

LABORATORY DATA CONSULTANTS, INC.

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ERM

September 10, 2014

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

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 September 9, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32627:

SDG

<u>Fraction</u>

4090421

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

102 pages-SF 3 DAY TAT Attachment 1 LDC #32627 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring) Level IV Cr(VI) DATE DATE (D7614) LDC SDG# REC'D DUE Matrix: Air/Water/Soil 09/09/14 09/12/14 18 70 4090421 Γotal A/CR

Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: September 3 through September 4, 2014

LDC Report Date: September 9, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4090421

Sample Identification

OAM 1 (09/03/14) PAM-1 (09/04/14)DUP OAM 2 (09/03/14) PAM-1D (09/04/14)DUP

PAM-1 (09/03/14)

PAM-1D (09/03/14)

PAM-2 (09/03/14)

PAM-3 (09/03/14)

PAM-4 (09/03/14)

PAM-21 (09/03/14)

PAM-31 (09/03/14)

OAM 1 (09/04/14)

OAM 2 (09/04/14) PAM-1 (09/04/14)

PAM-1D (09/04/14)

PAM-2 (09/04/14)

PAM-3 (09/04/14)

PAM-4 (09/04/14)

PAM-21 (09/04/14)

PAM-31 (09/04/14)

PAM-1 (09/03/14)DUP

PAM-1D (09/03/14)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 (09/03/14) and PAM-31 (09/04/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (09/03/14) and PAM-21 (09/04/14) 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 (09/03/14) and PAM-1D (09/03/14) and samples PAM-1 (09/04/14) and PAM-1D (09/04/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentration (ng/m³)		555		
Analyte	PAM-1 (09/03/14)	PAM-1D (09/03/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0162	0.0140	15 (≤20)	-	-

	Concentrat	Concentration (ng/m³)				
Analyte	PAM-1 (09/04/14)	PAM-1D (09/04/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0319	0.0302	5 (≤20)	-	-	

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4090421

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 4090421

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 4090421

No Sample Data Qualified in this SDG

LDC #:_ 32627A6

VALIDATION COMPLETENESS WORKSHEET

Level IV

SDG #: 4090421 Laboratory: Eastern Research Group

Page: \ of Reviewer: 55 2nd Reviewer: OL

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: 09/03-04/14
11	Initial calibration	Α	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	2	Not Required
VI.	Duplicates	A	Dup.
VII.	Laboratory control samples	A	usiò
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FO= (3.4) (12,13)
XL	Field blanks	<i>P0</i>	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:

	- "						
1	OAM 1 (09/03/14)	11	OAM 2 (09/04/14)	21	PAM-1 (09/04/14)DUP	31	
2	OAM 2 (09/03/14)	12	PAM-1 (09/04/14)	22	PAM-1D (09/04/14)DUP	32	
3	PAM-1 (09/03/14)	13	PAM-1D (09/04/14)	23		33	
4	PAM-1D (09/03/14)	14	PAM-2 (09/04/14)	24		34	
5	PAM-2 (09/03/14)	15	PAM-3 (09/04/14)	25		35	
6	PAM-3 (09/03/14)	16	PAM-4 (09/04/14)	26		36	
7	PAM-4 (09/03/14)	17	PAM-21 (09/04/14)	27		37	
8	PAM-21 (09/03/14)	18	PAM-31 (09/04/14)	28		38	
9	PAM-31 (09/03/14)	19	PAM-1 (09/03/14)DUP	29		39	
10	OAM 1 (09/04/14)	20	PAM-1D (09/03/14)DUP	30		40	

Notes:	 		

LDC #: 32627A6

VALIDATION FINDINGS CHECKLIST

Page: \of\(\bar{\lambda}\)
Reviewer: \(\sigma\) 2nd Reviewer: ______

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 99-110% QC limits?				
Were titrant checks performed as required? (Level IV only)			_	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for weters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 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?				

Dis

LDC#: 32017AU

VALIDATION FINDINGS CHECKLIST

Page: 2of 2
Reviewer: 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# 32627A6 VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:	<u></u> of
Reviewer:	30
2nd Reviewer:_	al

Inorganics: Method See Cover

	Concentration (ng/m3)			
Analyte	3	4	RPD (≤20)	Qual. (Parent only)
Hexavalent Chromium	0.0162	0.0140	15	

	Concentra			
Analyte	12	13	RPD (≤20)	Qual. (Parent only)
Hexavalent Chromium	0.0319	0.0302	5	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32627A6.wpd

LDC #: 32627A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: <u> ∖ </u> of <u> </u>	
Reviewer: 🌫 🗢	
nd Reviewer:	

Method:	Inorganics,	Method	See Cover	

The correlation coefficient (r) for the calibration of _____was recalculated.Calibration date:_ 9\8\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

Where,

Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution

True

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000164			
		s2	0.1	0.0000408	0.99997	0.99997	
	صدي	s3	0.2	0.0000834	_		
		s4	0.5	0.0002058			
		s5	5 1 0.000407		5		
		s6	2	0.0008236			
Ja 11:02		Found	True				(
Calibration verification	Crso	0.4957 mg/ml	0.5 neglow		99.1%R	99.2%2	
cw 12:01	طد م						
Calibration verification	Cx 26	0.5154ng/ml	0.5 ng/m		103.1%P	103118R	
Calibration verification							

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

LDC #: 32627 A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page:_	<u>lof_\</u>
Reviewer:_	$\supset \Omega$
2nd Reviewer:_	C1

WETHOD: Inorganics, Method <u>See</u>	_	Cover
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Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

 $%R = Found \times 100$ True

Where,

Found =

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,

Found = SSR (spiked sample result) - SR (sample result).

True = concentration of each analyte in the source.

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

 $RPD = |S-D| \times 100$

Where,

S =

Original sample concentration

(S+D)/2

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)
LLS	Laboratory control sample	Cris	1.07 ng/m	Inglu	107%R	107%R	3
7)	Matrix spike sample		(SSR-SR)				
15:22 DOB-	Duplicate sample	Cr26	0.0158 mg/m³	0.0162rg/m3	2.50% ERD	Z.62 %880	5)

Comments:	Refer to appropriate worksheet fo	r list of qualifications and associ	ated samples when reported resu	ults do not agree within 10.0%	of the recalculated results.
	·				
			· · ·		

LDC#: 32627A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	7	_of	
Reviewer:	-	5 5	>
2nd reviewer:	-	JZ	_

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
Concentration = $\left(avec - c_0\right)/c_1$ Recalculation: $\left(0.000012 - (-1.54E-06)\right)/0.000412=0.050$ Aven = 0.000012 $\left(va/m\right)(vf)$
aven=0.0000112 (rg/ml)(uf) (0.0309 ng/ml)(10ml) $C_1 = 0.000412$ (rg/ml)(uf) (0.0309 ng/ml)(10ml) = 0.0142 ng/m ³

#	Sample ID	Analyte	Reported Concentration (\(\text{Va\lm^2} \)	Calculated Concentration (ハムル3)	Acceptable (Y/N)
	\	Cx+40	0.0142	0,0142	Ц
	2	1	0.0212	0.0212	Ì
	3		0.0162	0.0162	
	Ц		0.0140	0.0140	
	2		0.0150	0.050	
	6		0.0153	0.0153	
	٦		0.0174	0.0174	
	8		ND	NO	·
	٩		NO	ND	
	lo		0.0163	0.0162	
	11		0.0108	0.0108	
	12		0.0319	0.0319	
	13		0.0302	0.0302	
	14		0.0247	0.0247	
	- 21		0.0552	0.0552	
	16		0.0210	0.0210	
			<i>PO</i>	NO	
	18	4	NO	W7	V

Note:



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 9/2/14 16:13

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 1

Air

Lab ID:

4090421-01

m³

Flag

Sampled: 09/03/14 16:20 Received: 09/04/14 11:38

Analysis Date: 09/08/14 13:43

Hexavalent Chromium

Results

0.0142

<u>MDL</u>

<u>Analyte</u> **Hexavalent Chromium**

Comments:

CAS Number 1854-02-99

Sample Volume:

ng/m³ Air

<u>ng/m³ Air</u>

0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 3 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE

SITE CODE:

21.66

Honeywell Hex Chrome Study

Description:

OAM 2

Air

Lab ID:

Sample Volume:

4090421-02

Sampled: 09/03/14 16:39

Analysis Date: 09/08/14 13:53

Received: 09/04/14 11:38

Comments:

Start Time 9/2/14 16:35

Hexavalent Chromium

Results

<u>MDL</u>

Analyte

Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air 0.0212

<u>Flaq</u>

ng/m³ Air

0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

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75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

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Col 1 Start Time 9/2/14 18:05

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-1 Air

Lab ID:

Sample Volume:

4090421-03

21.47

m³

Sampled: 09/03/14 17:56 Received: 09/04/14 11:38

Analysis Date: 09/08/14 12:22

Hexavalent Chromium

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

Comments:

1854-02-99

0.0162

0.0036

SEP 0 9 2014

Initials: CR



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE

SHECODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-1D

Lab ID:

Sample Volume:

4090421-04

21.53 m³ Sampled: 09/03/14 18:00

Received: 09/04/14 11:38 Analysis Date: 09/08/14 12:42

Comments:

Col 2 Start Time 9/2/14 18:05

Hexavalent Chromium

Results

<u>MDL</u>

<u>Analyte</u> **Hexavalent Chromium**

CAS Number 1854-02-99

ng/m³ Air 0.0140

Flag

ng/m³ Air

0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

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Malvern, PA 19355

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-2 Air

Lab ID:

Sample Volume:

4090421-05

m³

Sampled: 09/03/14 17:41

Received: 09/04/14 11:38 Analysis Date: 09/08/14 14:23

Comments:

Start Time 9/2/14 17:41

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0150

0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

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Page 7 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

wii. Jeli boyys

PHONE: (443) 803-8495

PAM-3

Start Time 9/2/14 17:27

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE CODE: SITE CODE:

m³

Honeywell Hex Chrome Study

4090421-06 me: 21.63

Sampled: 09/03/14 17:29 **Received:** 09/04/14 11:38

Analysis Date: 09/08/14 14:33

Hexavalent Chromium

Results

MDL

CAS Number

<u>ng/m³ Air</u>

Sample Volume:

Lab ID:

<u>Flaq</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

Analyte

1854-02-99

0.0153

0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

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Page 8 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

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Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE

SITE CODE:

21.66

Honeywell Hex Chrome Study

Description: Matrix:

PAM-4

Lab ID:

Sample Volume:

4090421-07

m³

Sampled: 09/03/14 17:09 Received: 09/04/14 11:38

Analysis Date: 09/08/14 14:43

Comments:

Start Time 9/2/14 17:05

Hexavalent Chromium

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number**

<u>ng/m³ Air</u> 0.0174

Flag

ng/m³ Air

1854-02-99

0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

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Page 9 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Hexavalent Chromium

Matrix:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

PAM-21

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Lab ID: 4090421-08

Sample Volume:

21.6 m³

Sampled: 09/03/14 00:00 **Received:** 09/04/14 11:38

Analysis Date: 09/08/14 14:53

Hexavalent Chromium

<u>Results</u>

<u>MDL</u>

<u>Analyte</u> <u>CAS Number</u>

1854-02-99

ng/m³ Air ND Flag

<u>ng/m³ Air</u>

0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 10 of 22



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Matrix:

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-31

Lab ID:

Sample Volume:

4090421-09

m³

Sampled: 09/03/14 00:00

Received: 09/04/14 11:38

Analysis Date: 09/08/14 15:03

Hexavalent Chromium

21.63

Results

<u>MDL</u>

<u>Analyte</u> **CAS Number** Hexavalent Chromium

1854-02-99

<u>ng/m³ Air</u> ND

<u>Flaq</u>

<u>ng/m³ Air</u> 0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 11 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 1

Start Time 9/3/14 16:26

Lab ID:

Sample Volume:

4090524-01

m³

<u>Flag</u>

Sampled: 09/04/14 16:24 Received: 09/05/14 11:21

Analysis Date: 09/08/14 15:12

Hexavalent Chromium

21.58

Results

<u>MDL</u>

Analyte Hexavalent Chromium

Comments:

CAS Number 1854-02-99

ng/m³ Air 0.0163

<u>ng/m³ Air</u>

0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

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Page 12 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE

SODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Air

Lab ID:

Sample Volume:

4090524-02

 m^3

Sampled: 09/04/14 16:40 Received: 09/05/14 11:21

Analysis Date: 09/08/14 15:22

Comments:

Start Time 9/3/14 16:44

Hexavalent Chromium

21.54

Results

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0108

<u>MDL</u>

0.0036

SEP 0 9 2014

Initials: CR



Environmental Resources Management, Inc

Col 1 Start Time 9/3/14 18:02

REPORTED:

FILE #: 3926.00

09/09/14 15:49

75 Valley Stream Parkway, Suite 400

09/04/14 to 09/05/14

Malvern, PA 19355

SUBMITTED:

ATTN: Mr. Jeff Boggs

AQS SITE STECODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-1

Lab ID:

4090524-03

Sampled: 09/04/14 17:58

Matrix:

PHONE: (443) 803-8495

Air

Sample Volume:

21.54

m³

Received: 09/05/14 11:21

Analysis Date: 09/08/14 13:02

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

FAX: (410) 266-8912

0.0319

0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 14 of 22



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 09/09/14 15:49

REPORTED. 05/0

SUBMITTED:

09/04/14 to 09/05/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

Malvern, PA 19355

CODE: SITE CODE:

21.54

Honeywell Hex Chrome Study

Description:

PAM-1D

Air

Lab ID:

Sample Volume:

4090524-04

Sampled: 09/04/14 18:01 Received: 09/05/14 11:21

Comments:

Matrix:

Col 2 Start Time 9/3/14 18:05

m³

Analysis Date: 09/08/14 13:21

Hexavalent Chromium

Results

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flaq</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

FAX: (410) 266-8912

0.0302

0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

09/09/14 15:49 REPORTED:

Malvern, PA 19355

SUBMITTED: 09/04/14 to 09/05/14

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

4090524-05

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-2 Air

Start Time 9/3/14 17:46

Lab ID:

m³

Sampled: 09/04/14 17:42 Received: 09/05/14 11:21

FAX: (410) 266-8912

Sample Volume: 21.55

Analysis Date: 09/08/14 15:32

Hexavalent Chromium

Results

<u>MDL</u>

CAS Number

ng/m³ Air

Flag

ng/m³ Air

<u>Analyte</u> Hexavalent Chromium

1854-02-99

0.0247

0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

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Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 09/09/14 15:49

Malvern, PA 19355

09/04/14 to 09/05/14

ATTN: Mr. Jeff Boggs

AQS SITE CODE: SITE CODE:

SUBMITTED:

PHONE: (443) 803-8495

Honeywell Hex Chrome Study

Description:

Comments:

PAM-3

Lab ID:

Sample Volume:

4090524-06

Sampled: 09/04/14 17:23

Matrix: Air

FAX: (410) 266-8912

21.43

Received: 09/05/14 11:21

Analysis Date: 09/08/14 15:42

Start Time 9/3/14 17:34

Hexavalent Chromium

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

m³

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0552

0.0036

SEP 0 9 2014

Initials: CR



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

3-8495 FA

Start Time 9/3/14 17:14

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-4

Air

Lab ID:

Sample Volume:

4090524-07

21.51

m³

Sampled: 09/04/14 17:08 Received: 09/05/14 11:21

Analysis Date: 09/08/14 15:52

Hexavalent Chromium

Results

<u>MDL</u>

Hexavalent Chromium

<u>Analyte</u>

CAS Number 1854-02-99

ng/m³ Air 0.0210

<u>Flaq</u>

ng/m³ Air

0.0036

SEP 0 9 2014

Initials: CR

Eastern Research Group

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Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

ATTN: Mr. Jeff Boggs

Malvern, PA 19355

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

09/04/14 to 09/05/14

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

Matrix:

Comments:

Air

Lab ID:

Sample Volume:

4090524-08

21.55 m³ Sampled: 09/04/14 00:00

Received: 09/05/14 11:21 Analysis Date: 09/08/14 16:22

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

<u>Flag</u>

ng/m³ Air 0.0036

1854-02-99 ND

SEP 0 9 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 19 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/09/14 15:49

SUBMITTED:

09/04/14 to 09/05/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Lab ID:

Sample Volume:

4090524-09

m³

Sampled: 09/04/14 00:00

Received: 09/05/14 11:21 Analysis Date: 09/08/14 16:32

Comments:

Hexavalent Chromium

21.43

Results

MDL

<u>Anaiyte</u> Hexavalent Chromium **CAS Number** 1854-02-99

<u>ng/m³ Air</u> ND

<u>Flaq</u>

ng/m³ Air

0.0036

Initials: CR

SEP 0 9 2014

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 20 of 22



LABORATORY DATA CONSULTANTS, INC.

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

ERM September 12, 2014

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

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 September 11, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32648:

SDG Fraction

4090913 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.

Christina Rink

Sincerely,

Project Manager/Chemist

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DC	SDG#	DATE REC'D	(3) DATE DUE	Cr((VI) 614)																													<u> </u>				
/latrix:	Air/Water/Soil			Α	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
A	4090913	09/11/14	09/16/14	18.	0																																	
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Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: September 5 through September 8, 2014

LDC Report Date: September 12, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4090913

Sample Identification

OAM 1(09/05/14) PAM-1(09/08/14)DUP OAM 2(09/05/14) PAM-1D(09/08/14)DUP

PAM-1(09/05/14)

PAM-1D(09/05/14)

PAM-2(09/05/14)

PAM-3(09/05/14)

PAM-4(09/05/14) PAM-21(09/05/14)

PAM-31(09/05/14)

OAM 1(09/05/14)

OAM 2(09/08/14)

PAM-1(09/08/14)

PAM-1D(09/08/14)

PAM-2(09/08/14)

PAM-3(09/08/14)

PAM-4(09/08/14) PAM-21(09/08/14)

PAM-31(09/08/14)

PAM-1(09/05/14)DUP

PAM-1D(09/05/14)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(09/05/14) and PAM-31(09/08/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (09/05/14) and PAM-21 (09/08/14) 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(09/05/14) and PAM-1D(09/05/14) and samples PAM-1(09/08/14) and PAM-1D(09/08/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentration (ng/m³)		222		
Analyte	PAM-1(09/05/14)	PAM-1D(09/05/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0455	0.0427	6 (≤20)	-	-

	Concentrati	ion (ng/m³)				
Analyte	PAM-1(09/08/14)	PAM-1D(09/08/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0152	0.0130	16 (≤20)	-	-	

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4090913

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 4090913

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 4090913

No Sample Data Qualified in this SDG

LDC #: 32648A6

VALIDATION COMPLETENESS WORKSHEET

Level IV

SDG#	4090913		
Labora	tory: Eastern	Research	Group

Page: 1 of 1 Reviewer: 50
2nd Reviewer: 61

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
<u>l.</u>	Technical holding times	A	Sampling dates: 95 14 2 9814
1	Initial calibration	A	, and the second
	Calibration verification	A	
IV	Blanks	A	
	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	Dup
VII.	Laboratory control samples	A	usio
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD=(3,4) (12,13)
XI	Field blanks	100	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:

Divs

1	OAM 1(09/05/14)	11	OAM 2(09/08/14)	21	PAM-1(09/08/14)DUP	31	
2	OAM 2(09/05/14)	12	PAM-1(09/08/14)	22	PAM-1D(09/08/14)DUP	32	╝
3	PAM-1(09/05/14)	13	PAM-1D(09/08/14)	23		33_	
4	PAM-1D(09/05/14)	14	PAM-2(09/08/14)	24		34_	
5	PAM-2(09/05/14)	15	PAM-3(09/08/14)	25		35	
6	PAM-3(09/05/14)	16	PAM-4(09/08/14)	26		36_	
7	PAM-4(09/05/14)	17	PAM-21(09/08/14)	27		37	
8	PAM-21(09/05/14)	18	PAM-31(09/08/14)	28		38	
9	PAM-31(09/05/14)	19	PAM-1(09/05/14)DUP	29		39_	
10	OAM 1(09/08/14)	20	PAM-1D(09/05/14)DUP	30		40	

Notes:			
	 		

LDC#: 3264814

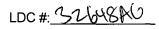
VALIDATION FINDINGS CHECKLIST

Page: 1 of 2 Reviewer: 52 2nd Reviewer: 2

Method: Inorganics (EPA Method See Love)

Method:Inorganics (EPA Method See (のペノ)			,	
Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	-			
Cooler temperature criteria was met.	/			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	_			
Were all initial calibration correlation coefficients > 0.995?	/			
Were all initial and continuing calibration verification %Rs within the 90-110 % QC limits?	/			
Were titrant checks performed as required? (Level IV only)			_	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
Was a method blank associated with every sample in this SDG?	(
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.				
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 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?			1	

airs



VALIDATION FINDINGS CHECKLIST

Page: Lof 2
Reviewer: 5 0
2nd Reviewer: 6

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.			118	
X. Field blanks				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		1		

LDC#<u>32648A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:	of
Reviewer:	ころ
2nd Reviewer:	a

Inorganics: Method See Cover

	Concentra			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0,0455	0.0427	6	

	Concentrat	tion (ng/m3)		
Analyte	12	13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0152	0.0130	16	

 $\verb|\LDCFILESERVER|\Validation|\FIELD DUPLICATES|\FD_inorganic|\wettemp.WPD|$

LDC #:3268A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:	<u>\</u> (of _	
Reviewer	:_``	<u>Sa</u>	_
nd Revie	wer		

Method: In	organics,	Method	See Cover

The correlation coefficient (r) for the calibration of Crtwas recalculated.Calibration date: 9 10 14

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

%R = <u>Found X 100</u>

Where,

Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution

True

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000142			
		s2	0.1	0.0000337	0.99999	0.99999	
		s3	0.2	0.0000773			
	طالح م	s4	0.5	0.0001989			u
		s5	1	0.000398			7
		s6	2	0.000805			
IW 10:42	مريد ح	Fand	True				j
Calibration verification		0.5005 ng/m	0.5 ng/ml		100.1%R	100.182	
CCV 13:42							
Calibration verification	CK	0.526ing/m	0.3 rgim		105.4%R	105.4 %R	7
Calibration verification							

Comments: Refer to Calibration \	Verification findings worksheet for I	list of qualifications and associa	ated samples when reported	results do not agree withi
10.0% of the recalculated results.	.			

LDC #: 5246 PC

VALIDATION FINDINGS WORKSHEET <u>Level IV Recalculation Worksheet</u>

Page:_	_of_\
Reviewer:_	50
2nd Reviewer:_	4

marrios, morganios, mornos	METHOD: Inorganics, Method	1 See Cover	
----------------------------	----------------------------	-------------	--

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

 $%R = Found \times 100$ True Where,

Found =

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,

Found = SSR (spiked sample result) - SR (sample result).

True = concentration of each analyte in the source.

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

 $RPD = |S-D| \times 100$

Where,

S =

Original sample concentration

(S+D)/2

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 11:12	Laboratory control sample	C+16	1.072mg/ml	1 ng/ml	107%R	107%F	3
2	Matrix spike sample		(SSR-SR)				
Dug	Duplicate sample	Cr26	0.0464 ng/m³	0.0455ng/m³	196%287	\.96% P 9D	J

Comments: Refer to ap	propriate worksheet for I	ist of qualifications and a	ssociated samples wh	en reported results do	not agree within 10.09	% of the recalculated results.

LDC #3248 AV

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	of_
Reviewer:	<u>'</u> S
2nd reviewer:	Ω

METHOD: Inorg	ganics, Method	See Carer				
Y N N/A	ifications below for Have results beer Are results within Are all detection li	the calibrated rar	nge of the instru	t applicable questior ly? ments?	ns are identified a	s "N/A".
Compound (ana recalculated and	lyte) results for I verified using the	following equation	on: (6)		_reported with a p	ositive detect were
Concentration = (avea - Co)/c	Re 21.08	ecalculation: (0	0.00000	40E-06)) 50 = 6).0575 ng/m/
40 = - S.400 4 = 0.000	<u></u>		ng lm³	(0.0575 ng/n	n1) (10 m1)	0.0213 ng/m³

			Reported	Calculated Concentration	Annontable
#	Sample ID	Analyte	Concentration (va/m³)	(na/m³)	Acceptable (Y/N)
	\	Cx+b	J	0.0202	4
	,		0.0203	l .	
	2		0.0205	0.0204	
	3		0.0455	0.0455	
<u> </u>	4		0.0427	0.0427	
	5		0.0444	0.0444	
	6		0.0273	0.0273	
	7		0.0432	0.0432	
	8		ND	NO	
	9		NO	NO	
	10		0.0109	0.0108	
	11		0.0144	0.0144	
	12		0.0152	0.0152	
	13		0.0130	0.0130	
	14		0.0148	0.0148	
	12		0.0227	0.0220	
	طا		0.0168	0.0168	
	17		NO	JU	
	18	4	20	NO	1

Note:	



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Hexavalent Chromium

Analyte

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

OAM 1

Start Time 9/4/14 16:30

FAX: (410) 266-8912

Lab ID:

4090913-01

Sample Volume:

m³

FILE #:

REPORTED:

SUBMITTED:

AQS SITE SITE CODE:

3926.00

Honeywell Hex Chrome Study

Sampled: 09/05/14 15:57

Received: 09/09/14 11:11 Analysis Date: 09/10/14 13:22

Hexavalent Chromium

Results ng/m³ Air <u>MDL</u>

09/11/14 14:56 09/09/14

CAS Number

1854-02-99

0.0203

<u>Flaq</u>

ng/m³ Air

0.0036

SEP 1 2 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 3 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/11/14 14:56 09/09/14

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Air

Lab ID:

Sample Volume:

4090913-02

m³

Sampled: 09/05/14 16:13 Received: 09/09/14 11:11

Analysis Date: 09/10/14 13:32

Comments:

Start Time 9/4/14 16:45

Hexavalent Chromium

21.13

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0205

0.0036

SEP 1 2 2014

Initials: CR

Eastern Research Group

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Page 4 of 22



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:

09/11/14 14:56 09/09/14

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-1

Lab ID:

Sample Volume:

4090913-03

m³

Sampled: 09/05/14 17:28 Received: 09/09/14 11:11

Analysis Date: 09/10/14 12:02

Comments:

Col 1 Start Time 9/4/14 18:04

Hexavalent Chromium

21.07

Results

<u>Flag</u>

<u>MDL</u>

Analyte Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air 0.0455

ng/m³ Air

0.0036

SEP 1 2 2014

Initials: CR



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:

09/11/14 14:56 09/09/14

SUBMITTED:

AQS SITE

SHE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-1D

Lab ID:

Sample Volume:

4090913-04

 $\,m^3$

Sampled: 09/05/14 17:29 Received: 09/09/14 11:11

Analysis Date: 09/10/14 12:22

Col 2 Start Time 9/4/14 18:06

Hexavalent Chromium

21.04

Results

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0427

0.0036

SEP 1 2 2014

Initials: CZ

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 6 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/11/14 14:56

SUBMITTED:

09/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

4090913-05

21.04

Sampled: 09/05/14 17:11

Analysis Date: 09/10/14 14:02

Received: 09/09/14 11:11

Comments:

Start Time 9/4/14 17:48

Hexavalent Chromium

Results

MDL

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ng/m³ Air 0.0444

Sample Volume:

<u>Flag</u>

m³

ng/m³ Air

0.0036

SEP 1 2 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 7 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/11/14 14:56

SUBMITTED: 09/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-3

Lab ID:

4090913-06

m³

Received: 09/09/14 11:11 Analysis Date: 09/10/14 14:12

Sampled: 09/05/14 16:56

Comments:

Start Time 9/4/14 17:30

Hexavalent Chromium

21.08

Results ng/m³ Air

0.0273

<u>MDL</u>

Analyte Hexavalent Chromium

CAS Number 1854-02-99

Sample Volume:

<u>Flaq</u>

ng/m³ Air

0.0036

SEP 1 2 2014

Initials: CR

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The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 8 of 22



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:

09/11/14 14:56

SUBMITTED: 09/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-4 Air

Lab ID:

Sample Volume:

4090913-07

m³

Sampled: 09/05/14 16:43

Received: 09/09/14 11:11 Analysis Date: 09/10/14 14:22

Comments:

Start Time 9/4/14 17:13

Hexavalent Chromium

21.14

Results

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ng/m³ Air

<u>Flag</u>

MDL ng/m³ Air

0.0432

0.0036

SEP 1 2 2014

Initials: CR



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/11/14 14:56

SUBMITTED: 09/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-21

Lab ID:

Sample Volume:

4090913-08

Sampled: 09/05/14 00:00 Received: 09/09/14 11:11

Air

21.04

Analysis Date: 09/10/14 14:32

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0036

SEP 1 2 2014

Initials: CR

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The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 10 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Hexavalent Chromium

Matrix:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

PAM-31

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/11/14 14:56

SUBMITTED: 09/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Lab ID: 4090913-09

Sample Volume:

21.08

Sampled: 09/05/14 00:00 Received: 09/09/14 11:11

Analysis Date: 09/10/14 14:42

Hexavalent Chromium

Results

MDL.

Analyte CAS Number

1854-02-99

ng/m³ Air ND

<u>Flaq</u>

<u>ng/m³ Air</u>

0.0036

SEP 1 2 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 11 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description:

Air

OAM 1

Start Time 9/7/14 16:29

FAX: (410) 266-8912

Lab ID:

4090913-10

Sample Volume:

21.45

m³

FILE #: 3926.00

REPORTED:

SUBMITTED: AQS SITE

SITE CODE:

Sampled: 09/08/14 16:19

Received: 09/09/14 11:11

Analysis Date: 09/10/14 14:51

Honeywell Hex Chrome Study

Hexavalent Chromium

Results

<u>MDL</u>

09/11/14 14:56

09/09/14

Analyte Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air 0.0109

Flag

ng/m³ Air

0.0036

SEP 1 2 2014

Initials: CR

Eastern Research Group

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Page 12 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 9/7/14 16:42

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/11/14 14:56

SUBMITTED: 09/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

Matrix:

OAM 2

Lab ID:

Sample Volume:

4090913-11

m³

Sampled: 09/08/14 16:35 Received: 09/09/14 11:11

Analysis Date: 09/10/14 15:01

Hexavalent Chromium

21.49

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0144

0.0036

SEP 1 2 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 13 of 22



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:

09/11/14 14:56

09/09/14 SUBMITTED:

AQS SITE

STECODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-1

Air

Lab ID:

Sample Volume:

4090913-12

m³

Sampled: 09/08/14 17:32

Received: 09/09/14 11:11 Analysis Date: 09/10/14 12:42

Comments: Col 1 Start Time 9/7/14 17:27

Hexavalent Chromium

21.66

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0152

0.0036

SEP 1 2 2014

Initials: CR



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Col 2 Start Time 9/7/14 17:27

FAX: (410) 266-8912

REPORTED:

09/11/14 14:56

SUBMITTED: 09/09/14

FILE #: 3926.00

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

Sample Volume:

4090913-13

21.69

Sampled: 09/08/14 17:33 Received: 09/09/14 11:11

Analysis Date: 09/10/14 13:01

Hexavalent Chromium

Results

MDL

<u>Analyte</u> **Hexavalent Chromium**

CAS Number 1854-02-99

ng/m³ Air 0.0130

<u>Flag</u>

ng/m³ Air

0.0036

SEP 1 2 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 15 of 22



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: 09/11/14 14:56

SUBMITTED: 09/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID:

Sample Volume:

4090913-14

m³

Sampled: 09/08/14 17:17 Received: 09/09/14 11:11

Analysis Date: 09/10/14 15:11

Comments:

Matrix:

Start Time 9/7/14 17:16

Hexavalent Chromium

21.62

Results

ng/m³ Air

<u>Flag</u>

MDL ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0148

0.0036

SEP 1 2 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 16 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 9/7/14 17:08

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/11/14 14:56 09/09/14

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-3

Lab ID:

4090913-15

Flag

Sampled: 09/08/14 17:08 Received: 09/09/14 11:11

Analysis Date: 09/10/14 15:21

Hexavalent Chromium

21.6

Results

MDL

Analyte Hexavalent Chromium

CAS Number 1854-02-99

Sample Volume:

ng/m³ Air 0.0227

ng/m³ Air

0.0036

SEP 1 2 2014

Initials: CR

Eastern Research Group

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Page 17 of 22



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:

09/11/14 14:56 09/09/14

SUBMITTED:

AQS SITE

SITE CODE:

Flag

m³

Honeywell Hex Chrome Study

Analysis Date: 09/10/14 15:31

Description: Matrix:

PAM-4

Lab ID:

4090913-16

21.56

Sampled: 09/08/14 16:59

Received: 09/09/14 11:11

Comments:

Start Time 9/7/14 17:01

Hexavalent Chromium

Results

0.0168

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air

Sample Volume:

ng/m³ Air

0.0036

SEP 1 2 2014

Initials: CR

Eastern Research Group

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Page 18 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

Comments:

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: SUBMITTED: 09/11/14 14:56

09/09/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21 Air

Lab ID:

Sample Volume:

4090913-17

Sampled: 09/08/14 00:00

Received: 09/09/14 11:11 Analysis Date: 09/10/14 16:01

Hexavalent Chromium

Results

ng/m³ Air ND

Flag

MDL ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

21.62

0.0036

SEP 1 2 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 19 of 22



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/11/14 14:56

SUBMITTED: 09/09/14

AQS SITE

STECODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-31

Lab ID:

Sample Volume:

4090913-18

m³

Sampled: 09/08/14 00:00

Received: 09/09/14 11:11 Analysis Date: 09/10/14 16:11

Hexavalent Chromium

Results

21.6

<u>MDL</u>

Analyte Hexavalent Chromium

Comments:

CAS Number 1854-02-99

ng/m³ Air

<u>Flag</u>

ng/m³ Air

0.0036

SEP 1 2 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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LABORATORY DATA CONSULTANTS, INC.

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

ERM

September 16, 2014

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

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 September 15, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32669:

SDG

Fraction

4091029

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.

1/2-y

Sincerely,

Christina Rink

Project Manager/Chemist

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LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr((VI) 614)																																		
Matrix	: Air/Water/Soil	7 7 DE 24		Α	s	w	s	W	s	W	s	W	s	w	s	٧	s	w	s	w	s	W	s	w	s	W	s	w	s	w	s	w	s	8	s	w	S	W	Ę
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Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: September 9, 2014

LDC Report Date: September 15, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4091029

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.

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

Samples 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:

	Concentrat	on (ng/m³)				
Analyte	PAM-1	PAM-1D	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0143	0.0135	6 (≤20)	-	-	

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4091029

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 4091029

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 4091029

No Sample Data Qualified in this SDG

LDC #: 32669A6

VALIDATION COMPLETENESS WORKSHEET

SDG #:	4091029	
Laborato	rv: Eastern	Research Group

Level IV

Reviewer: 2nd Reviewer: O

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
l.	Technical holding times	A	Sampling dates: 9/09/14
ll ll	Initial calibration	A	,
III.	Calibration verification	A	
IV	Blanks	<u> </u>	
	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	A	Da '
VII.	Laboratory control samples	IA_	icsin
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
Х.	Field duplicates	SW	FD=(3,4)
	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: Disa

	1/14)					
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 #: 3760 AY

VALIDATION FINDINGS CHECKLIST

Page: of 2 Reviewer: 20 2nd Reviewer: 02

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.				
Cooler temperature criteria was met.				
II. Calibration				
Were all instruments calibrated daily, each set-up time?				
Were the proper number of standards used?				
Were all initial calibration correlation coefficients ≥ 0.995?				
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	_			
Were titrant checks performed as required? (Level IV only)			_	
Were balance checks performed as required? (Level IV only)			_	
III. Blanks				
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/	-		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.				
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 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 #: 32669AC

VALIDATION FINDINGS CHECKLIST

Page: Zof Z Reviewer: 30 2nd Reviewer: 01

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#<u>32669A6</u> VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:_	<u> </u>
Reviewer:	30
2nd Reviewer:	OL

Inorganics: Method See Cover

	Concentr	ation (ng/m3)		
Analyte	3	4	RPD (≤20)	Qual. (Parent only)
Hexavalent Chromium	0.0143	0.0135	6	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\32669A6.wpd

LDC #: 32667A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: <u> </u>	
Reviewer: 30	
2nd Reviewer:	_

Method: Inorganics, Method _	See Cover
The correlation coefficient (r) for the	calibration of Communication date: 9 11 11

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

%R = Found X 100

Where,

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

True

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000125			
		s2	0.1	0.0000321	0.99995	0.99995)
		s3	0.2	0.000078			
	ما ^{لد} کک	s4	0.5	0.0001966			١.
		s5	1	0.0003994			\mathcal{G}
		s6	2	0.0007941			
TW 10:31	<u> </u>	Found	True				
Calibration verification	مالمي	0.507 ng/m/	0.5 ng/ml		101.4%R	101.3%2	
CW 11:30	C +6	0 15050 1					
Calibration verification	رر	0.5259ng/ml	O. Sneylow'	L	105.2%R	105.136R	<u> </u>
Calibration verification							

Comments: Refer to Calibration V	erification findings worksheet fo	or list of qualifications and	associated samples when rep	orted results do not agree withir
10.0% of the recalculated results.				
				** *

LDC #: 32669 A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page:	<u> </u>
Reviewer:_	30
2nd Reviewer:_	0

METHOD: Inorganics, Method <u>See Covey</u>

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

 $%R = Found \times 100$ True

Where,

Found =

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,

Found = SSR (spiked sample result) - SR (sample result).

True = concentration of each analyte in the source.

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

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

Where,

S =

Original sample concentration

Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
11:00	Laboratory control sample	Crab	1.09 ng/ml	1.00 ng/ml	109%R	109%R	J
	Matrix spike sample		(SSR-SR)				
Dup 12:29	Duplicate sample	Cr+6	0.017\ng/m3	0. Oluznolm3	18.5%R90	17.5% RPD	5

Comments: Ref	fer to appropriate w	orksheet for list of qua	alifications and associa	ited samples when repo	orted results do not agree	within 10.0% of the re	ecalculated results.
	· · · · · · · · · · · · · · · · · · ·	······································		·			

LDC#:321009A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	<u>of</u>
Reviewer:_	30
2nd reviewer:	A

METHOD: Inorganics, Method	See Cover		
Please see qualifications below Y N N/A	w for all questions answered " been reported and calculated of thin the calibrated range of the ion limits below the CRQL?	N". Not applicable questions ar correctly? e instruments?	e identified as "N/A".
Compound (analyte) results for recalculated and verified using	or(b) g the following equation:	гер	orted with a positive detect were
Concentration = (Avea- (o)/C	$M^3 = 21.82$ Recalculation $M_1 = 0.0211$	0.00040	1E-06)) 060 = 0.0271ng/ml
Area = 0.0000059 6=-4976-04 6= 0.0004006	(nglm) (uk)	(0.0271)(10m1) 21.82m ²	0.0124 ng/m3
C= 0.0004000		21.82m3	i rigim

#	Sample ID	Analyte	Reported Concentration ()\(\sigma^2\)	Calculated Concentration (১১২ (៳ ³)	Acceptable (Y/N)
	l	Crab	ND	77	4
	2		0.003	0.0113	,
	3		0.0143	0.014Z	
	4		0.0135	0.0135	
	5		0.0115	0.0115	
	6		0.0124	0.0124	
	7		0.015)	0.0151	
	8		NO .	100	·
	9	4	NO	NO	7
	,				
					4

Note:



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: 09/15/14 16:02

SUBMITTED:

09/10/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 1

Air

Lab ID:

Sample Volume:

4091029-01

Sampled: 09/09/14 16:23 Received: 09/10/14 11:21

Analysis Date: 09/11/14 13:11

Comments: Start Time 9/8/14 16:24

Hexavalent Chromium

21.62

Results

MDL

<u>Analyte</u> Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air ND

Flag

ng/m³ Air 0.0036

SEP 1 5 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 3 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

OAM 2

Start Time 9/8/14 16:38

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/15/14 16:02

SUBMITTED:

09/10/14

AQS SITE CODE:

SITE CODE:

Lab ID: Sample Volume:

4091029-02

m³

<u>Flag</u>

Honeywell Hex Chrome Study Sampled: 09/09/14 16:46

Received: 09/10/14 11:21

Analysis Date: 09/11/14 13:21

Hexavalent Chromium

Results

0.0113

Analyte Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air

21.72

<u>MDL</u> ng/m³ Air

0.0036

SEP 1 5 2014

Initials: CR

Eastern Research Group

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Page 4 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/15/14 16:02

SUBMITTED: 09/10/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Air

Lab ID:

Sample Volume:

4091029-03

m³

Sampled: 09/09/14 17:55 Received: 09/10/14 11:21

Analysis Date: 09/11/14 12:19

Comments:

Col 1 Start Time 9/8/14 17:36

Hexavalent Chromium

21.89

Results

<u>Flag</u>

<u>MDL</u> ng/m³ Air

Hexavalent Chromium

<u>Analyte</u>

CAS Number 1854-02-99

ng/m³ Air 0.0143

0.0036

SEP 1 5 2014

Initials: CR

Eastern Research Group

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Page 5 of 13



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:

09/15/14 16:02 09/10/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-1D

Air

Lab ID:

Sample Volume:

4091029-04

m³

Sampled: 09/09/14 17:58 Received: 09/10/14 11:21

Analysis Date: 09/11/14 12:39

Comments:

Col 2 Start Time 9/8/14 17:37

Hexavalent Chromium

21.92

Results

MDL

Analyte Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air 0.0135

<u>Flaq</u>

ng/m³ Air 0.0036

SEP 1 5 2014

Initials: CR

Eastern Research Group

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Page 6 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 9/8/14 17:21

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/15/14 16:02

09/10/14 SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-2

Air

Lab ID:

Sample Volume:

4091029-05

m³

Sampled: 09/09/14 17:40 Received: 09/10/14 11:21

Analysis Date: 09/11/14 13:31

Hexavalent Chromium

21.88

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air 0.0115

<u>Flag</u>

ng/m³ Air

0.0036

SEP 1 5 2014

Initials: CR

Eastern Research Group

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Page 7 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/15/14 16:02

SUBMITTED: 09/10/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3 Air

Lab ID:

Sample Volume:

4091029-06

m³

Sampled: 09/09/14 17:27 Received: 09/10/14 11:21

Analysis Date: 09/11/14 13:41

Start Time 9/8/14 17:12

Hexavalent Chromium

21.82

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air 0.0124

<u>Flag</u>

ng/m³ Air

0.0036

SEP 1 5 2014

Initials: CR

Eastern Research Group

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Page 8 of 13



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: 09/15/14 16:02 09/10/14

SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-4

Lab ID:

Sample Volume:

4091029-07

m³

Sampled: 09/09/14 17:15 Received: 09/10/14 11:21

Analysis Date: 09/11/14 13:51

Comments:

Start Time 9/8/14 17:03

Hexavalent Chromium

21.77

Results 8 1

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air 0.0151

<u>Flaq</u>

ng/m³ Air

0.0036

SEP 1 5 2014

Initials: CR

Eastern Research Group

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Page 9 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/15/14 16:02

09/10/14 SUBMITTED:

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

4091029-08 Sample Volume:

m³

Sampled: 09/09/14 00:00 Received: 09/10/14 11:21

Analysis Date: 09/11/14 14:01

Hexavalent Chromium

21.88

Results

MDL

Analyte CAS Number Hexavalent Chromium

1854-02-99

Lab ID:

ng/m³ Air ND

Flag

ng/m³ Air

0.0036

SEP 1 5 2014

Initials: CR

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 10 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

PAM-31

FAX: (410) 266-8912

4091029-09

Sample Volume:

Lab ID:

m³

FILE #: 3926.00

REPORTED:

SUBMITTED:

SITE CODE:

AQS SITE CODE:

Honeywell Hex Chrome Study

Sampled: 09/09/14 00:00 Received: 09/10/14 11:21

Analysis Date: 09/11/14 14:30

Hexavalent Chromium

21.82

Results

ng/m³ Air

<u>MDL</u> ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ND

<u>Flag</u>

0.0036

09/15/14 16:02

09/10/14

SEP 1 5 2014

Initials: CR



LABORATORY DATA CONSULTANTS, INC.

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

ERM

September 18, 2014

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

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 September 16, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32678:

SDG

Fraction

4091116/4091220

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

Viscos SV	114 pages-SF	3 DAY							1.1879.	. 6.9L5.						achm			1 z 6/5					10 00		_										<u> </u>			
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LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(r(VI) 7614)	,																																	
Matri	x: Air/Water/Soil			A	s'	w	s	<u>w</u> '	<u>s</u>	w '	s	w	s	w	s	w	s	w	s	w'	s	w	s	<u> w</u>	<u> s</u>	w	s	<u> w</u>	s	<u> w '</u>	s	<u>w</u>	<u> s</u>	<u> w</u>	s	w	s	w	s
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		 	 	+-'	+-'	 '	\vdash	\vdash	—	-	\vdash	\vdash	\vdash	\vdash	\vdash	 	\vdash	1	\vdash	-	+	+	\vdash	\vdash	\vdash	+-	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	-
\Box			 	—	 '	 	 	\vdash	-	\vdash	\Box	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	\vdash	_	 	 	\vdash	\vdash	\vdash		\vdash	\vdash		\vdash	\vdash	\sqcap	\vdash	\vdash
一十			†	+	\vdash	\top	\vdash	\vdash	\square	\vdash	\square		\vdash	\vdash	\vdash	<u> </u>	\vdash	\vdash	\vdash	\vdash	\vdash	+	†	+	\vdash	\vdash	\vdash			\vdash	\vdash	\vdash	\vdash					 	\vdash
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Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: September 10 through September 11, 2014

LDC Report Date: September 17, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4091116/4091220

Sample Identification

OAM 1(09/10/14) PAM-1(09/11/14)DUP OAM 2(09/10/14) PAM-1D(09/11/14)DUP

PAM-1(09/10/14) PAM-1D(09/10/14)

PAM-2(09/10/14)

PAM-3(09/10/14)

PAM-4(09/10/14)

PAM-21(09/10/14)

PAM-31(09/10/14)

OAM 1(09/11/14)

OAM 2(09/11/14)

PAM-1(09/11/14)

PAM-1D(09/11/14)

PAM-2(09/11/14)

PAM-3(09/11/14) PAM-4(09/11/14)

PAM-21(09/11/14)

PAM-31(09/11/14)

PAM-1(09/10/14)DUP

PAM-1D(09/10/14)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(09/10/14) and PAM-31(09/11/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (09/10/14) and PAM-21 (09/11/14) 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(09/10/14) and PAM-1D(09/10/14) and samples PAM-1(09/11/14) and PAM-1D(09/11/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrat	ion (ng/m³)	D DD		
Analyte	PAM-1(09/10/14)	PAM-1D(09/10/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0054	0.0057	5 (≤20)	-	-

	Concentrat	ion (ng/m³)			
Analyte	PAM-1(09/11/14)	PAM-1D(09/11/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0280	0.0293	5 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4091116/4091220

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 4091116/4091220

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 4091116/4091220

No Sample Data Qualified in this SDG

LDC #: 32678A6

VALIDATION COMPLETENESS WORKSHEET

Level IV

SDG #: 4091116/4091220 Laboratory: Eastern Research Group

Reviewer: 2nd Reviewer:_

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
1.	Technical holding times	Α	Sampling dates: 9/10 14 - 9/11/14
11	Initial calibration	А	
111.	Calibration verification	A	
IV	Blanks	А	
V	Matrix Spike/Matrix Spike Duplicates	7	not required
VI.	Duplicates	SWA	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)
XL	Field blanks	ND	FB=817TB=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

	T			1	1	<u> </u>	
1	OAM 1 (09/10/14)	11	OAM 2 (09/11/14)	21	PAM-1 (09/11/14)DUP	31	
2	OAM 2 (09/10/14)	12	PAM-1 (09/11/14)	22	PAM-1D (09/11/14)DUP	32	
3	PAM-1 (09/10/14)	13	PAM-1D (09/11/14)	23		33	
4	PAM-1D (09/10/14)	14	PAM-2 (09/11/14)	24		34	
5	PAM-2 (09/10/14)	15	PAM-3 (09/11/14)	25		35	
6	PAM-3 (09/10/14)	16	PAM-4 (09/11/14)	26		36	
7	PAM-4 (09/10/14)	17	PAM-21 (09/11/14)	27		37	
8	PAM-21 (09/10/14)	18	PAM-31 (09/11/14)	28		38	
9	PAM-31 (09/10/14)	19	PAM-1 (09/10/14)DUP	29		39	
10	OAM 1 (09/11/14)	20	PAM-1D (09/10/14)DUP	30		40	

Notes: Date appended to ID to differentiate between samples?

Method: Inorganics (EPA Method See Cover)

INIETHOU: INOrganics (EPA Method XX (NXX)	T	<u> </u>	ī	
Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times	,			
All technical holding times were met.	/		L	
Cooler temperature criteria was met.	V		<u> </u>	
II. Calibration				
Were all instruments calibrated daily, each set-up time?	1		<u></u>	
Were the proper number of standards used?	1			
Were all initial calibration correlation coefficients ≥ 0.995?	/			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	/			
Were titrant checks performed as required? (Level IV only)		×	/	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		V	 	
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.	V			
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/NSD 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 #: 32678 A6

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2 Reviewer: 14 2nd Reviewer: 0

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?	1			
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.	1			
Target analytes were detected in the field duplicates.	1			
X. Field blanks				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		V		

LDC #: 32678A6

VALIDATION FINDINGS WORKSHEET Duplicate Analysis

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Reviewer:_	KK
nd Reviewer:	$C\Omega$

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METHOD: Inorganics, Met	had See	Cover		
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Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

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

Was a duplicate sample analyzed for each matrix in this SDG? Were all duplicate sample relative percent differences (RPD) \leq 20% for water and \leq 35% for soil samples (\leq 10% for Method 300.0)? If no, see qualification below. 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. If field blanks were used for laboratory duplicates, see overall assessment.

LEVEL IV ONLY:

Y(N) N/A

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Associated Samples	Qualifications
	9/15/14	19	Air	Cr6+	26.9 (20)	3	J/UJ/A* ru no qual (L5xMD
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LDC#_32678A6___

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:	of
Reviewer:	KK"
2nd Reviewer:	a

Inorganics: Method See Cover

	Concentra	tion (ng/m³)			
Analyte	3	4	RPD (≤20)	Qual. (>5X)	
Hexavalent Chromium	0.0054	0.0057	5	_	

	Concentra	tion (ng/m³)		
Analyte	12	13	RPD (≤20)	Qual. (>5X)
Hexavalent Chromium	0.0280	0.0293	5	

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LDC #: 32678A4

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:	_ of <u> </u>
Reviewer:	KA
nd Review	rer: ~

Method: Inorganics, Method <u>See Cover</u>
The correlation coefficient (r) for the calibration of $\frac{C_{10}+C_{10}}{C_{10}+C_{10}}$ was recalculated. Calibration date: $\frac{9 15 14}{C_{10}+C_{10}}$
An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = <u>Found X 100</u> Where, Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution

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

				(mAU*min)	Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/mL)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.05	0.0000187			
	Hexavalent	s2	0.10	0.0000364	0.99992	0.99992	Y
	Chromium	s3	0.20	0.0000829	ļ		
		s4	0.50	0.0002134			
		s5	1.00	0.0004107			
		s6	2.00	0.0008244			
Calibration verification	•	ccv	0.5123	0.5000	102.5	102.5	Υ
						-	
Calibration verification	-	<u>-</u>	-	-	-	-	-
Calibration verification	-	_	-	-	_	-	-

Comments: Refer to Calibration Verification findings workshee	t for list of qualifications and associate	d samples when reported resul	ts do not agree within
10.0% of the recalculated results			

LDC #: 32678 A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page:_	<u>of</u>
Reviewer:	KK
2nd Reviewer:	\bigcirc

			~	
METHOD: Inorganics,	Method	99/	(sver	

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

 $%R = Found \times 100$ True Where,

Found =

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,

Found = SSR (spiked sample result) - SR (sample result).

True = concentration of each analyte in the source.

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

 $RPD = \underline{|S-D|} x 100$

Where,

S =

Original sample concentration

(S+D)/2

D =

Duplicate sample concentration

Sample ID	Type of Analysis	Element	ng/m(Found/S (units)	M/M True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
Les	Laboratory control sample	Cr6+	1.0862	1.00	109	109	Y
	Matrix spike sample	_	(SSR-SR)	_	_	_	-
21	Duplicate sample	Cr0+	0.0293mm³	0.0294ng m³	0.3407	0.165	Υ

Comments:	: Refer to appropria	ate worksheet for	list of qualifications	and associated sa	imples when repo	orted results do not	agree within 10.0%	of the recalculated	results
									
_									

LDC #: 32678 A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

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Reviewer:_	KK_	
2nd reviewer:_	c)	
_		

		2nd reviewer:	CA
METHOD: Inorganics, Method <u>ςς</u> C	IVEr		
Please see qualifications below for all quest N N/A Have results been reported Y N N/A Are results within the calib Are all detection limits below.	stions answered "N". Not a d and calculated correctly? rated range of the instrum ow the CRQL?	applicable questions are identified as "N/A". ? ents?	
Compound (analyte) results for recalculated and verified using the following	Cァし+ g equation:	reported with a positive dete	ct were
Concentration = (Area × X coefficient) + Ornstant Vi	Recalculation: 3: (0.0000 234 mg	AU* min (2421.52) + 0.001376) 10ml	

#_	Sample ID	Analyte	Reported Concentration ([g/m³)	Calculated Concentration (M/M ²)	Acceptable (Y/N)
	1	C-6+	0.0080	0.0080	Υ
	3		0.0054	0.0054	
	4		0.0057	0.00 58 KK 0.00	57
	5		0.0129	0.0130	
	6		0.0107	0.0108	
	7		0.0140	0.0140	
	10		0.0222	0.0223	
	11		0.0247	0.0248	
	12		0.0280	0.0280	
	13		0.0293	0.0293	
	14		0.0223	0.0224	
	15		0.0184	0.0185	
	16		0.117	0.117	

Note:			



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:

09/16/14 15:18

SUBMITTED:

09/11/14 to 09/12/14

AQS SITE

SHE CODE:

Honeywell Hex Chrome Study

Description: OAM 1 Matrix:

Air

Start Time 9/9/14 16:32

Lab ID:

Sample Volume:

4091116-01

21.63

m³

Sampled: 09/10/14 16:34

Received: 09/11/14 11:09

Analysis Date: 09/15/14 15:53

Hexavalent Chromium

<u>Results</u>

MDL

Analyte Hexavalent Chromium

Comments:

CAS Number 1854-02-99

ng/m³ Air 0.0080

Flag

ng/m³ Air 0.0036



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 09/16/14 15:18

Malvern, PA 19355

SUBMITTED:

09/11/14 to 09/12/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Start Time 9/9/14 16:50

Lab ID:

4091116-02

Sampled: 09/10/14 17:01

Matrix:

Comments:

Air

Sample Volume:

21.77

m³

Received: 09/11/14 11:09

Analysis Date: 09/15/14 16:03

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND

0.0036



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

09/16/14 15:18 REPORTED:

Malvern, PA 19355

09/11/14 to 09/12/14

SUBMITTED:

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Lab ID:

4091116-03

22.04

Sampled: 09/10/14 18:29

Matrix:

Sample Volume:

Received: 09/11/14 11:09

Comments:

Col 1 Start Time 9/9/14 17:59

m³

Analysis Date: 09/15/14 13:15

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0054

0.0036

KK 9.17.14



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 09/16/14 15:18

Malvern, PA 19355

SUBMITTED:

09/11/14 to 09/12/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-1D

Col 2 Start Time 9/9/14 18:02

Lab ID:

4091116-04

Sampled: 09/10/14 18:34

Matrix: /

Δir

Sample Volume:

22.08

m³

Received: 09/11/14 11:09

Analysis Date: 09/15/14 13:35

Hexavalent Chromium

Results

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flag</u>

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0057

0.0036

CK 9.17.14



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

09/16/14 15:18 REPORTED:

Malvern, PA 19355

SUBMITTED:

09/11/14 to 09/12/14

AQS SITE

ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

4091116-05

Sampled: 09/10/14 18:07

Matrix:

Sample Volume:

m³

Received: 09/11/14 11:09

Comments:

Start Time 9/9/14 17:44

Analysis Date: 09/15/14 16:13

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0129

0.0036



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:

09/16/14 15:18

SUBMITTED:

09/11/14 to 09/12/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix: Air

PAM-3

Start Time 9/9/14 17:31

Lab ID:

Sample Volume:

4091116-06

21.87

m³

Sampled: 09/10/14 17:49

Received: 09/11/14 11:09

Analysis Date: 09/15/14 16:23

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium

Comments:

CAS Number 1854-02-99

ng/m³ Air 0.0107

<u>Flag</u>

ng/m³ Air 0.0036



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 9/9/14 17:19

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/16/14 15:18

SUBMITTED:

09/11/14 to 09/12/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4 Matrix:

Lab ID:

Sample Volume:

4091116-07

21.78

m³

Sampled: 09/10/14 17:31

Received: 09/11/14 11:09

Analysis Date: 09/15/14 16:33

Hexavalent Chromium

Results

MDL

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

Comments:

1854-02-99

0.0140

0.0036

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 9 of 22



Environmental Resources Management, Inc.

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

09/16/14 15:18 REPORTED:

09/11/14 to 09/12/14 SUBMITTED:

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID:

Sampled: 09/10/14 00:00

Matrix:

Air

4091116-08

Received: 09/11/14 11:09

Sample Volume:

21.95 m³

Analysis Date: 09/15/14 16:42

Comments:

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium **CAS Number**

<u>ng/m³ Air</u>

Flag

<u>ng/m³ Air</u>

1854-02-99

ND



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 09/16/14 15:18

SUBMITTED:

Malvern, PA 19355

09/11/14 to 09/12/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-31

Lab ID: 4091116-09

Sample Volume:

Matrix:

Air

m³

Sampled: 09/10/14 00:00 Received: 09/11/14 11:09

Analysis Date: 09/15/14 16:52

Hexavalent Chromium

21.87

<u>Results</u>

MDL

Analyte Hexavalent Chromium CAS Number 1854-02-99

ng/m3 Air ND

Flag

ng/m3 Air 0.0036



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

09/16/14 15:18 REPORTED:

SUBMITTED:

09/11/14 to 09/12/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

OAM 1

Lab ID:

Sample Volume:

4091220-01

20.97 m³ Sampled: 09/11/14 15:57

Received: 09/12/14 11:08 Analysis Date: 09/15/14 17:02

Start Time 9/10/14 16:39

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

<u>ng/m³ Air</u> 0.0222

<u>Flag</u>

ng/m3 Air 0.0036



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 09/16/14 15:18

Malvern, PA 19355

SUBMITTED: 09/11/14 to 09/12/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

140 0116

Honeywell Hex Chrome Study

Description:

SITE CODE:

20.87

Sampled: 09/11/14 16:18

Matrix:

..

OAM 2

Lab ID: 4091220-02

Sample Volume:

m³

Received: 09/12/14 11:08

Comments:

Start Time 9/10/14 17:07

111-

Analysis Date: 09/15/14 17:12

Hexavalent Chromium

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0247



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 09/16/14 15:18

Malvern, PA 19355

SUBMITTED:

09/11/14 to 09/12/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

PAM-1

SITE CODE:

Matrix:

Lab ID: 4091220-03

20.7

Sampled: 09/11/14 17:33 Received: 09/12/14 11:08

Sample Volume:

m³

<u>Flag</u>

Analysis Date: 09/15/14 13:55

Comments: Col 1 Start Time 9/10/14 18:33

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air 0.0280

nq/m³ Air 0.0036



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

09/16/14 15:18 REPORTED:

SUBMITTED:

09/11/14 to 09/12/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Air

Lab ID:

Sample Volume:

4091220-04

m³

Sampled: 09/11/14 17:37

Received: 09/12/14 11:08 Analysis Date: 09/15/14 14:39

Matrix: Comments:

Col 2 Start Time 9/10/14 18:37

Hexavalent Chromium

20.7

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0293



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Matrix:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE#: 3926.00

REPORTED:

09/16/14 15:18

SUBMITTED:

09/11/14 to 09/12/14

AQS SITE

CODE:

 m^3

Honeywell Hex Chrome Study

PAM-2

Start Time 9/10/14 18:11

Sample Volume:

Lab ID:

4091220-05 20.75 Sampled: 09/11/14 17:14

Analysis Date: 09/15/14 17:22

Received: 09/12/14 11:08

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air 0.0223

<u>Flaq</u>

ng/m³ Air 0.0036



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 9/10/14 17:58

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/16/14 15:18

SUBMITTED:

09/11/14 to 09/12/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3 Matrix:

Air

Lab ID:

Sample Volume:

4091220-06

20.79

m³

Sampled: 09/11/14 17:04

Received: 09/12/14 11:08 Analysis Date: 09/15/14 17:52

Hexavalent Chromium

<u>Results</u> ng/m3 Air MDL

Analyte Hexavalent Chromium

Comments:

CAS Number

1854-02-99

0.0184

<u>Flag</u>

ng/m³ Air



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 09/16/14 15:18

Malvern, PA 19355

SUBMITTED:

09/11/14 to 09/12/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

PAM-4 Description:

Sampled: 09/11/14 16:50

Lab ID:

4091220-07

Received: 09/12/14 11:08

Matrix:

Comments:

Air

Start Time 9/10/14 17:37

Sample Volume: 20.9

m³

Analysis Date: 09/15/14 18:02

Hexavalent Chromium

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m3 Air 0.117

<u>Flag</u>

ng/m3 Air 0.0036



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 09/16/14 15:18

Malvern, PA 19355

SUBMITTED: 09/11/14 to 09/12/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-21 Air

4091220-08 Lab ID:

Sample Volume:

20.75

m³

Sampled: 09/11/14 00:00

Received: 09/12/14 11:08 Analysis Date: 09/15/14 18:12

Comments:

Hexavalent Chromium

Results

<u>MDL</u>

Analyte Hexavalent Chromium CAS Number 1854-02-99

ng/m³ Air ND

Flag

ng/m³ Air 0.0036



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

09/16/14 15:18 REPORTED:

Malvern, PA 19355

SUBMITTED:

09/11/14 to 09/12/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-31

Sampled: 09/11/14 00:00

Matrix: Comments: Air

Lab ID: 4091220-09 Sample Volume:

20.79

 m^3

Received: 09/12/14 11:08

Analysis Date: 09/15/14 18:22

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air ND

Flag

ng/m³ Air 0.0036



LABORATORY DATA CONSULTANTS, INC.

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

ERM September 22, 2014

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

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 September 19, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32703:

<u>SDG</u>	<u>Fraction</u>
4091622	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

102 pages-SF 3 DAY TAT Attachment 1 LDC #32703 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring) Level IV Cr(VI) (D7614) DATE DATE LDC SDG# REC'D DUE Matrix: Air/Water/Soil 18 0 4091622 09/19/14 09/24/14 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 T/CR Total

Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: September 12 through September 15, 2014

LDC Report Date: September 19, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4091622

Sample Identification

OAM 1(09/12/14) PAM-1(09/15/14)DUP OAM 2(09/12/14) PAM-1D(09/15/14)DUP

PAM-1(09/12/14)

PAM-1D(09/12/14)

PAM-2(09/12/14)

PAM-3(09/12/14)

PAM-4(09/12/14)

PAM-21(09/12/14)

PAM-31(09/12/14)

OAM 1(09/15/14)

OAM 2(09/15/14) PAM-1(09/15/14)

PAM-1D(09/15/14)

PAM-2(09/15/14)

PAM-3(09/15/14)

PAM-4(09/15/14)

PAM-21(09/15/14)

PAM-31(09/15/14)

PAM-1(09/12/14)DUP

PAM-1D(09/12/14)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(09/12/14) and PAM-31(09/15/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (09/12/14) and PAM-21 (09/15/14) 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(09/12/14) and PAM-1D(09/12/14) and samples PAM-1(09/15/14) and PAM-1D(09/15/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrat	ion (ng/m³)	555		
Analyte	PAM-1(09/12/14)	PAM-1D(09/12/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0192	0.0190	1 (≤20)	-	-

	Concentrati	ion (ng/m³)	RPD	:	
Analyte	PAM-1(09/15/14)	PAM-1(09/15/14) PAM-1D(09/15/14)		Flags	A or P
Hexavalent chromium	0.0170	0.0153	11 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4091622

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 4091622

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 4091622

No Sample Data Qualified in this SDG

LDC #: 32703A6 SDG #: 4091622

VALIDATION COMPLETENESS WORKSHEET

			_
Laboratory:	<u> </u>	Research	Group

Level IV

Reviewer:_ < 2nd Reviewer: 01

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
ı.	Technical holding times	A	Sampling dates: 9/12/14 , 9/15/14
П	Initial calibration	A	, in the second
111.	Calibration verification	A	
IV	Blanks	>	
V	Matrix Spike/Matrix Spike Duplicates	7	Not Required
VI.	Duplicates	A	Dup.
VII.	Laboratory control samples	A	LESIO
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD=(3,4) (12,13)
XI	Field blanks	20	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: A

1	OAM 1(09/12/14)	11	OAM 2(09/15/14)	21	PAM-1(09/15/14) MS ()	31	
2	OAM 2(09/12/14)	12	PAM-1(09/15/14)	22	PAM-1D(09/15/14) M8D OF	32	
3	PAM-1(09/12/14)	13	PAM-1D(09/15/14)	23		33	
4	PAM-1D(09/12/14)	14	PAM-2(09/15/14)	24		34	
5	PAM-2(09/12/14)	15	PAM-3(09/15/14)	25		35	
6	PAM-3(09/12/14)	16	PAM-4(09/15/14)	26		36	
7	PAM-4(09/12/14)	17	PAM-21(09/15/14)	27		37	
8	PAM-21(09/12/14)	18	PAM-31(09/15/14)	28		38	
9	PAM-31(09/12/14)	19	PAM-1(09/12/14) MS 0	29		39	
10	OAM 1(09/15/14)	20	PAM-1D(09/12/14) M8D DQ	30		40	

votes: Date was appended	to differentiat between	2 samples

Method: Inorganics (EPA Method See (and)

Yes	No	NA	
		INA	Findings/Comments
/			
_			
		/	
		/	

Airs 30



VALIDATION FINDINGS CHECKLIST

Page: Zof Z Reviewer: 80 2nd Reviewer: 01

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#<u>32703A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: <u> </u>
Reviewer: 30
2nd Reviewer:

Inorganics: Method See Cover

	Concentra	tion (ng/m3)			
Analyte	3	4	RPD (≤20)	Qual.	
Hexavalent Chromium	0.0192	0.0190	1		

	Concentr			
Analyte	12	13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0170	0.0153	11	

\\LDCFILESERVER\\Validation\FIELD DUPLICATES\FD_inorganic\\32703A6.wpd

LDC #: 32703A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:	_ of
Reviewer:	$\mathcal{Q}\mathcal{D}$
nd Reviev	ver: 0

Method:	: Inorganics,	Method	See Cover	

The correlation coefficient (r) for the calibration of _____was recalculated.Calibration date: _________

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

%R = <u>Found X 100</u>

Where,

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

True

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

			/mlani an		Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	50 γ5 m\ Conc. (mg/ L)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration	,	s1	0.1	0.0000134			
		s2	0.1	0.0000316	0.99990	0.99990	
		s3	0.2	0.0000801			
	طلع	s4	0.5	0.0001925			Ц
		s5	1	0.0003892			\mathcal{I}
		s6	2	0.0008001			
ICU 10:56	C 11	Found	True				
Calibration verification	Chalo	0.530 ng/ml	0. 500 ng/m)		106%R	106%R	
ccv 11:56	Cx+10						
Calibration verification	C4	0.533ng/m/	0. Sangler		106.6%R	106.6%R	
Calibration verification							

mments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree wi	thi
0% of the recalculated results.	

LDC #: 32703A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: <u>\</u>	_of <u>\</u> _
Reviewer:	30
2nd Reviewer:_	C_{ℓ}

METHOD: Inorganics	, Method	ee Love	
Percent recoveries (%	6R) for a labor	atory control sam	ple and a matrix spike sample were recalculated using the following formula:
%R = <u>Found</u> x 100 True	Where,	Found =	concentration of each analyte <u>measured</u> 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:

 $RPD = \underline{|S-D|} \times 100$

Where,

S =

Original sample concentration

(S+D)/2

D =

Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported %R / RPD	Acceptable (Y/N)
LLS 11:-26	Laboratory control sample	Cx26	1.06 ng/mi	Inglan	106%R	106%8	y
N	Matrix spike sample		(SSR-SR)				:
D-8 (2:26)	Duplicate sample	1	0.0205 ng/m²	0.0192ng/m3	6.55% RRD	6.03%890	9×

Comments: Refer to ap	propriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated re	sults.
* Rounding		
3		

LDC#: 32703A6

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:	of\
Reviewer:_	30
2nd reviewer:	$\mathcal{C}\Omega$

						2nd revie	wer:	_
	METH	IOD: Inorganics, Metho	od <u>See</u> C	wer				
	X N Y N Y N Comp	N/A Are results w	been reported an vithin the calibrated tion limits below the for	d calculated correctly? d range of the instrume ne CRQL?	nts?	e identified as "N/ orted with a positi		e
(Co	tration = $(A - (0))/C$ = 0.000625 = -6.78=-06 = 0.0004020	(ng/m1) (v3 m3	Recalculation: (0.0)	000025-(-60 0-0004020 (0.72mg)	BE-06) = (m1)(10m1) 1.43m3),172 ngli _ = 0.080	m] Yng
	#	Sample ID		Analyte	Reported Concentration () () ()	Calculated Concentration (শহ/m³)	Acceptable (Y/N)	
		1		1 +6	0.0124	0.0124	4	
		2		1	N0	ND		
		3			0.0192	0.0192		
		Ų			0.0190	0.080		

#	Sample ID	Analyte	Concentration (value)	Concentration (ハベール3)	Acceptable (Y/N)
	1	C5+6	0.0124	0.0124	3
	2	\	NO	20	,
	3		0.0192	0.0192	
	Ų		0.0190	0.080	
	2		4080.0	P080.0	
	6		NO	100	
	\neg		0.0199	0.0199	
	8		PD	ND	
	ع		QU	100	
	10		0.0159	0.0128	
	1)		0.0235	0.0235	
	(2		0.000	0.000	
	13		0.0153	0.0153	
	14		0.0225	0.0225	
	15		0.0149	0.049	
	16		0-0945	0.0945	
	17		20	ND	
	18	<u> </u>	100	90	1

Note:



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:

09/18/14 15:30 09/16/14

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 1

Start Time 9/11/14 16:04

Lab ID:

4091622-01

m³

Sampled: 09/12/14 15:25

Matrix:

Comments:

Air

Sample Volume:

20.87

Received: 09/16/14 11:19

Analysis Date: 09/17/14 13:37

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air

Flag

ng/m³ Air

0.0124



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FILE #: 3926.00

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09/18/14 15:30

Malvern, PA 19355

SUBMITTED:

09/16/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SHE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID:

4091622-02

Sampled: 09/12/14 15:56

Matrix:

Air

Sample Volume:

21.19 m^3 Received: 09/16/14 11:19

Comments:

Start Time 9/11/14 16:23

Analysis Date: 09/17/14 13:46

Hexavalent Chromium

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0036

KK 9.19.14



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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

35 FAX: (410

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/18/14 15:30 09/16/14

SUBMITTED:

AQS SITE

CODE:

Honeywell Hex Chrome Study

PAM-1

Lab ID:

Sample Volume:

4091622-03

m³

<u>Flag</u>

Sampled: 09/12/14 17:44 **Received:** 09/16/14 11:19

Analysis Date: 09/17/14 12:17

Comments: Co

Col 1 Start Time 9/11/14 17:36

Hexavalent Chromium

21.72

Results

ng/m³ Air

MDL

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0192

ng/m³ Air 0.0036

KK 9.19.14

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 5 of 22



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:

09/18/14 15:30 09/16/14

SUBMITTED:

_

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

Sample Volume:

4091622-04

m³

Sampled: 09/12/14 17:44 **Received:** 09/16/14 11:19

Analysis Date: 09/17/14 12:36

Matrix: /
Comments: (

Col 2 Start Time 9/11/14 17:38

Hexavalent Chromium

21.69

Results

ng/m³ Air

MDL ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0190

<u>Flag</u>

0.0036

KK 9.19.14



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FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

09/18/14 15:30

Malvern, PA 19355

SUBMITTED:

09/16/14

ATTN: Mr. Jeff Boggs

AQS SITE SITE CODE:

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

Sample Volume:

4091622-05

m³

Sampled: 09/12/14 17:07 Received: 09/16/14 11:19

Analysis Date: 09/17/14 14:16

Matrix: Comments:

Start Time 9/11/14 17:18

Hexavalent Chromium

21.43

<u>Results</u>

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m3 Air

Hexavalent Chromium

1854-02-99

0.0804

0.0036

KK 9.19.14



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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/18/14 15:30 09/16/14

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-3

Start Time 9/11/14 17:08

Lab ID:

Sample Volume:

4091622-06

21.27 m³ Sampled: 09/12/14 16:46 Received: 09/16/14 11:19

Analysis Date: 09/17/14 14:26

Hexavalent Chromium

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

ND



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 09/18/14 15:30

Malvern, PA 19355

SUBMITTED:

09/16/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-4

Lab ID: 4091622-07 **Sample Volume:** 2

21.23 r

Sampled: 09/12/14 16:29 Received: 09/16/14 11:19

Matrix: All Comments: Si

Start Time 9/11/14 16:54

m³

Analysis Date: 09/17/14 14:36

Hexavalent Chromium

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

<u>ng/m³ Air</u>

Flag

<u>ng/m³ Air</u>

Hexavalent Chromium

1854-02-99

0.0199

0.0036

KK 9.19.14



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

09/18/14 15:30

Malvern, PA 19355

SUBMITTED:

09/16/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-21

Lab ID:

4091622-08

Sampled: 09/12/14 00:00

Matrix:

Air

Sample Volume:

21.43 $\,m^3$ Received: 09/16/14 11:19

Analysis Date: 09/17/14 14:46

Hexavalent Chromium

<u>Results</u>

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

<u>Flag</u>

ng/m³ Air

1854-02-99

ND



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

Lab ID:

4091622-09

Sample Volume:

21.27

m³

FILE #: 3926.00

REPORTED:

SUBMITTED: **AQS SITE**

SITE CODE:

Honeywell Hex Chrome Study

Sampled: 09/12/14 00:00 Received: 09/16/14 11:19

Analysis Date: 09/17/14 14:56

Hexavalent Chromium

Results

<u>Flaq</u>

<u>MDL</u>

09/18/14 15:30

09/16/14

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ng/m³ Air ND

ng/m³ Air 0.0036

KK 9.19.14



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/18/14 15:30

SUBMITTED: 09/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 1

Start Time 9/14/14 16:09

Air

Lab ID:

Sample Volume:

4091622-10

21.69 m³

Sampled: 09/15/14 16:15 Received: 09/16/14 11:19

Analysis Date: 09/17/14 15:06

Hexavalent Chromium

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number**

ng/m³ Air

Flag

ng/m³ Air

1854-02-99 0.0159



Environmental Resources Management, Inc

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/18/14 15:30

SUBMITTED: 09/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: O

Matrix:

Comments:

OAM 2

Start Time 9/14/14 16:44

Lab ID:

Sample Volume:

4091622-11

m³

Sampled: 09/15/14 16:36 **Received:** 09/16/14 11:19

Analysis Date: 09/17/14 15:16

Hexavalent Chromium

21.48

Results

MDL

Analyte
Hexavalent Chromium

1854-02-99

ng/m³ Air 0.0235 <u>Flag</u>

<u>ng/m³ Air</u>

0.0036

KK 9.19.14



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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/18/14 15:30

SUBMITTED: 09/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-1

Lab ID:

Sample Volume:

4091622-12

m³

Sampled: 09/15/14 18:08 Received: 09/16/14 11:19

Analysis Date: 09/17/14 12:56

Col 1 Start Time 9/14/14 17:46

Hexavalent Chromium

21.94

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air

Flag

ng/m³ Air

0.0170

0.0036

KK 9.19.14



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ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Col 2 Start Time 9/14/14 17:48

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/18/14 15:30

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Matrix:

Comments:

PAM-1D

Lab ID:

Sample Volume:

4091622-13

21.91 m³ Sampled: 09/15/14 18:09 Received: 09/16/14 11:19

Analysis Date: 09/17/14 13:16

Hexavalent Chromium

Results

<u>MDL</u>

09/16/14

Analyte

CAS Number

ng/m³ Air

Flag

ng/m3 Air

Hexavalent Chromium

1854-02-99

0.0153



Environmental Resources Management, Inc

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ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/18/14 15:30

SUBMITTED: 09/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

PAM-2 **Description:**

Start Time 9/14/14 17:27

Lab ID:

Sample Volume:

4091622-14

m³

Sampled: 09/15/14 17:44 Received: 09/16/14 11:19

Analysis Date: 09/17/14 15:26

Hexavalent Chromium

21.86

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air 0.0225

Flag

ng/m³ Air



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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/18/14 15:30 09/16/14

SUBMITTED: **AQS SITE**

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-3

Lab ID:

Sample Volume:

4091622-15

m³

Sampled: 09/15/14 17:29 Received: 09/16/14 11:19

Analysis Date: 09/17/14 15:35

Air Comments: Start Time 9/14/14 17:20

Hexavalent Chromium

21.73

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m3 Air

Hexavalent Chromium

1854-02-99

0.0149

0.0036

KK 9.19.14



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

CAS Number

1854-02-99

FILE #: 3926.00

REPORTED:

09/18/14 15:30

SUBMITTED: 09/16/14

AQS SITE

SITE CODE:

<u>Flaq</u>

m³

Honeywell Hex Chrome Study

Description: Matrix:

PAM-4

Lab ID:

Sample Volume:

4091622-16

21.72

Sampled: 09/15/14 17:13

Received: 09/16/14 11:19 **Analysis Date:** 09/17/14 15:45

Comments:

Hexavalent Chromium

Analyte

Start Time 9/14/14 17:06

Hexavalent Chromium

Results

<u>MDL</u>

ng/m³ Air

0.0945

ng/m³ Air 0.0036

KK 9,19.14



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

09/18/14 15:30 REPORTED:

09/16/14

SUBMITTED: **AQS SITE**

SHE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

PAM-21

Lab ID:

Sample Volume:

4091622-17

m³

Sampled: 09/15/14 00:00 Received: 09/16/14 11:19

Comments:

Analysis Date: 09/17/14 16:15

Hexavalent Chromium

21.86

Results

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

<u>ng/m³ Air</u> ND

Flag

ng/m³ Air 0.0036

KK 9.19.14



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/18/14 15:30

SUBMITTED:

09/16/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

Comments:

PAM-31

Lab ID:

Sample Volume:

4091622-18

21.73 m³

Sampled: 09/15/14 00:00 Received: 09/16/14 11:19

Analysis Date: 09/17/14 16:25

Hexavalent Chromium

Results

<u>MDL</u>

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air ND

<u>Flaq</u>

ng/m³ Air 0.0036

KK 9.19.14



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

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 September 22, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32716:

SDG

Fraction

4091716

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

September 23, 2014

	70 pages-SF	3 DAY															nent															· · · · · · · · · · · · · · · · · · ·							
	Level IV	L	DC #32	716	6 (E	R۱	1 - 1	Мо	rris	vil	le,	NC	: /	Ha	rbo	r P	oin	ıt, l	MD	, H	exa	val	len	t C	hrc	mi	um	M	oni	tor	ing	ı) <u> </u>							. A.
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cri	(VI) 614)																																		
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
Α	4091716	09/22/14	09/25/14	9	0 -																																\exists		
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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	0	0	0	0	9

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date:

September 16, 2014

LDC Report Date:

September 23, 2014

Matrix:

Air

Parameters:

Hexavalent Chromium

Validation Level:

EPA Level IV

Laboratory:

Eastern Research Group

Sample Delivery Group (SDG): 4091716

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.

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

Samples 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:

	Concentrat	ion (ng/m³)			
Analyte	PAM-1	PAM-1D	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.101	0.0867	15 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4091716

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 4091716

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 4091716

No Sample Data Qualified in this SDG

LDC #: 32716A6

VALIDATION COMPLETENESS WORKSHEET

Level IV

S	DG	# <u>:</u>	4091	716	
			_		_

Laboratory: Eastern Research Group

Page: of 1

Reviewer: 50

2nd Reviewer: 0

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
l.	Technical holding times	A	Sampling dates: 9 1614
11	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	À	
<u> </u>	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VI.	Duplicates	LA_	Dup.
VII.	Laboratory control samples	A	LCSID
VIII.	Sample result verification	A	·
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FD=(3,4)
xı	Field blanks	<i>V0</i>	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:

	1400					
1	OAM 1	11	PAM-1DDUP	21	31	1
2	OAM 2	12		22	32	2
3	PAM-1	13		23	33	3
4	PAM-1D	14		24	34	1
5	PAM-2	15		25	35	5
6	PAM-3	16		26	36	5
7	PAM-4	17		27	37	7
8	PAM-21	18		28	38	3
9	PAM-31	19		29	39)
10	PAM-1DUP	20		30	40)

Notes:			

VALIDATION FINDINGS CHECKLIST

Page: \ of Reviewer: \ 2nd Reviewer:

Method: Inorganics (EPA Method See Lov €)				
Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.				
Cooler temperature criteria was met.		<u></u>		
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 90-116% QC limits?	/			
Were titrant checks performed as required? (Level IV only)			_	
Were balance checks performed as required? (Level IV only)				
III. Blanks				
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.				
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.		,		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for weters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 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?				

MA



VALIDATION FINDINGS CHECKLIST

Page: 2 of Reviewer: 50
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 <u>32716A6</u>

Field Duplicates

Reviewer: 50 2nd Reviewer: 0

Inorganics: Method See Cover

	Concentra	tion (ng/m3)		
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.101	0.0867	15	

 $\verb|\LDCFILESERVER|\Validation|\FIELD DUPLICATES|\FD_inorganic|\32716A6.wpd|$

LDC #:32716AP

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:_	f	of_	<u>`</u>
Review	er:_	<u> </u>	2_
2nd Revi	iew	er: <u> </u> (2

Method: Inorganics, Method	See Cover	ı	,	
The correlation coefficient (r) for the co	alibration ofwas recalculated.Calibration date:_	9/18	14	

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

%R = <u>Found X 100</u> True

Where,

Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000135			
		s2	0.1	0.0000322	0.99992	0.99992	
	Crab	s3	0.2	0.0000792	_		
	Cx	s4	0.5	0.0002065	·		
		s5	1	0.0004023			
		s6	2	0.0008186			
Je 11:04	1 +6-	Found	True				
Calibration verification	CK	0.5153mg/m/	0.5 ng/ml		103.1%2	103.1%R	
しているから	(x-16		0.5nglml			1011 011	
Calibration verification	LY	0.520m/m	10. Svejlmi		104.0%2	1040%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 #: 32716A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page:_	<u></u> of_\
Reviewer:	20
2nd Reviewer:	a
	_

METHOD: Inorganics, Method See Lover

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:

 $RPD = \underline{|S-D|} \times 100$

Where,

S =

Original sample concentration

(S+D)/2

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	6-7-10	1.095 mylm1	1-00 reglan)	10%	110%Z	7
0	Matrix spike sample	Ì	(SSR-SR)				
Dup	Duplicate sample	1	0.105 ng/m³	0.10 lvg/m3	3.88% ERS	4.57%20	5)

LDC#52116A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

9	
Reviewer:_	<u> </u>

2nd reviewer: METHOD: Inorganics, Method See Lover Rlease see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Have results been reported and calculated correctly? Y N N/A Y N N/A Are results within the calibrated range of the instruments? Are all detection limits below the CRQL? Y/N N/A reported with a positive detect were Compound (analyte) results for _ recalculated and verified using the following equation: Concentration = $(R-C_0)/C$, $V_1 = 10 \text{ m}^2 = 21.67$ (0.0000583 - (-5.57E-06)) (Recalculation: (0.00005Calculated Reported Concentration () Concentration Acceptable mgles) (Y/N) Sample ID Analyte 0.0230 0.0230 0.0189 2 0.0189 0.101 101-0 0.0866 0.0867 0.0716 0.0716 0.205 0.0206 12.0327 0.0326 てり てり 0 NO 60 Note:



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/22/14 12:29

SUBMITTED:

09/17/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

Sample Volume:

4091716-01

21.6 m³ Sampled: 09/16/14 16:25

Received: 09/17/14 10:43 Analysis Date: 09/18/14 13:04

Comments:

Start Time 9/15/14 16:25

Hexavalent Chromium

Results

ng/m³ Air

<u>Flag</u>

MDL ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0230



Environmental Resources Management, Inc

OAM 2

Start Time 9/15/14 16:46

Air

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

Lab ID:

Sample Volume:

4091716-02

21.63

m³

<u>Flag</u>

AQS SITE CODE:

FILE #: 3926.00

SUBMITTED:

SITE CODE:

REPORTED: 09/22/14 12:29

Honeywell Hex Chrome Study

Sampled: 09/16/14 16:48

Received: 09/17/14 10:43 Analysis Date: 09/18/14 13:14

Hexavalent Chromium

Resuits

<u>MDL</u> ng/m³ Air

09/17/14

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ng/m³ Air

0.0189



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/22/14 12:29

SUBMITTED: 09/17/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

Analyte

PAM-1

Lab ID:

Sample Volume:

4091716-03

Hexavalent Chromium

21.58

m³

Sampled: 09/16/14 18:18 Received: 09/17/14 10:43

Analysis Date: 09/18/14 12:23

Col 1 Start Time 9/15/14 18:19

Results

ng/m³ Air Flag

MDL ng/m³ Air

Hexavalent Chromium

CAS Number 1854-02-99

0.101



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

Description: PAM-1D

Air

Col 2 Start Time 9/15/14 18:19

FAX: (410) 266-8912

Lab ID:

Sample Volume:

21.66

m³

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 09/22/14 12:29

09/17/14

Honeywell Hex Chrome Study

Sampled: 09/16/14 18:23

Received: 09/17/14 10:43 Analysis Date: 09/18/14 12:43

Hexavalent Chromium

4091716-04

Results ng/m³ Air

<u>Flaq</u>

MDL ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0867

0.0036

KK 9/23/14

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 6 of 13



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

PAM-2

Start Time 9/15/14 17:51

FAX: (410) 266-8912

Lab ID:

4091716-05

Sample Volume:

21.67

m³

AQS SITE CODE:

FILE #: 3926.00

SUBMITTED:

SITE CODE:

REPORTED: 09/22/14 12:29

Honeywell Hex Chrome Study

Sampled: 09/16/14 17:56

Received: 09/17/14 10:43

Analysis Date: 09/18/14 13:24

Hexavalent Chromium

Results

<u>ng/m³ Air</u>

Flag

<u>MDL</u> ng/m³ Air

09/17/14

Hexavalent Chromium

<u>Analyte</u>

CAS Number 1854-02-99

0.0716



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

PAM-3

Air

Start Time 9/15/14 17:36

FAX: (410) 266-8912

Lab ID:

4091716-06

Sample Volume:

21.95

m³

FILE #: 3926.00

SUBMITTED:

SITE CODE:

AQS SITE CODE:

REPORTED: 09/22/14 12:29

Honeywell Hex Chrome Study

Sampled: 09/16/14 17:42

Received: 09/17/14 10:43 Analysis Date: 09/18/14 13:34

Hexavalent Chromium

Results

<u>Flaq</u>

MDL

09/17/14

<u>Analyte</u>

CAS Number

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0206

ng/m³ Air 0.0036



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

PAM-4

Air

490 FA/

Start Time 9/15/14 17:21

FAX: (410) 266-8912

912

Lab ID: 4091 Sample Volume:

4091716-07

21.56

m³

SITE CODE:

SUBMITTED:

AQS SITE CODE:

FILE #: 3926.00

REPORTED: 09/22/14 12:29

Honeywell Hex Chrome Study

Sampled: 09/16/14 17:18

Received: 09/17/14 10:43 **Analysis Date:** 09/18/14 13:43

Hexavalent Chromium

Results

MDL

Analyte
Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air 0.0327

<u>Flag</u>

ng/m³ Air 0.0036

09/17/14



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495 **Description:**

Air

PAM-21

FAX: (410) 266-8912

Lab ID:

4091716-08

Sample Volume:

21.67

m³

SUBMITTED: **AQS SITE CODE:**

SITE CODE:

FILE #: 3926.00

REPORTED: 09/22/14 12:29

Honeywell Hex Chrome Study

Sampled: 09/16/14 00:00

Received: 09/17/14 10:43

Analysis Date: 09/18/14 13:53

Hexavalent Chromium

Results

ng/m³ Air

<u>Flag</u>

MDL ng/m³ Air

09/17/14

Analyte Hexavalent Chromium **CAS Number** 1854-02-99



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/22/14 12:29

SUBMITTED: 09/17/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-31

Lab ID:

Sample Volume:

4091716-09

m³

Sampled: 09/16/14 00:00

Received: 09/17/14 10:43 Analysis Date: 09/18/14 14:23

Comments:

Matrix:

Hexavalent Chromium

21.95

Results

ng/m³ Air

<u>Flag</u>

MDL <u>ng/m³ Air</u>

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ND



LABORATORY DATA CONSULTANTS, INC.

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

ERM

September 24, 2014

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

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 September 23, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32725:

SDG Fraction

4091821/4091909 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.

Christina Rink

Sincerely,

Project Manager/Chemist

	102 pages-SF	3 DAY														achn					2.1.																_	_	
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Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: September 17 through September 18, 2014

LDC Report Date: September 24, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: **EPA Level IV**

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4091821/4091909

Sample Identification

PAM-1(09/18/14)DUP OAM 1(09/17/14) OAM 2(09/17/14) PAM-1D(09/18/14)DUP

PAM-1(09/17/14)

PAM-1D(09/17/14)

PAM-2(09/17/14)

PAM-3(09/17/14)

PAM-4(09/17/14)

PAM-21(09/17/14) PAM-31(09/17/14)

OAM 1(09/18/14)

OAM 2(09/18/14)

PAM-1(09/18/14)

PAM-1D(09/18/14)

PAM-2(09/18/14)

PAM-3(09/18/14) PAM-4(09/18/14)

PAM-21(09/18/14)

PAM-31(09/18/14)

PAM-1(09/17/14)DUP

PAM-1D(09/17/14)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(09/17/14) and PAM-31(09/18/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (09/17/14) and PAM-21 (09/18/14) 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.

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(09/17/14) and PAM-1D(09/17/14) and samples PAM-1(09/18/14) and PAM-1D(09/18/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrat	ion (ng/m³)				
Analyte	nalyte PAM-1(09/17/14) PAM-10		RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0140	0.0161	14 (≤20)	-	-	

	Concentrat	ion (ng/m³)				
Analyte	PAM-1(09/18/14) PAM-1D(09/18/14)		RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0325	0.0281	15 (≤20)	-	-	

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4091821/4091909

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
4091821/4091909

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 4091821/4091909

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

LDC #: 32725A6

VALIDATION COMPLETENESS WORKSHEET

SDG #: 4091821/4091909 L

Laboratory: Eastern Research Group

Level IV

Date: 4 23/14

Page: 1 of 1

Reviewer: 50

2nd Reviewer: 6

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
1.	Technical holding times	A	Sampling dates: 9/17-18/14
11	Initial calibration	A	
111.	Calibration verification	B	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	2	Not Required
VI.	Duplicates	A	Dup.
VII.	Laboratory control samples	A	LUSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	FO=(3.4) (12.13)
ΧI	Field blanks	100	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:

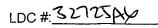
_	7-(\ V)				transfer to the second		_
1	OAM 1 (9/17/14)	11	OAM2 (9/18/14)	21	(4/18/14) PAM-1DUP	31	
2	OAM 2	12	PAM-1	22	PAM-1DDUP	32	
3	PAM-1	13	PAM-1D	23		33	
4	PAM-1D	14	PAM-2	24		34	
5	PAM-2	15	PAM-3	25		35	
6	PAM-3	16	PAM-4	26		36	
7	PAM-4	17	PAM-21	27		37	
8	PAM-21	18	PAM-31	28		38	
9	PAM-31	19	(9/17/14) PAM-1DUP	29		39	
10	OAM 1 (9/18/14)	20	PAM-1DDUP	30		40	

Notes: Date appended to differentiate between samples

Page: \(\) of \(\frac{2}{9} \)
Reviewer: \(\frac{9}{9} \)
2nd Reviewer: \(\frac{9}{9} \)

Method: Inorganics (EPA Method See (sex))

Method:Inorganics (EPA Method Tee (wex)				
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 99-110% QC limits?	/	_		
Were titrant checks performed as required? (Level IV only)				
Were balance checks performed as required? (Level IV only)				
III. Blanks				
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		1		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.				
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 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?				
			1	



VALIDATION FINDINGS CHECKLIST

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?	1			
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.	1			
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 32725A6

Field Duplicates

Page	1 <u>of</u> 1
Reviewer:	₹ <u>ე</u>
2nd Reviewer:	O

Inorganics: Method See Cover

	Concentra			
Analyte	3 4		RPD (≤20)	Qual.
Hexavalent Chromium	0.0140	0.0161	14	

	Concentr	ation (ng/m3)		Qual.
Analyte	12	13	RPD (≤20)	
Hexavalent Chromium	0.0325	0.0281	15	

 $\verb|\LDCFILESERVER|\Validation|\FIELD DUPLICATES|\FD_inorganic|\32725A6.wpd|$

LDC #: 32725A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:_ of_
Reviewer: 70
2nd Reviewer:

Method: Inorganics, Method	See Cover
The correlation coefficient (r) for the c	alibration of Ct was recalculated.Calibration date: 9/22/14

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

%R = <u>Found X 100</u>

Where,

Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution

True

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

	<u>:</u>				Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000143			
		s2	0.1	0.0000372	0.99996	0.99996	
		s3	0.2	0.0000797			4
	طدر	s4	0.5	0.0001972			
	$\bigcup \mathcal{C}'$	s5	1	0.0003961			
		s6	2	0.0008077			
JW 11:08		Fand	True				1
Calibration verification		0.5008 mg/ml	O.S reful		100.2%R	1002%2	
COU \2.07 Calibration verification	1	0.50\ naja	0.5ng/ml		100.2%2	100.2%2	4
Campiagon Vermication	'\	<u> </u>	<u> </u>				
Calibration verification							

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

LDC #: 32725N/

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page:_	<u>l</u> of'	_
Reviewer:	50	_
2nd Reviewer:	C	

METHOD: Inorganics, Method See Lover

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:

 $RPD = \underline{|S-D|} \times 100$

Where,

S =

Original sample concentration

(S+D)/2

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)
LC5 11:38	Laboratory control sample	Crab	1.059 ng/m1	1.00 ng/m/	106°6R	(06%R	9
1	Matrix spike sample		(SSR-SR)				
Dup 12:38	Duplicate sample	Cx*10	0.0153 ng/m3	0.0141 ng/m3	8.16% 890	8-61%29	7

Comments:				

LDC#: 32725A6

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:_	<u>(</u> of _ \
Reviewer:_	50
nd reviewer.	Ca

					2nd revie	wer:	
MET	HOD: Inorganics, Metho	od See Gove	<u>ev</u>				
YN	N/A Have results N/A Are results w	ow for all questions ans been reported and cale within the calibrated rang tion limits below the CF	culated correctly? ge of the instrument	·	e identified as "N/	A".	
Comp	Compound (analyte) results for						
Concer	tration = $(A - co) / c$	VE-10ml m3 = 21.73 Rec	calculation: (0 00 i	003-(-4.5	59E-06))		
۵ د	$A = 0.00003 (ng/m)(vk)$ $C_0 = 0.00000 459 (ng/m)(vk)$ $C_1 = 0.0004051 m^3$ $C_1 = 0.0004051 0.0393 m/m^3$						0854 _m
#	Sample ID	Analy	rte	Reported Concentration (似い)	Calculated Concentration (14 (u ³)	Accepta (Y/N)	- 11
	1	Cr	+10	0.0156	0.0156	4	
	2	\		0.0171	0.0170		
	3			0.0140	0.0(4)		
	4			0.0161	0.0161		
	7			0.0213	11/12/3		

#	Sample ID	Analyte	Concentration (ハムレル・)	Concentration (Mg/u3)	Acceptable (Y/N)
	1	Cr+10	0.0156	0.0156	4
	2		0.0171	0.0170	
	3		0.0140	0.0141	
	μ		0.0161	1010.0	
	5		0.0213	100213	
	6		0.0142	0.0142	
	7		0.0414	0.0414	
	8		ND	NO	
	٩		NO	NO	
	10		0.0339	0.0339	
	11		0.0393	0.0393	
	12		0.0325	0.0324	
	13		0.0281	0.0281	
	<u>14</u>		0.0405	0.0405	
	15	·	0-0319	0.0319	
	16		0.0409	0.0409	
	17		NO	NO	
	18	4	PO	ND	4

Note:	
	



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: 09/23/14 14:02

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix:

OAM 1

Lab ID:

4091821-01

 m^3

Sampled: 09/17/14 16:12

Received: 09/18/14 10:46 Analysis Date: 09/22/14 13:54

Comments: Start Time 9/16/14 16:31

Hexavalent Chromium

21.31

Results

<u>MDL</u>

<u>Analyte</u> **Hexavalent Chromium** **CAS Number** 1854-02-99

Sample Volume:

ng/m³ Air 0.0156

Flag

ng/m³ Air 0.0036



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FILE #: 3926.00

REPORTED: 09/23/14 14:02

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2 Lab ID:

4091821-02 21.32 Sampled: 09/17/14 16:34

Matrix:

Air

Start Time 9/16/14 16:53

Sample Volume:

m³

Received: 09/18/14 10:46

Analysis Date: 09/22/14 14:04

Hexavalent Chromium

<u>Results</u>

<u>MDL</u>

<u>Analyte</u>

CAS Number

<u>ng/m³ Air</u>

Flag

ng/m³ Air

Hexavalent Chromium

Comments:

1854-02-99

0.0171



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Col 1 Start Time 9/16/14 18:23

FILE #: 3926.00

REPORTED: 09/23/14 14:02

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1 Lab ID:

4091821-03

21.38

Sampled: 09/17/14 18:09

Matrix:

Air

Sample Volume:

m³

Received: 09/18/14 10:46

Analysis Date: 09/22/14 12:28

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

Comments:

1854-02-99

0.0140



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FILE #: 3926.00

REPORTED: 09/23/14 14:02

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Col 2 Start Time 9/16/14 18:28

Lab ID:

4091821-04

Sampled: 09/17/14 18:09

Matrix:

Sample Volume:

21.32 m³ Received: 09/18/14 10:46

Analysis Date: 09/22/14 12:48

Hexavalent Chromium

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

Comments:

1854-02-99

0.0161



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Air

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FILE #: 3926.00

REPORTED: 09/23/14 14:02

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Matrix:

Comments:

Start Time 9/16/14 18:00

Lab ID:

4091821-05

 m^3

<u>Flag</u>

Sampled: 09/17/14 17:45

Received: 09/18/14 10:46

Analysis Date: 09/22/14 14:33

Hexavalent Chromium

21.38

Results

0.0213

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

Sample Volume:

ng/m³ Air

ng/m³ Air



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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 9/16/14 17:46

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/23/14 14:02

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

PAM-3 Description:

Lab ID:

4091821-06

Sampled: 09/17/14 17:31

Matrix:

Air

Sample Volume:

21.37

m³

Received: 09/18/14 10:46

Analysis Date: 09/22/14 14:43

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

Comments:

1854-02-99

0.0142



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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

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Start Time 9/16/14 17:27

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/23/14 14:02

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

PAM-4 Description:

Matrix: Air Lab ID:

Sample Volume:

4091821-07

m³

Sampled: 09/17/14 17:10

Received: 09/18/14 10:46

Analysis Date: 09/22/14 14:53

Hexavalent Chromium

21.35

Results

MDL

Analyte

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

Comments:

1854-02-99

0.0414



Environmental Resources Management, Inc

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Malvern, PA 19355

Comments:

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FILE #:

3926.00

REPORTED:

09/23/14 14:02

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

> Matrix: Air

Lab ID:

Sample Volume:

4091821-08

21.38

m³

Sampled: 09/17/14 00:00

Received: 09/18/14 10:46 Analysis Date: 09/22/14 15:03

Hexavalent Chromium

Results

ng/m³ Air

<u>Flag</u>

MDL ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ND



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

Comments:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/23/14 14:02

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

PAM-31 Description:

Air

Lab ID:

4091821-09

21.37

m³

Sampled: 09/17/14 00:00

Received: 09/18/14 10:46

Analysis Date: 09/22/14 15:13

Hexavalent Chromium

Results

Sample Volume:

MDL

Analyte Hexavalent Chromium **CAS Number**

1854-02-99

ng/m³ Air ND

Flag

ng/m³ Air 0.0036



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

Start Time 9/17/14 16:18

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/23/14 14:02

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Flag

Honeywell Hex Chrome Study

Description: OAM 1 Matrix:

Lab ID:

Sample Volume:

4091909-01

m³

Sampled: 09/18/14 16:18

Received: 09/19/14 10:28

Analysis Date: 09/22/14 15:23

Hexavalent Chromium

21.6

Results

MDL

Analyte

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

Comments:

1854-02-99

0.0339



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:

09/23/14 14:02

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

OAM 2 Description:

Matrix: Air Lab ID:

4091909-02

21.73 m³ Sampled: 09/18/14 16:48

Received: 09/19/14 10:28 Analysis Date: 09/22/14 15:33

Comments: Start Time 9/17/14 16:44

Hexavalent Chromium

Results

MDL

<u>Analyte</u> Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air 0.0393

Sample Volume:

Flag

ng/m³ Air



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:

09/23/14 14:02

SUBMITTED:

m³

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

<u>Flag</u>

Honeywell Hex Chrome Study

Analysis Date: 09/22/14 13:08

Description: PAM-1

Air

Lab ID:

Sample Volume:

4091909-03

21.53

Sampled: 09/18/14 18:14

Received: 09/19/14 10:28

Comments:

Matrix:

Col 1 Start Time 9/17/14 18:19

Hexavalent Chromium

Results

ng/m³ Air

MDL

ng/m3 Air

Hexavalent Chromium

<u>Analyte</u>

CAS Number 1854-02-99

0.0325



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #:

REPORTED: 09/23/14 14:02

3926.00

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1D

Lab ID:

Sample Volume:

4091909-04

m³

Flag

Sampled: 09/18/14 18:19

Received: 09/19/14 10:28 Analysis Date: 09/22/14 13:27

Comments: Col 2 Start Time 9/17/14 18:19

Hexavalent Chromium

21.6

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

ng/m³ Air

0.0036

Hexavalent Chromium

1854-02-99



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/23/14 14:02

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-2

Lab ID:

Sample Volume:

4091909-05

21.58

m³

Sampled: 09/18/14 17:51

Received: 09/19/14 10:28 Analysis Date: 09/22/14 15:43

Comments: Start Time 9/17/14 17:52

Air

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m3 Air

Hexavalent Chromium

1854-02-99

0.0405



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #:

3926.00

REPORTED:

09/18/14 to 09/19/14

SUBMITTED:

09/23/14 14:02

AQS SITE CODE:

m³

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-3

Lab ID:

Sample Volume:

4091909-06

Sampled: 09/18/14 17:39

Received: 09/19/14 10:28 Analysis Date: 09/22/14 15:53

Comments: Start Time 9/17/14 17:39

Hexavalent Chromium

21.6

Results

MDL

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m3 Air

Hexavalent Chromium

1854-02-99

0.0319



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/23/14 14:02

SUBMITTED:

m³

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4

Matrix:

Comments:

Start Time 9/17/14 17:17

Lab ID:

4091909-07

Sampled: 09/18/14 17:24

Sample Volume:

21.7

Received: 09/19/14 10:28

Analysis Date: 09/22/14 16:02

Hexavalent Chromium

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m3 Air

Hexavalent Chromium

1854-02-99

0.0409



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: SUBMITTED:

09/18/14 to 09/19/14

09/23/14 14:02

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-21

> Matrix: Air

Lab ID:

Sample Volume:

4091909-08

m³

Sampled: 09/18/14 00:00

Received: 09/19/14 10:28 Analysis Date: 09/22/14 16:32

Hexavalent Chromium

21.58

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

Comments:

1854-02-99

ND



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

FILE #: 3926.00

09/23/14 14:02 REPORTED:

SUBMITTED:

09/18/14 to 09/19/14

AQS SITE CODE:

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-31

Air

Lab ID: Sample Volume:

4091909-09

 m^3

Sampled: 09/18/14 00:00

Received: 09/19/14 10:28 Analysis Date: 09/22/14 16:42

Comments:

Hexavalent Chromium

21.6

<u>Results</u>

ng/m³ Air

<u>Flag</u>

MDL ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0036

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 20 of 22

ERM October 1, 2014

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

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 September 30, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32767:

SDG Fraction

4092326/4092410 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

Childre for

171 pages-SF 5 DAY TAT Attachment 1 LDC #32767 (ERM - Morrisville, NC / Harbor Point, MD, Hexavalent Chromium Monitoring) Level IV (3) DATE Cr(VI) DATE LDC SDG# REC'D DUE (D7614) Matrix: Air/Water/Soil 27 0 4092326/4092410 09/30/14 10/07/14 0 0 0 0 0 0 0 0 0 0 0 0 0 Total A/CR

Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: September 19 through September 23, 2014

LDC Report Date: October 1, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4092326/4092410

Sample Identification

OAM 1(09/19/14) PAM-1(09/23/14) OAM 2(09/19/14) PAM-1D(09/23/14) PAM-1(09/19/14) PAM-2(09/23/14) PAM-1D(09/19/14) PAM-3(09/23/14) PAM-2(09/19/14) PAM-4(09/23/14) PAM-3(09/19/14) PAM-21(09/23/14) PAM-31(09/23/14) PAM-4(09/19/14) PAM-1(09/19/14)DUP PAM-21(09/19/14) PAM-31(09/19/14) PAM-1D(09/19/14)DUP OAM 1(09/22/14) PAM-1(09/22/14)DUP PAM-1D(09/22/14)DUP OAM 2(09/22/14) PAM-1(09/23/14)DUP PAM-1(09/22/14) PAM-1D(09/22/14) PAM-1D(09/23/14)DUP

PAM-2(09/22/14) PAM-3(09/22/14) PAM-4(09/22/14) PAM-21(09/22/14)

PAM-31(09/22/14)

OAM 1(09/23/14) OAM 2(09/23/14)

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

Introduction

This data review covers 33 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(09/19/14), PAM-31(09/22/14), and PAM-31(09/23/14) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(09/19/14), PAM-21(09/22/14), and PAM-21(09/23/14) 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(09/19/14) and PAM-1D(09/19/14), samples PAM-1(09/22/14) and PAM-1D(09/22/14), and samples PAM-1(09/23/14) and PAM-1D(09/23/14) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrat	ion (ng/m³)			
Analyte	PAM-1(09/19/14)	PAM-1D(09/19/14)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0141	0.0147	4 (≤20)	-	-

	Concentrat	ion (ng/m³)	222			
Analyte	PAM-1(09/22/14)	PAM-1D(09/22/14)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0553	0.0404	31 (≤20)	J (all detects)	А	

	Concentrat	ion (ng/m³)	222		
Analyte	PAM-1(09/23/14)	PAM-1D(09/23/14)	RPD (Limits)	Flags_	A or P
Hexavalent chromium	0.0302	0.0272	10 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4092326/4092410

SDG	Sample	Analyte	Flag	A or P	Reason
4092326/ 4092410	PAM-2(09/19/14) PAM-4(09/19/14) PAM-1(09/22/14) PAM-1D(09/22/14) PAM-4(09/22/14)	Hexavalent chromium	J (all detects)	А	Field duplicates (RPD)

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4092326/4092410

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 4092326/4092410

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

LDC #: 32767A6

VALIDATION COMPLETENESS WORKSHEET

SDG #: 4092326/4092410

Laboratory: Eastern Research Group

Level IV

Reviewer: 2nd Reviewer:

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
1.	Technical holding times	A	Sampling dates: 09/19/14 & 9/23/14
11	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	LUSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	4	
X.	Field duplicates	SW	FD=(3,4) (12,13) (21,22)
ΧI	Field blanks	100	FB=(8)(17)(26) TB=(9)(18)(27)

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

D = Duplicate

TB = Trip blank

EB = Equipment blank FB = Field blank

Validated Samples: Aur S

1	OAM 1(09/19/14)	11	OAM 2(09/22/14)	21	PAM-1(09/23/14)	31	PAM-1D(09/22/14)DUP
2	OAM 2(09/19/14)	12	PAM-1(09/22/14)	22	PAM-1D(09/23/14)	32	PAM-1(09/23/14)DUP
3	PAM-1(09/19/14)	13	PAM-1D(09/22/14)	23	PAM-2(09/23/14)	33	PAM-1D(09/23/14)DUP
4	PAM-1D(09/19/14)	14	PAM-2(09/22/14)	24	PAM-3(09/23/14)	34	
5	PAM-2(09/19/14)	15	PAM-3(09/22/14)	25	PAM-4(09/23/14)	35	
6	PAM-3(09/19/14)	16	PAM-4(09/22/14)	26	PAM-21(09/23/14)	36	
7	PAM-4(09/19/14)	17	PAM-21(09/22/14)	27	PAM-31(09/23/14)	37	
8	PAM-21(09/19/14)	18	PAM-31(09/22/14)	28	PAM-1(09/19/14)DUP	38	
9	PAM-31(09/19/14)	19	OAM 1(09/23/14)	29	PAM-1D(09/19/14)DUP	39	
10	OAM 1(09/22/14)	20	OAM 2(09/23/14)	30	PAM-1(09/22/14)DUP	40	

Notes:		

Page: 1 of 2
Reviewer: 50
2nd Reviewer: MC

Method: Inorganics (EPA Method See Cover)

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.	1 -					
II. Calibration						
Were all instruments calibrated daily, each set-up time?	/					
Were the proper number of standards used?	/					
Were all initial calibration correlation coefficients ≥ 0.995?	//					
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?						
Were titrant checks performed as required? (Level IV only)	J	_		20		
Were balance checks performed as required? (Level IV only)						
III. Blanks						
Was a method blank associated with every sample in this SDG?	/					
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.						
IV. Matrix spike/Matrix spike duplicates and Duplicates	···					
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.						
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	\ \P'		/	30		
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for weters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 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?						
	1 T	1				

Airs

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: 30
2nd Reviewer: MG

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#<u>32767A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: _of _ Reviewer: _\$\mathcal{S}\mathc

Inorganics: Method See Cover

	Concentra			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0141	0.0147	4	

	Concentral	ion (ng/m3)	DDD.	0 -1 (5 7 40
Analyte	12	13	RPD (≤20)	Qual. (5, 7, 12, 13, 16)
Hexavalent Chromium	0.0553	0.0404	31	Jdet/A

	Concentra	tion (ng/m3)		
Analyte	21	22	RPD (≤20)	Qual.
Hexavalent Chromium	0.0302	0.0272	10	·

\\LDCFILESERVER\\Validation\FIELD DUPLICATES\FD_inorganic\\32767A6.wpd

LDC #: 32767A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:_\	_ of \
Reviewer:	3D
nd Review	er: MG

Method: Inorganics, Method	See Cover
The correlation coefficient (r) for the	calibration of Cotto was recalculated Calibration date: 9 24 14

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

%R = <u>Found X 100</u>

Where,

Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.0000133			
		s2	0.1	0.0000326	0.99975	0.99975	
	Cr+6	s3	0.2	0.0000804			
		s4	0.5	0.0001959			U
		s5	1	0.0004155			
		s6	2	0.0008047			
Jev 11:06	طده	Found	True				1
Calibration verification	Crth	0.503ng/ml	0.5 mg/ml		101%7	101%R	
ce 12:06	1	2 2 2 1	75-11				
Calibration verification		0.5125 ng/m	O.Snglml		102.2%	102.5%R	
JW 10:52		1500.11	25-11		105 13/2	1 2 12/2	1
Calibration verification	4	U. Sulongimi	Osrglml		100,7 %	1004%2	<u> </u>

Comments: Refer to Calibration Ve	erification findings worksheet for lis	t of qualifications and asso	ociated samples when reporte	ed results do not agree withi
10.0% of the recalculated results				

LDC#: 32767A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

	Page:_\	of
F	Reviewer:	ヹ゙゙゙゙゙
2nd F	Reviewer:	MG

METHOD: Inorganics, Method See Cover

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

 $%R = Found \times 100$ True

Where,

Found =

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,

Found = SSR (spiked sample result) - SR (sample result).

True = concentration of each analyte in the source.

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

 $RPD = \underline{[S-D]} \times 100$

Where,

S =

Original sample concentration

(S+D)/2

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 11:36	Laboratory control sample	C+x	1-10 ng/ml	1 ng/ml	110%2	110%P	5
2	Matrix spike sample		(SSR-SR)				
Dog.	Duplicate sample		0.0163 ng/m³	0.0141 ng/m³	14.5 %R*D	14.8% P3D	3

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#:32767A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	1 of 2
Reviewer:	30
2nd reviewer	MC

METHOD: Inorganics, Method See Cou	er	
Please see qualifications below for all questions Y N N/A	calculated correctly? range of the instruments?	ons are identified as "N/A".
Compound (analyte) results for (4) recalculated and verified using the following equations:	ation:	reported with a positive detect were
Concentration = (Area - Co)/C,	Recalculation: (0.000085 - ($\frac{-4.21E-06}{1072} = 0.0312 \text{ m/m}$
Area= 0.0000085 (ng/m1)(Uf Co=-4.21 E-06 (ng/m1)(Uf C1= 0.0004072	0.0004 0.0312 0.0312	$\frac{1072}{120} = 0.0147 \text{ mg/m}^2$

		17=10m1 M= 51. D1	200		
#	Sample ID	Analyte	Reported Concentration (\asim^3)	Calculated Concentration (ngim³)	Acceptable (Y/N)
	1	Cr+10	0.0153	0.0153	4
	2		0.0150	0.0150	
	3		0:014]	1410.0	
	Ц		0.0147	0-0147	
	\$		0.0182	0.0182	
	6		0-0145	0.0145	
	7		0.0193	0.0192	
	8		100	ND	
	9		NO 04	20	
	lo		NO	ND	
	11		0.0095	0.000	*
	12		0.0553	4220.6	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	13		0.0404	0.0409	
	14		0.0121	0.0121	
	15		ND	P0	
	16		0.0455	0.0456	*
	17		707	20	
	18		NO	NO	
	19		0.0142	0.0141	X
	20	4	0.0138	0.0137	1 *

Vote: * Round Ma	
	_
	_

LDC #: 32761A6

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	<u>2of ユ</u>
Reviewer:	~~
nd reviewer.	

METH	IOD: Inorganics, Metho	d See Cover			
Y N Y N Y N	N/A Have results w N/A Are all detections	bow for all questions answered "N". Not appear reported and calculated correctly? within the calibrated range of the instrumention limits below the CRQL?		e identified as "N	/A" .
Comp recalc	ound (analyte) results f	for 21) C+b ig the following equation:	repo	orted with a positi	ve detect were
Concen	tration = (Aran-Co) $ C $ $ C$	8-7-881000	79 E-06)	0.6656 n
Area Co=	-8.79E-06 0-0004145	(vg/m//Luf) (0.66564	y(m1)(10m1) 22.03m3 =	D.030Z	-nglm³
#	Sample ID	Analyte	Reported Concentration (\gamma_{\mathbb{M}}^{\mathbb{M}})	Calculated Concentration ()\(\sigma_i \lefta_i^3\)	Acceptable (Y/N)
	21	C++6	0.0302	0.0302	3
	22		0.0272	0.0273	1 *
	23		0.0367	0.0367	
	24		0.0229	0.0229	
	25		0.0375	0.0375	
	26		ND	N9_	
	27	4	ND	<i>P</i> 0	4
				<u> </u>	
	-				
			 	 	· · · · · · · · · · · · · · · · · · ·

D	FC	ΔI	\sim	e	

* Zounding



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 09/30/14 14:09

Malvern, PA 19355

SUBMITTED:

09/23/14 to 09/24/14

ATTN: Mr. Jeff Boggs

AQS SITE CODE: SITE CODE:

------- (4.48)

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

4092326-01

Sampled: 09/19/14 16:14

Matrix:

Air

Sample Volume:

21.39

m³

Received: 09/23/14 10:47 **Analysis Date:** 09/24/14 14:28

Comments:

Start Time 9/18/14 16:28

Hexavalent Chromium

Results

ng/m³ Air

Flag

MDL ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0153

0.0036



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Malvern, PA 19355

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Air

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FILE #: 3926.00

REPORTED:

09/30/14 14:09

SUBMITTED:

09/23/14 to 09/24/14

AQS SITE

SITE CODE:

т³

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID:

Sample Volume:

4092326-02

21.33

Sampled: 09/19/14 16:34

Received: 09/23/14 10:47 Analysis Date: 09/24/14 14:38

Matrix: Comments:

Start Time 9/18/14 16:52

Hexavalent Chromium

Results

ng/m³ Air

Flag

<u>MDL</u> ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0150



Environmental Resources Management, Inc

75 Valley Stream Parkway, Suite 400

Malvern, PA 19355

Description:

Comments:

Matrix:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Col 1 Start Time 9/18/14 18:19

PAM-1

Air

FAX: (410) 266-8912

Lab ID: Sample Volume:

4092326-03

21.29

m³

SUBMITTED:

AQS SITE SITE CODE:

FILE #: 3926.00

REPORTED: 09/30/14 14:09

Sampled: 09/19/14 17:58 Received: 09/23/14 10:47

Honeywell Hex Chrome Study

Analysis Date: 09/24/14 12:26

Hexavalent Chromium

Results ng/m³ Air

<u>Flag</u>

MDL ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0141

0.0036

09/23/14 to 09/24/14



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Matrix:

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/30/14 14:09

SUBMITTED:

09/23/14 to 09/24/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1D

Lab ID:

Sample Volume:

4092326-04

21.24 m³

Sampled: 09/19/14 18:00 Received: 09/23/14 10:47 Analysis Date: 09/24/14 12:46

Comments:

Col 2 Start Time 9/18/14 18:24

Hexavalent Chromium

<u>Results</u>

ng/m³ Air

<u>Flag</u>

MDL ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0147



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SHECODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

4092326-05

Sampled: 09/19/14 17:40

Matrix: A

Air

Sample Volume:

21.35

Received: 09/23/14 10:47

Comments:

Start Time 9/18/14 17:57

m³

Analysis Date: 09/24/14 14:48

Hexavalent Chromium

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

ng/m³ Air

Flag

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0182 J



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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Start Time 9/18/14 17:43

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/30/14 14:09

09/23/14 to 09/24/14

SUBMITTED:

AQS SITE

SHE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

Matrix:

PAM-3

Air

Lab ID:

Sample Volume:

4092326-06

m³

Sampled: 09/19/14 17:27 Received: 09/23/14 10:47

Analysis Date: 09/24/14 14:58

Hexavalent Chromium

<u>Results</u>

MDL

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ng/m³ Air 0.0145

<u>Flaq</u>

ng/m³ Air 0.0036



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Matrix:

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/30/14 14:09

SUBMITTED:

09/23/14 to 09/24/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-4

Lab ID:

Sample Volume:

4092326-07

21.33

Sampled: 09/19/14 17:12 Received: 09/23/14 10:47

Analysis Date: 09/24/14 15:08

Comments:

Start Time 9/18/14 17:30

Hexavalent Chromium

Results

ng/m³ Air

<u>Flaq</u>

MDL ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0193 J

0.0036

ICC 10-1-14



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Matrix:

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/30/14 14:09

SUBMITTED:

m³

09/23/14 to 09/24/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID:

Sample Volume:

21.35

Sampled: 09/19/14 00:00

Received: 09/23/14 10:47

Analysis Date: 09/24/14 15:18

Comments:

Hexavalent Chromium

4092326-08

Results

ng/m³ Air

<u>Flag</u>

<u>MDL</u> ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ND

0.0036



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FAX: (410) 266-8912

SITE CODE:

m³

Honeywell Hex Chrome Study

Description:

Comments:

PAM-31

Lab ID:

4092326-09

Sampled: 09/19/14 00:00

Matrix:

Air

Sample Volume:

21.36

Received: 09/23/14 10:47

Analysis Date: 09/24/14 15:28

Hexavalent Chromium

<u>Results</u>

MDL

Hexavalent Chromium

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Analyte

1854-02-99

ND



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PHONE: (443) 803-8495

Matrix:

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/30/14 14:09

SUBMITTED:

09/23/14 to 09/24/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

Sample Volume:

4092326-10

m³

Sampled: 09/22/14 16:17

Received: 09/23/14 10:47 Analysis Date: 09/24/14 15:38

Comments:

Start Time 9/21/14 16:29

Hexavalent Chromium

21.41

Results

ng/m³ Air

<u>Flaq</u>

MDL

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

ND

ng/m³ Air 0.0036



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FILE #: 3926.00

REPORTED: 09/30/14 14:09

SUBMITTED:

09/23/14 to 09/24/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Air

Lab ID:

Sample Volume:

4092326-11

m³

Sampled: 09/22/14 16:34

Received: 09/23/14 10:47 Analysis Date: 09/24/14 15:48

Matrix: Comments:

Start Time 9/21/14 16:41

Hexavalent Chromium

21.49

Results

ng/m³ Air

Flag

MDL

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0095

ng/m³ Air



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FILE #: 3926.00

REPORTED:

09/30/14 14:09

09/23/14 to 09/24/14

SUBMITTED:

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-1

Air

Lab ID:

Sample Volume:

4092326-12

21.78 $\,m^3$

Sampled: 09/22/14 17:34 Received: 09/23/14 10:47

Analysis Date: 09/24/14 13:05

Comments:

Hexavalent Chromium

Col 1 Start Time 9/21/14 17:22

Hexavalent Chromium

Results

MDL

<u>Analyte</u>

CAS Number

1854-02-99

<u>ng/m³ Air</u> 0.0553

<u>Flaq</u>

ng/m³ Air



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Air

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CAS Number

1854-02-99

FILE #: 3926.00

REPORTED:

09/30/14 14:09

09/23/14 to 09/24/14

SUBMITTED:

AQS SITE

CODE:

Honeywell Hex Chrome Study

Description:

Matrix:

PAM-1D

Lab ID:

Sample Volume:

4092326-13

m³

Sampled: 09/22/14 17:36

Received: 09/23/14 10:47 Analysis Date: 09/24/14 13:48

Comments:

Hexavalent Chromium

Analyte

Col 2 Start Time 9/21/14 17:20

Hexavalent Chromium

21.84

<u>ng/m³ Air</u> 0.0404 J <u>Flag</u>

MDL ng/m³ Air

Results

D-F



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FAX: (410) 266-8912

FiLE #: 3926.00

REPORTED: 09/30/14 14:09

09/23/14 to 09/24/14

SUBMITTED: AQS SITE SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Air

Lab ID:

Sample Volume:

4092326-14 21.67

m³

Sampled: 09/22/14 17:18 Received: 09/23/14 10:47

Analysis Date: 09/24/14 15:58

Matrix: Comments:

Start Time 9/21/14 17:13

Hexavalent Chromium

Results

ng/m³ Air

<u>Flag</u>

MDL ng/m3 Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0121

0.0036



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Air

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AQS SITE

REPORTED:

SUBMITTED:

FILE #: 3926.00

SITE CODE:

Honeywell Hex Chrome Study

Description: Matrix: PAM-3

Lab ID:

Sample Volume:

4092326-15

m³

Sampled: 09/22/14 17:08

Received: 09/23/14 10:47

Analysis Date: 09/24/14 16:27

Comments:

Start Time 9/21/14 17:08

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

21.59

ng/m³ Air

09/30/14 14:09

09/23/14 to 09/24/14

Hexavalent Chromium

1854-02-99

ng/m³ Air ND

<u>Flag</u>

0.0036

LK 10.1-14



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Matrix:

PHONE: (443) 803-8495

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED: 09/30/14 14:09

SUBMITTED:

09/23/14 to 09/24/14

AQS SITE

CODE: SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

PAM-4

Start Time 9/21/14 17:00

Lab ID:

4092326-16

m³

Sampled: 09/22/14 16:58 Received: 09/23/14 10:47

Analysis Date: 09/24/14 16:37

Hexavalent Chromium

21.56

Results ng/m³ Air MDL

Analyte

CAS Number

Sample Volume:

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0455 丁



Environmental Resources Management, Inc

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Malvern, PA 19355

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/30/14 14:09

SUBMITTED:

09/23/14 to 09/24/14

AQS SITE

CODE:

Honeywell Hex Chrome Study

Description:

Matrix:

PAM-21

Lab ID:

Sample Volume:

4092326-17

21.67 m³ Sampled: 09/22/14 00:00 Received: 09/23/14 10:47

Analysis Date: 09/24/14 16:47

Comments:

Hexavalent Chromium

<u>Results</u>

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

ND

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0036



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Description:

Comments:

ATTN: Mr. Jeff Boggs

PHONE: (443) 803-8495

Matrix:

PAM-31

Air

FAX: (410) 266-8912

Lab ID:

Sample Volume:

21.59

<u>Flaq</u>

FILE #: 3926.00

REPORTED:

SUBMITTED:

AQS SITE SITE CODE:

Honeywell Hex Chrome Study

Sampled: 09/22/14 00:00 Received: 09/23/14 10:47

Analysis Date: 09/24/14 16:57

Hexavalent Chromium

4092326-18

Results ng/m³ Air MDL

09/30/14 14:09

09/23/14 to 09/24/14

<u>Anaiyte</u> **CAS Number** Hexavalent Chromium

1854-02-99

ND

ng/m³ Air 0.0036



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FILE #: 3926.00

REPORTED: 09/30/14 14:09

SUBMITTED:

09/23/14 to 09/24/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 1

Lab ID:

4092410-01

Sampled: 09/23/14 16:17

Matrix: Comments:

Start Time 9/22/14 16:21

Sample Volume:

m³

Received: 09/24/14 11:13 Analysis Date: 09/25/14 13:00

Hexavalent Chromium

21.54

Results

MDL

Analyte Hexavalent Chromium

CAS Number 1854-02-99

ng/m³ Air 0.0142

<u>Flaq</u>

ng/m³ Air

0.0036



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FILE #: 3926.00

REPORTED:

09/30/14 14:09

SUBMITTED:

09/23/14 to 09/24/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

OAM 2

Lab ID:

Sample Volume:

4092410-02

<u>Flag</u>

Sampled: 09/23/14 16:38 Received: 09/24/14 11:13

Analysis Date: 09/25/14 13:10

Comments:

Start Time 9/22/14 16:38

Hexavalent Chromium

21.59

Results

0.0138

MDL

<u>Analyte</u> **Hexavalent Chromium**

CAS Number 1854-02-99

ng/m³ Air

ng/m³ Air

0.0036



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FAX: (410) 266-8912

Sample Volume:

AQS SITE

SITE CODE:

REPORTED:

SUBMITTED:

09/23/14 to 09/24/14

FILE #: 3926.00

Honeywell Hex Chrome Study

Description: Matrix: PAM-1

Lab ID:

4092410-03

22.03

m³

Sampled: 09/23/14 18:02

Received: 09/24/14 11:13 Analysis Date: 09/25/14 12:19

Comments:

Col 1 Start Time 9/22/14 17:34

Hexavalent Chromium

Results

ng/m³ Air

<u>Flaq</u>

MDL ng/m³ Air

09/30/14 14:09

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0302

0.0036

KF 10.1.14



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FILE #: 3926.00

REPORTED:

09/30/14 14:09

09/23/14 to 09/24/14

SUBMITTED: AQS SITE

CODE:

Honeywell Hex Chrome Study

Description:

Comments:

Matrix:

PAM-1D

Col 2 Start Time 9/22/14 17:40

Lab ID:

Sample Volume:

4092410-04

22.02 m³ Sampled: 09/23/14 18:09 Received: 09/24/14 11:13

Analysis Date: 09/25/14 12:39

Hexavalent Chromium

Results <u>ng/m³ Air</u> MDL

<u>Analyte</u> **Hexavalent Chromium** **CAS Number** 1854-02-99

0.0272

<u>Flaq</u>

ng/m³ Air

0.0036



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FILE #: 3926.00

REPORTED:

09/30/14 14:09

SUBMITTED:

09/23/14 to 09/24/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-2

Lab ID:

Sample Volume:

4092410-05

Sampled: 09/23/14 17:46

Matrix: Comments:

Start Time 9/22/14 17:22

21.95

m³

Received: 09/24/14 11:13

Analysis Date: 09/25/14 13:20

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air 0.0367

<u>Flag</u>

ng/m³ Air

0.0036



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FAX: (410) 266-8912

SUBMITTED:

AQS SITE SITE CODE:

REPORTED:

FILE #: 3926.00

Honeywell Hex Chrome Study

Description: Matrix: PAM-3

Air

Lab ID:

Sample Volume:

4092410-06

m³

Sampled: 09/23/14 17:33

Received: 09/24/14 11:13 Analysis Date: 09/25/14 13:30

Comments:

Start Time 9/22/14 17:13

Hexavalent Chromium

Results

ng/m³ Air

Flag

MDL

09/30/14 14:09

09/23/14 to 09/24/14

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0.0229

ng/m³ Air 0.0036



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Matrix:

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FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/30/14 14:09

09/23/14 to 09/24/14

SUBMITTED:

AQS SITE

SODE:

Honeywell Hex Chrome Study

Description:

PAM-4

Air

Lab ID:

Sample Volume:

4092410-07

m³

Sampled: 09/23/14 17:17

Received: 09/24/14 11:13 Analysis Date: 09/25/14 13:39

Comments:

Start Time 9/22/14 17:03

Hexavalent Chromium

21.82

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0375

0.0036

KK 10-1-14



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Air

FAX: (410) 266-8912

FILE #: 3926.00

REPORTED:

09/30/14 14:09

SUBMITTED:

09/23/14 to 09/24/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

PAM-21

Lab ID:

4092410-08

21.95

m³

Sampled: 09/23/14 00:00

Received: 09/24/14 11:13 Analysis Date: 09/25/14 13:49

Matrix: Comments:

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air

Sample Volume:

<u>Flag</u>

ng/m³ Air 0.0036



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FILE #: 3926.00

REPORTED:

09/30/14 14:09

SUBMITTED:

09/23/14 to 09/24/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

Description:

Comments:

Matrix:

PAM-31

Lab ID:

Sample Volume:

4092410-09

21.9

m³

Sampled: 09/23/14 00:00 Received: 09/24/14 11:13

Analysis Date: 09/25/14 14:19

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium **CAS Number**

1854-02-99

ng/m³ Air

ND

Flag

ng/m³ Air

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

ERM October 3, 2014

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

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 October 2, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #32782:

SDG

Fraction

4092508

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 guestions.

Sincerely,

Project Manager/Chemist

	70 pages-SF	5 DAY													_	achn																							
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Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: September 24, 2014

LDC Report Date: October 3, 2014

Matrix: Air

Parameters: Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 4092508

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:

	Concentrati	on (ng/m³)			
Analyte	PAM-1	PAM-1D	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0334	0.0284	16 (≤20)	-	-

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 4092508

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

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 4092508

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 4092508

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



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:

10/02/14 14:54

SUBMITTED:

09/25/14

AQS SITE

SITE CODE:

Honeywell Hex Chrome Study

OAM 1 Description:

Matrix:

Lab ID:

4092508-01

21.59

m³

Sampled: 09/24/14 16:24

Received: 09/25/14 10:38 Analysis Date: 09/29/14 12:55

Comments: Start Time 9/23/14 16:25

Hexavalent Chromium

Sample Volume:

Results ng/m³ Air

0.0146

Flag

<u>MDL</u> ng/m³ Air

Hexavalent Chromium

Analyte

CAS Number 1854-02-99

0,0036

KK 10.3.14

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 3 of 13



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 10/02/14 14:54

Malvern, PA 19355

SUBMITTED:

09/25/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description: OAM 2 Lab ID: 4092508-02

Sampled: 09/24/14 16:39

Matrix:

Sample Volume:

Received: 09/25/14 10:38

Comments:

Start Time 9/23/14 16:50

m³

Analysis Date: 09/29/14 13:05

Hexavalent Chromium

21.42

Results

<u>MDL</u>

Analyte

CAS Number

ng/m³ Air

<u>Flaq</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0203

0.0036



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

10/02/14 14:54 REPORTED:

Malvern, PA 19355

. 09/25/14 SUBMITTED:

AQS SITE

ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-1

21.19

Sampled: 09/24/14 17:52

Matrix:

Lab ID: 4092508-03

Sample Volume:

Received: 09/25/14 10:38

Comments:

Col 1 Start Time 9/23/14 18:19

m³

Analysis Date: 09/29/14 12:15

Hexavalent Chromium

Resuits

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air 0.0334

<u>Flag</u>

ng/m³ Air 0.0036

KK 10.3.14



Environmental Resources Management, Inc.

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 10/02/14 14:54

75 valley Girealli Faikway, Gull

SUBMITTED:

09/25/14

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

1443 311E

Honeywell Hex Chrome Study

Description: PAM-1D

SITE CODE:

21.24

Sampled: 09/24/14 17:55

Matrix: A

Air

Lab ID: 4092508-04

Sample Volume:

m³

Received: 09/25/14 10:38

Comments:

Col 2 Start Time 9/23/14 18:19

m₂

Flag

Analysis Date: 09/29/14 12:35

Hexavalent Chromium

Results

<u>MDL</u>

<u>Analyte</u>

CAS Number

<u>ng/m³ Air</u>

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0284

0.0036



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED:

10/02/14 14:54

Malvern, PA 19355

SUBMITTED:

09/25/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

Honeywell Hex Chrome Study

Description:

PAM-2

4092508-05

SITE CODE:

Flag

m³

Sampled: 09/24/14 17:36

Matrix:

Air

Lab ID: Sample Volume:

21.36

Received: 09/25/14 10:38 Analysis Date: 09/29/14 13:15

Comments:

Start Time 9/23/14 17:52

Hexavalent Chromium

Results

MDL

Analyte

CAS Number

ng/m³ Air

ng/m³ Air

Hexavalent Chromium

1854-02-99

0.0319

0.0036



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 10/02/14 14:54

SUBMITTED:

09/25/14

Malvern, PA 19355

ATTN: Mr. Jeff Boggs

Comments:

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-3 Lab ID:

Sample Volume:

Sampled: 09/24/14 17:27

Matrix:

4092508-06

m³

<u>Flag</u>

Received: 09/25/14 10:38

Start Time 9/23/14 17:39

Analysis Date: 09/29/14 13:25

Hexavalent Chromium

21.42

Results

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

ng/m³ Air 0.0223

ng/m³ Air

0.0036

KK 10.3.1H

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 8 of 13



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

REPORTED: 10/02/14 14:54

SUBMITTED:

09/25/14

Malvern, PA 19355 ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

FAX: (410) 266-8912

SITE CODE:

Honeywell Hex Chrome Study

Description: PAM-4 Lab ID: 4092508-07

Sampled: 09/24/14 17:05

Matrix:

Sample Volume:

<u>Flag</u>

Received: 09/25/14 10:38

Comments:

Start Time 9/23/14 17:25

m³

Analysis Date: 09/29/14 13:35

Hexavalent Chromium

21.3

Results

MDL

<u>Analyte</u> **Hexavalent Chromium** **CAS Number** 1854-02-99

ng/m³ Air 0.0273

ng/m³ Air

0.0036

KK 10.3.14



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

10/02/14 14:54 REPORTED:

Malvern, PA 19355

SUBMITTED:

09/25/14

ATTN: Mr. Jeff Boggs

AQS SITE

PHONE: (443) 803-8495

SUPECODE:

Honeywell Hex Chrome Study

Description: PAM-21 Lab ID: 4092508-08 Sampled: 09/24/14 00:00

Matrix:

Sample Volume:

21.36

Received: 09/25/14 10:38

Comments:

m³

Analysis Date: 09/29/14 13:45

Hexavalent Chromium

Results

MDL

Analyte Hexavalent Chromium **CAS Number** 1854-02-99

FAX: (410) 266-8912

ng/m³ Air ND

<u>Flag</u>

ng/m³ Air 0.0036

KK 10.3.14



Environmental Resources Management, Inc

FILE #: 3926.00

75 Valley Stream Parkway, Suite 400

10/02/14 14:54 REPORTED:

SUBMITTED: 09/25/14

Malvern, PA 19355

AQS SITE

ATTN: Mr. Jeff Boggs

Honeywell Hex Chrome Study

PHONE: (443) 803-8495

SITE CODE:

Description:

PAM-31

Lab ID: 4092508-09

Sampled: 09/24/14 00:00

Matrix: Air Sample Volume:

m³

Received: 09/25/14 10:38 Analysis Date: 09/29/14 14:14

Comments:

Hexavalent Chromium

21.42

Results

<u>MDL</u>

CAS Number

ng/m³ Air

<u>Flag</u>

ng/m³ Air

Analyte Hexavalent Chromium

1854-02-99

FAX: (410) 266-8912

ND

0.0036

KK 10.3.14

Eastern Research Group

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 11 of 13

LDC #: 32782A6 SDG #: 4092508

VALIDATION COMPLETENESS WORKSHEET

Level IV

Laboratory: Eastern Research Group

2nd Reviewer:_

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: 09/24/14
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Not Regulred
VI.	Duplicates	A	Dup.
VII.	Laboratory control samples	A	LCSID
VIII.	Sample result verification	A	
IX.	Overall assessment of data	LA	
X.	Field duplicates	SW	FD = (3,4)
xı	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

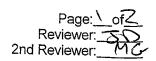
TB = Trip blank

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:		
	=	



Method:Inorganics (EPA Method See (あない)				
Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times		,		
All technical holding times were met.	/			
Cooler temperature criteria was met.	/	<u> </u>	<u> </u>	
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 99-410 % QC limits?	/			
Were titrant checks performed as required? (Level IV only)	!	<u> </u>	/	
Were balance checks performed as required? (Level IV only)			/	
III. Blanks				
Was a method blank associated with every sample in this SDG?	/	<u> </u>		
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spike/Matrix spike duplicates and Duplicates			•	
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	/			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?				
Was an LCS analyzed per extraction batch?		<u> </u>		
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?		<u> </u>		
Were the performance evaluation (PE) samples within the acceptance limits?		į		

Airs

LDC#32782A4

VALIDATION FINDINGS CHECKLIST

Page: Z of Z Reviewer: 50 2nd Reviewer: MC

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#<u>32782A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:_	\ o <u>f</u> \
Reviewer:_	70
2nd Reviewer:	MG

Inorganics: Method See Cover

	Concentra	ation (ng/m3)		
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0334	0.0284	16	

 $\verb|\LDCFILESERVER|\Validation|\FIELD DUPLICATES|\FD_inorganic|\32782A6.wpd|$

LDC #: 32782A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:_of	<u> </u>
Reviewer: ゞ	
2nd Reviewer:	MG

Method:	Inorganics,	Method	See Cover	
	•			

The correlation coefficient (r) for the calibration of ______ was recalculated.Calibration date: __ q [29]

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

%R = <u>Found X 100</u>

Where,

Found = concentration of each analyte <u>measured</u> in the analysis of the ICV or CCV solution

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ng/ml)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0.1	0.000016			
		s2	0.1	0.0000368	0.99998	0.99998	
	Cr+6	s3	0.2	0.0000789			
		s4	0.5	0.0002017			\sim
		s5	1	0.0003975		•	
		s6	2	0.0008028			
ICU 10:49	Crap	Found	The		10.505	10. 20.	\
Calibration verification	CC	5000 0.5075 ng/ml	0.5 nglm 1		101.5%E	101.5%R	
ود ۱۱:49	1.	A 5717)	2201		1-1172/5	3 - 4 - 2 / -	
Calibration verification		0.5217mg/ml	0,319/11		104.3%2	104.3%R	9
Calibration verification							

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

LDC #: 3278246

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

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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:

 $%R = Found \times 100$ True

Where,

Found =

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,

Found = SSR (spiked sample result) - SR (sample result).

True = concentration of each analyte in the source.

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

 $RPD = |S-D| \times 100$

Where,

S =

Original sample concentration

(S+D)/2

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)
LUS	Laboratory control sample	Cr 46	1.06 ng/m/	1.00 ng/n/	106%R	106%R	3
2	Matrix spike sample		(SSR-SR)				
DvQ	Duplicate sample	Crto	0.0324 ng/m³	0.0333 ng/m3	2.74 % 28 0	Z.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#: 32782A6

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

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2nd reviewer:	MC

METHOD: Inorganics, Method See Cover	
Please see qualifications below for all questions answere Y N N/A Have results been reported and calculate Y N N/A Are results within the calibrated range of Y N N/A Are all detection limits below the CRQL?	ed correctly? the instruments?
Compound (analyte) results for	reported with a positive detect were
Concentration = $\left(A - C_0\right) / C_1$	ation: (0.0000207 - (-2.72E-06)
A = 0.0000207 (ng/n1)(4) $C_0 = -2.72E-06$ (mg/n1)(4)	$\frac{0.05817}{0.05817}(10ml) = 0.0273 \text{ rg/m}^{3}$

	0 1000 (007				
#	Sample ID	Analyte	Reported Concentration (Mglv ³)	Calculated Concentration (Neg (us))	Acceptable (Y/N)
		Cr->6	0,0146	0.0145	4
	2		0.0203	0.0203	ì
	3		0.0334	0.0333	
	4		0.0284	0.0283	
	2,		0.0319	0.0319	
	6		0.0223	0.0223	
	7		0.0273	0.0273	
	8		NO	120	
	9	<u> </u>	20	070	
		•			
					1 1

Note:	