:23
Matrix: Air **Sample Volume:** 21.07 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/27/14 18:17 **Analysis Date:** 07/03/14 13:30

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0133		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4070130-24 **Sampled:** 06/28/14 17:09
Matrix: Air **Sample Volume:** 20.92 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/27/14 17:54 **Analysis Date:** 07/03/14 13:40

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0163		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4070130-25 **Sampled:** 06/28/14 16:45
Matrix: Air **Sample Volume:** 20.92 m^3 **Received:** 07/01/14 11:56
Comments: Start Time 6/27/14 17:31 **Analysis Date:** 07/03/14 13:50

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0127		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4070130-26 **Sampled:** 06/28/14 00:00
Matrix: Air **Sample Volume:** 21.07 m^3 **Received:** 07/01/14 11:56
Comments: **Analysis Date:** 07/03/14 14:00

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4070130-27 **Sampled:** 06/28/14 00:00
Matrix: Air **Sample Volume:** 20.92 m^3 **Received:** 07/01/14 11:56
Comments: **Analysis Date:** 07/03/14 14:10

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 1 **Lab ID:** 4070213-01 **Sampled:** 06/30/14 15:58
Matrix: Air **Sample Volume:** 21.4 m^3 **Received:** 07/02/14 11:35
Comments: Start Time 6/29/14 16:11 **Analysis Date:** 07/03/14 14:20

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0141		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: OAM 2 **Lab ID:** 4070213-02 **Sampled:** 06/30/14 16:27
Matrix: Air **Sample Volume:** 21.33 m^3 **Received:** 07/02/14 11:35
Comments: Start Time 6/29/14 16:46 **Analysis Date:** 07/03/14 14:29

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0195		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1 **Lab ID:** 4070213-03 **Sampled:** 06/30/14 17:55
Matrix: Air **Sample Volume:** 21.62 m^3 **Received:** 07/02/14 11:35
Comments: Col 1 Start Time 6/29/14 17:54 **Analysis Date:** 07/03/14 12:08

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0526		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-1D **Lab ID:** 4070213-04 **Sampled:** 06/30/14 18:00
Matrix: Air **Sample Volume:** 21.66 m^3 **Received:** 07/02/14 11:35
Comments: Col 2 Start Time 6/29/14 17:56 **Analysis Date:** 07/03/14 12:28

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0559		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-2 **Lab ID:** 4070213-05 **Sampled:** 06/30/14 17:36
Matrix: Air **Sample Volume:** 21.88 m^3 **Received:** 07/02/14 11:35
Comments: Start Time 6/29/14 17:37 **Analysis Date:** 07/03/14 14:39

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0526		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-3 **Lab ID:** 4070213-06 **Sampled:** 06/30/14 17:16
Matrix: Air **Sample Volume:** 21.5 m^3 **Received:** 07/02/14 11:35
Comments: Start Time 6/29/14 17:23 **Analysis Date:** 07/03/14 14:49

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0320		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-4 **Lab ID:** 4070213-07 **Sampled:** 06/30/14 16:55
Matrix: Air **Sample Volume:** 21.37 m^3 **Received:** 07/02/14 11:35
Comments: Start Time 6/29/14 17:10 **Analysis Date:** 07/03/14 14:59

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	0.0795		0.0036

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FILE #: 3926.00
REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-21 **Lab ID:** 4070213-08 **Sampled:** 06/30/14 00:00
Matrix: Air **Sample Volume:** 21.88 m^3 **Received:** 07/02/14 11:35
Comments: **Analysis Date:** 07/03/14 15:29

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

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REPORTED: 07/07/14 13:16
SUBMITTED: 07/01/14 to 07/02/14
AQS SITE CODE:
SITE CODE: Honeywell Hex Chrome Study

Description: PAM-31 **Lab ID:** 4070213-09 **Sampled:** 06/30/14 00:00
Matrix: Air **Sample Volume:** 21.5 m^3 **Received:** 07/02/14 11:35
Comments: **Analysis Date:** 07/03/14 15:39

Hexavalent Chromium

Analyte	CAS Number	Results ng/m³ Air	Flag	MDL ng/m³ Air
Hexavalent Chromium	1854-02-99	ND	U	0.0036

7/7/14