

March 13, 2015

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 March 12, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

#### LDC Project #33874:

<u>SDG</u>

#### **Fraction**

503033/5030424/5030924/5031028 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

	194 pages-SF	1 WEE	K TAT						_						Atta	chn	nent	1																					_
	Level IV	L	DC #33	874	4 (E	ERN	٨÷	Mo	rris	svil	le,	NC	; [	Ha	rbo	)r P	oir	nt, I	MD	, H	exa	iva	len	t C	hro	omi	un	ÌМ	oni	tor	ing	<b>J)</b>							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr( (D7	(VI) 614)																· · · · · · ·		Í																
Matr	x: Air/Water/Soil			A	S	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	W	s	w	s	W	S	w	s	w	s
A	503033/5030424/ 5030924/5031028	03/12/15	03/19/15	33	0																																		
							_																													$\square$	$\square$		
				ļ																		<u> </u>	<u> </u>													$\square$	-+		$\square$
				<b> </b>									<u> </u>											<b> </b>												⊢┤	-+		
<u> </u>								-																												┢╼╼╋		]	
<u> </u>																		_					<u> </u>																$\left  - \right $
<u> </u>																																				-	$\dashv$		$\left  - \right $
				-									-									-															$\dashv$		┢──┤
																		_																					
																																				$\square$			$\square$
					<u> </u>																															<b></b>			<b> </b>
<u> </u>				<u> </u>																																	$\dashv$		
				+																																$ \rightarrow $	-+		
						-			<u> </u>															<u> </u>												-	-+	-	
																							<b> </b>													$ \dashv$	$\neg$		
																			-																				
				1																																			
																																				$\square$	$\square$		
				_		<u> </u> '								<u> </u>				<u> </u> '					<u> </u>													⊢┤		·	$\vdash$
						<u> </u>												<u> </u>				<b> </b>	<u> </u>	<u> </u>												$\vdash$		┢━━━┦	<u> </u>
<u> </u>	<u> </u>							<b> </b>		<u> </u>						<b> </b>		<u> </u>					├	<u> </u>												┝──┤	-+		
Total	T/CR			33	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	33

### Laboratory Data Consultants, Inc. Data Validation Report

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

Hexavalent Chromium

Collection Date: March 2 through March 5, 2015

LDC Report Date: March 13, 2015

Matrix:

Parameters:

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5030333/5030424/5030924/5031028

Air

#### Sample Identification

	PAM-1 (03/04/15)
OAM 1 (03/02/15)	PAM-1D (03/04/15)
OAM 2 (03/02/15)	PAM-2 (03/04/15)
PAM-1 (03/02/15)	PAM-3 (03/04/15)
PAM-1D (03/02/15)	PAM-4 (03/04/15)
PAM-2 (03/02/15)	PAM-21 (03/04/15)
PAM-3 (03/02/15)	PAM-31 (03/04/15)
PAM-4 (03/02/15)	PAM-1 (03/05/15)
PAM-21 (03/02/15)	PAM-1D (03/05/15)
PAM-31 (03/02/15)	PAM-3 (03/05/15)
OAM 1 (03/03/15)	PAM-4 (03/05/15)
OAM 2 (03/03/15)	PAM-21 (03/05/15)
PAM-1 (03/03/15)	PAM-31 (03/05/15)
PAM-1D (03/03/15)	PAM-1 (03/02/15)DUP
PAM-2 (03/03/15)	PAM-1D (03/02/15)DUP
PAM-3 (03/03/15)	PAM-1 (03/03/15)DUP
PAM-4 (03/03/15)	PAM-1D (03/03/15)DUP
PAM-21 (03/03/15)	PAM-1 (03/04/15)DUP
PAM-31 (03/03/15)	PAM-1D (03/04/15)DUP
OAM 1 (03/04/15)	PAM-1 (03/05/15)DUP
OAM 2 (03/04/15)	PAM-1D (03/05/15)DUP

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

#### Introduction

This data review covers 41 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 (03/02/15), PAM-31 (03/03/15), PAM-31 (03/04/15), and PAM-31 (03/05/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (03/02/15), PAM-21 (03/03/15), PAM-21 (03/04/15), and PAM-21 (03/05/15) 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 (03/02/15) and PAM-1D (03/02/15), samples PAM-1 (03/03/15) and PAM-1D (03/03/15), samples PAM-1 (03/04/15) and PAM-1D (03/04/15), and samples PAM-1 (03/05/15) and PAM-1D (03/05/15) 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 (03/02/15)	PAM-1D (03/02/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0190	0.0227	18 (≤20)	-	-

	Concentrat	tion (ng/m³)			
Analyte	PAM-1 (03/03/15)	PAM-1D (03/03/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0398	0.0192	70 (≤20)	J (all detects)	А

	Concentrat	tion (ng/m³)				
Analyte	PAM-1 (03/04/15)	PAM-1D (03/04/15)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0924	0.0768	18 (≤20)	-	-	

	Concentrat	ion (ng/m³)				
Analyte	PAM-1 (03/05/15)	PAM-1D (03/05/15)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.114	0.127	11 (≤20)	_	-	

#### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 5030333/5030424/5030924/5031028

SDG	Sample	Analyte	Flag	A or P	Reason
5030333/ 5030424/ 5030924/ 5031028	OAM 2 (03/03/15) PAM-1 (03/03/15) PAM-1D (03/03/15) PAM-3 (03/03/15) PAM-4 (03/03/15)	Hexavalent chromium	J (all detects)	A	Field duplicates (RPD)

#### Harbor Point, MD, Hexavalent Chromium Monitoring

Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 5030333/5030424/5030924/5031028

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 5030333/5030424/5030924/5031028

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

SDG #: <u>5030333/5030424/5030924/5031028</u> Laboratory: <u>Eastern Research Group</u> Date: 31215 Page: 1 of 2 Reviewer: 55 2nd Reviewer: 0

53

#### METHOD: (Analyte) 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
١.	Sample receipt/Technical holding times	A	03/02-05/15
П	Initial calibration	A	
Ш.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(1)(23)(32) TB=(9)(8/21)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUR
VIII.	Laboratory control samples	A	LUSID
IX.	Field duplicates	SW	FD=(3.4)(12,13)(21,22)(28,29)
Х.	Sample result verification	A	
xı	Overall assessment of data	A	

Note: A = A

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 SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (03/02/15)	5030333-19	Air	03/02/15
2	OAM 2 (03/02/15)	5030333-20	Air	03/02/15
3	PAM-1 (03/02/15)	5030333-21	Air	03/02/15
4	PAM-1D (03/02/15)	5030333-22	Air	03/02/15
5	PAM-2 (03/02/15)	5030333-23	Air	03/02/15
6	PAM-3 (03/02/15)	5030333-24	Air	03/02/15
7	PAM-4 (03/02/15)	5030333-25	Air	03/02/15
8	PAM-21 (03/02/15)	5030333-26	Air	03/02/15
9	PAM-31 (03/02/15)	5030333-27	Air	03/02/15
10	OAM 1 (03/03/15)	5030424-01	Air	03/03/15
11	OAM 2 (03/03/15)	5030424-02	Air	03/03/15
12	PAM-1 (03/03/15)	5030424-03	Air	03/03/15
13	PAM-1D (03/03/15)	5030424-04	Air	03/03/15
14	PAM-2 (03/03/15)	5030424-05	Air	03/03/15
15	PAM-3 (03/03/15)	5030424-06	Air	03/03/15
16	PAM-4 (03/03/15)	5030424-07	Air	03/03/15
17	PAM-21 (03/03/15)	5030424-08	Air	03/03/15

LDC #: <u>33</u>	8874A6	ALIDATION COMPLETENESS WORKSHEET	

SDG #: <u>5030333/5030424/5030924/5031028</u> Laboratory: <u>Eastern Research Group</u> Level IV



METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (03/03/15)	5030424-09	Air	03/03/15
19	OAM 1 (03/04/15)	5030924-01	Air	03/04/15
20	OAM 2 (03/04/15)	5030924-02	Air	03/04/15
21	PAM-1 (03/04/15)	5030924-03	Air	03/04/15
22	PAM-1D (03/04/15)	5030924-04	Air	03/04/15
23	PAM-2 (03/04/15)	5030924-05	Air	03/04/15
24	PAM-3 (03/04/15)	5030924-06	Air	03/04/15
25	PAM-4 (03/04/15)	5030924-07	Air	03/04/15
26	PAM-21 (03/04/15)	5030924-08	Air	03/04/15
27	PAM-31 (03/04/15)	5030924-09	Air	03/04/15
28	PAM-1 (03/05/15)	5031028-03	Air	03/05/15
29	PAM-1D (03/05/15)	5031028-04	Air	03/05/15
30	PAM-3 (03/05/15)	5031028-06	Air	03/05/15
31	PAM-4 (03/05/15)	5031028-07	Air	03/05/15
32	PAM-21 (03/05/15)	5031028-08	Air	03/05/15
33	PAM-31 (03/05/15)	5031028-09	Air	03/05/15
34	PAM-1 (03/02/15)DUP	5030333-21DUP	Air	03/02/15
35	PAM-1D (03/02/15)DUP	5030333-22DUP	Air	03/02/15
36	PAM-1 (03/03/15)DUP	5030424-03DUP	Air	03/03/15
37	PAM-1D (03/03/15)DUP	5030424-04DUP	Air	03/03/15
38	PAM-1 (03/04/15)DUP	5030924-03DUP	Air	03/04/15
39	PAM-1D (03/04/15)DUP	5030924-04DUP	Air	03/04/15
40	PAM-1 (03/05/15)DUP	5031028-03DUP	Air	03/05/15
41	PAM-1D (03/05/15)DUP	5031028-04DUP	Air	03/05/15
42				
43				
44				
45				
46				
Note	Si			



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?	1			
Were all initial and continuing calibration verification %Rs within the 9 <del>0-110</del> % QC limits?	1			
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?	/	<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?				
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	
Were the performance evaluation (PE) samples within the acceptance limits?				

LDC #: 33874

#### 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?	/								
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>33874A6</u>

#### VALIDATION FINDINGS WORKSHEET Field Duplicates



Inorganics: Method See Cover

	Concentrati	Concentration (ng/m3)			
Analyte	3	4	RPD (≤20)	Qual.	
Hexavalent Chromium	0.0190	0.0227	18		

	Concentration (ng/m3)			*	
Analyte	12	13	RPD (≤20)	Qual. (11-10)	11-13,15,16
Hexavalent Chromium	0.0398	0.0192	70	Jdet/A (det)	

	Concentrati			
Analyte	21	22	RPD (≤20)	Qual.
Hexavalent Chromium	0.0924	0.0768	18	

	Concentrati			
Analyte	28	29	RPD (≤20)	Qual.
Hexavalent Chromium	0.114	0.127	11	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\33874A6.wpd

\*audify all samples on same day that are 75× MDL

LDC #: 33874A6

#### Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:  $\land$  of  $\land$ Reviewer: 35 2nd Reviewer:

Method: Inorganics, Method <u>See Cover</u>

The correlation coefficient (r) for the calibration of G was recalculated.Calibration date: 31115

Where,

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

%R = Found X 100

True

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 <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0000284			
		s2	0.1	0.0000671	0.99996	0.99996	
		s3	0.2	0.0001424			L
		s4	0.5	0.0003674	-		$\square$
		s5	1	0.0007291			
		s6	2	0.001493			
ろこし Calibration verification	6-20	Found D. 5258 not	True O. Svajimi		105.2%.R	405.2%.R	Y Y
Calibration verification	04	0-5263nglui	0.5 ngh1		105.39,2	-103:4%.2	- 7*
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.\_\_\_\_\_\_

\* Pourding

IDC # 33874A6

#### VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

	Page:	$\sqrt{of}$
	Reviewer:	50
2nd	Reviewer:	9
	-	

METHOD: Inorganics, Method Sec. Cover

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

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

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:

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

S = D = Original sample concentration Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated // RPD	<u> </u>	Acceptable (Y/N)
LCS 11.09	Laboratory control sample	G+10	1-11 mg/ml	1.00 ng/m	11105E	111%2	У
N	Matrix spike sample		(SSR-SR)				
DUR	Duplicate sample		0,0180rg/m3	0-DAOnglus	5.41% PPD	S-85%87	y*

Comments:	*Rounding		 	
		\	 	

LDC #: 33874A6

#### VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: Reviewe 2nd reviewer

TXER METHOD: Inorganics, Method

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

-10

Have results been reported and calculated correctly?



Are results within the calibrated range of the instruments?

Are all detection limits below the CRQL?

\_reported with a positive detect were

Compound (analyte) results for <u>(2)</u> <u>(2)</u>

	ie following equation.			
oncentration = $(A - c_3)$ $(c_1)$	$Vf = (2 - )^{\text{Recalculation:}}$	0.0000154-6-9-	345-6) _ (	), (132)
P210000.0=A	$m^2 = 21.12$	0.00074	م - ر	
(0= -9,36E-6	(nglim )(ot)	(0.033 malm1)(10	(m	
C = 0.000749	m3	ZIJZH	3	).0152
# Sample ID	Analvte	Reported Concentration (۲۷۵۱سک)	Calculated Concentration	Acceptable (Y/N)
<u> </u>	Crtb	0.0169	0099	U
2		0.0157	Darsz	
3		0.050	0.090	
4		0.0227	0.0227	Ŷ
2		0.0259	0.0208	yx
6		0.0149	0.0150	4×
<u> </u>		0.0262	0.0262	ÿ
8		NO	ND	1
9		NO	ND	
10		0.0169	0.0169	
\\		0.0282	0.0282	Ý
12		0.0358	0.0397	yx
13		0.0192	0.0192	3
14		P1810.0	0.0184	
		0.0231	0.0231	
16		0.0242	0.0242	<b> </b>
<u> </u>		NO	NO	
18	· · · · · · · · · · · · · · · · · · ·	<u></u>	NO	
		0.0574	0.0574	<i>,</i>
1 7.5	ý.	10.0877	10.057.1	Y

LDC #	# <u>33814</u> ASS	VALIDATION FINDINGS V Sample Calculation Ve	<b>WORKSHEET</b> erification	Pa Revie 2nd review	ge:of wer: wer:
Pleas Y N Y N Y N Comp recalc	e see qualifications belo N/A Have results wing N/A Are results wing N/A Are all detections bound (analyte) results for resulted and verified using N/A Are all detections	w for all questions answered "N". Not appeen reported and calculated correctly? ithin the calibrated range of the instrume ion limits below the CRQL? or $23$ C $4$ $8$ g the following equation:	pplicable questions ar ents? rep	re identified as "N/ orted with a positi	A''. ve detect were
Concer	A = 0.1595073 $C = 9.59 = -03$	(ng]m! X(f) = (0.21)	7766611 1013-6-9,5 1013-6-11 1013-11)(10-11)	$\frac{1}{2} = 0.098$	-0.2177 ngi 5 naim3
	$C_1 = 0.7166611$		22.11m3		
#	Sample ID	Analyte	Reported Concentration (পর্ব্যক্র)	Calculated Concentration ( \vv2)	Acceptable (Y/N)
	21	$\int s^{\pm i\rho}$	0.0924	00924	Y
	22		0.076	00767	
	23		0.0985	0.0985	्र
	24		0.0890	00890	<u> </u>
	25		0.0005	Drass	
	25		100933	100133	
	27		ND	ND	
	28				
	79		0.174	0.07	
	20		Doora	10000	
	21			Out	4.7
	27			NO.	2
	22				
		¥			
					<b> </b>
				<u> </u>	
Note:	* Provindai	No.			

# ERG

## CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc				FILE #: 3926.00					
75 Valley Stream Parkway, Suite 400					REPORTED: 03/12/15 14:53				
Malvern, PA 19355					SUBMITT	ED: 03/03/15	to 03/10/15		
ATTN: Mr. Jeff Boggs						AQS SITE CODE:			
PHONE: (443) 8	03-8495 <b>FAX:</b> (4	410) 266-8912			SITE COD	DE:	Honeywell Hex Chrome Study		
Description:	OAM 1	La	ab ID:	5030333-19			Sampled: 03/02/15 14:41		
Matrix:	Air	Sa	ample Volu	i <b>me:</b> 21.64	4 m³		Received: 03/03/15 10:58		
Comments:	Start Time 3/1/15 14:3	8					Analysis Date: 03/11/15 13:30		
		Hexav	valent Chr	romium by S	OP ERG-M	IOR-063			
			<u>R</u>	<u>lesults</u>		MDL			
<u>Analyte</u>		CAS Number	ng	<u>ı/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99		0.0199		0.0038			

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc				FILE #:	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORT	REPORTED: 03/12/15 14:53			
Malvern, PA 19355				SUBMIT	SUBMITTED: 03/03/15 to 03/10/15			
ATTN: Mr. Jeff Boggs					AQS SITE CODE:			
PHONE: (443) 8	03-8495 FAX:	(410) 266-8912		SITE CO	DE:	Honeywell Hex Chrome Study		
Description:	OAM 2	L	ab ID: 5030333	-20		Sampled: 03/02/15 15:02		
Matrix:	Air	S	ample Volume:	21.72 m <sup>3</sup>	1	Received: 03/03/15 10:58		
Comments:	Start Time 3/1/15 14	:53				Analysis Date: 03/11/15 13:40		
· · · · ·		Hexa	valent Chromium	by SOP ERG-	MOR-063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0152		0.0038			

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORT	REPORTED: 03/12/15 14:53			
Malvern, PA 19355				SUBMIT	SUBMITTED: 03/03/15 to 03/10/15			
ATTN: Mr. Jeff Boggs					AQS SITE CODE:			
PHONE: (443) 8	03-8495 FAX:	(410) 266-8912		SITE CO	DE:	Honeywell Hex Chrome Study		
Description:	PAM-1		Lab ID: 5030333	3-21		Sampled: 03/02/15 16:07		
Matrix:	Air	:	Sample Volume:	22.05 m	3	Received: 03/03/15 10:58		
Comments:	Col 1 Start Time 3/1/	15 15:37				Analysis Date: 03/11/15 12:00		
		Hex	avalent Chromium	n by SOP ERG-	MOR-063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>r ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0190		0.0038			

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORTED:	REPORTED: 03/12/15 14:53			
Malvern, PA 19355				SUBMITTED:	SUBMITTED: 03/03/15 to 03/10/15			
ATTN: Mr. Jeff B		AQS SITE CODE:						
PHONE: (443) 8	03-8495 FAX: (41	0) 266-8912		SITE CODE:	н	oneywell Hex Chrome Study		
Description:	PAM-1D	Lab ID:	5030333-22			Sampled: 03/02/15 16:08		
Matrix:	Air	Sample V	<b>'olume:</b> 22.0	)8 m³		Received: 03/03/15 10:58		
Comments:	Col 2 Start Time 3/1/15 1	.5:36				Analysis Date: 03/11/15 12:20		
		Hexavalent	Chromium by S	OP ERG-MOR	L-063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium	I	1854-02-99	0.0227		0.0038			

MAR 1 3 2015

a strange of a support of Ballingian and Ballingian

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORTED	REPORTED: 03/12/15 14:53			
Malvern, PA 19355				SUBMITTE	SUBMITTED: 03/03/15 to 03/10/15			
ATTN: Mr. Jeff Boggs					AQS SITE CODE:			
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	)) 266-8912		SITE CODE	<b>:</b> I	Honeywell Hex Chrome Study		
Description:	PAM-2	Lab ID:	5030333-23			Sampled: 03/02/15 15:41		
Matrix:	Air	Sample	Volume: 21.	82 m³		Received: 03/03/15 10:58		
Comments:	Start Time 3/1/15 15:27					Analysis Date: 03/11/15 14:10		
		Hexavalent	Chromium by S	SOP ERG-MC	DR-063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0209		0.0038			

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc				FILE #:	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPORT	REPORTED: 03/12/15 14:53			
Malvern, PA 19355					SUBMITTED: 03/03/15 to 03/10/15			
ATTN: Mr. Jeff Boggs					AQS SITE CODE:			
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	)) 266-8912		SITE CO	DE:	Honeywell Hex Chrome Study		
Description:	PAM-3	Lab II	<b>):</b> 5030333-:	24		Sampled: 03/02/15 15:34		
Matrix:	Air	Sampl	le Volume:	21.83 m <sup>3</sup>		Received: 03/03/15 10:58		
Comments:	Start Time 3/1/15 15:19			_		Analysis Date: 03/11/15 14:20		
		Hexavale	nt Chromium	by SOP ERG-N	MOR-063			
			<u>Results</u>		<u>MDL</u>			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0149		0.0038			

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc				FILE a	FILE #: 3926.00			
75 Valley Stream	75 Valley Stream Parkway, Suite 400				REPORTED: 03/12/15 14:53			
Malvern, PA 19355				SUBN	ITTED:	03/03/15	to 03/10/15	
ATTN: Mr. Jeff Boggs					AQS SITE CODE:			
PHONE: (443)	803-8495 FAX	(+ (410) 266-8912		SITE	ODE:		Honeywell Hex Chrome Study	
Description:	PAM-4		Lab ID: 503033	33-25			Sampled: 03/02/15 15:18	
Matrix:	Air		Sample Volume:	21.75	m³		Received: 03/03/15 10:58	
Comments:	Start Time 3/1/15	15:08					Analysis Date: 03/11/15 14:30	
		He	xavalent Chromiu	m by SOP ER	G-MOR	-063		
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Numbe	er <u>ng/m³ A</u>	<u>ir Fla</u>	a	<u>ng/m³ Air</u>		

0.0262

Hexavalent Chromium

1854-02-99

0.0038

a shele sheered

MAR 1 3 2015

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 39

# ERG

### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc					ł	FILE #: 3926.00			
75 Valley Stream	75 Valley Stream Parkway, Suite 400					REPORTED: 03/12/15 14:53			
Malvern, PA 19355					5	SUBMITTED: 03/03/15 to 03/10/15			to 03/10/15
ATTN: Mr. Jeff Boggs						AQS SITE CODE:			
PHONE: (443)	803-8495 FAX:	(410) 266-8912			5		DE:		Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID:	5030333	-26				Sampled: 03/02/15 00:00
Matrix:	Air		Sample Vo	lume:	21.82	m³			Received: 03/03/15 10:58
Comments:									Analysis Date: 03/11/15 14:40
		He	xavalent C	hromium	by SO	P ERG-N	MOR-06	3	
				<u>Results</u>				MDL	
<u>Analyte</u>		CAS Number	er i	ng/m³ Air		Flag	<u>r</u>	ng/m³ Air	
Hexavalent Chromium		1854-02-99		ND		U		0.0038	

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc	FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400		REPORTED: 03/12/15 14:53			
Malvern, PA 19355		SUBMITTED: 03/03/15 to 03/10/15			
ATTN: Mr. Jeff Boggs		AQS SITE CODE:			
<b>PHONE:</b> (443) 803-8495 <b>FAX:</b> (410) 266-8912		SITE CODE: Honeywell Hex Chrome Study			
Description: PAM-31	Lab ID: 5030333-27	Sampled: 03/02/15 00:00			
Matrix: Air	Sample Volume: 21.8	3 m <sup>3</sup> Received: 03/03/15 10:58			
Comments:		Analysis Date: 03/11/15 14:50			
He	exavalent Chromium by S	OP ERG-MOR-063			
	<u>Results</u>	MDL			
Analyte CAS Numb	er ng/m³ Air	<u>Flag ng/m³ Air</u>			

Analyte	CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>nq/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038
		,		

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Res	:	FILE #: 3926.00						
75 Valley Stream F	75 Valley Stream Parkway, Suite 400				REPORTED: 03/12/15 14:53			
Malvern, PA 19355				SUBMITTED: 03/03/15 to 03/10/15				
ATTN: Mr. Jeff Bo			AQS SITE CODE:					
PHONE: (443) 8	03-8495 FAX: (410)	266-8912		SITE CODE:	H	loneywell Hex Chrome Study		
Description:	OAM 1	Lab ID:	5030424-01			Sampled: 03/03/15 14:12		
Matrix:	Air	Sample V	<b>'olume:</b> 21.1	2 m <sup>3</sup>		Received: 03/04/15 12:13		
Comments:	Start Time 3/2/15 14:44					Analysis Date: 03/11/15 15:00		
		Hexavalent	Chromium by S	OP ERG-MOR	-063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0169		0.0038			

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400					REPORTED: 03/12/15 14:53				
Malvern, PA 19355					SUBMITTED: 03/03/15 to 03/10/15				
ATTN: Mr. Jeff Boggs						AQS SITE CODE:			
PHONE: (443) 8	803-8495 <b>FAX:</b> (41	0) 266-8912		s		Ε:	Honeywell Hex Chrome Study		
Description:	OAM 2	Lab ID:	5030424	-02			Sampled: 03/03/15 14:29		
Matrix:	Air	Sample	Volume:	21.07	m³		Received: 03/04/15 12:13		
Comments:	Start Time 3/2/15 15:04						Analysis Date: 03/11/15 15:09		
		Hexavalent	t Chromium	by SOF	P ERG-M	OR-063			
			<u>Results</u>			MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	:	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium	1	1854-02-99	0.0282	•		0.0038			

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Res	sources Management, I	nc		FILE #:	3926.00			
75 Valley Stream Parkway, Suite 400				REPORT	REPORTED: 03/12/15 14:53			
Malvern, PA 19355				SUBMIT	SUBMITTED: 03/03/15 to 03/10/15			
ATTN: Mr. Jeff Boggs AQS SITE C								
PHONE: (443) 8	603-8495 FAX: (41	10) 266-8912		SITE CO	DE:	Honeywell Hex Chrome Study		
Description:	PAM-1	Lab	ID: 5030424-	-03		Sampled: 03/03/15 15:35		
Matrix:	Air	San	nple Volume:	21.08 m <sup>3</sup>	5	Received: 03/04/15 12:13		
Comments:	Col 1 Start Time 3/2/15	16:10				Analysis Date: 03/11/15 12:39		
		Hexava	alent Chromium	by SOP ERG-	MOR-063			
			<u>Results</u>		<u>MDL</u>			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0398	-	0.0038			

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc				FILE	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPO	REPORTED: 03/12/15 14:53			
Malvern, PA 19355				SUB	SUBMITTED: 03/03/15 to 03/10/15			
ATTN: Mr. Jeff Boggs					AQS SITE CODE:			
PHONE: (443) 803-8495 FAX: (410) 266-8912				SITE	SITE CODE: Honeywell Hex Chrome Study			
Description:	PAM-1D	Lab ID:	5030424-	04			Sampled: 03/03/15 15:37	
Matrix:	Air	Sample	Volume:	21.07	m³		Received: 03/04/15 12:13	
Comments:	Col 2 Start Time 3/2/15 1	6:12					Analysis Date: 03/11/15 12:59	
Hexavalent Chromium by SOP ERG-MOR-063								
			<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Fla</u>	g	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0192 5	•		0.0038		

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc				FILE	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400				REPO	REPORTED: 03/12/15 14:53			
Malvern, PA 19355				SUBM	SUBMITTED: 03/03/15 to 03/10/15			
ATTN: Mr. Jeff B	oggs			AQS	AQS SITE CODE:			
PHONE: (443) 803-8495 FAX: (410) 266-8912				SITE	SITE CODE: Honeywell Hex Chrome Study			
Description:	PAM-2	Lab II	<b>D:</b> 5030424-	-05			Sampled: 03/03/15 15:21	
Matrix:	Air	Samp	le Volume:	21.25	m³		Received: 03/04/15 12:13	
Comments:	Start Time 3/2/15 15:45						Analysis Date: 03/11/15 15:19	
		Hexavale	nt Chromium	by SOP ER	G-MOR	-063		
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Fla</u>	g	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0184			0.0038		

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Res	:	FILE #: 3926.00						
75 Valley Stream Parkway, Suite 400				REPORTED:	REPORTED: 03/12/15 14:53			
Malvern, PA 19355				SUBMITTED: 03/03/15 to 03/10/15				
ATTN: Mr. Jeff Be	oggs			AQS SITE CODE:				
PHONE: (443) 8	03-8495 <b>FAX:</b> (410)	266-8912		SITE CODE:	Hone	ywell Hex Chrome Study		
Description:	PAM-3	Lab ID:	5030424-06			Sampled: 03/03/15 15:12		
Matrix:	Air	Sample V	<b>'olume:</b> 21.23	3 m³		Received: 03/04/15 12:13		
Comments:	Start Time 3/2/15 15:37				Anal	ysis Date: 03/11/15 15:29		
Hexavalent Chromium by SOP ERG-MOR-063								
			<u>Results</u>		MDL			
Analyte		CAS Number	ng/m³ Air	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0231 5		0.0038			

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Res	C	FILE #: 3926.00					
75 Valley Stream F	75 Valley Stream Parkway, Suite 400				03/12/15 14:53		
Malvern, PA 19355				SUBMITTED: 03/03/15 to 03/10/15			
ATTN: Mr. Jeff Boggs AQS SITE CODE:							
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	Hone	ywell Hex Chrome Study	
Description:	PAM-4	Lab ID:	5030424-07			Sampled: 03/03/15 14:43	
Matrix:	Air	Sample \	<b>/olume:</b> 21.0	)2 m³		Received: 03/04/15 12:13	
Comments:	Start Time 3/2/15 15:22				Ana	lysis Date: 03/11/15 15:39	
		Hexavalent	Chromium by S	OP ERG-MOR-	063		
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0242 5		0.0038		

MAR 1 3 2015

Initials: CR

Eastern Research Group



Analyte CAS Num	per ng/m³ Air	Flag ng/m³ Air					
Hexavalent Chromium by SOP ERG-MOR-063 Results MDL							
Comments:		Analysis Date: 03/11/15 16:09					
Matrix: Air	Sample Volume: 21.25	m <sup>3</sup> <b>Received:</b> 03/04/15 12:13					
Description: PAM-21	Lab ID: 5030424-08	Sampled: 03/03/15 00:00					
PHONE: (443) 803-8495 FAX: (410) 266-8912	SIT	E CODE: Honeywell Hex Chrome Study					
ATTN: Mr. Jeff Boggs AQS SITE CODE:							
Malvern, PA 19355	SU	SUBMITTED: 03/03/15 to 03/10/15					
75 Valley Stream Parkway, Suite 400	RE	PORTED: 03/12/15 14:53					
Environmental Resources Management, Inc	FIL	<b>E #:</b> 3926.00					

AnalyteCAS Numberng/m³ AirFlagHexavalent Chromium1854-02-99NDU

MAR 1 3 2015

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.

0.0038



Environmental Resources Management, Inc		FILE #: 3926.00					
75 Valley Stream Parkway, Suite 400		<b>REPORTED:</b> 03/12/15 14:53					
Malvern, PA 19355	SUBMITTED: 03/03/15 to 03/10/15						
ATTN: Mr. Jeff Boggs AQS SITE CODE:							
PHONE: (443) 803-8495 FAX: (410) 266-8912		SITE CODE: Honeywell Hex Chrome Study					
Description: PAM-31	Lab ID: 5030424-09	Sampled: 03/03/15 00:00					
Matrix: Air	Sample Volume: 21.2	3 m <sup>3</sup> <b>Received:</b> 03/04/15 12:13					
Comments:		Analysis Date: 03/11/15 16:19					
Hexavalent Chromium by SOP ERG-MOR-063 Results MDL							

Analyte	CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Re	esources Manageme	nt, Inc			FILE #:	3926.00	
75 Valley Stream	Parkway, Suite 400				REPORT	ED: 03/12/15 1	4:53
Malvern, PA 19355				SUBMITTED: 03/03/15 to 03/10/15			
ATTN: Mr. Jeff Boggs AQS SIT				S SITE CODE:			
PHONE: (443) 8	803-8495 <b>FAX:</b>	(410) 266-8912			SITE CO	DE:	Honeywell Hex Chrome Study
Description:	OAM 1		Lab ID: 5	030924-01			Sampled: 03/04/15 14:45
Matrix:	Air		Sample Volum	ne: 22.0	5 m³		Received: 03/09/15 11:48
Comments:	Start Time 3/3/15 14	ł:15					Analysis Date: 03/11/15 14:41
Hexavalent Chromium by SOP ERG-MOR-063							
			Re	<u>sults</u>		MDL	
<u>Analyte</u>		CAS Number	<u>r ng/</u>	<u>m³ Air</u>	<u>Flag</u>	<u>ng/m³ Ai</u>	<u>r</u>

0.0574

**Hexavalent Chromium** 

1854-02-99

<u>Flag</u>

<u>ng/m³ Air</u> 0.0038

MAR 1 3 2015

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 22 of 39



Environmental Res	sources Management, In	c		FILE	<b>#:</b> 3926	6.00		
75 Valley Stream F	Parkway, Suite 400			REPO	RTED:	03/12/15 14:53	3	
Malvern, PA 19355				SUBM	SUBMITTED: 03/03/15 to 03/10/15			
ATTN: Mr. Jeff B	oggs			AQS	AQS SITE CODE:			
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	)) 266-8912		SITE	CODE:	Не	oneywell Hex Chrome Study	
Description:	OAM 2	La	ab ID: 5030924-	02			Sampled: 03/04/15 15:08	
Matrix:	Air	Sa	ample Volume:	22.15	m³		Received: 03/09/15 11:48	
Comments:	Start Time 3/3/15 14:32					A	nalysis Date: 03/11/15 14:52	
Hexavalent Chromium by SOP ERG-MOR-063								
			<u>Results</u>			MDL		
Analyte		CAS Number	<u>ng/m³ Air</u>	<u>Fia</u>	g	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0877			0.0038		

MAR 1 3 2015

Initials: CR

Eastern Research Group
# **NERG**

# CERTIFICATE OF ANALYSIS

Environmental Res	Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400					REPORTED: 03/12/15 14:53				
Malvern, PA 19355						SUBMITTED: 03/03/15 to 03/10/15				
ATTN: Mr. Jeff Boggs							AQS SITE CODE:			
PHONE: (443) 8	03-8495 <b>FAX:</b> (	410) 266-8912				SITE COD	DE:	Honeywell Hex Chrome Study		
Description:	PAM-1		Lab ID:	5030924-	·03			Sampled: 03/04/15 16:18		
Matrix:	Air		Sample Vo	lume:	22.19	m³		Received: 03/09/15 11:48		
Comments:	Col 1 Start Time 3/3/1	5 15:39						Analysis Date: 03/11/15 13:15		
		Hex	avalent C	hromium	by SO	P ERG-M	10R-063			
				<u>Results</u>			MDL			
<u>Analyte</u>		CAS Numbe	r I	ng/m³ Air		<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium	I	1854-02-99		0.0924			0.0038			

MAR 1 3 2015

Initials: CR

Eastern Research Group

# **NERG**

# CERTIFICATE OF ANALYSIS

Environmental Re	sources Management, Inc			FILE #: 3926.00						
75 Valley Stream	Parkway, Suite 400			REPORTED	<b>D:</b> 03/12/15 14:53					
Malvern, PA 19355					<b>D:</b> 03/03/15 to 03/10/15					
ATTN: Mr. Jeff Boggs AQS SITE CODE:										
PHONE: (443) 8	<b>FAX:</b> (410) 266-8912			SITE CODE	Honeywell Hex Chrome Study					
Description:	PAM-1D	Lab ID: 50	30924-04		Sampled: 03/04/15 16:20					
Matrix:	Air	Sample Volume	22.2	m³	Received: 03/09/15 11:48					
Comments:	Col 2 Start Time 3/3/15 15:40				Analysis Date: 03/11/15 13:45					
	Hexavalent Chromium by SOP ERG-MOR-063									
		Res	ults		MDL					

		INCOULCO		<u></u>
Analyte	CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	0.0768		0.0038

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Res	sources Management, Ind	<b>c</b>	FILE #: 392	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400			REPORTED:	REPORTED: 03/12/15 14:53			
Malvern, PA 19355	5		SUBMITTED:	SUBMITTED: 03/03/15 to 03/10/15				
ATTN: Mr. Jeff Bo	oggs		AQS SITE CO	AQS SITE CODE:				
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	F	Ioneywell Hex Chrome Study		
Description:	PAM-2	Lab ID:	5030924-05			Sampled: 03/04/15 15:59		
Matrix:	Air	Sample	Volume: 22.3	11 m³		Received: 03/09/15 11:48		
Comments:	Start Time 3/3/15 15:25					Analysis Date: 03/11/15 15:24		
		Hexavalent	Chromium by S	SOP ERG-MOR	-063			
			<u>Results</u>		MDL			
Analyte		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>nq/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0985		0.0038			

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Res	sources Management, Ind	2	FILE #: 3	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400			REPORTED	REPORTED: 03/12/15 14:53			
Malvern, PA 1935	5		SUBMITTE	SUBMITTED: 03/03/15 to 03/10/15				
ATTN: Mr. Jeff B	oggs		AQS SITE CODE:					
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE	i: I	Honeywell Hex Chrome Study		
Description:	PAM-3	Lab ID:	5030924-06			Sampled: 03/04/15 15:46		
Matrix:	Air	Sample \	<b>/olume:</b> 22.0	07 m³		Received: 03/09/15 11:48		
Comments:	Start Time 3/3/15 15:15					Analysis Date: 03/11/15 15:35		
		Hexavalent	Chromium by S	SOP ERG-MC	DR-063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0890		0.0038			

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Res	sources Management, In	IC	FILE #: 3	FILE #: 3926.00				
75 Valley Stream F	<sup>D</sup> arkway, Suite 400			REPORTED	REPORTED: 03/12/15 14:53			
Malvern, PA 1935	5		SUBMITTE	SUBMITTED: 03/03/15 to 03/10/15				
ATTN: Mr. Jeff B	oggs		AQS SITE (	CODE:				
PHONE: (443) 8	03-8495 FAX: (410	0) 266-8912		SITE CODE	i: I	Honeywell Hex Chrome Study		
Description:	PAM-4	Lab ID:	5030924-07			Sampled: 03/04/15 15:31		
Matrix:	Air	Sample	Volume: 22.	26 m³		Received: 03/09/15 11:48		
Comments:	Start Time 3/3/15 14:47					Analysis Date: 03/11/15 15:46		
		Hexavalen	t Chromium by	SOP ERG-MC	DR-063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0955		0.0038			

### MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc							FILE #: 3926.00			
75 Valley Stream	n Parkway, Su	ite 400					REPORTED: 03/12/15 14:53			
Malvern, PA 19355						SUBMITTED: 03/03/15 to 03/10/15				
ATTN: Mr. Jeff Boggs							AQS SITE CODE:			
<b>PHONE:</b> (443)	803-8495	FAX:	(410) 266-8912				SITE CODE	:	Honeywell Hex Chrome Study	
Description:	PAM-21			Lab ID:	5030924	-08			Sampled: 03/04/15 00:00	
Matrix:	Air			Sample Vo	olume:	22.11	m³		Received: 03/09/15 11:48	
Comments:									Analysis Date: 03/11/15 15:56	
			He	xavalent C	hromium	by SO	P ERG-MC	DR-063		
	1				<u>Results</u>			MDL		
<u>Analyte</u>			CAS Numbe	er .	<u>ng/m³ Air</u>		<u>Flag</u>	ng/m³ Air		
Hexavalent Chromium			1854-02-99		ND		U	0.0038		

MAR 1 3 2015

Initials: CR

Eastern Research Group



Analyte			CAS Numb	er na/m³Ai	r	Flag		na/m³ Air		
				<u>Results</u>	-			<u>MDL</u>		
			Не	xavalent Chromiun	n by SO	PERG-N	40R-0	63		
Comments:									Analysis Date: 03/11/15 16:31	
Matrix:	Air			Sample Volume:	22.07	m³			Received: 03/09/15 11:48	
Description:	PAM-31			Lab ID: 503092	4-09				Sampled: 03/04/15 00:00	
PHONE: (443)	803-8495	FAX:	(410) 266-8912		5		DE:		Honeywell Hex Chrome Study	
ATTN: Mr. Jeff	Boggs						ECODE	:		
Malvern, PA 19355						SUBMITTED: 03/03/15 to 03/10/15				
75 Valley Stream Parkway, Suite 400						REPORTED: 03/12/15 14:53				
Environmental Resources Management, Inc					F	FILE #: 3926.00				

AnalyteCAS Numberng/m³ AirFlagng/m³ AiHexavalent Chromium1854-02-99NDU0.0038

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Res	sources Management, In	с	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400			REPORTED: 03/12/15 14:53			
Malvern, PA 19355	5		SUBMITTED: 03/03/15 to 03/10/15				
ATTN: Mr. Jeff Be	oggs		AQS SITE CODE:				
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	)) 266-8912		SITE CODE:	:	Honeywell Hex Chrome Study	
Description:	PAM-1	Lab ID:	5031028-03			Sampled: 03/05/15 15:47	
Matrix:	Air	Sample V	<b>/olume:</b> 21.0	)8 m³		Received: 03/10/15 11:23	
Comments:	Col 1 Start Time 3/4/15 1	6:21				Analysis Date: 03/11/15 14:04	
		Hexavalent	Chromium by S	OP ERG-MO	R-063		
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.114		0.0038		

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Res	sources Management, In	c	FILE #: 3926.00				
75 Valley Stream I	<sup>⊃</sup> arkway, Suite 400			REPORTED: 03/12/15 14:53			
Malvern, PA 1935	5		SUBMITTED: 03/03/15 to 03/10/15				
ATTN: Mr. Jeff B	oggs		AQS SITE CODE:				
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	)) 266-8912		SITE CODE:	ł	Ioneywell Hex Chrome Study	
Description:	PAM-1D	Lab ID:	5031028-04			Sampled: 03/05/15 15:49	
Matrix:	Air	Sample \	/olume: 21.0	08 m³		Received: 03/10/15 11:23	
Comments:	Col 2 Start Time 3/4/15 1	6:24				Analysis Date: 03/11/15 14:22	
		Hexavalent	Chromium by S	SOP ERG-MOR-	063		
			<u>Results</u>		<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.127		0.0038		

0.127

1854-02-99

MAR 1 3 2015

Initials: CR

Eastern Research Group

0.0038



Environmental Res	sources Management, In	c	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400			REPORTED: 03/12/15 14:53			
Malvern, PA 19355	5		SUBMITTED: 03/03/15 to 03/10/15				
ATTN: Mr. Jeff Bo	oggs			AQS SITE CODE:			
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	Н	oneywell Hex Chrome Study	
Description:	PAM-3	Lab ID:	5031028-06			Sampled: 03/05/15 15:21	
Matrix:	Air	Sample V	/olume: 21.1	1 m³		Received: 03/10/15 11:23	
Comments:	Start Time 3/4/15 15:54					Analysis Date: 03/11/15 16:18	
		Hexavalent	Chromium by S	OP ERG-MOR-	063		
			<u>Results</u>		<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>nq/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0859		0.0038		

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Res	Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream	Parkway, Suite 400			RE	REPORTED: 03/12/15 14:53					
Malvern, PA 1935		SU	SUBMITTED: 03/03/15 to 03/10/15							
ATTN: Mr. Jeff B		AC	AQS SITE CODE:							
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	)) 266-8912		SIT	TE CODE:		Honeywell Hex Chrome Study			
Description:	PAM-4	Lab ID	<b>5031028</b>	-07			Sampled: 03/05/15 15:06			
Matrix:	Air	Sample	e Volume:	21.18	m³		Received: 03/10/15 11:23			
Comments:	Start Time 3/4/15 15:34						Analysis Date: 03/11/15 16:41			
		Hexavale	nt Chromium	by SOP	ERG-MOR	-063				
			<u>Results</u>			<u>MDL</u>				
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		Flag	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	0.110			0.0038				

MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental R	esources Ma	nageme	nt, Inc			i	FILE #:	3926.00	
75 Valley Stream	ı Parkway, Sı	uite 400				I	REPORTE	ED: 03/12/15 14	1:53
Malvern, PA 1938	55					:	SUBMITT	ED: 03/03/15	to 03/10/15
ATTN: Mr. Jeff Boggs						AQS SITE	CODE:		
PHONE: (443)	803-8495	FAX:	(410) 266-8912			:		DE:	Honeywell Hex Chrome Study
Description:	PAM-21			Lab ID:	5031028	3-08			Sampled: 03/05/15 00:00
Matrix:	Air			Sample Vo	lume:	21.11	m³		Received: 03/10/15 11:23
Comments:									Analysis Date: 03/11/15 16:52
			He	xavalent C	hromium	ı by SO	P ERG-M	10R-063	
	<u>Results</u> <u>MDL</u>								
<u>Analyte</u>			CAS Numbe	er !	ng/m³ Air		<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		U	0.0038	

#### MAR 1 3 2015

Initials: CR

Eastern Research Group



Environmental Re	esources Ma	nageme	nt, Inc				FILE #:	3926.00		
75 Valley Stream	Parkway, Su	uite 400					REPORTE	D: 03/12/15 14	:53	
Malvern, PA 19355					SUBMITTE	ED: 03/03/15	to 03/10/15			
ATTN: Mr. Jeff Boggs						AQS SITE	CODE:			
PHONE: (443)	803-8495	FAX:	(410) 266-8912			:	SITE COD	E:	Honeywell Hex Chrome Study	
Description:	PAM-31			Lab ID:	5031028	-09			Sampled: 03/05/15 00:00	
Matrix:	Air			Sample Vo	lume:	21.11	m³		Received: 03/10/15 11:23	
Comments:									Analysis Date: 03/11/15 17:03	
			He	xavalent C	hromium	by SO	P ERG-M	OR-063		
	<u>Results</u> <u>MDL</u>									
<u>Analyte</u>			CAS Numbe	er !	ng/m³ Air		<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium			1854-02-99		ND		U	0.0038		

MAR 1 3 2015

Initials: CR

Eastern Research Group

#### LDC Report# 33882B6

### Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	March 9 through March 10, 2015
LDC Report Date:	March 16, 2015
Matrix:	Air
Parameters:	Hexavalent Chromium

Validation Level: EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5031028/5031123

#### Sample Identification

OAM 1 (03/09/15) OAM 2 (03/09/15) PAM-1 (03/09/15) PAM-1D (03/09/15) PAM-2 (03/09/15) PAM-3 (03/09/15) PAM-4 (03/09/15) PAM-21 (03/09/15) PAM-31 (03/09/15) OAM 1 (03/10/15) OAM 2 (03/10/15) PAM-1 (03/10/15) PAM-1D (03/10/15) PAM-2 (03/10/15) PAM-3 (03/10/15) PAM-4 (03/10/15) PAM-21 (03/10/15) PAM-31 (03/10/15) PAM-1 (03/09/15) DUP PAM-1D (03/09/15) DUP PAM-1 (03/10/15) DUP PAM-1D (03/10/15) 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(03/09/15) and PAM-31(03/10/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(03/09/15) and PAM-21(03/10/15) 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. Results 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(03/09/15) and PAM-1D (03/09/15) and samples PAM-1(03/10/15) and PAM-1D (03/10/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrati	ion (ng/m³)				
Analyte	PAM-1(03/09/15)	PAM-1D (03/09/15)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0693	0.0724	4 (≤20)	-	-	

	Concentrati	ion (ng/m³)				
Analyte	PAM-1(03/10/15)	PAM-1D (03/10/15)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0621	0.0559	11 (≤20)	-	-	

#### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 5031028/5031123

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 5031028/5031123

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 5031028/5031123

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

LDC #: <u>33882B6</u>	VALIDATION COMPLETENESS WORKSHEET	Date:
SDG #: <u>5031028/5031123</u>	Level IV	Page:_
Laboratory: Eastern Research	Group	Reviewer:

# 2 2nd Reviewer

#### METHOD: (Analyte) 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
Ι.	Sample receipt/Technical holding times	A	03/09/15-03/10/15
11	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	24	FB=(8)(17) TB=(9)(18)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LUSIO
IX.	Field duplicates	SW	FO = (3.4)(12.13)
X	Sample result verification	A	
	Overall assessment of data	A	

Note:

Г

Ŧ

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

т

SB=Source blank OTHER:

ī

T

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (03/09/15)	5031028-10	Air	03/09/15
2	OAM 2 (03/09/15)	5031028-11	Air	03/09/15
3	PAM-1 (03/09/15)	5031028-12	Air	03/09/15
4	PAM-1D (03/09/15)	5031028-13	Air	03/09/15
5	PAM-2 (03/09/15)	5031028-14	Air	03/09/15
6	PAM-3 (03/09/15)	5031028-15	Air	03/09/15
7	PAM-4 (03/09/15)	5031028-16	Air	03/09/15
8	PAM-21 (03/09/15)	5031028-17	Air	03/09/15
9	PAM-31 (03/09/15)	5031028-18	Air	03/09/15
10	OAM 1 (03/10/15)	5031123-01	Air	03/10/15
11	OAM 2 (03/10/15)	5031123-02	Air	03/10/15
12	PAM-1 (03/10/15)	5031123-03	Air	03/10/15
13	PAM-1D (03/10/15)	5031123-04	Air	03/10/15
14	PAM-2 (03/10/15)	5031123-05	Air	03/10/15
15	PAM-3 (03/10/15)	5031123-06	Air	03/10/15
16	PAM-4 (03/10/15)	5031123-07	Air	03/10/15
17	PAM-21 (03/10/15)	5031123-08	Air	03/10/15

LDC #:_	33882B6	VALIDATION CC
SDG #:	5031028/5031123	
Laborat	ory: Eastern Research	Group

#### LIDATION COMPLETENESS WORKSHEET

Level IV

Date: 21/21/5 Page: 2of 2 Reviewer: 55 2nd Reviewer: \_\_\_\_\_

METHOD: (Analyte) <u>Hexavalent Chromium (ASTM D7614)</u>

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (03/10/15)	5031123-09	Air	03/10/15
19	PAM-1 (03/09/15) DUP	5031028-12DUP	Air	03/09/15
20	PAM-1D (03/09/15) DUP	5031028-13DUP	Air	03/09/15
21	PAM-1 (03/10/15) DUP	5031123-03DUP	Air	03/10/15
22	PAM-1D (03/10/15) DUP	5031123-04DUP	Air	03/10/15
23				
24				
25				
26				
27				
Note	S:			





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?	$\leq$			
Were all initial calibration correlation coefficients	/			
Were all initial and continuing calibration verification %Rs within the <del>90-110</del> % QC limits? ろうーいろ	/			
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?				
Nas 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				
Nere performance evaluation (PE) samples performed?			$\langle$	· · · · · · · · · · · · · · · · · · ·
Nere the performance evaluation (PE) samples within the acceptance limits?				



#### VALIDATION FINDINGS CHECKLIST

Page:2\_of\_2 Reviewer:\_\_\_\_\_ 2nd Reviewer:\_\_\_\_\_

Validation Area	Yes	No	NA	Findings/Comments			
VII. Sample Result Verification		-	<u>.</u>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	1						
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.	/						
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>33882B6</u>

#### VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: <u>\</u> of <u>\</u> Reviewer: <u>SO</u> 2nd Reviewer: <u></u>

Inorganics: Method See Cover

	Concentrati			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0693	0.0724	4	

	Concentrati			
Analyte	12	13	RPD (≤20)	Qual,
Hexavalent Chromium	0.0621	0.0559	11	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\33882B6.wpd

LDC #: 330828

#### Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: \ of Reviewer: 🖸 2nd Reviewer

Method: Inorganics, Method <u>See Cover</u>

The correlation coefficient (r) for the calibration of  $2^{4}$  was recalculated. Calibration date: 03/12/15

Where,

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

%R = Found X 100

True

\_\_\_\_

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 <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0319857			
		s2	0.1	0.0728461	0.99960 0.99960		
		s3	0.2	0.1554074			6 N
	Cro	s4	0.5	0.3500817			5
		s5	1	0.7800158			1
		s6	2	1.5875426			
エビン ハニント Calibration verification	Cr*4	Fourse 0.5409 nojml	True O.Srahul		108.2%.2	108.2%	
CCC \2:28 Calibration verification	Criv	0.5323 iveylml	O. Snglul		106.5%E	106.4%2	, L
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 #: 33882

#### VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

	Page:		of_	1
	Reviewer:	$\overline{}$	72	>
2nd	Reviewer:	$\mathcal{O}$	Ł	

.

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 = <u>Found</u> x 100 Where, Found = True

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 = <u>|S-D|</u> x 100 Where, (S+D)/2

D =

S =

Original sample concentration Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported %R / RPD	Acceptable (Y/N)
LCS 11:56	Laboratory control sample	Crab	1.08brg/m	1.00 nghul	109%P	109%R	J
P	Matrix spike sample		(SSR-SR)				
DUQ 200	Duplicate sample		0.0711 ngjuž	0.0693mg/m3	2.56%RPD	2.56%89	Y

Comments:

Page: <u>\</u> Reviewer: \_\_\_\_ LDC #: 3382, PSO VALIDATION FINDINGS WORKSHEET Sample Calculation Verification 2nd reviewer: METHOD: Inorganics, Method Sec. Cover Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". <u>M N N/A</u> Have results been reported and calculated correctly? Y N N/A Are results within the calibrated range of the instruments? YN N/A Are all detection limits below the CRQL? Compound (analyte) results for \_\_\_\_\_\_\_ C\_\_\_\_ reported with a positive detect were  $Concentration = (A-c_0)/c, \quad \forall F=10m1 \xrightarrow{\text{Recalculation:}} 0.177970-(-1.56E-c_2) = 0.2417ngln$   $(0 = -1.56E-02 \quad (nglm1)(0f)$   $C = 0.7977524 \quad (nglm1)(0f)$   $A = 0.171970 \quad m^3 = nglm^3 \quad (0.2417nglm1)(0m1) = 0.115nglm^3$   $Z1.99m^3 = 21.09m^3$ Reported Calculated Concentration Concentration Acceptable (Y/N) # Sample ID (vain?) (norms) Analyte 7, +6 Ô.NS DINS J 0.0599 .0599 2 3 ONAS 0.0693 0.0724 O. CLSIS O.OLAS  $\oslash$  $\bigcirc$   $11 \le$ ノリン 0.037 0.0895ろり Q  $\mathcal{N}$ ND OI 1,0492 0.0492 11 0.0542 12 0.0621 13 N.0559 4 DOUX DOSIU 0.0772 ().O177 NOND NO Note:



Environmental Resources Management, Inc					l	FILE #: 3926.00			
75 Valley Stream F	arkway, Suite 400				l	REPORTE	ED: 03/	/16/15 11:2	24
Malvern, PA 19355						SUBMITTED: 03/10/15 to 03/11/15			o 03/11/15
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912				AQS SITE	E DE:	ł	loneywell Hex Chrome Study
Description:	OAM 1	La	ab ID:	5031028-1	.0				Sampled: 03/09/15 14:58
Matrix:	Air	Sa	ample Vo	olume:	21.09	m³			Received: 03/10/15 11:23
Comments:	Start Time 3/8/15 15:32								Analysis Date: 03/12/15 14:16
		Hexav	/alent C	hromium b	oy SO	P ERG-M	10R-063	3	
				<u>Results</u>				MDL	
<u>Analyte</u>		CAS Number		<u>ng/m³ Air</u>		<u>Flaq</u>	ng	g/m³ Air	
Hexavalent Chromium		1854-02-99		0.115				0.0038	

MAR 1 7 2015

Initials: CR

Eastern Research Group

Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPOR	REPORTED: 03/16/15 11:24			
Malvern, PA 19355					SUBMITTED: 03/10/15 to 03/11/15			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SI SITE C	TE ODE:	ŀ	loneywell Hex Chrome Study	
Description:	OAM 2	Lab I	<b>D:</b> 5031028-1	1		.,	Sampled: 03/09/15 15:19	
Matrix:	Air	Samp	ole Volume:	21.11 r	J3		Received: 03/10/15 11:23	
Comments:	Start Time 3/8/15 15:51						Analysis Date: 03/12/15 14:27	
		Hexavale	ent Chromium l	by SOP ERG	-MOR-	063		
			<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flac	l	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0599			0.0038		

MAR 1 7 2015

Initials: CR

Eastern Research Group

**N**ERG

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 4 of 22

# ERG

# CERTIFICATE OF ANALYSIS

Environmental Res	c	FILE #	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400			REPO	REPORTED: 03/16/15 11:24		
Malvern, PA 1935		SUBM	SUBMITTED: 03/10/15 to 03/11/15		o 03/11/15		
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 266-8912				AQS SITE CODE: SITE CODE:		Honeywell Hex Chrome Study	
Description:	PAM-1	Lab ID:	5031028-1	2			Sampled: 03/09/15 16:03
Matrix:	Air	Sample	Volume:	21.11	m³		Received: 03/10/15 11:23
Comments:	Col 1 Start Time 3/8/15 1	5:36					Analysis Date: 03/12/15 12:50
		Hexavalent	: Chromium b	y SOP ER	G-MOR-	063	
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Fla	g	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0693			0.0038	

MAR 1 7 2015

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 5 of 22

# **NERG**

## CERTIFICATE OF ANALYSIS

Environmental Re	с	FILE #	FILE #: 3926.00					
75 Valley Stream I	Parkway, Suite 400			REPO	REPORTED: 03/16/15 11:24			
Malvern, PA 19355					SUBMITTED: 03/10/15 to 03/11/15			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 <b>FAX:</b> (410	)) 266-8912		AQS S	ITE ODE:	ŀ	loneywell Hex Chrome Study	
Description:	PAM-1D	Lab I	<b>D:</b> 503102	3-13			Sampled: 03/09/15 16:05	
Matrix:	Air	Samp	ole Volume:	21.12	m <sup>3</sup>		Received: 03/10/15 11:23	
Comments:	Col 2 Start Time 3/8/15 1	6:36					Analysis Date: 03/12/15 13:09	
-		Hexavale	ent Chromiun	n by SOP ERG	i-MOR	-063		
			<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Ai</u>	<u>Flag</u>	1	<u>ng/m³ Air</u>		
Hexavalent Chromium	1	1854-02-99	0.0724			0.0038		

MAR 1 7 2015

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 6 of 22



Environmental Re	C	FILE #: 3926.00						
75 Valley Stream I	Parkway, Suite 400			REPORTED:	REPORTED: 03/16/15 11:24			
Malvern, PA 19355					SUBMITTED: 03/10/15 to 03/11/15			
<b>ATTN:</b> Mr. Jeff B <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	ł	Honeywell Hex Chrome Study		
Description:	PAM-2	Lab ID:	5031028-14			Sampled: 03/09/15 15:52		
Matrix:	Air	Sample	Volume: 21.1	11 m³		Received: 03/10/15 11:23		
Comments:	Start Time 3/8/15 16:25					Analysis Date: 03/12/15 15:22		
		Hexavalent	Chromium by S	OP ERG-MOR	R-063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0695		0.0038			

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream I	<sup>D</sup> arkway, Suite 400					REPORTED: 03/16/15 11:24			
Malvern, PA 19355					SUBMITTED: 03/10/15 to 03/11/15				
ATTN: Mr. Jeff B	oggs					AQS SITE	E		
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	)) 266-8912				SUECOD	DE:	Honeywell Hex Chrome Study	
Description:	PAM-3	L	ab ID:	5031028-1	.5			Sampled: 03/09/15 15:47	
Matrix:	Air	S	Sample Vo	olume:	21.2	m³		Received: 03/10/15 11:23	
Comments:	Start Time 3/8/15 16:14							Analysis Date: 03/12/15 15:10	
		Hexa	avalent C	hromium b	oy SC	OP ERG-M	IOR-063		
				<u>Results</u>			MDL		
Analyte		CAS Number	1	ng/m³ Air		<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.115			0.0038		

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					FILE #:	FILE #: 3926.00			
75 Valley Stream I	<sup>D</sup> arkway, Suite 400				REPORT	REPORTED: 03/16/15 11:24			
Malvern, PA 1935	5				SUBMIT	TED:	03/10/15 to	03/11/15	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			AQS SIT	E DE:	H	oneywell Hex Chrome Study	
Description:	PAM-4	L	ab ID:	5031028-16				Sampled: 03/09/15 15:41	
Matrix:	Air	s	Sample Vol	lume: 21	.18 m³	3		Received: 03/10/15 11:23	
Comments:	Start Time 3/8/15 16:09							Analysis Date: 03/12/15 15:33	
		Hexa	valent Cl	hromium by	SOP ERG-I	MOR-C	)63		
				<u>Results</u>			MDL		
Analyte		CAS Number	n	ng/m³ Air	<u>Flag</u>		<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0895			0.0038		

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400					REPORTED: 03/16/15 11:24				
Malvern, PA 19355					SUBMITTE	SUBMITTED: 03/10/15 to 03/11/15			
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495 F/	<b>AX:</b> (410) 266-8912			AQS SITE	E:	Honeywell Hex Chrome Study		
Description:	PAM-21		Lab ID: 503102	28-17			Sampled: 03/09/15 00:00		
Matrix:	Air		Sample Volume:	21.1	1 m³		Received: 03/10/15 11:23		
Comments:							Analysis Date: 03/12/15 15:43		
Hexavalent Chromium by SOP ERG-MOR-063									
			<u>Results</u>			<u>MDL</u>			
<u>Analyte</u>		CAS Numb	er <u>ng/m³ A</u>	ir	<u>Flag</u>	<u>ng/m³ Air</u>			

Analyte	CAS Number	<u>nq/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAR 1 7 2015

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



Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					REPORTED: 03/16/15 11:24				
Malvern, PA 19355						SUBMITTED	to 03/11/15		
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495 <b>FAX</b> :	(410) 266-8912	12		AQS SITE CODE: SITE CODE:		Honeywell Hex Chrome Study		
Description:	PAM-31		Lab ID:	5031028	-18			Sampled: 03/09/15 00:00	
Matrix:	Air		Sample Vo	olume:	21.2	m³		Received: 03/10/15 11:23	
Comments:								Analysis Date: 03/12/15 15:54	
Hexavalent Chromium by SOP ERG-MOR-063									
				<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Numbe	<u>er</u>	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		ND		U	0.0038		

MAR 1 7 2015

Initials: CR

Eastern Research Group

Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400					REPORTED: 03/16/15 11:24				
Malvern, PA 19355					SUBMITTED: 03/10/15 to 03/11/15				
ATTN: Mr. Jeff B PHONE: (443) 8	) 266-8912	A S		AQS SITE CODE: SITE CODE:		Honeywell Hex Chrome Study			
Description:	OAM 1	Lab I	<b>D:</b> 5031123	3-01			Sampled: 03/10/15 15:09		
Matrix:	Air	Sam	ole Volume:	21.71	n³		Received: 03/11/15 12:49		
Comments:	Start Time 3/9/15 15:01						Analysis Date: 03/12/15 16:05		
Hexavalent Chromium by SOP ERG-MOR-063									
			<u>Results</u>			MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Ai</u>	<u>Fla</u>	1	<u>ng/m³ Air</u>			
Hexavalent Chromium	1	1854-02-99	0.0492			0.0038			

MAR 1 7 2015

Initials: CR

Eastern Research Group

**N**ERG

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 12 of 22


Environmental Res	sources Management, Inc	C		FILE #: 39	26.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/16/15 11:24	
Malvern, PA 19355	5			SUBMITTED:	03/10/15 to 0	3/11/15
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Hor	neywell Hex Chrome Study
Description:	OAM 2	Lab ID:	5031123-02			Sampled: 03/10/15 15:27
Matrix:	Air	Sample	Volume: 21.6	58 m³		Received: 03/11/15 12:49
Comments:	Start Time 3/9/15 15:22				An	alysis Date: 03/12/15 16:16
		Hexavalent	Chromium by S	OP ERG-MOR	R-063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0542		0.0038	

MAR 1 7 2015

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

# ERG

Hexavalent Chromium

### CERTIFICATE OF ANALYSIS

Environmental Re	sources Manage	ment, Inc				FILE #:	3926.0	0	
75 Valley Stream	Parkway, Suite 4	00				REPORT	ED: 0	3/16/15 11	:24
Malvern, PA 1935	5					SUBMIT	TED:	03/10/15	to 03/11/15
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 <b>FA</b>	<b>X:</b> (410) 266-8912				AQS SITI	e de:		Honeywell Hex Chrome Study
Description:	PAM-1		Lab ID:	5031123	3-03				Sampled: 03/10/15 16:09
Matrix:	Air		Sample Vo	lume:	21.65	m³	3		Received: 03/11/15 12:49
Comments:	Col 1 Start Time	3/9/15 16:06							Analysis Date: 03/12/15 13:39
		He	xavalent C	hromium	ı by SC	P ERG-I	MOR-06	3	
				<u>Results</u>				<u>MDL</u>	
Analyte		CAS Numbe	<u>er 1</u>	ng/m³ Air	5	<u>Flag</u>	1	ng/m³ Air	:

0.0621

1854-02-99

MAR 1 7 2015

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.

0.0038

Page 14 of 22

٠



Environmental Res	sources Management, In	c		FILE #: 3	926.00	
75 Valley Stream	Parkway, Suite 400			REPORTED	03/16/15 11:	24
Malvern, PA 1935	5			SUBMITTED	<b>b:</b> 03/10/15	to 03/11/15
ATTN: Mr. Jeff B	oggs			AQS SITE		
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	: ا	Honeywell Hex Chrome Study
Description:	PAM-1D	Lab ID:	5031123-04			Sampled: 03/10/15 16:11
Matrix:	Air	Sample	Volume: 21.	65 m³		Received: 03/11/15 12:49
Comments:	Col 2 Start Time 3/9/15 1	5:08				Analysis Date: 03/12/15 13:57
		Hexavalent	Chromium by S	SOP ERG-MO	R-063	
			<u>Results</u>		MDL	
Analyte		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0559		0.0038	

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Res	sources Management, In	с			F	FILE #:	3926.00	
75 Valley Stream	<sup>D</sup> arkway, Suite 400				F	REPORTE	ED: 03/16/15 11	:24
Malvern, PA 1935	5				ę	SUBMITT	ED: 03/10/15	to 03/11/15
<b>ATTN:</b> Mr. Jeff Be <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			, (	AQS SITE	E:	Honeywell Hex Chrome Study
Description:	PAM-2	La	ab ID:	5031123-0	5			Sampled: 03/10/15 15:56
Matrix:	Air	Sa	ample Vo	lume:	21.61	m³		Received: 03/11/15 12:49
Comments:	Start Time 3/9/15 15:55					_		Analysis Date: 03/12/15 16:26
		Hexa	valent C	hromium b	y SO	P ERG-M	IOR-063	
				<b>Results</b>			MDL	
Analyte		CAS Number	I	ng/m³ Air		<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0481			0.0038	

MAR 1 7 2015

Initials: CR

Eastern Research Group

## **NERG**

## CERTIFICATE OF ANALYSIS

Environmental Re	sources Management, In	c			FILE #:	3926.00	
75 Valley Stream I	<sup>o</sup> arkway, Suite 400				REPORTE	E <b>D:</b> 03/16/15 11	:24
Malvern, PA 1935	5				SUBMITTI	ED: 03/10/15	to 03/11/15
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			AQS SITE	E:	Honeywell Hex Chrome Study
Description:	PAM-3	Lat	<b>b ID:</b> 503112	23-06			Sampled: 03/10/15 15:51
Matrix:	Air	Sar	mple Volume:	21.61	1 m³		Received: 03/11/15 12:49
Comments:	Start Time 3/9/15 15:50						Analysis Date: 03/12/15 16:37
		Hexava	alent Chromiu	m by SC	OP ERG-M	IOR-063	
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ A</u>	<u>ir</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0516			0.0038	

#### MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Res	sources Management, Ind	<b>c</b>		FILE #:	3926.00	
75 Valley Stream F	Parkway, Suite 400			REPORTE	ED: 03/16/15 11:	24
Malvern, PA 19355	<b>i</b>			SUBMITT	ED: 03/10/15	to 03/11/15
ATTN: Mr. Jeff Bo	oggs				E	
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITECOL	DE:	Honeywell Hex Chrome Study
Description:	PAM-4	Lab II	<b>D:</b> 5031123-07			Sampled: 03/10/15 15:48
Matrix:	Air	Sampl	le Volume: 2	1.66 m³		Received: 03/11/15 12:49
Comments:	Start Time 3/9/15 15:44					Analysis Date: 03/12/15 16:48
		Hexavale	nt Chromium by	SOP ERG-M	IOR-063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0772		0.0038	

MAR 1 7 2015

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 18 of 22

# **NERG**

## CERTIFICATE OF ANALYSIS

Environmental Resources Manager 75 Valley Stream Parkway, Suite 40	nent, Inc	FILE #: 392	6.00
75 Valley Stream Parkway, Suite 40	n	BEBODTED.	00110115 11 01
	<b>,</b>	REPORTED:	03/16/15 11:24
Malvern, PA 19355		SUBMITTED:	03/10/15 to 03/11/15
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX	: (410) 266-8912	AQS SITE CODE: SITE CODE:	Honeywell Hex Chrome Study
Description: PAM-21	Lab ID: 5031123-0	08	Sampled: 03/10/15 00:00
Matrix: Air	Sample Volume:	21.61 m <sup>3</sup>	Received: 03/11/15 12:49
Comments:			Analysis Date: 03/12/15 17:20

Analyte	CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



Environmental Re	esources Manageme	nt, Inc			FILE #:	3926.00		
75 Valley Stream	Parkway, Suite 400				REPORT	ED: 03/1	6/15 11:24	
Malvern, PA 1935	5				SUBMITT	<b>TED:</b> 03	3/10/15 to 03/11/15	
ATTN: Mr. Jeff E PHONE: (443) 8	3oggs 803-8495 <b>FAX:</b>	(410) 266-8912			AQS SITI	E DE:	Honeywell Hex Chrome Study	
Description:	PAM-31		Lab ID:	5031123-09			Sampled: 03/10/15 00:00	
Matrix:	Air	5	Sample Vol	ume: 21.	.61 m³	:	Received: 03/11/15 12:49	
Comments:							Analysis Date: 03/12/15 17:30	
		Hexa	avalent Ch	romium by Results	SOP ERG-N	MOR-063	MDL	

Analyte	CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

MAR 1 7 2015

Initials: CR

Eastern Research Group



March 19, 2015

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 March 18, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

#### LDC Project #33906:

## SDG Fraction

5031209/5031313 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

	103 pages-SF	1 WEE	K TAT												Atta	achn	nent	: 1															_						
	Level IV	Ľ	DC #33	906	6 (E	ERN	<b>/</b> -	Mo	rris	svil	le,	NC	<b>)</b>	Ha	rbo	or F	?oiı	nt, I	MD	); H	exa	ava	ler	nt C	hre	omi	un	n M	on	itor	ing	<b>J)</b>							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr( (D76	(VI) 614)																						r												
Matr	x: Air/Water/Soil		i (1970) a des a suge a des a des a des a des I	A	S	w.	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s
A	5031209/5031313	03/18/15	03/25/15	18	С.															<u> </u>	<u> </u>			_															
													<u> </u>	<u> </u>	<u> </u>	├──		<u> </u>		-					<u> </u>													<u> </u> '	┝──╢
<b>—</b>				<u> </u>																															•	$ \rightarrow$			$\left  - \right $
																		$\vdash$		-	-	-		╂──	-											$ \rightarrow$			
<u> </u>																							+	+															
																						1	1	$\square$															
																							1	$\square$															
																																							$\Box$
				<u> </u>									ļ		ļ	ļ	<u> </u>																						
																						<u> </u>	_																
																				-																			$\left  - \right $
																							-														_		$\vdash$
													-									$\left  \right $														$ \rightarrow$			$\left  - \right $
																							$\left  \right $																
																					<b> </b>																		
																							<b> </b>																
															<u> </u>									-															
														<u> </u>	<b> </b>	<u> </u>	<u> </u>					<u> </u>																	
—													-							-		-	<u> </u>	-												$ \rightarrow$	-		$\left  - \right $
													_			<u> </u>																					_		$\left\  - \right\ $
																								+	-					<u> </u>					_	-+			$- \ $
																						1														$\rightarrow$			-
										· · ·												<u>†                                    </u>		1	<u> </u>														
																							1	1													_	 	
Fotal	T/CR			18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18

#### LDC Report# 33906A6

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	March 11 through March 12, 2014
LDC Report Date:	March 19, 2015
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	5031209/5031313

#### **Sample Identification**

OAM 1 (03/11/15)	PAM-1 (03/12/15)DUP
OAM 2 (03/11/15)	PAM-1D (03/12/15)DUP
PAM-1 (03/11/15)	
PAM-1D (03/11/15)	
PAM-2 (03/11/15)	
PAM-3 (03/11/15)	
PAM-4 (03/11/15)	
PAM-21 (03/11/15)	
PAM-31 (03/11/15)	
OAM 1 (03/12/15)	
OAM 2 (03/12/15)	
PAM-1 (03/12/15)	
PAM-1D (03/12/15)	
PAM-2 (03/12/15)	
PAM-3 (03/12/15)	
PAM-4 (03/12/15)	
PAM-21 (03/12/15)	
PAM-31 (03/12/15)	
PAM-1 (03/11/15)DUP	
PAM-1D (03/11/15)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.

2

#### 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 (03/11/15) and PAM-31 (03/12/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (03/11/15) and PAM-21 (03/12/15) 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 (03/11/15) and PAM-1D (03/11/15) and samples PAM-1 (03/12/15) and PAM-1D (03/12/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentration (ng/m <sup>3</sup> )				
Analyte	PAM-1 (03/11/15)	PAM-1D (03/11/15)	RPD (Limits)	Flag	A or P
Hexavalent chromium	0.0713	0.0654	9 (≤20)	-	-

,	Concentrati	tration (ng/m³)			
Analyte	PAM-1 (03/12/15)	PAM-1D (03/12/15)	RPD (Limits)	Flag	A or P
Hexavalent chromium	0.0200	0.0239	18 (≤20)	-	-

4

#### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 5031209/5031313

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 5031209/5031313

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 5031209/5031313

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

5

LDC #:	33906A6	VALIDATION COMPLETENESS WORKSHEET
SDG #:	5031209/5031313	Level IV
Laborato	ry: <u>Eastern Researc</u>	h Group



#### METHOD: (Analyte) 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>I.</u>	Sample receipt/Technical holding times	A	3/11-12/15
	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
v	Field blanks	QU	FB=(8)(n) TB=(9)(8)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not Regulica
VII.	Duplicate sample analysis	A	DR
VIII.	Laboratory control samples	A	
IX.	Field duplicates	SW	FD=(3,4) (2,13)
Х.	Sample result verification	A	
	Overall assessment of data	A	

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 SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (03/11/15)	5031209-01	Air	03/11/15
2	OAM 2 (03/11/15)	5031209-02	Air	03/11/15
3	PAM-1 (03/11/15)	5031209-03	Air	03/11/15
4	PAM-1D (03/11/15)	5031209-04	Air	03/11/15
5	PAM-2 (03/11/15)	5031209-05	Air	03/11/15
6	PAM-3 (03/11/15)	5031209-06	Air	03/11/15
7	PAM-4 (03/11/15)	5031209-07	Air	03/11/15
8	PAM-21 (03/11/15)	5031209-08	Air	03/11/15
9	PAM-31 (03/11/15)	5031209-09	Air	03/11/15
10	OAM 1 (03/12/15)	5031313-01	Air	03/12/15
11	OAM 2 (03/12/15)	5031313-02	Air	03/12/15
12	PAM-1 (03/12/15)	5031313-03	Air	03/12/15
13	PAM-1D (03/12/15)	5031313-04	Air	03/12/15
14	PAM-2 (03/12/15)	5031313-05	Air	03/12/15
15	PAM-3 (03/12/15)	5031313-06	Air	03/12/15
16	PAM-4 (03/12/15)	5031313-07	Air	03/12/15
17	PAM-21 (03/12/15)	5031313-08	Air	03/12/15

LDC #:	33906A6	VALIDATION
SDG #:_	5031209/5031313	
1	ww.Fastawa Daaaawah	<u>O</u>

SDG Laboratory: Eastern Research Group

#### **COMPLETENESS WORKSHEET**

Level IV

Date: Page: 20 Reviewer: 2nd Reviewer:

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (03/12/15)	5031313-09	Air	03/12/15
19	PAM-1 (03/11/15)DUP	5031209-03DUP	Air	03/11/15
20	PAM-1D (03/11/15)DUP	5031209-04DUP	Air	03/11/15
21	PAM-1 (03/12/15)DUP	5031313-03DUP	Air	03/12/15
22	PAM-1D (03/12/15)DUP	5031313-04DUP	Air	03/12/15
23				
24				
25				
26		-		
27				
Note	S:			



Method: Inorganics (EPA Method Sec Course)									
Validation Area	Yes	No	NA	Findings/Comments					
I. Technical holding times	I. Technical holding times								
All technical holding times were met.	1								
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?	1								
Were all initial and continuing calibration verification %Rs within the <del>99-110</del> % QC limits? ろくいち									
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.			1						
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?		L							

Akis

LDC #: 3390604

#### 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?	/								
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>33906A6</u>

#### VALIDATION FINDINGS WORKSHEET Field Duplicates



Inorganics: Method See Cover

	Concentrati			
Analyte	3	3 4		Qual.
Hexavalent Chromium	0.0713	0.0654	9	

	Concentrati			
Analyte	12	13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0200	0.0239	18	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\33906A6.wpd

LDC #: 33906A10

#### Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:_\_	of
Reviewer:	30
2nd Reviev	ver:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of  $G^{4}$  was recalculated. Calibration date: <u>3/16/15</u>

Where,

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

%R = Found X 100

True

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 <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0388126			
		s2	0.1	0.0735122	0.99997	0.99997	
		s3	0.2	0.1526063			
	Cr	s4	0.5	0.3895493			$\sim$
		<u>s5</u>	1	0.7718894			
		s6	2	1.5665728			
JCU 11:07	معر م	Found	True				
Calibration verification		0,5527malul	OrSnalml		110.5%R	110.5%P	
CW 12:05	447						
Calibration verification		0.5525 nom	U. Snafurl		110,5%P	110.5%P	7
		<b>v</b>					
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 #: 33906A6

#### VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

	Page:	_of_	/
	Reviewer:	Z	$\sum$
2nd	Reviewer:	$\overline{z}$	

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 = <u>Found</u> x 100 Where, True 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 =  S-D	x 100	Where,	S =
(S+D)/2			D =

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)
LCS 11:33	Laboratory control sample	CCLO	1.069mg/m)	1.00 malent	107% R	107%e	y
2	Matrix spike sample		(SSR-SR)				
D.R (2:30	Duplicate sample	Y	0.0618 ng/w3	0.0713 hg/m <sup>3</sup>	2.13% BPD	2.1195 AD	5)

Comments:

LDC #: 33906A.P	VALIDATION FINDINGS WO Sample Calculation Ver	ORKSHEET ification	Pa Reviev 2nd reviev	ge:of ver: ver:
METHOD: Inorganics, Metho	d See Cover			
Please see qualifications below <u>Y N N/A</u> <u>Y N N/A</u> Are results w <u>Y N N/A</u> Compound (analyte) results for recalculated and verified using Concentration = $(A-C_0)(C_0)$ A=0.056744 $C_0 = -3.91E \cdot 0.3$ $C_1 = 0.7835755$	w for all questions answered "N". Not app been reported and calculated correctly? ithin the calibrated range of the instrument tion limits below the CRQL? or	licable questions ar ts? 	e identified as "N/ ported with a positive CE - CS M) (com) $E1 - 11m^3$	4". 1e detect were = 0.075 nghu = 0.0367 nghu
# Sample ID	Analyte	Reported Concentration (vs/w3)	Calculated Concentration ( $\sqrt{\sqrt{3}}$ )	Acceptable (Y/N)
	Crtb	0.0367	0.0367	3
2	)	0.0696	0.0676	
3		0.07.3	0.0713	
4		0.0654	0.0654	L'
5		0.0845	0.0844	y*
6		0.0430	0.0430	y
2		80,0	0.108	9
8		04	DU	(
٩		24	ND	
10		0.0129	0.0129	
		0.0194	0.094	
12		0.0200	0.0200	
13		0.0239	0.0239	Le
(4		0.0461	0.0460	<u> </u>
(5		0.0178	0.0(28	3
10		0.0321	0.0321	
$\square$		04	DU DU	
18	<u> </u>	NO	ND	
Note: -X Pour	L	L		

\_



Environmental Res	nvironmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream I	75 Valley Stream Parkway, Suite 400					REPORTED: 03/18/15 11:04			
Malvern, PA 19355						SUBMITTI	ED: 03/12/15	to 03/13/15	
ATTN: Mr. Jeff B	oggs					AQS SITE			
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912				SITECOD	)E:	Honeywell Hex Chrome Study	
Description:	OAM 1	L	Lab ID:	5031209-0	01			Sampled: 03/11/15 14:39	
Matrix:	Air	S	Sample Vo	olume:	21.11	m³		Received: 03/12/15 10:40	
Comments:	Start Time 3/10/15 15:12							Analysis Date: 03/16/15 13:42	
		Hexa	avalent C	hromium l	by SO	P ERG-M	IOR-063		
				<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number		ng/m³ Air		<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0367			0.0038		

MAR 1 9 2015

Initials: CR

DRAFT REPORT



Environmental Res	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400					REPORT	ED: (	03/18/15 11:	04
Malvern, PA 19355	5					SUBMITT	ED:	03/12/15	to 03/13/15
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912				AQS SITE	E DE:		Honeywell Hex Chrome Study
Description:	OAM 2		Lab ID:	5031209-0	)2				Sampled: 03/11/15 15:07
Matrix:	Air	:	Sample V	olume:	21.25	m³			Received: 03/12/15 10:40
Comments:	Start Time 3/10/15 15:30								Analysis Date: 03/16/15 13:52
		Hex	avalent (	Chromium l	oy SO	P ERG-M	10R-0	63	
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Number	c .	<u>ng/m³ Air</u>		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0696				0.0038	

MAR 1 9 2015

Initials: CR

DRAFT REPORT



Environmental Res	ources Management, In-	C	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400			REPORTED:	REPORTED: 03/18/15 11:04		
Malvern, PA 19355	i			SUBMITTED:	SUBMITTED: 03/12/15 to 03/13/15		
ATTN: Mr. Jeff Bo	oggs			AQS SITE			
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	Hone	ywell Hex Chrome Study	
Description:	PAM-1	Lab ID:	5031209-03			Sampled: 03/11/15 16:01	
Matrix:	Air	Sample	Volume: 21.4	4 m³		Received: 03/12/15 10:40	
Comments:	Col 1 Start Time 3/10/15	16:12			Ana	lysis Date: 03/16/15 12:26	
		Hexavalent	Chromium by S	OP ERG-MOR-	063		
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0713		0.0038		

MAR 1 9 2015

Initials: CR

DRAFT REPORT



Environmental Res	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	75 Valley Stream Parkway, Suite 400					REPORTED: 03/18/15 11:04			
Malvern, PA 19355	<b>i</b>			SUBMITTED:	03/12/15 to 0	03/13/15			
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Но	neywell Hex Chrome Study			
Description:	PAM-1D	Lab ID:	5031209-04			Sampled: 03/11/15 16:04			
Matrix:	Air	Sample \	<b>/olume:</b> 21.4	5 m³		Received: 03/12/15 10:40			
Comments:	Col 2 Start Time 3/10/15	16:14			Ai	nalysis Date: 03/16/15 12:45			
		Hexavalent	Chromium by S	OP ERG-MOR-	063				
			<b>Results</b>		MDL				
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	0.0654		0.0038				

## MAR 1 9 2015

Initials: CR

DRAFT REPORT



Environmental Res	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400					REPORTI	<b>ED:</b> 0	3/18/15 <b>1</b> 1	:04
Malvern, PA 19355	5					SUBMITT	ED:	03/12/15	to 03/13/15
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912				AQS SITE	E DE:		Honeywell Hex Chrome Study
Description:	PAM-2		Lab ID:	5031209-0	)5				Sampled: 03/11/15 15:40
Matrix:	Air	:	Sample V	olume:	21.31	m³			Received: 03/12/15 10:40
Comments:	Start Time 3/10/15 15:59								Analysis Date: 03/16/15 14:25
		Hexa	avalent (	Chromium b	by SO	P ERG-M	40R-06	i3	
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Number	1	<u>ng/m³ Air</u>		<u>Flag</u>	Ī	ng/m³ Air	
Hexavalent Chromium		1854-02-99		0.0845				0.0038	

MAR 1 9 2015

Initials: CR

DRAFT REPORT



Environmental Res	nvironmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	75 Valley Stream Parkway, Suite 400					REPORTED: 03/18/15 11:04			
Malvern, PA 19355						SUBMITTED: 03/12/15 to 03/13/15			
<b>ATTN:</b> Mr. Jeff Be <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912				AQS SITE	E DE:	Honeywell Hex Chrome Study	
Description:	PAM-3		Lab ID:	5031209-0	06			Sampled: 03/11/15 00:00	
Matrix:	Air	:	Sample Vo	olume:	21.3	m³		Received: 03/12/15 10:40	
Comments:	Start Time 3/10/15 15:55							Analysis Date: 03/16/15 14:35	
		Hex	avalent C	hromium	by SC	DP ERG-M	10R-063		
				<u>Results</u>			<u>M</u>	<u>DL</u>	
<u>Analyte</u>		CAS Number	<b>.</b> .	<u>ng/m³ Air</u>		<u>Flag</u>	ng/m	<u><sup>3</sup> Air</u>	
Hexavalent Chromium		1854-02-99		0.0430			0.0	038	

MAR 1 9 2015

Initials: CR

DRAFT REPORT



Environmental Res	sources Management, Ind	C		FILE #: 392	26.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/18/15 11:0	94
Malvern, PA 19355					SUBMITTED: 03/12/15 to 03/13/15	
ATTN: Mr. Jeff B	oggs		AQS SITE			
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	F	Ioneywell Hex Chrome Study
Description:	PAM-4	Lab ID:	5031209-07			Sampled: 03/11/15 15:25
Matrix:	Air	Sample	Volume: 21.2	2 m³		Received: 03/12/15 10:40
Comments:	Start Time 3/10/15 15:51					Analysis Date: 03/16/15 14:46
		Hexavalent	Chromium by S	OP ERG-MOR	-063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.108		0.0038	

MAR 1 9 2015

Initials: CR

DRAFT REPORT



Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 03/18/15 11:04			
Malvern, PA 1935	55					SUBMIT	TED:	03/12/15	to 03/13/15
ATTN: Mr. Jeff E PHONE: (443)	Boggs 803-8495 F/	<b>AX:</b> (410) 266-8912				AQS SIT	TE DDE:		Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID:	5031209	-08				Sampled: 03/11/15 00:00
Matrix:	Air		Sample Vo	lume:	21.31	m	3		Received: 03/12/15 10:40
Comments:									Analysis Date: 03/16/15 14:57
Hexavalent Chromium by SOP ERG-MOR-063									
				<u>Results</u>				<u>MDL</u>	
Analyte		CAS Numbe	er 1	ng/m³ Air		<u>Flag</u>		<u>ng/m³ Air</u>	

ND

1854-02-99

υ

0.0038

Hexavalent Chromium

MAR 1 9 2015

Initials: CR

DRAFT REPORT



Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream	Parkway, Suite	400				REPORTED	<b>D:</b> 03/18/15 11:04		
Malvern, PA 1935	55					SUBMITTE	D: 03/12/15 to 03/13/15		
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495 F	<b>AX:</b> (410) 266-891	2			AQS SITE CODE: SITE CODE	E: Honeywell Hex Chrome Study		
Description:	PAM-31		Lab ID:	503120	9-09		Sampled: 03/11/15 00:00		
Matrix:	Air		Sample V	olume:	21.3	m³	Received: 03/12/15 10:40		
Comments:							Analysis Date: 03/16/15 15:07		
	Hexavalent Chromium by SOP ERG-MOR-063								
				<u>Results</u>			MDL		
<u>Analyte</u>		CAS Nun	<u>nber</u>	<u>ng/m³ Ai</u>	ir	Flag	<u>ng/m³ Air</u>		

U

0.0038

ND

1854-02-99

Hexavalent Chromium

MAR 1 9 2015

Initials: CR

DRAFT REPORT

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 Res	sources Management, Inc	•				FILE #:	3926.00		
75 Valley Stream F	Parkway, Suite 400					REPORTE	ED: 03/18/15 11	:04	
Malvern, PA 19355						SUBMITTED: 03/12/15 to 03/13/15			
ATTN: Mr. Jeff Boggs						AQS SITE			
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912					)E:	Honeywell Hex Chrome Study	
Description:	OAM 1	I	Lab ID:	5031313-0	1			Sampled: 03/12/15 14:41	
Matrix:	Air	9	Sample Vo	olume:	21.58	m³		Received: 03/13/15 11:44	
Comments:	Start Time 3/11/15 14:42							Analysis Date: 03/16/15 15:18	
	Hexavalent Chromium by SOP ERG-MOR-063								
				<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Number	:	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0129			0.0038		

MAR 1 9 2015

Initials: CR

DRAFT REPORT



Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/18/15 11:04				
Malvern, PA 19355	5			SUBMITTED:	03/12/15 to	03/13/15			
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Но	neywell Hex Chrome Study			
Description:	OAM 2	Lab ID	<b>5031313-02</b>			Sampled: 03/12/15 14:58			
Matrix:	Air	Sample	e Volume: 21.4	43 m³		Received: 03/13/15 11:44			
Comments:	Start Time 3/11/15 15:10				A	nalysis Date: 03/16/15 15:29			
	Hexavalent Chromium by SOP ERG-MOR-063								
			<u>Results</u>		MDL				
<u>Analyte</u>		CAS Number	ng/m³ Air	<u>Flag</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	0.0194		0.0038				

MAR 1 9 2015

Initials: CR

DRAFT REPORT



Environmental Res	sources Management, In	c		FILE #:	3926.00				
75 Valley Stream F	Parkway, Suite 400			REPORTE	<b>D:</b> 03/18/15 11:	04			
Malvern, PA 19355					SUBMITTED: 03/12/15 to 03/13/15				
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE COD	E:	Honeywell Hex Chrome Study			
Description:	PAM-1	Lab ID	5031313-03			Sampled: 03/12/15 16:11			
Matrix:	Air	Sample	e Volume: 21.	69 m³		Received: 03/13/15 11:44			
Comments:	Col 1 Start Time 3/11/15	16:05				Analysis Date: 03/16/15 13:04			
	Hexavalent Chromium by SOP ERG-MOR-063								
			<u>Results</u>		MDL				
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	0.0200		0.0038				

MAR 1 9 2015

4

Initials: CR

DRAFT REPORT



Environmental Res	sources Management, Inc	•	FILE #: 3926.00					
75 Valley Stream Parkway, Suite 400					REPORTED: 03/18/15 11:04			
Malvern, PA 19355	i		SUBMITTED:	SUBMITTED: 03/12/15 to 03/13/15				
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410		AQS SITE SITECODE: Honeywell Hex Chro		well Hex Chrome Study			
Description:	PAM-1D	Lab ID:	5031313-04		5	Sampled: 03/12/15 16:13		
Matrix:	Air	Sample	Volume: 21.7	′ m³	I	Received: 03/13/15 11:44		
Comments:	Col 2 Start Time 3/11/15 1	6:06			Analy	rsis Date: 03/16/15 13:23		
	Hexavalent Chromium by SOP ERG-MOR-063							
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0239		0.0038			

MAR 1 9 2015

Initials: CR

DRAFT REPORT


Environmental Res	nvironmental Resources Management, Inc						3926.00		
75 Valley Stream	Parkway, Suite 400					REPORT	ED: 03	/18/15 11	:04
Malvern, PA 1935	5					SUBMITT	TED: (	03/12/15	to 03/13/15
ATTN: Mr. Jeff B	oggs					AQS SITE	E		
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912				SITECOL	DE:		Honeywell Hex Chrome Study
Description:	PAM-2		Lab ID:	5031313	-05				Sampled: 03/12/15 15:57
Matrix:	Air		Sample Vo	olume:	21.8	m³			Received: 03/13/15 11:44
Comments:	Start Time 3/11/15 15:44								Analysis Date: 03/16/15 15:39
		Hex	xavalent C	Chromium	by SC	OP ERG-M	MOR-063	1	
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	<u>er</u>	<u>ng/m³ Air</u>		<u>Flag</u>	<u>n</u>	<u>a/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0461				0.0038	

MAR 1 9 2015

Initials: CR

DRAFT REPORT



Environmental Res	sources Management, Inc	<b>c</b>		FILE #: 3926	6.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/18/15 11:04	
Malvern, PA 19355	5			SUBMITTED:	03/12/15 to (	03/13/15
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Но	neywell Hex Chrome Study
Description:	PAM-3	Lab ID:	5031313-06			Sampled: 03/12/15 15:52
Matrix:	Air	Sample	Volume: 21.8	34 m³		Received: 03/13/15 11:44
Comments:	Start Time 3/11/15 15:36				A	nalysis Date: 03/16/15 16:54
		Hexavalent	Chromium by S	OP ERG-MOR-	063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0128		0.0038	

MAR 1 9 2015

Initials: CR

DRAFT REPORT

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.

.



Environmental Res	sources Management, Ind	•		FILE #: 392	6.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/18/15 11:04	4
Malvern, PA 19355	5			SUBMITTED:	03/12/15 to	03/13/15
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	н	oneywell Hex Chrome Study
Description:	PAM-4	Lab ID:	5031313-07			Sampled: 03/12/15 15:46
Matrix:	Air	Sample	Volume: 21.8	36 m <sup>3</sup>		Received: 03/13/15 11:44
Comments:	Start Time 3/11/15 15:29					Analysis Date: 03/16/15 16:01
		Hexavalent	Chromium by S	OP ERG-MOR-	063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0321		0.0038	

MAR 1 9 2015

Initials: CR

DRAFT REPORT



Hexavalent Chromium

### **CERTIFICATE OF ANALYSIS**

Environmental R	esources Mai	nagemei	nt, Inc				FILE #: 392	6.00	
75 Valley Stream	Parkway, Su	ite 400					REPORTED:	03/18/15 11:	:04
Malvern, PA 1938	55						SUBMITTED:	03/12/15	to 03/13/15
ATTN: Mr. Jeff I	Boggs						AQS SITE		
<b>PHONE:</b> (443)	803-8495	FAX:	(410) 266-8912				SITE CODE:		Honeywell Hex Chrome Study
Description:	PAM-21			Lab ID:	5031313	3-08			Sampled: 03/12/15 00:00
Matrix:	Air			Sample Vo	olume:	21.8	m³		Received: 03/13/15 11:44
Comments:									Analysis Date: 03/16/15 16:33
			He	xavalent C	hromium	n by S	OP ERG-MOR	-063	
					<u>Results</u>			<u>MDL</u>	
<u>Analyte</u>			CAS Numbe	er .	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium			1854-02-99		ND		υ	0.0038	

ND

1854-02-99

MAR 1 9 2015 Initials: CR

DRAFT REPORT

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.

0.0038



Environmental Re	esources Mar	nageme	nt, Inc				FILE #:	3926.	00	
75 Valley Stream	Parkway, Su	ite 400					REPORT	ED: (	03/18/15 11	:04
Malvern, PA 1938	55						SUBMITT	TED:	03/12/15	to 03/13/15
ATTN: Mr. Jeff F	Boggs						AQS SITE	E		
<b>PHONE:</b> (443)	803-8495	FAX:	(410) 266-8912				SITECO	DE:		Honeywell Hex Chrome Study
Description:	PAM-31			Lab ID:	5031313	3-09				Sampled: 03/12/15 00:00
Matrix:	Air			Sample Vo	olume:	21.84	m³			Received: 03/13/15 11:44
Comments:										Analysis Date: 03/16/15 16:44
			He	xavalent C	hromiun	n by SO	P ERG-N	MOR-0	63	
					<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>			CAS Numbe	er l	ng/m³ Aiı	r	<u>Flag</u>		ng/m³ Air	
Hexavalent Chromium			1854-02-99		ND		U		0.0038	

MAR 1 9 2015

Initials: CR

DRAFT REPORT

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.

-



March 31, 2015

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 March 20, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

#### LDC Project #33938:

#### <u>SDG</u>

<u>Fraction</u>

5031727 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

	95 pages-SF	1 WEE	EK TAT												Atta	achn	nent	1																					
	Level IV	L.	DC #33	93	8 (E	ERN	1-	Mõ	orris	svi	llė,	NC	; /	Ha	rbo	or P	oir	nt, I	MD	, H	exa	ava	ler	nt C	hro	omi	um	ìМ	oni	itor	ing	J)							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr( (D7	(VI) 614)						1												I																
Matri	c Air/Water/Soil	Г	l i	A	S	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	W	s	w	s	w	s	w	s	W	s	w	s	w	s	w	s	w	s
A	5031727	03/20/15	03/27/15	15	10		<u> </u>	<u> </u>												┞—		<u> </u>	<u> </u>	┣──										┝──┦	$\left  - \right $	$\vdash$		<sup> </sup>	
							<u> </u>					-	-							<u> </u>	-	<u> </u>			-					-			$\left  - \right $	┝──┦		┝─┥			
									-		┢									-														┢╼╼┦		┢──┨		┟───┥	
						· · ·													-				<u> </u>	1															$\square$
																					$\vdash$																		
	· · · · · · · · · · · · · · · · · · ·									_																													
												L																										$\square$	
							<u> </u>																	<u> </u>										┢──┦				$\square$	
											<u> </u>																						$\left  - \right $	┢━━┦	$\square$	┢━━┫	$ \rightarrow$		
				-												├						-			_								$\left  - \right $		$\vdash$				$\square$
														-	-																						$\neg$		
<b> </b>						—																	-																
																																							$\square$
				ļ										ļ																									
												<b>_</b>										<u> </u>													$\square$				
													[																					$\mid$	$\vdash$				
┝──┤											<u> </u>	<u> </u>									_		<u> </u>	-									$\left  - \right $	┢──┦	┝─┥		-+		$\left  - \right $
																					-	-		<u> </u>									$\left  - \right $		┝─┥	┟──┨	$\rightarrow$		
													-			<u> </u>																							
																						<u> </u>															$\neg$		
	_													ļ		<u> </u>								<u> </u>									$\square$		$\square$				
Fotal	A/CR			15	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	15

### LDC Report# 33938A6

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	March 13 through March 16, 2015
LDC Report Date:	March 24, 2015
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	5031727

### Sample Identification

OAM 1 (03/13/15)
OAM 2 (03/13/15)
PAM-1D (03/13/15)
PAM-2 (03/13/15)
PAM-3 (03/13/15)
PAM-4 (03/13/15)
PAM-21 (03/13/15)
PAM-31 (03/13/15)
PAM-1 (03/16/15)
PAM-1D (03/16/15)
PAM-2 (03/16/15)
PAM-3 (03/16/15)
PAM-4 (03/16/15)
PAM-21 (03/16/15)
PAM-31 (03/16/15)
PAM-1D (03/13/15)DUP
PAM-1 (03/16/15)DUP
PAM-1D (03/16/15)DUP

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

1

#### Introduction

This data review covers 18 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 (03/13/15) and PAM-31 (03/16/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (03/13/15) and PAM-21 (03/16/15) 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

Sample PAM-1(3/13/15) was received by the laboratory torn; therefore, the sample was not reported.

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

### X. Field Duplicates

Samples PAM-1 (03/16/15) and PAM-1D (03/16/15) 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 (03/16/15)	PAM-1D (03/16/15)	RPD (Limits)	Flag	A or P
Hexavalent chromium	0.0183	0.0211	14 (≤20)	-	-

#### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 5031727

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 5031727

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 5031727

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

·	VALIDATION COMPLETENESS WORKSHEET

Level IV



# Laboratory: Eastern Research Group

33938A6

5031727

#### METHOD: (Analyte) 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
Ι.	Sample receipt/Technical holding times	A	3/13-16/15
11	Initial calibration	A	9
111.	Calibration verification	$A_{i}$	
IV	Laboratory Blanks	A	
v	Field blanks	20	FB=(7)(14) TB=(8)(17)
VI.	Matrix Spike/Matrix Spike Duplicates	Ň	Not Required
VII.	Duplicate sample analysis	A	Rup
VIII.	Laboratory control samples	A	uslo
IX.	Field duplicates	SW	FD=(9,10)
<u>x</u> .	Sample result verification	A	
	OveralLassessment of data	LA	

Note:

LDC #:

SDG #:\_\_

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 SB=Source blank

OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (03/13/15)	5031727-01	Air	03/13/15
2	OAM 2 (03/13/15)	5031727-02	Air	03/13/15
3	PAM-1D (03/13/15)	5031727-04	Air	03/13/15
4	PAM-2 (03/13/15)	5031727-05	Air	03/13/15
5	PAM-3 (03/13/15)	5031727-06	Air	03/13/15
6	PAM-4 (03/13/15)	5031727-07	Air	03/13/15
7	PAM-21 (03/13/15)	5031727-08	Air	03/13/15
8	PAM-31 (03/13/15)	5031727-09	Air	03/13/15
9	PAM-1 (03/16/15)	5031727-12	Air	03/16/15
10	PAM-1D (03/16/15)	5031727-13	Air	03/16/15
11	PAM-2 (03/16/15)	5031727-14	Air	03/16/15
12	PAM-3 (03/16/15)	5031727-15	Air	03/16/15
13	PAM-4 (03/16/15)	5031727-16	Air	03/16/15
14	PAM-21 (03/16/15)	5031727-17	Air	03/16/15
15	PAM-31 (03/16/15)	5031727-18	Air	03/16/15
16	PAM-1D (03/13/15)DUP	5031727-04DUP	Air	03/13/15
17	PAM-1 (03/16/15)DUP	5031727-12DUP	Air	03/16/15

LDC #:	33938A6	_ VALIDATION COMPLETENESS WORKSHEET	
SDG #:	5031727	Level IV	
Laborator	ry: Eastern Res	search Group	



METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-1D (03/16/15)DUP	5031727-13DUP	Air	03/16/15
19				
20				
21				
22				
23				
24				
25				
26				
27				
Note	S.			



#### VALIDATION FINDINGS CHECKLIST



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	$\leq$			
Were all initial and continuing calibration verification %Rs within the 9 <del>0 110</del> % QC limits?	<			
Were titrant checks performed as required? (Level IV only)			1	
Were balance checks performed as required? (Level IV only)			1	
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?	$\leq$			
Was an LCS analyzed per extraction batch?	$\left  \right $			
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?				
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?				



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

.

LDC#<u>33938A6</u>

### VALIDATION FINDINGS WORKSHEET Field Duplicates



Inorganics: Method See Cover

	Concentrati			
Analyte	9	10	RPD (≤20)	Qual.
Hexavalent Chromium	0.0183	0.0211	14	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\33938A6.wpd

LDC #: つう

#### Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: 🔪 of 🤨
Reviewer: <u>50</u>
2nd Reviewer:

Method: Inorganics, Method <u>See Cover</u>

The correlation coefficient (r) for the calibration of  $G_{\rm c}^{\rm t}$  was recalculated.Calibration date: 3/8/15

Where,

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

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 <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0346333			
		s2	0.1	0.0709481	0.99996	0.99996	
	( sel	s3	0.2	0.1500043			J
		s4	0.5	0.388163			
		s5	1	0.7655741			
		s6	2	1.5642397			
ICU 10:45	Q+- 7	Found	True				
Calibration verification		0.5533na/ml	0. Snalwl		110,7%R	1107%	
Cev 12:00	0+-		2 2 2 2 1				
Calibration verification		0.556chgimi	U. Snelm		111. 27.K	. 111.2/se	<u> </u>
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 #: 333380

#### VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet



METHOD: Inorganics, Method \_\_\_\_\_

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

%R = <u>Found\_</u>x 100 Where, True 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 = <u> S-D </u> x 100	Where,	S =	Original sample concentration
(S+D)/2		D =	Duplicate sample concentration

					Recalculated	Reported	
Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	%R / RPD	%R / RPD	Acceptable (Y/N)
LCS 11:57	Laboratory control sample	Crab	1.07 vym)	1 ng (m)	(07%R	(07%E	(C
N	Matrix spike sample		(SSR-SR)				
DUP 1,2:51	Duplicate sample	5	D.039777463	0.0312m/43	6.50% RPD	6.49%890	J

Comments:

LDC #:\_\_\_\_

Y

N N/A

YN N/A

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification



Ever METHOD: Inorganics, Method

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

-+10

Have results been reported and calculated correctly?

Are results within the calibrated range of the instruments?

Are all detection limits below the CRQL?

reported with a positive detect were

Compound (analyte) results for recalculated and verified using the following equation:

centra	ation = $(A - C_0)(C_1)$	لم الله الحديث الحري الم	711533- (-7.15	E-03))	
A	0.0391033	(ucle 1) $(vcl)$ $(vcl)$	1.7834961	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	0.0390n
لۍ زر	= -7.15 E-05 = 0.7834961	un3 = vylun3	(0.0590 mg/m 22-1	n1)(1001)	0.02670
5	Sample ID	Analyte	Reported Concentration ( দ্বাস <sup>3</sup> )	Calculated Concentration	Acceptable (Y/N)
Τ		(5%	0.0267	0.0267	4
	2		0.0324	0.0324	1
	3		0.0372	0.0372	
	4		1120.0	0.0511	
	2		0.0787	0.0287	
	6		0.0400	0.0400	
	7		NO	DU	
	8		NO	04	
	٩		0.0183	0.083	
	(0		0.0211	0.0211	
	<u>\\</u>		0.0240	0.0240	•
	12		0.0160	0.0161	y¥
	13		0.0385	0.0385	3
	14		<u>vo</u>	ND	
_	13	<u> </u>	NºV	NV 	4
		· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·
				<u> </u>	

# **NERG**

### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					REPORTE	ED: 03/20/15 13	:44	
Malvern, PA 19355					SUBMITT	ED: 03/17/15		
ATTN: Mr. Jeff Be	oggs				AQS SITE	E CODE:		
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912			SITE COD	DE:	Honeywell Hex Chrome Study	
Description:	OAM 1	L	.ab ID: 503	1727-01			Sampled: 03/13/15 15:18	
Matrix:	Air	s	Sample Volume:	22.1	1 m³		Received: 03/17/15 11:56	
Comments:	Start Time 3/12/15 14:44						Analysis Date: 03/18/15 13:37	
		Hexa	avalent Chrom	ium by S	OP ERG-M	10R-063		
			<u>Resu</u>	<u>lts</u>		MDL		
<u>Analyte</u>		<u>CAS Number</u>	<u>ng/m</u>	<u>³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.026	57		0.0038		

MAR 3 1 2015

Initials: CR

Eastern Research Group



Environmental Res	c	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400		REPORTED:	03/20/15 13:44		
Malvern, PA 19355	5		SUBMITTED:	03/17/15		
ATTN: Mr. Jeff Bo	oggs			AQS SITE COD	DE:	
<b>PHONE:</b> (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	Hor	neywell Hex Chrome Study
Description:	OAM 2	Lab ID:	5031727-02			Sampled: 03/13/15 15:42
Matrix:	Air	Sample	Volume: 22.2	22 m³		Received: 03/17/15 11:56
Comments:	Start Time 3/12/15 15:01				An	alysis Date: 03/18/15 13:48
		Hexavalen	t Chromium by S	OP ERG-MOR-	063	
			<u>Results</u>		<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0324		0.0038	

MAR 3 1 2015

Initials: CR

Eastern Research Group



Environmental Res	с	FILE #: 3926	FILE #: 3926.00						
75 Valley Stream F	Parkway, Suite 400		REPORTED:	REPORTED: 03/20/15 13:44					
Malvern, PA 19355	5			SUBMITTED: 03/17/15					
ATTN: Mr. Jeff Bo	ATTN: Mr. Jeff Boggs AQS SITE CODE:								
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	)) 266-8912		SITE CODE:	Hor	eywell Hex Chrome Study			
Description:	PAM-1D	Lab ID:	5031727-04			Sampled: 03/13/15 16:47			
Matrix:	Air	Sample	Volume: 22.	06 m³		Received: 03/17/15 11:56			
Comments:	Col 2 Start Time 3/12/15	16:16			An	alysis Date: 03/18/15 12:41			
		Hexavalen	t Chromium by S	SOP ERG-MOR-	063				
			<u>Results</u>		MDL				
<u>Analyte</u>		CAS Number	ng/m³ Air	<u>Flag</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	0.0372		0.0038				

MAR 3 1 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400			REPO	ORTED:	03/20/15 13:	44		
Malvern, PA 1935		SUB	NITTED:	03/17/15					
ATTN: Mr. Jeff B									
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE	CODE:	I	Honeywell Hex Chrome Study		
Description:	PAM-2	Lab II	<b>D:</b> 5031727	-05			Sampled: 03/13/15 16:16		
Matrix:	Air	Samp	le Volume:	21.84	m³		Received: 03/17/15 11:56		
Comments:	Start Time 3/12/15 16:00						Analysis Date: 03/18/15 14:32		
		Hexavale	nt Chromium	by SOP ER	G-MOR-	063		_	
			<u>Results</u>			MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Fl</u>	pg	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0511			0.0038			

MAR 3 1 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPOR	REPORTED: 03/20/15 13:44			
Malvern, PA 1935	5			SUBMI	SUBMITTED: 03/17/15			
ATTN: Mr. Jeff B	oggs							
PHONE: (443) 8	03-8495 <b>FAX:</b> (4	410) 266-8912		SITE C	ODE:	Honeywell Hex Chrome Study		
Description:	PAM-3	La	<b>ab ID:</b> 5031727	-06		Sampled: 03/13/15 16:07		
Matrix:	Air	Sa	ample Volume:	21.78 m	1 <sup>3</sup>	Received: 03/17/15 11:56		
Comments:	Start Time 3/12/15 15:	55				Analysis Date: 03/18/15 14:43		
		Hexav	alent Chromium	by SOP ERG	-MOR-063			
			<u>Results</u>		<u>1</u>	<u>IDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	ng/i	n <sup>3</sup> Air		
Hexavalent Chromium		1854-02-99	0.0287		0	0038		

MAR 3 1 2015

Initials: CR

Eastern Research Group



Environmental Re	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					TED:	03/20/15 13:4	44		
Malvern, PA 19355					SUBMITTED: 03/17/15				
ATTN: Mr. Jeff Boggs AQS SITE CODE:									
PHONE: (443) 8	303-8495 <b>FAX:</b> (410	)) 266-8912		SITE CO	DE:	ŀ	Ioneywell Hex Chrome Study		
Description:	PAM-4	Lab II	<b>):</b> 5031727	7-07			Sampled: 03/13/15 16:03		
Matrix:	Air	Samp	le Volume:	21.81 m	3		Received: 03/17/15 11:56		
Comments:	Start Time 3/12/15 15:49						Analysis Date: 03/18/15 14:54		
Hexavalent Chromium by SOP ERG-MOR-063									
			<u>Results</u>			<u>MDL</u>			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	. Flag		<u>ng/m³ Air</u>			

Hexavalent Chromium

0.0400

1854-02-99

0.0038

MAR 3 1 2015

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 8 of 19



Environmental Resources Management, Inc					FIL	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 03/20/15 13:44			
Malvern, PA 1935			SU	SUBMITTED: 03/17/15					
ATTN: Mr. Jeff Boggs AQS SITE CODE:									
<b>PHONE:</b> (443)	803-8495 F/	AX: (410) 266-8912			SIT	E CODE:		Honeywell Hex Chrome Study	
Description:	PAM-21		Lab ID:	5031727-0	8			Sampled: 03/13/15 00:00	
Matrix:	Air		Sample Volu	ume:	21.84	m³		Received: 03/17/15 11:56	
Comments:								Analysis Date: 03/18/15 15:04	
		Hex	kavalent Ch	romium b	y SOP E	RG-MOR	t-063		
			<u> </u>	<u>Results</u>			MDL		
<u>Analyte</u>		<u>CAS Numbe</u>	er no	<u>q/m³ Air</u>	1	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		ND		U	0.0038		

MAR 3 1 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc						F	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						F	REPORTED: 03/20/15 13:44			
Malvern, PA 19355 SUBMITTED: 03/17/15										
ATTN: Mr. Jeff E	Boggs					ļ	QS SITE	CODE:		
<b>PHONE:</b> (443)	803-8495	FAX:	(410) 266-8912			S	ITE COD	)E:	Honeywell Hex Chrome Study	
Description:	PAM-31			Lab ID:	5031727	7-09			Sampled: 03/13/15 00:00	
Matrix:	Air			Sample Vo	olume:	21.78	m³		Received: 03/17/15 11:56	
Comments:									Analysis Date: 03/18/15 15:15	
			Не	xavalent C	Chromium	n by SOI	PERG-M	IOR-063		
					<u>Results</u>			MDL		
<u>Analyte</u>			CAS Numb	<u>er</u>	<u>ng/m³ Air</u>	1	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium			1854-02-99		ND		U	0.0038		

MAR 3 1 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	75 Valley Stream Parkway, Suite 400					44		
Malvern, PA 19355	5		SUBMITT	SUBMITTED: 03/17/15				
ATTN: Mr. Jeff Boggs AQS SITE CODE:								
PHONE: (443) 8	03-8495 FAX: (41	0) 266-8912		SITE COD	DE:	Honeywell Hex Chrome Study		
Description:	PAM-1	Lab ID:	5031727-12			Sampled: 03/16/15 18:06		
Matrix:	Air	Sample	Volume: 22	.23 m³		Received: 03/17/15 11:56		
Comments:	Col 1 Start Time 3/15/15	17:24				Analysis Date: 03/18/15 12:59		
		Hexavalent	: Chromium by	SOP ERG-M	10R-063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0183		0.0038			

MAR 3 1 2015

Initials: CR

Eastern Research Group



Environmental Res	nt, Inc	FILE #	FILE #: 3926.00					
75 Valley Stream F	Parkway, Suite 400			REPO	REPORTED: 03/20/15 13:44			
Malvern, PA 1935		SUBN	SUBMITTED: 03/17/15					
ATTN: Mr. Jeff Boggs AQS SITE CODE:								
PHONE: (443) 8	03-8495 <b>FAX:</b>	(410) 266-8912		SITE	CODE:	F	loneywell Hex Chrome Study	
Description:	PAM-1D	Lab	ID: 5031727-	13			Sampled: 03/16/15 18:10	
Matrix:	Air	Sam	ple Volume:	22.26	m³		Received: 03/17/15 11:56	
Comments:	Col 2 Start Time 3/15	5/15 17:26					Analysis Date: 03/18/15 13:18	
		Hexaval	ent Chromium	by SOP ER	G-MOR-	063		
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Fla</u>	a	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0211			0.0038		

MAR 3 1 2015

Initials: CR

Eastern Research Group



Environmental Res	с	FILE #: 3926	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400		REPORTED:	REPORTED: 03/20/15 13:44			
Malvern, PA 19355	ō		SUBMITTED: 03/17/15				
ATTN: Mr. Jeff Boggs AQS SITE CODE:							
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	He	oneywell Hex Chrome Study	
Description:	PAM-2	Lab ID:	5031727-14			Sampled: 03/16/15 17:36	
Matrix:	Air	Sample	Volume: 22.0	)2 m³		Received: 03/17/15 11:56	
Comments:	Start Time 3/15/15 17:08					nalysis Date: 03/18/15 15:26	
		Hexavalent	Chromium by S	OP ERG-MOR-	063		
			<u>Results</u>		MDL		
Analyte		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0240		0.0038		

MAR 3 1 2015

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 19



Environmental Res	•	FILE #: 3926.00					
75 Valley Stream F	Parkway, Suite 400		REPORTED: 03/20/15 13:44				
Malvern, PA 19355	5			SUBMITTED: 03/17/15			
ATTN: Mr. Jeff Boggs AQS SITE CODE:							
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	Hone	eywell Hex Chrome Study	
Description:	PAM-3	Lab ID:	5031727-15			Sampled: 03/16/15 17:17	
Matrix:	Air	Sample	<b>/olume:</b> 21.8	1 m³		Received: 03/17/15 11:56	
Comments:	Start Time 3/15/15 17:03				Ana	lysis Date: 03/18/15 15:36	
		Hexavalent	Chromium by S	OP ERG-MOR-	063		
			<u>Results</u>		<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>nq/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0160		0.0038		

MAR 3 1 2015

Initials: CR

Eastern Research Group



Environmental Res	sources Management, Ind	0	FILE #: 392	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400		REPORTED: 03/20/15 13:44					
Malvern, PA 19355	5			SUBMITTED: 03/17/15				
ATTN: Mr. Jeff Bo	ATTN: Mr. Jeff Boggs AQS SITE CODE:							
PHONE: (443) 8	03-8495 <b>FAX:</b> (410	) 266-8912		SITE CODE:	H	oneywell Hex Chrome Study		
Description:	PAM-4	Lab ID:	5031727-16			Sampled: 03/16/15 16:52		
Matrix:	Air	Sample	Volume: 21.4	18 m³		Received: 03/17/15 11:56		
Comments:	Start Time 3/15/15 17:00					Analysis Date: 03/18/15 15:59		
		Hexavalent	Chromium by S	OP ERG-MOR-	063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0385		0.0038			

MAR 3 1 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					REPORTED: 03/20/15 13:44			
Malvern, PA 1935	55		SUBMITTE	SUBMITTED: 03/17/15				
ATTN: Mr. Jeff E	Boggs		AQS SITE	CODE:				
<b>PHONE:</b> (443)	803-8495 FAX	: (410) 266-8912		SITE CODE	≣: ⊦	Honeywell Hex Chrome Study		
Description:	PAM-21	Lab	ID: 5031727-1	7		Sampled: 03/16/15 00:00		
Matrix:	Air	Sam	ple Volume:	22.02 m³		Received: 03/17/15 11:56		
Comments:						Analysis Date: 03/18/15 16:09		
		Hexava	lent Chromium t	by SOP ERG-MO	DR-063			
			<b>Results</b>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	ND	U	0.0038			

MAR 3 1 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc 75 Valley Stream Parkway, Suite 400							FILE #: 3926.00 REPORTED: 03/20/15 13:44			
ATTN: Mr. Jeff Boggs							AQS SITE CODE:			
<b>PHONE:</b> (443)	803-8495	FAX:	(410) 266-8912			:	SITE CODE	:	Honeywell Hex Chrome Study	
Description:	PAM-31			Lab ID:	5031727	7-18			Sampled: 03/16/15 00:00	
Matrix:	Air			Sample Vo	olume:	21.81	m³		Received: 03/17/15 11:56	
Comments:									Analysis Date: 03/18/15 16:20	
			Не	xavalent C	hromium	ı by SO	P ERG-MC	DR-063		
			Results					MDL		
<u>Analyte</u>			CAS Numbe	<u>er</u>	ng/m³ Air	<u> </u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium			1854-02-99		ND		U	0.0038		

MAR 3 1 2015

Initials: CR

Eastern Research Group



March 31, 2015

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 March 27, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

#### LDC Project #33967:

### SDG Fraction

5031822 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
Commenter sus	70 pages-SF	1 WEE	K TAT		12.5			Mark 101 (1019	Ng TT 16 Mg ( 17780).	0.000.000.000					Atta	achn	nent	1		the second second second second																			
	Level IV	E	DC #33	<b>896</b>	7 (E	RN	Λ -	Mö	rri	svil	le,	NC	; /	Ha	rbo	or F	?oir	nt, I	MD	,Н	exa	ava	ler	nt C	hro	əmi	iun	n M	on	tor	ing	3)							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr( (D7	(VI) 614)										<b>•</b> • •																		T						
Matri	C Air/Water/Soil	<u> </u>		A	S	w	s	W	s	W	S	W	s	W	s	w	s	w	S	w	s	w.	s	w	s	w	s	w	s	W	s	w	s	w	s	w	s	w	s
A	5031822	03/27/15	04/03/15	9	0								-	╞	<u> </u>		<u> </u>							-	-											$\vdash$		├──	-
				-										┢	╞			<u> </u>				┣─	╎									╞				┢─┤			┝─┦
																							<u> </u>															<b> </b>	
																								1															
							_												_																				
														<u> </u>	<u> </u>					ļ		<u> </u>		<u> </u>	<u> </u>													<b> </b>	
														<u> </u>			<b> </b>							<u> </u>	<u> </u>							<b> </b>				$\vdash$		┝──	
+																	<u> </u>								-								<u> </u>			$\vdash$		'	
		<u> </u>												┢──	-								$\vdash$													⊢┤			
																							1																
							_																																
																																				$\vdash$			
																<u> </u>						<u> </u>	<b> </b>	<u> </u>	<u> </u>											$\vdash$		'	
																						<u> </u>			<u> </u>													<u> </u>	$\vdash$
┝──┤														<u> </u>										-															
┝──┼					-																	-											<u> </u>				-+		
																														-									
													-																										
																																					$- \downarrow$		
														<b> </b>									<u> </u>	<b> </b>														<sup> </sup>	
$\vdash$														<u> </u>										-												┢━━┫	-+	]	
														<u> </u>										├──												┢───┨	-+		$\left  - \right $
┝─┤														<u> </u>									$\square$		-												$\neg$		
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

## LDC Report# 33967A6

# Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: March 17, 2015

LDC Report Date: March 29, 2015

Matrix:

Parameters: Hexavalent Chromium

Air

Validation Level : EPA Level IV

Laboratory: Eastern Research Group

Sample Delivery Group (SDG): 5031822

## Sample Identification

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

1

### 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. Results 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	0.0626	0.0727	15 (≤20)	-	-

4

### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 5031822

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 5031822

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 5031822

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

5

LDC #:	33967A6	VALIDATION COMPLETENESS WORKSHEET	
SDG #:	5031822	Level IV	
Laborator	ry: <u>Eastern R</u>	esearch Group	•
			· · · ·



#### METHOD: (Analyte) 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.	Sample receipt/Technical holding times	A	3/11/15
11	Initial calibration	A	
.	Calibration verification	A	
IV	Laboratory Blanks	4	
v	Field blanks	ND	FB=(8) TB=(G)
VI.	Matrix Spike/Matrix Spike Duplicates	2	Not Required
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	Ā	LCSID
IX.	Field duplicates	SW	FD=(3.4)
Х.	Sample result verification	A	
xı	Overall assessment of data	A	

Note: A = Acceptable

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 SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1	5031822-01	Air	03/17/15
2	OAM 2	5031822-02	Air	03/17/15
3	PAM-1	5031822-03	Air	03/17/15
4	PAM-1D	5031822-04	Air	03/17/15
5	PAM-2	5031822-05	Air	03/17/15
6	PAM-3	5031822-06	Air	03/17/15
7	PAM-4	5031822-07	Air	03/17/15
8	PAM-21	5031822-08	Air	03/17/15
9	PAM-31	5031822-09	Air	03/17/15
10	PAM-1DUP	5031822-03DUP	Air	03/17/15
11	PAM-1DDUP	5031822-04DUP	Air	03/17/15
12				
13				
14				
15				
Jota				

LDC #: 335167.04



.

162	NO	NA	Findings/Comments
		<u></u>	
/			
<			
<			
/			
		_	
,		1	
<	,		
	/		
/	 		
		/	
/			
1			
/			
		_	

.



#### VALIDATION FINDINGS CHECKLIST

Page: \_20f \_\_\_\_\_ 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?	1			
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#<u>33967A6</u>

### VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: <u>\</u> of <u>\</u> Reviewer: <u>SO</u> 2nd Reviewer: <u></u>

Inorganics: Method See Cover

	Concentrati			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0626	0.0727	15	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\33967A6.wpd

# LDC #: 3396724

#### Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: Reviewer: 2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of  $\underline{Cr}$  was recalculated. Calibration date: 3/19/15

Where,

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

%R = Found X 100

True

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 <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0342059			
		s2	0.1	0.0703652	0.99996	0.99998	
	6-24	s3	0.2	0.1451847			Y
	Ċ	s4	0.5	0.3810375			$\mathbf{r}$
		s5	1	0.7642907			,
		\$6	2	1.5617175			
Calibration verification	Cray	Evend O. SSG3rejim	The O.Snglml		111.3%8	111.3%.2	
CCU \2~.38 Calibration verification	Crab	0.5541 ng/m	0. Snglml		110.8%2	(10.8%E	4
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 #: 336126

## VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

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

		0	$\Gamma$	
METHOD: Inorganics,	Method		Lover	

Where,

· ·

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

%R = <u>Found</u> x 100 True 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:

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

S = D = Original sample concentration Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported %R / RPD	Acceptable (Y/N)
LCSD 121.28	Laboratory control sample	Crto	1.07 mg/m	1.00 mg/m/	107%2	107%2	2
N	Matrix spike sample		(SSR-SR)				
DUR 13.10	Duplicate sample	J	0.0769 vg/m3	0.0727.ng/m3	5.62%.PR	5.61%RD	Z*

.....

Comments: \* Roundin

	LDC #	4 <u>339678</u> 4	VALIDATION FINDINGS W Sample Calculation Ver	ORKSHEET	Pa Review 2nd review	ge:of wer: wer:
	ИЕТН	IOD: Inorganics, Metho	d See Cover			Ú -
	Please YN YN YN Comp	e see qualifications belo <u>N/A</u> Have results <u>N/A</u> Are results w <u>N/A</u> Are all detect ound (analyte) results for culated and verified using	w for all questions answered "N". Not app been reported and calculated correctly? ithin the calibrated range of the instrumen ion limits below the CRQL? or g the following equation:	blicable questions ar hts? repo	re identified as "N/ orted with a positiv	A". /e detect were
(	Concer	$\operatorname{tration} \left( A \cdot C_{6} \right) \right _{C_{6}}$	$vf = \{0,\} \text{ Recalculation:} (0.067)$	\$3484-(-9.9	E-03)	) OSTYME Lin
		A = 0.0663984 $L_0 = -9.9 = -03$ $L_1 = 0.7834326$	$\frac{(uf)(ung)m!}{m3} = ng(m3)$	(10mi)(0.0 21-21-	2974 mg/ml) 31m2	- 0. 0457nglv
	. #	Sample ID	Analyte	Reported Concentration ( Na W <sup>3</sup> )	Calculated Concentration (Vig 1473)	Acceptable (Y/N)
		ĺ	Crtp	0.0457	0.0457	Y
		2		0.0626	0.0626	
	•	3	·····	0.027	0.0727	
		<u> </u>		0.0106	0.0708	
		5		0.0548	0.0548	
ľ	<u></u>			0.0402	0.0462	
		8		10.125	$\frac{10.(25)}{100}$	<u>├</u>
		<u>ද</u>			ND	<u> </u>
			Ţ			
		· ·				
				·		
				<u> </u>	<u> </u>	

Note:\_\_\_\_\_

\_\_\_\_\_

# CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Inc	;		FILE #: 3926	6.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/25/15 13:58	
Malvern, PA 19355	5			SUBMITTED:	03/18/15	
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Но	neywell Hex Chrome Study
Description:	OAM 1	Lab ID:	5031822-01			Sampled: 03/17/15 14:59
Matrix:	Air	Sample	Volume: 21.3	1 m³		Received: 03/18/15 13:01
Comments:	Start Time 3/16/15 15:19				A1	nalysis Date: 03/19/15 13:37
		Hexavalent	Chromium by S	OP ERG-MOR-	063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0457		0.0038	

MAR 3 0 2015

Initials: CR

Eastern Research Group

# CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Inc	;		FILE #: 3926	6.00	
75 Valley Stream F	arkway, Suite 400			REPORTED:	03/25/15 13:58	
Malvern, PA 19355	i			SUBMITTED:	03/18/15	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410)	) 266-8912		AQS SITE	Но	neywell Hex Chrome Study
Description:	OAM 2	Lab ID:	5031822-02			Sampled: 03/17/15 15:42
Matrix:	Air	Sample	Volume: 21.1	.1 m³		Received: 03/18/15 13:01
Comments:	Start Time 3/16/15 16:15			<u></u>	A	nalysis Date: 03/19/15 13:48
		Hexavalent	Chromium by S	OP ERG-MOR-	063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0626		0.0038	

MAR 3 0 2015

Initials: CR

Eastern Research Group

# CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, In	с		FILE #: 392	26.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/25/15 13:	58
Malvern, PA 19355	5			SUBMITTED:	03/18/15	
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	)) 266-8912		AQS SITE CODE: SITE CODE:	ŀ	Ioneywell Hex Chrome Study
Description:	PAM-1	Lab ID:	5031822-03			Sampled: 03/17/15 17:38
Matrix:	Air	Sample	Volume: 20.9	99 m³		Received: 03/18/15 13:01
Comments:	Col 1 Start Time 3/16/15	18:19				Analysis Date: 03/19/15 13:00
		Hexavalent	t Chromium by S <u>Results</u>	SOP ERG-MOR	t-063 MDL	
Analyte		CAS Number	ng/m³ Air	<u>Flag</u>	ng/m³ Air	
Hexavalent Chromium		1854-02-99	0.0727		0.0038	

MAR 3 0 2015

Initials: CR

Eastern Research Group

# CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Inc	<b>;</b>		FILE #: 3926	.00	
75 Valley Stream F	<sup>o</sup> arkway, Suite 400			REPORTED:	03/25/15 13:58	
Malvern, PA 19355	5			SUBMITTED:	03/18/15	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Hone	eywell Hex Chrome Study
Description:	PAM-1D	Lab ID:	5031822-04			Sampled: 03/17/15 17:37
Matrix:	Air	Sample V	<b>/olume:</b> 20.7	8 m³		Received: 03/18/15 13:01
Comments:	Col 2 Start Time 3/16/15 1	.8:32			Ana	lysis Date: 03/19/15 13:18
		Hexavalent	Chromium by S	OP ERG-MOR-	063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0708		0.0038	

MAR 3 0 2015

Initials: CR

Eastern Research Group

# **ERG**

# CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Inc	•		FILE #: 3920	5.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/25/15 13:58	:
Malvern, PA 19355	5			SUBMITTED:	03/18/15	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE	Hc	neywell Hex Chrome Study
Description:	PAM-2	Lab ID:	5031822-05			Sampled: 03/17/15 17:12
Matrix:	Air	Sample V	<b>'olume:</b> 21.0	7 m³		Received: 03/18/15 13:01
Comments:	Start Time 3/16/15 17:47				A	nalysis Date: 03/19/15 13:59
		Hexavalent	Chromium by S	OP ERG-MOR-	063	
			Results		<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-9 <del>9</del>	0.0548		0.0038	

MAR 3 0 2015

Initials: CR

Eastern Research Group



# CERTIFICATE OF ANALYSIS

Environmental Re	sources Management, In	5		FILE #: 3920	6.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/25/15 13:5	8
Malvern, PA 1935	5			SUBMITTED:	03/18/15	
<b>ATTN:</b> Mr. Jeff Be <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	н	oneywell Hex Chrome Study
Description:	PAM-3	Lab II	<b>5</b> 031822-06			Sampled: 03/17/15 16:52
Matrix:	Air	Sampl	e Volume: 21.0	06 m³		Received: 03/18/15 13:01
Comments:	Start Time 3/16/15 17:28					Analysis Date: 03/19/15 14:09
		Hexavale	nt Chromium by S	OP ERG-MOR-	063	
			<u>Results</u>		<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0462		0.0038	

MAR 3 0 2015

Initials: CR

Eastern Research Group

# **ERG**

# CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Inc	>		FILE #: 3926	5.00	
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/25/15 13:58	3
Malvern, PA 1935	5			SUBMITTED:	03/18/15	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Но	oneywell Hex Chrome Study
Description:	PAM-4	Lab ID:	5031822-07			Sampled: 03/17/15 16:11
Matrix:	Air	Sample \	/olume: 20.7	'9 m³		Received: 03/18/15 13:01
Comments:	Start Time 3/16/15 17:05				AA	nalysis Date: 03/19/15 14:20
		Hexavalent	Chromium by S	OP ERG-MOR-	063	
			<u>Results</u>		<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.123		0.0038	

MAR 3 0 2015

Initials: CR

Eastern Research Group

# CERTIFICATE OF ANALYSIS

Environmental Re	sources Manageme	nt, Inc				FILE #:	3926.00	D		
75 Valley Stream	Parkway, Suite 400					REPORT	ED: 03	8/25/15 13:5	В	
Malvern, PA 1935	5					SUBMITT	ED:	03/18/15		
<b>ATTN:</b> Mr. Jeff B <b>PHONE:</b> (443) 8	oggs 803-8495 FAX:	(410) 266-8912				AQS SITE	E DE:	н	oneywell Hex Chrome Study	
Description:	PAM-21		Lab ID:	5031822-	08				Sampled: 03/17/15 00:00	
Matrix:	Air		Sample Vo	lume:	21.07	m³			Received: 03/18/15 13:01	
Comments:									Analysis Date: 03/19/15 14:31	
		He	xavalent C	hromium	by SO	P ERG-M	40R-06	3		
				<u>Results</u>				<u>MDL</u>		
<u>Analyte</u>		CAS Numbe	er .	<u>ng/m³ Air</u>		<u>Flag</u>	n	<u>iq/m³ Air</u>		
Hexavalent Chromium		1854-02-99		ND		U		0.0038		

MAR 3 0 2015

Initials: CR

Eastern Research Group

## CERTIFICATE OF ANALYSIS

Environmental Re	esources Manag	ement, Inc				FILE #:	392	6.00	
75 Valley Stream	Parkway, Suite	400				REPOR	TED:	03/25/15 13:	58
Malvern, PA 1935	5					SUBMIT	TED:	03/18/15	
ATTN: Mr. Jeff B PHONE: (443) 8	8oggs 803-8495 F/	<b>AX:</b> (410) 266-8912				AQS SI SODE: SITE CO	TE DDE:	I	Honeywell Hex Chrome Study
Description:	PAM-31	·····	Lab ID:	503182	2-09				Sampled: 03/17/15 00:00
Matrix:	Air		Sample Vo	lume:	21.06	m	13		Received: 03/18/15 13:01
Comments:									Analysis Date: 03/19/15 15:03
		He	xavalent C	hromiur	n by SC	P ERG	MOR	-063	••••••••••••••••••••••••••••••••••••••
				<u>Results</u>				<u>MDL</u>	
Analyte		CAS Numbe	er <u>I</u>	ng/m³ Ai	r	Flag		<u>ng/m³ Air</u>	

ND

1854-02-99

U

0.0038

Hexavalent Chromium

MAR 3 0 2015

Initials: CR

Eastern Research Group



March 31, 2015

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 March 27, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

### LDC Project #33968:

## SDG Fraction

5031911/5032011 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

Automatic concerns	102 pages-SF	1 WEE	K TAT		300047-0024	1011000000	454.7-2-7.7	120-017.00	101000			104			Atta	chn	nent	: 1							S. R. C. Statul & R.		- 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10												\$\$217 KG
	Level IV	Ŀ	DC #33	896	8 (E	ERM	<b>N</b> ≓	Mo	rris	svil	le,	NC	<u>;  </u>	Ha	rbc	or P	?oir	nt, I	MD	, H	exa	ava	len	nt C	hro	omi	um	M	oni	tor	ing	)							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr( (D7)	(VI) 614)																																		
Mati	ix: 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	×	s	w	s	w	s	w	s	w	s
A	5031911/5032011	03/27/15	04/03/15	18	0										<u> </u>	<u> </u>							<u> </u>														<b></b>	<u>                                     </u>	$\vdash$
<u> </u>														<u> </u>	<u> </u>								-															⊢′	'
<u> </u>																							-													$\rightarrow$		<sup> </sup>	├──
					<u> </u>		<u> </u>													i																		!	
<u> </u>					$\vdash$																-																	┟╍╼╼┦	
<u> </u>				<u> </u>			<u> </u>						-	┝		<u> </u>																							<u> </u>
				1					-																				-									<b>  </b>	<u> </u>
																																							<b> </b>
				<b> </b>										<u> </u>																									<u> </u>
				ļ			<u> </u>							<u> </u>																									<b> </b>
				<u> </u>										<u> </u>		<u> </u>				<u> </u>																$ \rightarrow $		┝──┘	
				-			-																													-+			<b> </b>
														<u> </u>						<u> </u>																-+			
							-																-															┢──┦	<u> </u>
	·			1	$\vdash$																						_												
																							<b> </b>																<b> </b>
				<u> </u>		<u> </u>																																	┣──
																	<u> </u>			<u> </u>																			
				_												<u> </u>	<u> </u>				<u> </u>			<u> </u>												⊢┤		┝──┘	<u> </u>
					<u> </u>		<u> </u>							<u> </u>								-	-		<u> </u>											$\dashv$		'	<u> </u>
						$\vdash$	<u> </u>							<u> </u>				-	-			-														$\square$		'	
					<u> </u>	<u> </u>																-														-+		<sup> </sup>	<b></b>
				$\square$										<u> </u>							<u> </u>			$\square$															
Total	T/CR			18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
	Chadad call	a indicata La		tion (o	all oth						:									MOD		DUD					1 -							2206		wod			

## LDC Report# 33968A6

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	March 18 through March 19, 2015
LDC Report Date:	March 29, 2015
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	5031911/5032011

### Sample Identification

OAM 1 (03/18/15) OAM 2 (03/18/15) PAM-1 (03/18/15) PAM-1D (03/18/15) PAM-2 (03/18/15) PAM-3 (03/18/15) PAM-4 (03/18/15) PAM-21 (03/18/15) PAM-31 (03/18/15) OAM 1 (03/19/15) OAM 2 (03/19/15) PAM-1 (03/19/15) PAM-1D (03/19/15) PAM-2 (03/19/15) PAM-3 (03/19/15) PAM-4 (03/19/15) PAM-21 (03/19/15) PAM-31 (03/19/15) PAM-1 (03/18/15) DUP PAM-1D (03/18/15) DUP PAM-1 (03/19/15) DUP PAM-1D (03/19/15) 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.

2

## 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(03/18/15) and PAM-31(03/19/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21(03/18/15) and PAM-21(03/19/15) 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. Results 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(03/18/15) and PAM-1D (03/18/15) and samples PAM-1(03/19/15) and PAM-1D (03/19/15) 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(03/18/15)	PAM-1D (03/18/15)	(Limits)	Flags	A or P
Hexavalent chromium	0.0348	0.0412	17 (≤20)	-	-

	Concentrati	on (ng/m³)				
Analyte	PAM-1(03/19/15)	PAM-1D (03/19/15)	RPD (Limits)	Flags	A or P	
Hexavalent chromium	0.0468	0.0500	7 (≤20)	-	-	

4

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 5031911/5032011

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 5031911/5032011

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 5031911/5032011

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

5

SDG #: 5031911/5032011 Level IV	
Laboratory: <u>Eastern Research Group</u>	0



#### METHOD: (Analyte) 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.	Sample receipt/Technical holding times	A	3/18/15 -3/4/15
	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB=(8)(n) TB=(9)(8)
VI.	Matrix Spike/Matrix Spike Duplicates	2	Not Revined
VII.	Duplicate sample analysis	A	900
VIII.	Laboratory control samples	A	LISIO
IX.	Field duplicates	SW	FO=(3.4)(7.13)
Х.	Sample result verification	A	)
XI	Overall assessment of data	R	

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 SB=Source blank OTHER:

**Client ID** Lab ID Matrix Date 03/18/15 1 OAM 1 (03/18/15) 5031911-01 Air Air 03/18/15 2 OAM 2 (03/18/15) 5031911-02 3 PAM-1 (03/18/15) 5031911-03 Air 03/18/15 4 PAM-1D (03/18/15) 5031911-04 Air 03/18/15 5 Air 03/18/15 PAM-2 (03/18/15) 5031911-05 6 PAM-3 (03/18/15) 5031911-06 Air 03/18/15 7 PAM-4 (03/18/15) Air 03/18/15 5031911-07 8 PAM-21 (03/18/15) Air 5031911-08 03/18/15 9 PAM-31 (03/18/15) 5031911-09 Air 03/18/15 10 OAM 1 (03/19/15) 5032011-01 Air 03/19/15 11 OAM 2 (03/19/15) 5032011-02 Air 03/19/15 12 PAM-1 (03/19/15) 5032011-03 Air 03/19/15 13 PAM-1D (03/19/15) 5032011-04 Air 03/19/15 14 PAM-2 (03/19/15) 5032011-05 Air 03/19/15 15 PAM-3 (03/19/15) Air 5032011-06 03/19/15 16 PAM-4 (03/19/15) 5032011-07 Air 03/19/15 17 PAM-21 (03/19/15) 5032011-08 Air 03/19/15

VALIDATION COMPLETENESS WORKSHEET
Level IV

LDC #: <u>33968A6</u> **VAL** SDG #: <u>5031911/5032011</u> Laboratory: <u>Eastern Research Group</u>

### Date: 32115 Page: 2072 Reviewer: 55 2nd Reviewer: 6

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (03/19/15)	5032011-09	Air	03/19/15
19	PAM-1 (03/18/15)DUP	5031911-03 DUP	Air	03/18/15
20	PAM-1D (03/18/15)DUP	5031911-04 DUP	Air	03/18/15
21	PAM-1 (03/19/15)DUP	5032011-03 DUP	Air	03/19/15
22	PAM-1D (03/19/15)DUP	5032011-04 DUP	Air	03/19/15
23				
24				
25				
26				
27				
Note	S.			

.

	V	Ne		
Validation Area	Yes	NO	NA	Findings/Comments
I. Technical holding times			<b></b>	r
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 <a> 0.995?</a>	/			
Were all initial and continuing calibration verification %Rs within the 90 110% QC limits? 85-LIS	/			
Were titrant checks performed as required? (Level IV only)		 	$\leq$	
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?	$\sum$			
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	
Were the performance evaluation (PE) samples within the acceptance limits?				



#### VALIDATION FINDINGS CHECKLIST

Page: <u>Zof</u> Reviewer: <u>36</u> 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>33968A6</u>

### VALIDATION FINDINGS WORKSHEET Field Duplicates



Inorganics: Method See Cover

	Concentrati			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0348	0.0412	17	

	Concentrati			
Analyte	_12	13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0468	0.0500	7	

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\33968A6.wpd

LDC #: 33968240

### Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:_\_	of <u>\</u>
Reviewer:	<u> </u>
2nd Reviewe	r: <u></u>

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of  $\underline{C}^{\vee}$  was recalculated. Calibration date: 3123/15

Where,

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

%R = Found X 100

True

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 <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0377155			
		s2	0.1	0.0761473	0.99998	0.99998	
	0 +10	s3	0.2	0.1498522			$\mathcal{A}$
	(LT)	s4	0.5	0.3941322			
		s5	1	0.7777418			
		s6	2	1.570445			
تلاس الناجج Calibration verification	Cr40	Found 0.5272.ng/ml	True O.Snglud		105.4%p	-105.4%P	3)
CCU (といい) Calibration verification	Criv	).5308 ng hul	0. Singlim		106.2%E	106.2%.R	. J
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 #: 339188710

#### VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

\* Rambing

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 = <u>Found</u> x 100 Where, True 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 = <u> S-D </u> x 100	) Where,	S =	Original sample concentration
(S+D)/2		D =	Duplicate sample concentration

					Recalculated	Reported	
Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	%R / RPD	%R / RPD	Acceptable (Y/N)
LCS 12:08	Laboratory control sample	Cr*6	1.08 mg/ml	(_00 ng/m)	108%.E	108-12	y
2	Matrix spike sample		(SSR-SR)				
DUR 13:11	Duplicate sample	J	0.0440 ng/m?	0.0468ng/m3	6.17% RPD	6.06%.RPD	5 *

Comments:
LDC #: 339684 VALIDATION FINDINGS WORKSHEET Page: of Sample Calculation Verification Reviewer: 50 2nd reviewer: METHOD: Inorganics, Method See Care Please see gualifications below for all questions answered "N". Not applicable questions are identified as "N/A". N N/A Have results been reported and calculated correctly? Are results within the calibrated range of the instruments? Y N N/A Are all detection limits below the CRQL? Y/N N/A (10)\_\_\_\_reported with a positive detect were Compound (analyte) results for recalculated and verified using the following equation:  $\begin{array}{r} \text{Recalculation:} \left(0.0567159 - (-3.41E-06)\right) \\ \text{A=0.0567159} \\ \text{A=0.0567159} \\ \text{Co=-3.41E-03} \\ \text{Co=-3.41E-0$ Concentration = (A-co) lc, Reported Calculated Concentration Concentration Acceptable (naim3) # Sample ID (malm?) (Y/N) Analyte 850,0 U 1 0.0289 2 0.0096 0.0096 2 0.0348 0.0348 0.0412 0.0412 0.0284 0.0284 6 0.0055 1.0055 0.0634 0.0634 5 ND 9 NO ND 10 1.0355 0.0355 0.0285 11 0.0285 (2 0.0468 0.0468 2 0.0500 0.0500 0.0897 0.089 0 NOBB UL -0312 0 0.06830-0682 ND NO 1R OU  $\mathcal{O}\mathcal{A}$ \*Ronding Note:

## CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 03/27/15 09:38			
Malvern, PA 19355						SUBMITTED: 03/19/15 to 03/20/15			
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			AQS SITE CODE: SITE CODE:		Honeywell Hex Chrome Study		
Description:	OAM 1	Lab	<b>b ID:</b> 5031911-	01		·	Sampled: 03/18/15 15:00		
Matrix:	Air	Sar	mple Volume:	21.34	m³		Received: 03/19/15 10:53		
Comments:	Start Time 3/17/15 15:17						Analysis Date: 03/23/15 15:53		
		Hexava	alent Chromium	by SO	P ERG-MO	R-063			
			<u>Results</u>			<u>MDL</u>			
Analyte		CAS Number	<u>ng/m³ Air</u>		Flag	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0289			0.0038			

. and the fact is the transfer the t

MAR 3 0 2015

Initials: CR

Eastern Research Group



## CERTIFICATE OF ANALYSIS

Environmental Res	с	FILE #:	FILE #: 3926.00					
75 Valley Stream F	Parkway, Suite 400			REPOR	REPORTED: 03/27/15 09:38			
Malvern, PA 1935		SUBMI	SUBMITTED: 03/19/15 to 03/20/15					
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	)) 266-8912		AQS S	ITE ODE:		Honeywell Hex Chrome Study	
Description:	OAM 2	Lab ID	: 5031911-0	)2		·	Sampled: 03/18/15 15:34	
Matrix:	Air	Sample	e Volume:	21.3 r	n³		Received: 03/19/15 10:53	
Comments:	Start Time 3/17/15 15:54						Analysis Date: 03/23/15 16:04	
		Hexavaler	nt Chromium l	by SOP ERG	-MOR-	063		
			<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flac</u>	L	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0096			0.0038		

MAR 3 0 2015

Initials: CR

Eastern Research Group

### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream F	<sup>o</sup> arkway, Suite 400				REPORTED: 03/27/15 09:38				
Malvern, PA 19355	5		SUBMITTED: 03/19/15 to 03/20/15						
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b>	(410) 266-8912			AQS SITE CODE: SITE CODE:		Honeywell Hex Chrome Study		
Description:	PAM-1		Lab ID: 503	1911-03			Sampled: 03/18/15 17:10		
Matrix:	Air	:	Sample Volume	: 20.7	5 m³		Received: 03/19/15 10:53		
Comments:	Col 1 Start Time 3/17	7/15 18:01					Analysis Date: 03/23/15 13:39		
		Hexa	avalent Chron <u>Resu</u>	nium by So lits	OP ERG-MO	R-063 MDL			
Analyte		CAS Number	<u>ng/m</u>	<u><sup>3</sup> Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.03	48		0.0038			

MAR 3 0 2015

Initials: CR

Eastern Research Group

## CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, In	D	FILE #: 3	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400		REPORTED	REPORTED: 03/27/15 09:38			
Malvern, PA 19355					SUBMITTED: 03/19/15 to 03/20/15		
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE	: Honeywell Hex Chrome Stu	ydy	
Description:	PAM-1D	Lab I	<b>D:</b> 5031911-04		Sampled: 03/18/15 1	6:53	
Matrix:	Air	Samp	ole Volume: 20.1	18 m³	Received: 03/19/15 1	0:53	
Comments:	Col 2 Start Time 3/17/15	17:52			Analysis Date: 03/23/15 1	3:58	
		Hexavale	ent Chromium by S	OP ERG-MO	PR-063		
			<b>Results</b>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0412		0.0041		

MAR 3 0 2015

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 6 of 22



### CERTIFICATE OF ANALYSIS

Environmental Re	sources Management, In	с	FILE #:	FILE #: 3926.00				
75 Valley Stream	Parkway, Suite 400			REPOR	REPORTED: 03/27/15 09:38			
Malvern, PA 1935	5		SUBMIT	SUBMITTED: 03/19/15 to 03/20/15				
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 <b>FAX:</b> (410	)) 266-8912		AQS SITE CO	E) DE:	Honeywell Hex Chrome Study		
Description:	PAM-2	Lab	ID: 5031911	-05		Sampled: 03/18/15 16:27		
Matrix:	Air	Sam	ple Volume:	20.64 m	3	Received: 03/19/15 10:53		
Comments:	Start Time 3/17/15 17:22					Analysis Date: 03/23/15 16:14		
		Hexaval	ent Chromium	by SOP ERG-	MOR-063			
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	<u>nq/m³ Air</u>	<u>Flag</u>	nc	<u>ı/m³ Air</u>		
Hexavalent Chromium	1	1854-02-99	0.0284			0.0038		

MAR 3 0 2015

Initials: CR

Eastern Research Group



## CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 03/27/15 09:38			
Malvern, PA 19355						SUBMITTED: 03/19/15 to 03/20/15			
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX: (4</b> 10	) 266-8912		A Ç	QS SITE	E:	Honeywell Hex Chrome Study		
Description:	PAM-3	Lab II	<b>D:</b> 5031911-0	)6			Sampled: 03/18/15 16:11		
Matrix:	Air	Samp	le Volume:	20.8	m³		Received: 03/19/15 10:53		
Comments:	Start Time 3/17/15 17:04						Analysis Date: 03/23/15 16:25		
		Hexavale	ent Chromium I	by SOP	PERG-M	OR-063			
			<b>Results</b>			MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flaq</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0055			0.0038			

MAR 3 0 2015

1

Initials: CR

Eastern Research Group

## CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc					F	ILE #:	3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 03/27/15 09:38				
Malvern, PA 19355	5				S	UBMITT	<b>ED:</b> 0	3/19/15	to 03/20/15	
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			۲ و	QS SITE	E DE:		Honeywell Hex Chrome Stud	ly
Description:	PAM-4	Lat	b ID:	5031911-07	,				Sampled: 03/18/15 16:	00
Matrix:	Air	Sar	mple Vol	ume: 2	1.18	m³			Received: 03/19/15 10	53
Comments:	Start Time 3/17/15 16:28								Analysis Date: 03/23/15 16	36
		Hexava	alent Ch	nromium by	y SOI	PERG-M	10R-063			
			l	<u>Results</u>				<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>n</u>	ig/m³ Air		<u>Flag</u>	ng	<u>/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0634				0.0038		

MAR 3 0 2015

Initials: CR

Eastern Research Group

## CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc						FILE #: 3926.00				
75 Valley Stream Parkway, Suite 400							REPORTED: 03/27/15 09:38			
Malvern, PA 19355						SUBMITTED: 03/19/15 to 03/20/15			io 03/20/15	
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495 <b>FAX:</b>	(410) 266-8912				AQS SITE	E DE:	I	Honeywell Hex Chrome Study	
Description:	PAM-21		Lab ID:	5031911	L-08		-		Sampled: 03/18/15 00:00	
Matrix:	Air		Sample Vo	olume:	20.64	h m³			Received: 03/19/15 10:53	
Comments:									Analysis Date: 03/23/15 17:08	
		He	xavalent C	hromium	n by SC	P ERG-N	MOR-0	63		
				<u>Results</u>				MDL		
<u>Analyte</u>		CAS Numb	<u>er</u>	<u>ng/m³ Air</u>	C C	<u>Flag</u>		<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		ND		U		0.0038		

MAR 3 0 2015

Initials: CR

Eastern Research Group

## **ERG**

### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 03/27/15 09:38			
Malvern, PA 1938	55					SUBMITTE	ED: 03/19/15	to 03/20/15	
ATTN: Mr. Jeff B PHONE: (443)	3oggs 803-8495 F/	<b>AX:</b> (410) 266-8912				AQS SITE CODE: SITE CODI	E:	Honeywell Hex Chrome Study	
Description:	PAM-31		Lab ID:	5031911	-09			Sampled: 03/18/15 00:00	
Matrix:	Air		Sample Vo	lume:	20.8	m³		Received: 03/19/15 10:53	
Comments:								Analysis Date: 03/23/15 17:18	
		He	xavalent C	hromium	by SC	OP ERG-M	OR-063		
				<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Numbe	er i	ng/m³ Air		<u>Flag</u>	<u>ng/m³ Air</u>		

ND

1854-02-99

υ

0.0038

Hexavalent Chromium

MAR 3 0 2015

Initials: CR

Eastern Research Group

## ERG

## CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400		REPORTED:	REPORTED: 03/27/15 09:38				
Malvern, PA 19355	5		SUBMITTED:	SUBMITTED: 03/19/15 to 03/20/15				
<b>ATTN:</b> Mr. Jeff Be <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410)	266-8912		AQS SITE CODE: SITE CODE:	Honeywe	II Hex Chrome Study		
Description:	OAM 1	Lab ID:	5032011-01		Sai	mpled: 03/19/15 15:04		
Matrix:	Air	Sample	Volume: 21.5	53 m³	Ree	ceived: 03/20/15 11:10		
Comments:	Start Time 3/18/15 15:11				Analysis	s Date: 03/23/15 14:17		
		Hexavalent	: Chromium by S	OP ERG-MOR-	063			
			<u>Results</u>		<u>MDL</u>			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0355		0.0038			

MAR 3 0 2015

Initials: CR

Eastern Research Group

### CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Ind	>	FILE #: 3	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400		REPORTED	REPORTED: 03/27/15 09:38			
Malvern, PA 1935	5		SUBMITTEI	SUBMITTED: 03/19/15 to 03/20/15			
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE	: Honeyw	vell Hex Chrome Study	
Description:	OAM 2	Lab ID:	5032011-02		S	ampled: 03/19/15 15:28	
Matrix:	Air	Sample	Volume: 21.	11 m³	R	eceived: 03/20/15 11:10	
Comments:	Start Time 3/18/15 15:39				Analys	sis Date: 03/23/15 14:27	
		Hexavalent	t Chromium by S	OP ERG-MC	R-063		
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-9 <del>9</del>	0.0285		0.0038		

MAR 3 0 2015

Initials: CR

Eastern Research Group

### CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Inc	c	FILE #:	FILE #: 3926.00			
75 Valley Stream F	<sup>o</sup> arkway, Suite 400		REPORTE	REPORTED: 03/27/15 09:38			
Malvern, PA 19355					SUBMITTED: 03/19/15 to 03/20/15		
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE	E: ł	Honeywell Hex Chrome Study	
Description:	PAM-1	Lab ID	5032011-03			Sampled: 03/19/15 16:48	
Matrix:	Air	Sample	e Volume: 21	09 m³		Received: 03/20/15 11:10	
Comments:	Col 1 Start Time 3/18/15	17:17				Analysis Date: 03/23/15 13:01	
		Hexavaler	nt Chromium by	SOP ERG-M	OR-063		
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>nq/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0468		0.0038		

MAR 3 0 2015

Initials: CR

Eastern Research Group

## CERTIFICATE OF ANALYSIS

Environmental Re	sources Management, In	ic		FILE #:	3926.00	
75 Valley Stream I	Parkway, Suite 400			REPORT	ED: 03/27/15 09:	38
Malvern, PA 1935	5			SUBMITT	ED: 03/19/15	to 03/20/15
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 <b>FAX:</b> (41)	0) 266-8912		AQS SITE	E DE:	Honeywell Hex Chrome Study
Description:	PAM-1D	Lab ID:	5032011-0	4		Sampled: 03/19/15 16:55
Matrix:	Air	Sample	Volume:	21.26 m³		Received: 03/20/15 11:10
Comments:	Col 2 Start Time 3/18/15	17:05				Analysis Date: 03/23/15 13:20
		Hexavalen	t Chromium b	y SOP ERG-N	10R-063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium	l i i i i i i i i i i i i i i i i i i i	1854-02-99	0.0500		0.0038	

MAR 3 0 2015

Initials: CR

Eastern Research Group

**NERG** 

## CERTIFICATE OF ANALYSIS

Environmental Re	sources Management, Ind	;		FILE #:	3926.00	
75 Valley Stream	<sup>p</sup> arkway, Suite 400			REPORT	ED: 03/27/15 09	:38
Malvern, PA 1935	5			SUBMITT	ED: 03/19/15	to 03/20/15
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 FAX: (410	) 266-8912		AQS SITE SITE COL	E DE:	Honeywell Hex Chrome Study
Description:	PAM-2	Lab ID	<b>5032011-05</b>	5		Sampled: 03/19/15 16:25
Matrix:	Air	Sampl	e Volume: 2	21.2 m³		Received: 03/20/15 11:10
Comments:	Start Time 3/18/15 16:29					Analysis Date: 03/23/15 14:59
		Hexavale	nt Chromium by	y SOP ERG-N	10R-063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0897		0.0038	

MAR 3 0 2015

Initials: CR

Eastern Research Group

## CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, In	с			FILE #:	3926.00	
75 Valley Stream	Parkway, Suite 400				REPORTE	D: 03/27/15 09	0:38
Malvern, PA 1935	5				SUBMITT	ED: 03/19/15	to 03/20/15
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			AQS SITE	E:	Honeywell Hex Chrome Study
Description:	PAM-3	L	Lab ID: 5032011	-06			Sampled: 03/19/15 16:12
Matrix:	Air	S	Sample Volume:	21.35	5 m <sup>3</sup>		Received: 03/20/15 11:10
Comments:	Start Time 3/18/15 16:17						Analysis Date: 03/23/15 15:10
		Неха	avalent Chromium	by SC	P ERG-M	IOR-063	
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0312			0.0038	

MAR 3 0 2015

Initials: CR

Eastern Research Group

## CERTIFICATE OF ANALYSIS

NERC		CERTI	FICATE O	F ANA	LYSIS	6	
Environmental Re	sources Management, In	c		FILE	#: 392	6.00	
75 Valley Stream	Parkway, Suite 400			REPO	ORTED:	03/27/15 09:3	38
Malvern, PA 1935	5			SUBI	AITTED:	03/19/15 te	0 03/20/15
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 <b>FAX:</b> (410	) 266-8912		AQS SOD SITE	SITE CODE:	ŀ	loneywell Hex Chrome Study
Description:	PAM-4	Lab	ID: 5032011-	07			Sampled: 03/19/15 16:03
Matrix:	Air	Sam	ple Volume:	21.37	m³		Received: 03/20/15 11:10
Comments:	Start Time 3/18/15 16:06						Analysis Date: 03/23/15 15:21
		Hexaval	ent Chromium	by SOP ER	G-MOR-	063	
			<u>Results</u>			MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>FI</u>	ag	<u>ng/m³ Air</u>	
Hexavalent Chromium	1	1854-02-99	0.0683			0.0038	

MAR 3 0 2015

Initials: CR

Eastern Research Group

## CERTIFICATE OF ANALYSIS

Environmental Re	esources Manage	ement, Inc			FILE #:	3926.00	
75 Valley Stream	Parkway, Suite 4	100			REPORTE	E <b>D:</b> 03/27/15 09	:38
Malvern, PA 1935	55				SUBMITT	ED: 03/19/15	to 03/20/15
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495 FA	<b>AX:</b> (410) 266-8912			AQS SITE	E DE:	Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID:	5032011-08			Sampled: 03/19/15 00:00
Matrix:	Air		Sample Volu	<b>me:</b> 21.	2 m³		Received: 03/20/15 11:10
Comments:							Analysis Date: 03/23/15 15:31
		He	xavalent Chr	omium by S	SOP ERG-M	10R-063	
			<u>Re</u>	<u>esults</u>		<u>MDL</u>	
<u>Analyte</u>		CAS Numbe	er ng,	/m³ Air	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		ND	U	0.0038	

ND

1854-02-99

Hexavalent Chromium

MAR 3 0 2015

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.

## **CERTIFICATE OF ANALYSIS**

Environmental Resources	Management, Inc		FILE #:	3926.00	
75 Valley Stream Parkway,	Suite 400		REPORT	ED: 03/27/15 09:	38
Malvern, PA 19355			SUBMITT	ED: 03/19/15	to 03/20/15
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495	<b>FAX:</b> (410) 266-8912		AQS SITE	E:	Honeywell Hex Chrome Study
Description: PAM-31		Lab ID: 5032011	-09		Sampled: 03/19/15 00:00
Matrix: Air		Sample Volume:	21.35 m³		Received: 03/20/15 11:10
Comments:					Analysis Date: 03/23/15 15:42
	Hex	avalent Chromium	by SOP ERG-M	10R-063	
		<u>Results</u>		MDL	
<u>Analyte</u>	CAS Numbe	<u>r ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	1854-02-99	ND	U	0.0038	

ND

1854-02-99

Hexavalent Chromium

MAR 3 0 2015

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.

0.0038



April 2, 2015

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 March 31, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

### LDC Project #33991:

# SDGFraction5032434/5032522Hexavalent 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

	167 pages-SF	1 WEE	<u>K TAT</u>												Atta	chr	nent	1								-													
	Level IV	as L	DC #33	99°	1 (E	ERN	<b>1</b> -	Mo	rri	svil	le,	NC	; 1	Ha	rbc	)r P	loir	nt, I	MD	, H	êxa	ava	len	nt C	hro	omi	um	) M	oni	tor	ing	I)			•				
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr( (D7(	(VI) 614)								r		1						I				1														
Mat	ix: Air/Water/Soil	( (	1	A	S	w	s	w	s	w	s	w	s	w	s	w	s	w	S	w	s	W	s	<u>w</u>	s	w	s	w	s	W	s	w	s	w	s	W	S	w	s
A	5032434/5032522	03/31/15	04/07/15	26	第0章					<b> </b>		<u> </u>																								├	-+	<sup> </sup>	$\vdash$
				┢										<u> </u>								-														$\vdash$	-	'	$\vdash$
-					$\vdash$							<u> </u>											-														$\neg$	<sup> </sup>	
				-																																		<sup> </sup>	
																	-																						$\square$
															-																								
	<i></i>									<u> </u>			<u> </u>																							$\square$		<u> </u>	$\square$
						<u> </u>			<u> </u>	<u> </u>			<b> </b>									<u> </u>			<u> </u>											⊢₋┤	$\square$	<b> </b>	
				<u> </u>																																⊢┤		<u> </u>	
														<u> </u>			<u> </u>																			┢──┤		<sup> </sup>	
<u> </u>					_									<u> </u>										-													$\dashv$		$\left  - \right $
							<u> </u>														<u> </u>		<u> </u>														-+	<sup> </sup>	
													<u> </u>		-							-																	$\vdash$
																						- ···																	
																							1	1															
														<u> </u>							<u> </u>															$\square$			
										_			ļ									<u> </u>	<u> </u>		<b> </b>											$\vdash$		$\vdash$	
<b> </b>																						<u> </u>	<b> </b>													$\vdash$		'	
				-		<u> </u>								<u> </u>								<u> </u>														⊢−−┨		$\vdash$	$\vdash$
	<u>.</u>			┝		<u> </u>				┣—-		<u> </u>	┣──							<u> </u>	┞	┞──														┢──┨		<sup> </sup>	┝╌┥
				-		-						—		<u> </u>	┣─		<u> </u>				-	╞	┢		-											┟──┫		<u> </u>	$\vdash$
		 																				┟╌╴	┢──		$\vdash$												$\dashv$		$\vdash$
				<b> </b>																		┼──	<del> </del>														$\neg$		$\vdash$
Total	A/CR			26	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	26

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	March 20 through March 24, 2015
LDC Report Date:	April 2, 2015
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group

### Sample Delivery Group (SDG): 5032434/5032522

### Sample Identification

OAM 1 (03/20/15)	PAM-1D (03/24/15)
OAM 2 (03/20/15)	PAM-2 (03/24/15)
PAM-1 (03/20/15)	PAM-3 (03/24/15)
PAM-1D (03/20/15)	PAM-4 (03/24/15)
PAM-3 (03/20/15)	PAM-21 (03/24/15)
PAM-4 (03/20/15)	PAM-31 (03/24/15)
PAM-21 (03/20/15)	PAM-1 (03/20/15)DUP
PAM-31 (03/20/15)	PAM-1D (03/20/15)DUP
OAM 1 (03/23/15)	PAM-1 (03/23/15)DUP
OAM 2 (03/23/15)	PAM-1D (03/23/15)DUP
PAM-1 (03/23/15)	PAM-1 (03/24/15)DUP
PAM-1D (03/23/15)	PAM-1D (03/24/15)DUP
PAM-2 (03/23/15)	
PAM-3 (03/23/15)	
PAM-4 (03/23/15)	
PAM-21 (03/23/15)	
PAM-31 (03/23/15)	
OAM 1 (03/24/15)	
OAM 2 (03/24/15)	
PAM-1 (03/24/15)	

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

#### Introduction

This data review covers 32 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 (03/20/15), PAM-31 (03/23/15), and PAM-31 (03/24/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (03/20/15), PAM-21 (03/23/15), and PAM-21 (03/24/15) 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 (03/20/15) and PAM-1D (03/20/15), samples PAM-1 (03/23/15) and PAM-1D (03/23/15), samples PAM-1 (03/24/15) and PAM-1D (03/05/15), and samples PAM-1 (03/05/15) and PAM-1D (03/05/15) were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

	Concentrati	on (ng/m³)	220		
Analyte	PAM-1 (03/20/15)	PAM-1D (03/20/15)	(Limits)	Flags	A or P
Hexavalent chromium	0.103	0.109	6 (≤20)	-	-

	Concentrati	ion (ng/m³)			
Analyte	PAM-1 (03/23/15)	PAM-1D (03/23/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0139	0.0132	5 (≤20)	-	-

	Concentrat	ion (ng/m³)			
Analyte	PAM-1 (03/24/15)	PAM-1D (03/24/15)	RPD (Limits)	Flags	A or P
Hexavalent chromium	0.0426	0.0431	1 (≤20)	-	-

#### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 5032434/5032522

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 5032434/5032522

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 5032434/5032522

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

LDC #:_	<u>33991A6</u>	VAL
SDG #:_	5032434/503252	2
Laborato	ory: Eastern Resear	ch Group

### LIDATION COMPLETENESS WORKSHEET

Level IV



#### METHOD: (Analyte) 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
١.	Sample receipt/Technical holding times	A	3/20-24/15
	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
v	Field blanks	SN	FB=(7)(16)(25) TB=(8)(17)(26)
<u>VI.</u>	Matrix Spike/Matrix Spike Duplicates	N	Not fegured
VII.	Duplicate sample analysis	A	DUR
VIII.	Laboratory control samples	A	LCSID
IX.	Field duplicates	SW	FO = (3.4) (11, 12) (20, 21)
X.	Sample result verification	A	
	Overall assessment of data	A	

Note:

T

ſŗ

A = Acceptable N = Not provided/applicable SW = See worksheet

ND = No compounds detected FB = Field blank

TB = Trip blank EB = Equipment blank SB=Source blank

T

٦

R = Rinsate

D = Duplicate

OTHER:

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (03/20/15)	5032434-01	Air	03/20/15
2	OAM 2 (03/20/15)	5032434-02	Air	03/20/15
3	PAM-1 (03/20/15)	5032434-03	Air	03/20/15
4	PAM-1D (03/20/15)	5032434-04	Air	03/20/15
5	PAM-3 (03/20/15)	5032434-06	Air	03/20/15
6	PAM-4 (03/20/15)	5032434-07	Air	03/20/15
7	PAM-21 (03/20/15)	5032434-08	Air	03/20/15
8	PAM-31 (03/20/15)	5032434-09	Air	03/20/15
9	OAM 1 (03/23/15)	5032434-10	Air	03/23/15
10	OAM 2 (03/23/15)	5032434-11	Air	03/23/15
11	PAM-1 (03/23/15)	5032434-12	Air	03/23/15
12	PAM-1D (03/23/15)	5032434-13	Air	03/23/15
13	PAM-2 (03/23/15)	5032434-14	Air	03/23/15
14	PAM-3 (03/23/15)	5032434-15	Air	03/23/15
15	PAM-4 (03/23/15)	5032434-16	Air	03/23/15
16	PAM-21 (03/23/15)	5032434-17	Air	03/23/15
17	PAM-31 (03/23/15)	5032434-18	Air	03/23/15

VALIDATION COMPLETENESS WORKSHEE
----------------------------------

LDC #: <u>33991A6</u> **VAL** SDG #: <u>5032434/5032522</u> Laboratory: <u>Eastern Research Group</u>

### Level IV

Date: 3/3/115 Page: ZofZ Reviewer: 355 2nd Reviewer:

METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	OAM 1 (03/24/15)	5032522-01	Air	03/24/15
19	OAM 2 (03/24/15)	5032522-02	Air	03/24/15
20	PAM-1 (03/24/15)	5032522-03	Air	03/24/15
21	PAM-1D (03/24/15)	5032522-04	Air	03/24/15
22	PAM-2 (03/24/15)	5032522-05	Air	03/24/15
23	PAM-3 (03/24/15)	5032522-06	Air	03/24/15
24	PAM-4 (03/24/15)	5032522-07	Air	03/24/15
25	PAM-21 (03/24/15)	5032522-08	Air	03/24/15
26	PAM-31 (03/24/15)	5032522-09	Air	03/24/15
27	PAM-1 (03/20/15)DUP	5032434-03DUP	Air	03/20/15
28	PAM-1D (03/20/15)DUP	5032434-04DUP	Air	03/20/15
29	PAM-1 (03/23/15)DUP	5032434-12DUP	Air	03/23/15
30	PAM-1D (03/23/15)DUP	5032434-13DUP	Air	03/23/15
31	PAM-1 (03/24/15)DUP	5032522-03DUP	Air	03/24/15
32	PAM-1D (03/24/15)DUP	5032522-04DUP	Air	03/24/15
33				
34				
35				
Note	S:			



Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	-			
II. Calibration				<u> </u>
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 <del>90-11</del> 0% 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?				

## Method: Inorganics (EPA Method See Cover)

#### 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?				
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#<u>33991A6</u>

#### VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: \_\_\_\_\_\_ of \_\_\_\_\_ Reviewer:\_\_\_\_\_\_\_ 2nd Reviewer:\_\_\_\_\_\_

Inorganics: Method See Cover

	Concentrati			
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.103	0.109	6	

	Concentrati	on (ng/m3)		
Analyte	11	12	RPD (≤20)	Qual.
Hexavalent Chromium	0.0139	0.0132	5	

	Concentrati	on (ng/m3)		Qual.
Analyte	20	21	RPD (≤20)	
Hexavalent Chromium	0.0426	0.0431	1	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\33991A6.wpd

### LDC #: 33991A10

#### Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: \ **Reviewer:** 2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of  $\frac{25}{5}$  was recalculated.Calibration date:  $\frac{03}{25}$ 

Where.

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

%R = Found X 100

True

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 <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0338194			x
		s2	0.1	0.0687896	0.99998	0.99998	
	0+ 20	s3	0.2	0.1470135			· · · · · · · · · · · · · · · · · · ·
	Cr	s4	0.5	0.3882267			q
		s5	1	0.7727523			$\bigcirc$
		s6	2	1.5669104			
IW 10:52	صدر	Found	True		_		
Calibration verification	G	0.5282ndm)	0.5 ngjml		105.6%.R	105.6%R	
CCU 11:56	0+0						
Calibration verification		0.5255 value	U.Sugimi		(05.1%F	-105.138-	
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 #: 33991ALD

### VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet



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\_x 100
 Where,
 Found =
 concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,

 True
 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:

 $\begin{array}{cccc} \text{RPD} = \underline{|S-D|} & x \ 100 & \text{Where,} & S = & & \text{Original sample concentration} \\ & (S+D)/2 & & D = & & \text{Duplicate sample concentration} \end{array}$ 

			Found / S	True / D	Recalculated	Reported	Acceptable
Sample ID	I ype of Analysis	Element	(units)	(units)	%R / RPD	<u>%R / RPD</u>	(Y/N)
Les	Laboratory control sample						
11:24		Crip	1.07ng/ml	1.00 ng/m/	107%p	107%R	$\tilde{\mathcal{I}}$
MS	Matrix spike sample		(SSR-SR)				
nla							
DUP	Duplicate sample		_	. 7			
12:42		Ч	0.1060ng/m3	0.1026vg/m3	3.26%RD	3.29%RPD	5)

Comments:

LDC #: 33991PW

Y)

#### VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:_	<u> </u>	2
Reviewer:	77	>
2nd reviewer:		/
	$\sim$	

Cover 60 METHOD: Inorganics, Method

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

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

Compound (analyte) results for \_\_\_\_\_\_C

Concentration = (A - CO) | CVEIOW1 Recalculation: (0.0147342-(-8.57E-03))  $m^3 = 21.36$ = 0.02962 mg/m<sup>2</sup> = 0.0139 mg/m<sup>3</sup> A=0-0147342 1867314 60=-8.57E-03 (0-02962mg/m1)(10m1) L= 0.7867314 ſ Т

#	Sample ID	Analyte	Reported Concentration	Calculated Concentration	Acceptable (Y/N)
		CF <sup>+0</sup>	0.124	0.124	Y Y
	2	1	0.506	0.500	
	N		0.103	0.103	
	J J		0.109	0.109	
	2		0.102	0.102	
	6		0.0917	0.0977	
	7		NØ	ND	
	8		QU	04	
-	٩		04	QU	
	10		0-0108	8010.0	
	11		0.0139	0.0139	9
	12		0.0132	0.0132	
	13		0.0298	0.0298	
	14		0.0091	0.0091	
	is		0.0303	0.0303	
	16		ND	00	
	17		CU	04	
	18		0.0278	0.028	
	۱۹		0-0362	0.0362	
	20	$\checkmark$	0.0426	0.0426	Ŀ

Note:

LDC #: 3391120

### VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification



Secover METHOD: Inorganics, Method

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

- <u>Y N N/A</u> Have results been reported and calculated correctly?
- Y N N/A Are results within the calibrated range of the instruments?
- $\frac{V}{N}$  N/A Are all detection limits below the CRQL?

Compound (analyte) results for \_\_\_\_\_\_C

$Concentration = \left(A - C_0\right)  C_1   \forall f = 10 \text{ ml}  \frac{\text{Recalculation:}}{2} \left(0.0673628 - (-6.59E - 03)\right) = 0.0832 \text{ ms}  1 $							
A = 0.0573028 (naluel)(uf) $= 0.013235$ = 0.013235							
$C_{1} = 0.733135$ m <sup>3</sup> m <sup>3</sup> m <sup>3</sup> 21.63 m <sup>3</sup> = 0.0431 m <sup>3</sup>							
#	Sample ID	Analyte	Reported Concentration (ハス\พรี)	Calculated Concentration (^୵ସ୍\ୁ୴ <sup>3</sup> )	Acceptable (Y/N)		
	21	6-10	0.0431	0.0431	J.J.		
	22		0.0820	0.0820			
	23		0.0424	0.0424			
	24		0.0559	0.0559			
	25		NO	NO			
	250	<u> </u>	04	ND	4		
				· · · · · · · · · · · · · · · · · · ·			
	<b></b>						
				<u></u>			
	<u></u>						
					·		
<u> </u>					L		

Note:

#### CERTIFICATE OF ANALYSIS **NERG** Environmental Resources Management, Inc FILE #: 3926.00 75 Valley Stream Parkway, Suite 400 REPORTED: 03/31/15 15:30 Malvern, PA 19355 SUBMITTED: 03/24/15 to 03/25/15 ATTN: Mr. Jeff Boggs AQS SITE SITE CODE: Honeywell Hex Chrome Study PHONE: (443) 803-8495 FAX: (410) 266-8912 Lab ID: 5032434-01 Sampled: 03/20/15 14:39 **Description:** OAM 1 Sample Volume: Matrix: Air 21.4 m³ Received: 03/24/15 11:40 Analysis Date: 03/25/15 13:48 Comments: Start Time 3/19/15 15:08 Hexavalent Chromium by SOP ERG-MOR-063

 Results
 MDL

 Analyte
 CAS Number
 ng/m³ Air
 Flag
 ng/m³ Air

 Hexavalent Chromium
 1854-02-99
 0.124
 0.0038

APR 0 2 2015

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 4 of 31


Environmental Res	sources Management, Ind	c	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/31/15 15:3	0
Malvern, PA 19355	5			SUBMITTED:	03/24/15 to	03/25/15
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Н	oneywell Hex Chrome Study
Description:	OAM 2	Lab ID:	5032434-02			Sampled: 03/20/15 15:08
Matrix:	Air	Sample	Volume: 21.2	4 m³		Received: 03/24/15 11:40
Comments:	Start Time 3/19/15 15:36					Analysis Date: 03/25/15 13:58
		Hexavalen	t Chromium by S	OP ERG-MOR	-063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.506		0.0038	

APR 0 2 2015

Initials: CR

Eastern Research Group



Environmental Res	sources Management, In	c	FILE #:	FILE #: 3926.00			
75 Valley Stream F	<sup>o</sup> arkway, Suite 400		REPORTE	REPORTED: 03/31/15 15:30			
Malvern, PA 19355	5			SUBMITT	ED: 03/24/15	to 03/25/15	
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	)) 266-8912		AQS SITE	E DE:	Honeywell Hex Chrome Study	
Description:	PAM-1	Lab ID:	5032434-03			Sampled: 03/20/15 16:12	
Matrix:	Air	Sample	Volume: 2	1.27 m³		Received: 03/24/15 11:40	
Comments:	Col 1 Start Time 3/19/15	16:51				Analysis Date: 03/25/15 12:32	
		Hexavalen	t Chromium by	SOP ERG-M	10R-063		
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.103		0.0038		

بريعر مر

APR 0 2 2015

Initials: CR

Eastern Research Group

## ERG

### CERTIFICATE OF ANALYSIS

Environmental Res	Environmental Resources Management, Inc							
75 Valley Stream F	<sup>p</sup> arkway, Suite 400			REPORTED: 03/31/15 15:30				
Malvern, PA 19355						SUBMITTED: 03/24/15 to 03/25/15		
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			AQS SITE	E:	Honeywell Hex Chrome Study	
Description:	PAM-1D	Lab II	<b>D:</b> 5032434-	-04			Sampled: 03/20/15 16:12	
Matrix:	Air	Samp	le Volume:	21.03	m³		Received: 03/24/15 11:40	
Comments:	Col 2 Start Time 3/19/15	16:57					Analysis Date: 03/25/15 12:51	
		Hexavale	nt Chromium	by SC	P ERG-M	IOR-063		
			<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Ai</u>	:	
Hexavalent Chromium		1854-02-99	0.109			0.0038		

APR 0 2 2015

Initials: CR

Eastern Research Group

### CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Inc	D	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400		REPORTED: 03/31/15 15:30			
Malvern, PA 1935	5		SUBMITTED: 03/24/15 to 03/25/15			
ATTN: Mr. Jeff Br PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	ł	Honeywell Hex Chrome Study
Description:	PAM-3	Lab ID:	5032434-06			Sampled: 03/20/15 15:39
Matrix:	Air	Sample	Volume: 21.0	2 m³		Received: 03/24/15 11:40
Comments:	Start Time 3/19/15 16:17					Analysis Date: 03/25/15 14:30
		Hexavalent	Chromium by S	OP ERG-MOI	R-063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.102		0.0038	

APR 0 2 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc						FILE #: 3926.00				
75 Valley Stream F	75 Valley Stream Parkway, Suite 400						REPORTED: 03/31/15 15:30			
Malvern, PA 19355						SUBMITTED: 03/24/15 to 03/25/15			to 03/25/15	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912				AQS SITE	E DE:	I	Honeywell Hex Chrome Study	
Description:	PAM-4		Lab ID:	5032434-02	7				Sampled: 03/20/15 15:33	
Matrix:	Air	9	Sample Vo	olume:	21.07	m³			Received: 03/24/15 11:40	
Comments:	Start Time 3/19/15 16:06								Analysis Date: 03/25/15 14:53	
		Hexa	avalent C	Chromium b	y SO	P ERG-M	10R-06	53		
				<u>Results</u>				<u>MDL</u>		
<u>Analyte</u>		CAS Number	:	<u>ng/m³ Air</u>		<u>Flag</u>	ļ	ng/m³ Air		
Hexavalent Chromium		1854-02-99		0.0977				0.0038		

APR 0 2 2015

1

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream	75 Valley Stream Parkway, Suite 400							15:30	
Malvern, PA 19355						SUBMITTED: 03/24/15 to 03/25/15			
ATTN: Mr. Jeff Boggs							AQS SITE		
<b>PHONE:</b> (443)	803-8495 FAX	(: (410) 266-8912				SITECOD	DE:	Honeywell Hex Chrome Study	
Description:	PAM-21		Lab ID:	5032434-	08			Sampled: 03/20/15 00:00	
Matrix:	Air		Sample Vo	lume:	21.02	m³		Received: 03/24/15 11:40	
Comments:								Analysis Date: 03/25/15 15:04	
		He	xavalent C	hromium	by SO	P ERG-M	10R-063		
				<u>Results</u>			MDL		
<u>Analyte</u>		CAS Numbe	er 1	ng/m³ Air		<u>Flag</u>	<u>ng/m³ /</u>	<u>Air</u>	
Hexavalent Chromium		1854-02-99		ND		U	0.0038	8	

APR 0 2 2015

Initials: CR

Eastern Research Group

## CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 03/31/15 15:30			
Malvern, PA 19355						SUBMITTED: 03/24/15 to 03/25/15			
ATTN: Mr. Jeff E	Boggs			AQS SITE	AQS SITE				
PHONE: (443)	803-8495 <b>FA</b>	<b>X:</b> (410) 266-8912			SITECOL	DE:	Honeywell Hex Chrome Study		
Description:	PAM-31		Lab ID:	5032434-09			Sampled: 03/20/15 00:00		
Matrix:	Air		Sample Volu	i <b>me:</b> 21.	.02 m³		Received: 03/24/15 11:40		
Comments:							Analysis Date: 03/25/15 15:14		
		He	xavalent Ch	romium by	SOP ERG-N	10R-063			
			<u>R</u>	<u>lesults</u>		MDL			
<u>Analyte</u>		CAS Numbe	er ng	<u>ı/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99		ND	U	0.0038			

#### APR 0 2 2015

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 31



Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream	Parkway, Suite 400				R	REPORTED: 03/31/15 15:30			
Malvern, PA 19355						SUBMITTED: 03/24/15 to 03/25/15		to 03/25/15	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 <b>FAX:</b> (410	) 266-8912			AC Si	as site DE: TE COD	E:	Honeywell Hex Chrome Study	
Description:	OAM 1	La	ab ID:	5032434-10	)			Sampled: 03/23/15 14:50	
Matrix:	Air	Sa	ample Vol	ume: 2	21.63	m³		Received: 03/24/15 11:40	
Comments:	Start Time 3/22/15 14:48							Analysis Date: 03/25/15 15:25	
		Hexav	valent Ch	nromium by Results	y SOP	ERG-M	IOR-063 MDL		
Analyte		CAS Number	<u>n</u>	g/m³ Air		<u>Flag</u>	<u>ng/m³ Ai</u>	ſ	
Hexavalent Chromium		1854-02-99		ND		U	0.0038		

APR 0 2 2015

Initials: CR

Eastern Research Group

### CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Inc	c	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400		REPORTED: 03/31/15 15:30			
Malvern, PA 19355	5		SUBMITTED:	SUBMITTED: 03/24/15 to 03/25/15		
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Hone	eywell Hex Chrome Study
Description:	OAM 2	Lab ID:	5032434-11			Sampled: 03/23/15 15:13
Matrix:	Air	Sample	Volume: 21.5	3 m³		Received: 03/24/15 11:40
Comments:	Start Time 3/22/15 15:18				Ana	lysis Date: 03/25/15 15:36
		Hexavalent	Chromium by S	OP ERG-MOR-	063	
			<u>Results</u>		<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0108		0.0038	

APR 0 2 2015

Initials: CR

Eastern Research Group

#### CERTIFICATE OF ANALYSIS **NERG** Environmental Resources Management, Inc FILE #: 3926.00 75 Valley Stream Parkway, Suite 400 REPORTED: 03/31/15 15:30 Malvern, PA 19355 SUBMITTED: 03/24/15 to 03/25/15 ATTN: Mr. Jeff Boggs AQS SITE SITE CODE: Honeywell Hex Chrome Study PHONE: (443) 803-8495 FAX: (410) 266-8912 Lab ID: 5032434-12 Sampled: 03/23/15 16:16 Description: PAM-1 Sample Volume: Matrix: Air 21.36 т³ Received: 03/24/15 11:40 Analysis Date: 03/25/15 13:10 Comments: Col 1 Start Time 3/22/15 16:32

# Hexavalent Chromium by SOP ERG-MOR-063 Results MDL Analyte CAS Number ng/m³ Air Flag ng/m³ Air Hexavalent Chromium 1854-02-99 0.0139 0.0038

#### APR 0 2 2015

#### Initials: CR

Eastern Research Group

### CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Ir	1C	FILE #:	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400		REPORTE	REPORTED: 03/31/15 15:30				
Malvern, PA 19355	5			SUBMITTE	ED: 03/24/15	to 03/25/15		
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (41	0) 266-8912		AQS SITE	E:	Honeywell Hex Chrome Study		
Description:	PAM-1D	Lab ID:	5032434-13			Sampled: 03/23/15 16:17		
Matrix:	Air	Sample	Volume: 21.3	39 m <sup>3</sup>		Received: 03/24/15 11:40		
Comments:	Col 2 Start Time 3/22/15	16:31				Analysis Date: 03/25/15 13:29		
		Hexavalen	t Chromium by S	OP ERG-M	OR-063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0132		0.0038			

## APR 0 2 2015

Initials: CR

Eastern Research Group

## **ERG**

#### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc						FILE #: 3926.00						
75 Valley Stream F	75 Valley Stream Parkway, Suite 400							REPORTED: 03/31/15 15:30				
Malvern, PA 19355						SUBMITTED: 03/24/15 to 03/25/15			to 03/25/15			
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912				AQS SITE	E DE:		Honeywell Hex Chrome Study			
Description:	PAM-2		Lab ID:	5032434-	14				Sampled: 03/23/15 15:53			
Matrix:	Air	9	Sample Vo	olume:	21.36	m³			Received: 03/24/15 11:40			
Comments:	Start Time 3/22/15 16:09								Analysis Date: 03/25/15 15:47			
		Hexa	avalent C	hromium	by SC	P ERG-M	10R-0	63				
				<u>Results</u>				<u>MDL</u>				
<u>Analyte</u>		CAS Number	: 1	ng/m³ Air		<u>Flag</u>		<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99		0.0298				0.0038				

#### APR 0 2 2015

Initials: CR

Eastern Research Group

### CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, Ind	c	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400		REPORTED: 03/31/15 15:30			
Malvern, PA 1935	5		SUBMITTED: 03/24/15 to 03/25/15			
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE	i: ł	Honeywell Hex Chrome Study
Description:	PAM-3	Lab ID:	5032434-15			Sampled: 03/23/15 15:45
Matrix:	Air	Sample	Volume: 21.4	18 m³		Received: 03/24/15 11:40
Comments:	Start Time 3/22/15 15:53					Analysis Date: 03/25/15 15:57
		Hexavalent	Chromium by S	OP ERG-MO	DR-063	
			<u>Results</u>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0091		0.0038	

APR 0 2 2015

Initials: CR

Eastern Research Group

### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc					FILE #:	FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400				REPOR	REPORTED: 03/31/15 15:30			
Malvern, PA 19355				SUBMIT	SUBMITTED: 03/24/15 to 03/25/15				
<b>ATTN:</b> Mr. Jeff Br <b>PHONE:</b> (443) 8	oggs :03-8495 <b>FAX:</b> (410	) 266-8912			AQS SI CODE: SITE CO	DE:	н	oneywell Hex Chrome Study	
Description:	PAM-4		Lab ID:	5032434-16				Sampled: 03/23/15 15:34	
Matrix:	Air	:	Sample Vol	<b>ume:</b> 21	.49 m	3		Received: 03/24/15 11:40	
Comments:	Start Time 3/22/15 15:41							Analysis Date: 03/25/15 16:08	
		Hex	avalent Ch	nromium by	SOP ERG-	MOR-	063		
			Ī	<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number	r <u>n</u>	g/m³ Air	<u>Flag</u>		<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0303			0.0038		

APR 0 2 2015

Initials: CR

Eastern Research Group

### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream	Parkway, Suite 40	0				REPORTED: 03/31/15 15:30		
Malvern, PA 19355					SUBMITTED: 03/24/15 to 03/		5 to 03/25/15	
ATTN: Mr. Jeff I	Boggs					AQS SITE	:	
<b>PHONE:</b> (443)	803-8495 FAX	: (410) 266-8912				SITECOD	DE:	Honeywell Hex Chrome Study
Description:	PAM-21		Lab ID:	5032434	-17			Sampled: 03/23/15 00:00
Matrix:	Air		Sample Vo	lume:	21.36	m³		Received: 03/24/15 11:40
Comments:								Analysis Date: 03/25/15 16:19
		Не	xavalent C	hromium	by SC	P ERG-M	IOR-063	
				<u>Results</u>			MDL	
<u>Analyte</u>		CAS Numbe	er !	ng/m³ Air		<u>Flag</u>	<u>ng/m³ A</u>	<u>ir</u>
Hexavalent Chromium		1854-02-99		ND		U	0.0038	

APR 0 2 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream	Parkway, Suite 400			REPORT	REPORTED: 03/31/15 15:30			
Malvern, PA 19355					SUBMITTED: 03/24/15 to 03/25/15			
ATTN: Mr. Jeff Boggs					AQS SITE			
<b>PHONE:</b> (443)	803-8495 FAX:	(410) 266-8912		SITECOI	DE:	Honeywell Hex Chrome Study		
Description:	PAM-31	Lab	ID: 5032434-	18		Sampled: 03/23/15 00:00		
Matrix:	Air	San	nple Volume:	21.48 m <sup>3</sup>		Received: 03/24/15 11:40		
Comments:						Analysis Date: 03/25/15 16:51		
		Hexava	alent Chromium	by SOP ERG-N	10R-063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	ND	U	0.0038			

APR 0 2 2015

Initials: CR

Eastern Research Group



Environmental Res	sources Management, Ind	•	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/31/15 15:30	
Malvern, PA 19355	5			SUBMITTED:	03/24/15 to 03/25/15	
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Honeywell H	ex Chrome Study
Description:	OAM 1	Lab ID	5032522-01		Sampl	ed: 03/24/15 14:51
Matrix:	Air	Sampl	e Volume: 21.5	6 m³	Receiv	red: 03/25/15 11:06
Comments:	Start Time 3/23/15 14:53				Analysis Da	ate: 03/26/15 13:13
		Hexavale	nt Chromium by S	OP ERG-MOR-	063	
			<b>Results</b>		MDL	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99	0.0278		0.0038	

APR 0 2 2015

Initials: CR

Eastern Research Group

### CERTIFICATE OF ANALYSIS

Environmental Res	c	FILE #: 3926.00					
75 Valley Stream F	Parkway, Suite 400			REPORTED:	03/31/15 15:30	I	
Malvern, PA 19355				SUBMITTED:	SUBMITTED: 03/24/15 to 03/25/15		
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Ho	neywell Hex Chrome Study	
Description:	OAM 2	Lab ID:	5032522-02			Sampled: 03/24/15 15:15	
Matrix:	Air	Sample	Volume: 21.5	9 m³		Received: 03/25/15 11:06	
Comments:	Start Time 3/23/15 15:16				A	nalysis Date: 03/26/15 13:24	
		Hexavalent	Chromium by S	OP ERG-MOR	-063		
			<u>Results</u>		<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0362		0.0038		

APR 0 2 2015

Initials: CR

Eastern Research Group

## CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	<sup>D</sup> arkway, Suite 400			REF	<b>REPORTED:</b> 03/31/15 15:30			
Malvern, PA 19355				SUE	SUBMITTED: 03/24/15 to 03/25/15			
<b>ATTN:</b> Mr. Jeff Be <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	)) 266-8912		AQ: SIT	S SITE DE: E CODE:	F	ioneywell Hex Chrome Study	
Description:	PAM-1	Lab	<b>ID:</b> 5032522-	·03			Sampled: 03/24/15 16:21	
Matrix:	Air	Sam	nple Volume:	21.63	m³		Received: 03/25/15 11:06	
Comments:	Col 1 Start Time 3/23/15	16:19					Analysis Date: 03/26/15 12:14	
		Hexava	alent Chromium	by SOP E	RG-MOR	-063		
			<u>Results</u>			MDL		
Analyte		CAS Number	<u>ng/m³ Air</u>	1	Flag	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0426			0.0038		

## APR 0 2 2015

Initials: CR

Eastern Research Group



Environmental Res	sources Management, Inc	c	FILE #: 3926.00				
75 Valley Stream F	Parkway, Suite 400			REPORTED: 03/31/15 15:30			
Malvern, PA 19355					SUBMITTED: 03/24/15 to 03/25/15		
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Н	oneywell Hex Chrome Study	
Description:	PAM-1D	Lab ID:	5032522-04			Sampled: 03/24/15 16:22	
Matrix:	Air	Sample \	/olume: 21.6	3 m³		Received: 03/25/15 11:06	
Comments:	Col 2 Start Time 3/23/15	16:20	· · · · · · · · · · · ·			Analysis Date: 03/26/15 12:55	
		Hexavalent	Chromium by S	OP ERG-MOR-	063		
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0431		0.0038		

APR 0 2 2015

Initials: CR

Eastern Research Group

## **ERG**

### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc				FILE #: 3926.00			
75 Valley Stream I	Parkway, Suite 400			REPORTED:	REPORTED: 03/31/15 15:30		
Malvern, PA 1935	5			SUBMITTED:	03/24/15 to 03	/25/15	
ATTN: Mr. Jeff B PHONE: (443) 8	oggs :03-8495 <b>FAX:</b> (410	) 266-8912		AQS SITE CODE: SITE CODE:	Hone	eywell Hex Chrome Study	
Description:	PAM-2	Lab ID:	5032522-05			Sampled: 03/24/15 16:09	
Matrix:	Air	Sample	Volume: 21.8	36 m³		Received: 03/25/15 11:06	
Comments:	Start Time 3/23/15 15:56				Ana	lysis Date: 03/26/15 13:35	
		Hexavalen	t Chromium by S	OP ERG-MOR-	063		
			<u>Results</u>		<u>MDL</u>		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0820		0.0038		

APR 0 2 2015

Initials: CR

Eastern Research Group

#### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc				FILE #:	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPORTE	ED: 03/31/15 15:	30		
Malvern, PA 19355	5			SUBMITT	ED: 03/24/15 t	o 03/25/15		
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	)) 266-8912		AQS SITE	E: H	Honeywell Hex Chrome Study		
Description:	PAM-3	Lab II	<b>D:</b> 5032522-06			Sampled: 03/24/15 16:03		
Matrix:	Air	Sampi	le Volume: 2	1.82 m³		Received: 03/25/15 11:06		
Comments:	Start Time 3/23/15 15:48					Analysis Date: 03/26/15 13:45		
		Hexavale	nt Chromium by	SOP ERG-M	IOR-063			
			<u>Results</u>		MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0424		0.0038			

APR 0 2 2015

Initials: CR

Eastern Research Group

#### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	75 Valley Stream Parkway, Suite 400					REPORTED: 03/31/15 15:30		
Malvern, PA 19355					SUBMITT	SUBMITTED: 03/24/15 to 03/25/15		
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	)) 266-8912			AQS SITE	E:	Honeywell Hex Chrome Study	
Description:	PAM-4	Lab	ID:	5032522-07			Sampled: 03/24/15 15:39	
Matrix:	Air	Sam	ple Volu	i <b>me:</b> 21.63	3 m³		Received: 03/25/15 11:06	
Comments:	Start Time 3/23/15 15:37						Analysis Date: 03/26/15 13:56	
		Hexaval	lent Chr	romium by SO	OP ERG-M	IOR-063		
			<u>R</u>	esults		MDL		
<u>Analyte</u>		CAS Number	ng	<u>/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	:	
Hexavalent Chromium		1854-02-99	(	0.0559		0.0038		

APR 0 2 2015

Initials: CR

Eastern Research Group

## CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream	Parkway, Suite 4	400		R	REPORTED: 03/31/15 15:30			
Malvern, PA 19355 S				SUBMITTED: 03/24/15 to 03/25/15				
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495 F <b>/</b>	<b>AX:</b> (410) 266-8912		A S	QS SITE	F	loneywell Hex Chrome Study	
Description:	PAM-21		Lab ID: 503252	22-08			Sampled: 03/24/15 00:00	
Matrix:	Air		Sample Volume:	21.86	m³		Received: 03/25/15 11:06	
Comments:							Analysis Date: 03/26/15 14:07	
		He	xavalent Chromiu	m by SOP	ERG-MOR-	063		
			<u>Results</u>			MDL		
<u>Analyte</u>		CAS Numb	<u>er ng/m³ A</u>	ir	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	ND		U	0.0038		

APR 0 2 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					FILE #: 3926.00				
75 Valley Stream	75 Valley Stream Parkway, Suite 400					REPORTED: 03/31/15 15:30			
Malvern, PA 1935	55			SUBMITT	ED: 03/24/15 1	to 03/25/15			
ATTN: Mr. Jeff E	Boggs			AQS SITE	E				
PHONE: (443)	803-8495 FAX	: (410) 266-8912		SITECOL	DE: I	Honeywell Hex Chrome Study			
Description:	PAM-31	Li	ab ID: 5032522	-09		Sampled: 03/24/15 00:00			
Matrix:	Air	S	ample Volume:	21.82 m³		Received: 03/25/15 11:06			
Comments:				-		Analysis Date: 03/26/15 14:39			
		Hexa	valent Chromium	by SOP ERG-N	40R-063				
			<u>Results</u>		MDL				
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flaq</u>	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	ND	U	0.0038				

APR 0 2 2015

Initials: CR

Eastern Research Group



April 7, 2015

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 April 2, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

#### LDC Project #34011:

#### SDG Fraction

5032607/5032729 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	1 WEE	K TAT											-	Atta	achr	nent	1							1997, 200 - X		*********	1.000000.000	a un sui vi more							ACTIVE COLUMN 2 1 1 1 1 1	CALIFORNIA AND A		in the second second
	Level IV	Ĺ	DC #34	01	1 (E	ERI	M -	Mo	orri	svi	lle,	NC	; 1	Ha	rbo	or F	?oiı	ńt,	MD	), H	ex	ava	ler	it C	hro	òmi	um	ΝM	oni	itor	ing	3)				-			
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr (D7	(VI) 614)												•		•																				
Mat	ix: Air/Water/Soil	<u>, servizer (</u>		A	S	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s	w	s
A	5032607/5032729	04/02/15	04/09/15	18	0	<u> </u>	<u> </u>						<u> </u>			<u> </u>	<u> </u>			<b>_</b>													$\vdash$	┢──┦	$\left  - \right $		$ \rightarrow $		
┣—									-				-			$\vdash$				-	-	$\left  - \right $	-	<u> </u>										┢━┩	$\vdash$				
									-			<u> </u>								<u> </u>				-									$\vdash$	$\vdash$	┢─┦				
																				<u> </u>		1-												$\square$					
																																		$\square$					
																																		Г	$\square$	Ш			
							<u> </u>		<u> </u>		<u> </u>		<u> </u>							<u> </u>	<u> </u>	ļ	ļ																
																<b> </b>						<u> </u>	<u> </u>		<u> </u>												$ \rightarrow $		
				-			<u> </u>											<u> </u>	-	_	-		-	<u> </u>									$\vdash$		$\left  - \right $	$\left  - \right $			
<u> </u>																		<u> </u>		╞	$\vdash$											<u> </u>					$\neg$		
├──				-		<u> </u>								-	$\vdash$																		┢─┤		┝─┦		$\neg$		
								<u> </u>																									┝─┦						
													1									$\uparrow$	1											$\square$					
																																		$\square$					
									<b> </b>											ļ		<u> </u>	<u> </u>	ļ													$ \rightarrow$		
									<b> </b>							<u> </u>		.	<u> </u>	<u> </u>	_	<u> </u>		<u> </u>	<u> </u>											$\square$	-		
														┣—					-	-	-											├	$\vdash$		$\vdash$	$\vdash$	-+		
							<u> </u>	<u> </u>	┠───					-											<u> </u>								$\vdash$	┝──┦	$\vdash$	┢──┨	$\dashv$		
<u> </u>																┢	<u> </u>	-														-	$\square$				-+		-
																																	┢─┦	$ \neg  $					
																							1																
									<u> </u>											<u> </u>		<u> </u>	<u> </u>	<u> </u>		<u> </u>						_		$\square$			$ \rightarrow $		
				<u> </u>										<u> </u>		┣		<u> </u>						<b> </b>									$\vdash$	$\vdash$	$\vdash$	$\left  - \right $			
<u> </u>								-	-		_	_				<u> </u>		-	-	<u> </u> _	-	-	-	-	-		$\left  - \right $				-		⊢_́	H	$\left  - \right $	H	-		
Total	A/CR		<u> </u>	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	_0	<u> </u>	18

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:	Harbor Point, MD, Hexavalent Chromium Monitoring
Collection Date:	March 25 through March 26, 2015
LDC Report Date:	April 6, 2015
Matrix:	Air
Parameters:	Hexavalent Chromium
Validation Level:	EPA Level IV
Laboratory:	Eastern Research Group
Sample Delivery Group (SDG):	5032607/5032729

#### Sample Identification

OAM 1 (03/25/15) OAM 2 (03/25/15) PAM-1 (03/25/15) PAM-1D (03/25/15) PAM-2 (03/25/15) PAM-3 (03/25/15) PAM-4 (03/25/15) PAM-21 (03/25/15) PAM-31 (03/25/15) OAM 1 (03/26/15) OAM 2 (03/26/15) PAM-1 (03/26/15) PAM-1D (03/26/15) PAM-2 (03/26/15) PAM-3 (03/26/15) PAM-4 (03/26/15) PAM-21 (03/26/15) PAM-31 (03/26/15) PAM-1 (03/25/15) DUP PAM-1D (03/25/15) DUP PAM-1 (03/26/15) DUP PAM-1D (03/26/15) DUP

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

1

#### 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.

2

#### 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 (03/25/15) and PAM-31 (03/26/15) were identified as trip blanks. No hexavalent chromium was found.

Samples PAM-21 (03/25/15) and PAM-21 (03/26/15) 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. Results 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(03/25/15) and PAM-1D (03/25/15) and samples PAM-1(03/26/15) and PAM-1D (03/26/15) 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(03/25/15)	PAM-1D (03/25/15)	(Limits)	Flags	A or P	
Hexavalent chromium	0.0477	0.0524	9 (≤20)	-	-	

	Concentrati	ion (ng/m³)			A or P	
Analyte	PAM-1(03/26/15)	PAM-1D (03/26/15)	RPD (Limits)	Flags		
Hexavalent chromium	0.0417	0.0386	8 (≤20)	-	-	

4

Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 5032607/5032729

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 5032607/5032729

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 5032607/5032729

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

5

Level IV



#### METHOD: (Analyte) 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
١.	Sample receipt/Technical holding times	A	03/25-26/15
11	Initial calibration	À	
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
v	Field blanks	00	FB=(8)(1) TB=(9)(18)
VI.	Matrix Spike/Matrix Spike Duplicates	S	Not Required
VII.	Duplicate sample analysis	A	DUR '
VIII.	Laboratory control samples	A	LUSID
IX.	Field duplicates	Su	FO = (3.4)(12.13)
Х.	Sample result verification	A	
	Overall assessment of data	A	

Note:

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

OTHE

EB = Equipment blank

SB=Source blank OTHER:

OTTER.

	Client ID	Lab ID	Matrix	Date
1	OAM 1 (03/25/15)	5032607-01	Air	03/25/15
2	OAM 2 (03/25/15)	5032607-02	Air	03/25/15
3	PAM-1 (03/25/15)	5032607-03	Air	03/25/15
4	PAM-1D (03/25/15)	5032607-04	Air	03/25/15
5	PAM-2 (03/25/15)	5032607-05	Air	03/25/15
6	PAM-3 (03/25/15)	5032607-06	Air	03/25/15
7	PAM-4 (03/25/15)	5032607-07	Air	03/25/15
8	PAM-21 (03/25/15)	5032607-08	Air	03/25/15
9	PAM-31 (03/25/15)	5032607-09	Air	03/25/15
10	OAM 1 (03/26/15)	5032729-01	Air	03/26/15
11	OAM 2 (03/26/15)	5032729-02	Air	03/26/15
12	PAM-1 (03/26/15)	5032729-03	Air	03/26/15
13	PAM-1D (03/26/15)	5032729-04	Air	03/26/15
14	PAM-2 (03/26/15)	5032729-05	Air	03/26/15
15	PAM-3 (03/26/15)	5032729-06	Air	03/26/15
16	PAM-4 (03/26/15)	5032729-07	Air	03/26/15
17	PAM-21 (03/26/15)	5032729-08	Air	03/26/15

LDC #:_	34011A6	VAL
SDG #:	5032607/50327	729
Laborat	ory: <u>Eastern Rese</u>	arch Group

#### ALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 4615 Page: 2 of 2 Reviewer: 30 2nd Reviewer: 2

#### METHOD: (Analyte) Hexavalent Chromium (ASTM D7614)

	Client ID	Lab ID	Matrix	Date
18	PAM-31 (03/26/15)	5032729-09	Air	03/26/15
19	PAM-1 (03/25/15)DUP	5032607-03DUP	Air	03/25/15
20	PAM-1D (03/25/15)DUP	5032607-04DUP	Air	03/25/15
21	PAM-1 (03/26/15)DUP	5032729-03DUP	Air	03/26/15
22	PAM-1D (03/26/15)DUP	5032729-04DUP	Air	03/26/15
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
Note	S:			



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 <u>&gt;</u> 0.995?	<u> </u>									
Were all initial and continuing calibration verification %Rs within the 9 <del>0-110</del> % QC limits? 8<-\\\$	/									
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.		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	•	<u>.</u>	•							
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?			$\square$							
Were the performance evaluation (PE) samples within the acceptance limits?										

LDC #: 34011 PLQ

#### 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?	1							
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.	/							
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>34011A6</u>

#### VALIDATION FINDINGS WORKSHEET Field Duplicates



Inorganics: Method See Cover

	Concentrati	on (ng/m3)		
Analyte	3	4	RPD (≤20)	Qual.
Hexavalent Chromium	0.0477	0.0524	9	

	Concentrati			
Analyte	12	13	RPD (≤20)	Qual.
Hexavalent Chromium	0.0417	0.0386	8	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\34011A6.wpd

#### LDC #: 34011AW

#### Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: $l$ of $\underline{\backslash}$	
Reviewer: 30	
2nd Reviewer:	

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of  $\underline{C}^{*}$  was recalculated. Calibration date:  $\underline{3}(\underline{3})(\underline{15})$ 

Where,

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

%R = Found X 100

True

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 <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0373886			
		s2	0.1	0.0688607	0.99989	0.99989	
	صد م	s3	0.2	0.1476989			U
	Cr	s4	0.5	0.3856212			5
		s5	1	0.7537491			
		s6	2	1.5562065			
ILU ILU	0 - + 6	Found	true				
Calibration verification		0.5226 nalm	0.Sngiml		104.5%E	104.5%.2	
CC 17:21	1 -			· · · · · · · · · · · · · · · · · · ·			
Calibration verification		0.5222 ng/m	0. Snalmi		104.4%E	104.4%R	
Calibration verification		<u> </u>					

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 #: 34011A6

### VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet



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 x 100 Where, True 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:

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

					Recalculated	Reported	
Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	%R / RPD	%R / RPD	Acceptable (Y/N)
LUS	Laboratory control sample						
11:49		Crto	1.06 ng/ml	1.00 ng/ml	106°/.e	106 % R	Y
Not	Matrix spike sample		(SSR-SR)				
Required							
DUP	Duplicate sample		D.0466mal.m3	0.047 nd/m3	223 20	229 / 000	4*
12:52		J.	Jun	<u> </u>	2.00 10 10	2.3(104)	

Comments: \* Rounding

LDC #: 34011ALO

V

## VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification



Seo, Cover METHOD: Inorganics, Method

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

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

2) Cris reported w

\_\_\_\_\_reported with a positive detect were

Compound (analyte) results for \_\_\_\_\_\_ (Compound (analyte) results for \_\_\_\_\_) (Compound (analyte)

Concentration =  $(A - C_0) | C_1$ Recalculation: 0-0752675-(-7.982E-03) WE= 10ml  $\frac{(0.1069 \text{ nglml})(10 \text{ ml})}{21.51 \text{ m}^2} = 0.1069 \text{ nglml}}$ 121.51 = 21.51 A=0.0752675 halm1)(uf) (0=-7.92E-03 = nalm<sup>3</sup> LI= 0.7784574 F

#	Sample ID	Analyte	Reported Concentration (നപ്പൂം )	Calculated Concentration ( ଏକ୍ (ଐ )	Acceptable (Y/N)
	١	Cr	0.0508	0.0508	y
	2		0.0497	0.0497	
	3		0.0477	0.0477	
	Ч		0-0524	0.0524	
	2		0.0407	0.0407	4
	6		0.0563	0.0562	y y
	7		0-0481	0.0481	5
	8		94	00	
	্র		NQ	ND	
	10		0-0519	0.0519	
	11		0.123	0.123	
	12		0.0417	0.0417	
	B		0.0386	0.0386	
	14		0.0502	0.0502	
	15		0-0514	0.0514	
	16		0-0460	0.0460	
	17		NQ	20	
	18	Ŀ	NQ	<u> </u>	J.

Note: <u>Apaundin</u>



Environmental Res	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	<sup>p</sup> arkway, Suite 400					REPORTED: 04/02/15 10:37			
Malvern, PA 19355					SUBMITT	SUBMITTED: 03/26/15 to 03/27/15		to 03/27/15	
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912				AQS SITE	E DE:		Honeywell Hex Chrome Study
Description:	OAM 1		Lab ID:	5032607-	01				Sampled: 03/25/15 14:48
Matrix:	Air		Sample V	olume:	21.51	. m³			Received: 03/26/15 11:32
Comments:	Start Time 3/24/15 14:53								Analysis Date: 03/31/15 13:57
		Hex	avalent (	Chromium	by SC	)P ERG-N	MOR-0	63	
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Number	C	<u>nq/m³ Air</u>		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0508				0.0038	

APR 0 7 2015

Initials: CR

Eastern Research Group

# **NERG**

## CERTIFICATE OF ANALYSIS

Environmental Res	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	75 Valley Stream Parkway, Suite 400					<b>REPORTED:</b> 04/02/15 10:37			:37
Malvern, PA 19355	5				5	SUBMITT	ED:	03/26/15	to 03/27/15
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			Į	AQS SITE	E DE:		Honeywell Hex Chrome Study
Description:	OAM 2	La	ab ID:	5032607-02	2				Sampled: 03/25/15 15:12
Matrix:	Air	Sa	ample Vo	olume: 2	21.51	m³			Received: 03/26/15 11:32
Comments:	Start Time 3/24/15 15:18								Analysis Date: 03/31/15 14:08
		Hexav	valent C	Chromium by	y SO	P ERG-M	10R-0	63	
				<u>Results</u>				MDL	
<u>Analyte</u>		<u>CAS Number</u>		<u>ng/m³ Air</u>		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0497				0.0038	

APR 0 7 2015

Initials: CR

Eastern Research Group

# **N**ERG

Analyte

Hexavalent Chromium

## CERTIFICATE OF ANALYSIS

Environmental Re	sources Management, Inc		FILE #: 392	FILE #: 3926.00			
75 Valley Stream I	⊃arkway, Suite 400		REPORTED:	04/02/15 10:37			
Malvern, PA 1935	5		SUBMITTED:	03/26/15 to 03/27/15			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 103-8495 <b>FAX:</b> (410) 266-8912		AQS SITE CODE: SITE CODE:	Honeywell Hex Chrome Study			
Description:	PAM-1	Lab ID: 5032607	-03 -	Sampled: 03/25/15 16:05			
Matrix:	Air	Sample Volume:	21.32 m <sup>3</sup>	Received: 03/26/15 11:32			
Comments:	Col 1 Start Time 3/24/15 16:24		•	Analysis Date: 03/31/15 12:42			
	Не	xavalent Chromium <u>Results</u>	by SOP ERG-MOR	R-063 MDL			

<u>ng/m³ Air</u>

0.0477

CAS Number

1854-02-99

<u>ng/m³ Air</u> <u>Flaq</u>

0.0038

APR 0 7 2015

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 5 of 22



Environmental Res	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	<sup>o</sup> arkway, Suite 400			REPORTED:	REPORTED: 04/02/15 10:37				
Malvern, PA 19355					SUBMITTED: 03/26/15 to 03/27/15				
ATTN: Mr. Jeff Be PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	0) 266-8912		AQS SITE CODE: SITE CODE:	F	loneywell Hex Chrome Study			
Description:	PAM-1D	Lab ID	5032607-04			Sampled: 03/25/15 16:06			
Matrix:	Air	Sample	Volume: 21.	32 m³		Received: 03/26/15 11:32			
Comments:	Col 2 Start Time 3/24/15	16:25				Analysis Date: 03/31/15 13:01			
		Hexavalen	t Chromium by S	SOP ERG-MOR	R-063				
			<u>Results</u>		MDL				
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>		·		
Hexavalent Chromium		1854-02-99	0.0524		0.0038				

APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Res	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	<sup>D</sup> arkway, Suite 400					REPORTE	ED: 04/02/15	10:37	
Malvern, PA 1935	5					SUBMITT	ED: 03/26/	15 to 03/27/15	
ATTN: Mr. Jeff Bo	oggs					AQS SITE	I		
PHONE: (443) 8	03-8495 <b>FAX:</b> (4	10) 266-8912					DE:	Honeywell Hex Chrome Study	
Description:	PAM-2	1	Lab ID:	5032607-0	)5			Sampled: 03/25/15 15:47	
Matrix:	Air	5	Sample Vo	lume:	21.16	m³		Received: 03/26/15 11:32	
Comments:	Start Time 3/24/15 16:	10						Analysis Date: 03/31/15 14:40	
		Hexa	avalent C	hromium t	oy SO	P ERG-M	10R-063		
				<u>Results</u>			<u>MDL</u>		
<u>Analyte</u>		CAS Number	. <u>I</u>	ng/m³ Air		Flag	<u>ng/m³</u>	Air	
Hexavalent Chromium		1854-02-99		0.0407			0.003	В	

APR 0 7 2015

Initials: CR

Eastern Research Group

# **NERG**

## CERTIFICATE OF ANALYSIS

Environmental Res	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400					REPORTED: 04/02/15 10:37			37
Malvern, PA 1935	5					SUBMITT	ED:	03/26/15 t	o 03/27/15
<b>ATTN:</b> Mr. Jeff Be <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912				AQS SITE	E DE:	ł	Honeywell Hex Chrome Study
Description:	PAM-3	Li	ab ID:	5032607-	06				Sampled: 03/25/15 15:37
Matrix:	Air	S	ample Vo	olume:	21.17	7 m³			Received: 03/26/15 11:32
Comments:	Start Time 3/24/15 16:06								Analysis Date: 03/31/15 14:51
		Hexa	valent C	Chromium	by SC	OP ERG-N	MOR-0	63	
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Number		ng/m³ Air		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0563				0.0038	

## APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Res	Invironmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400				REPORTED: 04/02/15 10:37				
Malvern, PA 19355					SUBMITTER	D: 03/26/15	to 03/27/15		
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			AQS SITE CODE: SITE CODE	:	Honeywell Hex Chrome Study		
Description:	PAM-4	Lab	<b>ID:</b> 503260	7-07			Sampled: 03/25/15 15:29		
Matrix:	Air	Sam	nple Volume:	21.4	m³		Received: 03/26/15 11:32		
Comments:	Start Time 3/24/15 15:42						Analysis Date: 03/31/15 15:02		
		Hexava	lent Chromiur	n by SC	OP ERG-MO	DR-063			
			<u>Results</u>			MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Ai</u>	Ľ	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0481			0.0038			

APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Re	nvironmental Resources Management, Inc						FILE #: 3926.00				
75 Valley Stream	Parkway, Suite 4	00			REPORT	REPORTED: 04/02/15 10:37					
Malvern, PA 1935	5				SUBMIT	TED: C	03/26/15 to 03/27/15				
ATTN: Mr. Jeff B PHONE: (443) 8	8oggs 303-8495 <b>FA</b>	<b>X:</b> (410) 266-8912			AQS SIT	E DE:	Honeywell Hex Chrome Study				
Description:	PAM-21	· · ·	Lab ID:	5032607-08			Sampled: 03/25/15 00:00				
Matrix:	Air		Sample Vo	lume: 2	l.16 m <sup>3</sup>	3	Received: 03/26/15 11:32				
Comments:							Analysis Date: 03/31/15 15:12				
Hexavalent Chromium by SOP ERG-MOR-063 Results MDL											

		Results		HDL
Analyte	CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc		FILE #: 3926.00	FILE #: 3926.00							
75 Valley Stream Parkway, Suite 400		REPORTED: 04/02/15	10:37							
Malvern, PA 19355		SUBMITTED: 03/26/1	5 to 03/27/15							
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410)	266-8912	AQS SITE CODE: SITE CODE:	Honeywell Hex Chrome Study							
Description: PAM-31	Lab ID: 5032607-	09	Sampled: 03/25/15 00:00							
Matrix: Air	Sample Volume:	21.17 m <sup>3</sup>	Received: 03/26/15 11:32							
Comments:			Analysis Date: 03/31/15 15:23							
Hexavalent Chromium by SOP ERG-MOR-063										
	<u>Results</u>	MDL								
Analyte	CAS Number ng/m <sup>3</sup> Air	Flag <u>ng/m³ A</u>	ir							

Analyte	<u>CAS Number</u>	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>
Hexavalent Chromium	1854-02-99	ND	U	0.0038

APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Res	Environmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400				<b>REPORTED:</b> 04/02/15 10:37				
Malvern, PA 19355					SUBMITT	to 03/27/15			
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			AQS SITE	E:	Honeywell Hex Chrome Study		
Description:	OAM 1	Lab I	<b>D:</b> 5032729-0	01			Sampled: 03/26/15 14:56		
Matrix:	Air	Samp	ole Volume:	21.67	m³		Received: 03/27/15 13:51		
Comments:	Start Time 3/25/15 14:51						Analysis Date: 03/31/15 15:34		
		Hexavale	ent Chromium	by SO	P ERG-M	IOR-063			
			<u>Results</u>			MDL			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>		<u>Flag</u>	<u>nq/m³ Air</u>			
Hexavalent Chromium		1854-02-99	0.0519			0.0038			

APR 0 7 2015

Initials: CR

Eastern Research Group

# **NERG**

# CERTIFICATE OF ANALYSIS

Environmental Res	nvironmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream F	⊃arkway, Suite 400				R	REPORTED: 04/02/15 10:37				
Malvern, PA 1935	Malvern, PA 19355						SUBMITTED: 03/26/15 to 03/27/15			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			A S	QS SITE	E DE:	ł	Honeywell Hex Chrome Study	
Description:	OAM 2	La	ab ID:	5032729-02	2				Sampled: 03/26/15 15:16	
Matrix:	Air	Sa	ample Vo	lume: 2	21.63	m³			Received: 03/27/15 13:51	
Comments:	Start Time 3/25/15 15:14								Analysis Date: 03/31/15 15:44	
Hexavalent Chromium by SOP ERG-MOR-063 Results MDL										
Analyte		CAS Number	I	ng/m³ Air		<u>Flag</u>		<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.123				0.0038		

## APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Res	ources Management, Inc	;	FILE #: 3926.00				
75 Valley Stream F	arkway, Suite 400			<b>REPORTED:</b> 04/02/15 10:37			
Malvern, PA 19355		SUBMITTED:	SUBMITTED: 03/26/15 to 03/27/15				
ATTN: Mr. Jeff Boggs PHONE: (443) 803-8495 FAX: (410) 266-8912				AQS SITE CODE: SITE CODE:		eywell Hex Chrome Study	
Description:	PAM-1	Lab ID:	5032729-03		· ·	Sampled: 03/26/15 16:28	
Matrix:	Air	Sample V	<b>/olume:</b> 21.8	9 m³		Received: 03/27/15 13:51	
Comments:	Col 1 Start Time 3/25/15 1	.6:09			An	alysis Date: 03/31/15 13:20	
		Hexavalent	Chromium by S	OP ERG-MOR-	063		
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0417		0.0038		

APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Res	nvironmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	<sup>o</sup> arkway, Suite 400			REPORTED:	<b>REPORTED:</b> 04/02/15 10:37				
Malvern, PA 1935	ō		SUBMITTED:	SUBMITTED: 03/26/15 to 03/27/15					
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	)) 266-8912		AQS SITE CODE: SITE CODE:	ŀ	Honeywell Hex Chrome Study			
Description:	PAM-1D	Lab ID:	5032729-04			Sampled: 03/26/15 16:31			
Matrix:	Air	Sample	Volume: 21	.91 m³		Received: 03/27/15 13:51			
Comments:	Col 2 Start Time 3/25/15	16:10				Analysis Date: 03/31/15 13:39			
Hexavalent Chromium by SOP ERG-MOR-063 Results MDL									
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	Flag	<u>ng/m³ Air</u>				
Hexavalent Chromium		1854-02-99	0.0386		0.0038				

## APR 0 7 2015

Initials: CR

Eastern Research Group

# **NERG**

## CERTIFICATE OF ANALYSIS

Environmental Rea	nvironmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream I	⊃arkway, Suite 400				R	<b>REPORTED:</b> 04/02/15 10:37			
Malvern, PA 19355					SI	SUBMITTED: 03/26/15 to 03/27/15			
<b>ATTN:</b> Mr. Jeff Br <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			A0 Si	QS SITE	E:	Honeywell Hex Chrome Study	
Description:	PAM-2	Li	ab ID:	5032729-0	5			Sampled: 03/26/15 16:13	
Matrix:	Air	Si	ample Vo	lume:	21.98	m³		Received: 03/27/15 13:51	
Comments:	Start Time 3/25/15 15:48							Analysis Date: 03/31/15 15:55	
Hexavalent Chromium by SOP ERG-MOR-063 Results MDL									
<u>Analyte</u>		CAS Number	l	ng/m³ Air		<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0502			0.0038		

## APR 07 2015

Initials: CR

Eastern Research Group

# **NERG**

## CERTIFICATE OF ANALYSIS

Environmental Res	invironmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	<sup>p</sup> arkway, Suite 400					REPORTED: 04/02/15 10:37			
Malvern, PA 19355					4	SUBMITTED: 03/26/15 to 03/27/15			o 03/27/15
<b>ATTN:</b> Mr. Jeff B <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			-	AQS SITE	E DE:	ŀ	Ioneywell Hex Chrome Study
Description:	PAM-3	Lab	b ID:	5032729-0	6				Sampled: 03/26/15 16:05
Matrix:	Air	San	mple Vol	lume:	21.98	m³			Received: 03/27/15 13:51
Comments:	Start Time 3/25/15 15:40								Analysis Date: 03/31/15 16:06
		Hexava	alent Ch	nromium b	y SO	P ERG-M	10R-00	53	
			l	<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>n</u>	<u>ig/m³ Air</u>		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0514				0.0038	

## APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Res	nvironmental Resources Management, Inc					FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400				I	REPORTED: 04/02/15 10:37			
Malvern, PA 1935	Malvern, PA 19355					SUBMITTI	to 03/27/15		
<b>ATTN:</b> Mr. Jeff Br <b>PHONE:</b> (443) 8	oggs :03-8495 <b>FAX:</b> (410	)) 266-8912			1	AQS SITE	E:	Honeywell Hex Chrome Study	
Description:	PAM-4	L	ab ID:	5032729-0	7			Sampled: 03/26/15 15:49	
Matrix:	Air	S	ample Vo	olume:	21.86	m³		Received: 03/27/15 13:51	
Comments:	Start Time 3/25/15 15:32							Analysis Date: 03/31/15 16:17	
		Hexa	valent C	hromium b	y SO	P ERG-M	IOR-063		
				<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number		<u>ng/m³ Air</u>		<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0460			0.0038		

APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Re	Environmental Resources Management, Inc					FILE #: 3926.00						
75 Valley Stream	Parkway, Suite 400				RE	PORTED:	04/02/15 10	:37				
Malvern, PA 1938	55				SU	BMITTED:	03/26/15	to 03/27/15				
ATTN: Mr. Jeff I	Boggs				AQ	S SITE						
<b>PHONE:</b> (443)	803-8495 FAX:	(410) 266-8912			ŝn	DE: E CODE:		Honeywell Hex Chrome Study				
Description:	PAM-21		Lab ID:	503272 <del>9</del> -0	8			Sampled: 03/26/15 00:00				
Matrix:	Air		Sample Vo	lume:	21.98	m³		Received: 03/27/15 13:51				
Comments:								Analysis Date: 03/31/15 16:49				
		Не	xavalent C	hromium b	y SOP E	ERG-MOR	-063					
				<u>Results</u>			MDL					
<u>Analyte</u>		CAS Numbe	er I	ng/m³ Air	ļ	<u>Flag</u>	<u>ng/m³ Air</u>					
Hexavalent Chromium		1854-02-99		ND		U	0.0038					

APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Resources	Management, Inc		FILE #: 3926	5.00	
75 Valley Stream Parkway	, Suite 400		REPORTED:	04/02/15 10:37	
Malvern, PA 19355			SUBMITTED:	03/26/15 to 03/27/15	
ATTN: Mr. Jeff Boggs			AQS SITE		
PHONE: (443) 803-8495	<b>FAX:</b> (410) 266-8912		SITE CODE:	Honeywell H	ex Chrome Study
Description: PAM-31	Lab ID:	5032729-09		Sampl	ed: 03/26/15 00:00
Matrix: Air	Sample	Volume: 21.98	3 m³	Receiv	ed: 03/27/15 13:51
Comments:				Analysis Da	ate: 03/31/15 16:59
	Hexavalent	Chromium by SC	OP ERG-MOR-	063	
		<u>Results</u>		<u>MDL</u>	
<u>Analyte</u>	CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>	
Hexavalent Chromium	1854-02-99	ND	U	0.0038	

APR 0 7 2015

Initials:  $\mathcal{CR}$ 

Eastern Research Group



April 8, 2015

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 April 7, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

### LDC Project #34039:

<u>SDG</u>	<u>Fraction</u>
5040133	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,

Anchen Learne for:

Christina Rink Project Manager/Chemist

<b>1</b>	70 pages-SF	1 WEE	K TAT												Atta	achn	nent	: 1																					
	Level IV	Ļ	DC #34	103	9_(E	ERN	٨÷	Mo	rris	svil	le,	NC	21	Ha	rbç	or F	?oii	1 <b>t,</b>	MD	, H	exa	ava	ler	nt C	hro	əmi	un	n M	oni	itor	ing	3)							
LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr (D7	(VI) 614)														_																				
Matr	x: Air/Water/Soil	///Spanates		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	<u>w</u>	s	w	s	w	s
А	5040133	04/07/15	04/14/15	9	<u>0</u>													┣				<u> </u>			<u> </u>												$\rightarrow$		
											_					-		┣				<u> </u>	-			-						-		$\vdash$	$\vdash$	┝──┨	$\dashv$		
	<u> </u>															<del> </del>									├──	-													
			<u> </u>	$\vdash$												$\vdash$		├		·					$\vdash$									┝──┤	$\left  - \right $		$\neg$		
										-																									$\square$				
																		<b> </b>									-												
																ŀ																							
																		L																			$\square$		
<b></b>		· · · ·												<u> </u>		<u> </u>		<u> </u>		<u> </u>															<b> </b>	┝──┤	$\square$		
																								<u> </u>											$\mid$	┢━━┫	$\dashv$		
																		<u> </u>			—		_													┢──┨	$\rightarrow$		
<u> </u>																-		<u> </u>				<u> </u>		-							<u> </u>						-+		
																		<u> </u>		-		-									<u> </u>			┢──┦			$\dashv$		
																		<u> </u>																			$\neg$		
																																		$\Box$	$\Box$				
																																					$\square$		
	· · ···																	<u> </u>					<u> </u>														$\dashv$		
				<u> </u>																					<u> </u>										$\mid$	┢──┨	$\dashv$		
										_																								$\square$			$\dashv$		
																																						$\dashv$	
	<u>.</u>															-		┣──			-				-						—	<u> </u>		$\vdash$	$\left  - \right $	⊢┤	$\rightarrow$		
	······	-					-																1									<u> </u>					-+	-+	
																																					$\dashv$		$\neg$
Total	A/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

#### LDC Report# 34039A6

## Laboratory Data Consultants, Inc. Data Validation Report

Hexavalent Chromium

Eastern Research Group

**Project/Site Name:** 

Harbor Point, MD, Hexavalent Chromium Monitoring

Collection Date: March 31, 2015

. . . . . . . . . . . . . . .

LDC Report Date: April 7, 2015

Matrix:

Air

Parameters:

Validation Level: EPA Level IV

Laboratory:

Sample Delivery Group (SDG): 5040133

Sample Identification

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

1

#### 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)	Flag	A or P
Hexavalent chromium	0.0492	0.0460	7 (≤20)	-	-

#### Harbor Point, MD, Hexavalent Chromium Monitoring Hexavalent Chromium - Data Qualification Summary - SDG 5040133

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 5040133

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 5040133

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

L:\ERM\Harbor Point_Honeywell\34039A6W.wpc	I
L:\ERM\Harbor Point_Honeyweii\34039A6VV.wpd	1

LDC #: <u>34039A6</u> VAL SDG #: <u>5040133</u> Laboratory: Eastern Research Group

#### METHOD: (Analyte) 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
١.	Sample receipt/Technical holding times	A	03/31/15
п	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	QU	FB=(8) $TB=(9)$
VI.	Matrix Spike/Matrix Spike Duplicates	$\mathbf{N}$	Not Required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LISIO
IX.	Field duplicates	Sw	FD=(3,4)
Х.	Sample result verification	A	
	Overall assessment of data		

Note:

A = Acceptable N = Not provided/applicable SW = See worksheet ND = No compounds detected R = Rinsate

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank EB = Equipment blank SB=Source blank

**Client ID** Matrix Date Lab ID 1 OAM 1 5040133-01 Air 03/31/15 2 OAM 2 Air 5040133-02 03/31/15 3 PAM-1 5040133-03 Air 03/31/15 4 PAM-1D 5040133-04 Air 03/31/15 PAM-2 5 Air 03/31/15 5040133-05 6 PAM-3 5040133-06 Air 03/31/15 7 PAM-4 Air 03/31/15 5040133-07 8 PAM-21 Air 03/31/15 5040133-08 9 PAM-31 5040133-09 Air 03/31/15 PAM-1 DUP 10 5040133-03DUP Air 03/31/15 11 PAM-1D DUP 5040133-04DUP Air 03/31/15 12 13 14 15 Notes:

Date: <u>4|-1|5</u> Page: <u>\of</u> Reviewer: <u>50</u> 2nd Reviewer:

#### VALIDATION COMPLETENESS WORKSHEET

Level IV

#### VALIDATION FINDINGS CHECKLIST



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 9 <del>0-110</del> % QC limits? ろらーいう	/			
Were titrant checks performed as required? (Level IV only)			$\leq$	
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	<u>.</u>			
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?	$\square$			
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?			/	

## Method:Inorganics (EPA Method See (معد)

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

LDC#<u>34039A6</u>

#### VALIDATION FINDINGS WORKSHEET Field Duplicates



Inorganics: Method See Cover

	Concentrati					
Analyte	3	4	RPD (≤20)	Qual.		
Hexavalent Chromium	0.0492	0.0460	7			

\LDCFILESERVER\Validation\FIELD DUPLICATES\FD\_inorganic\34039A6.wpd

LDC#: 34039AL

#### Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method <u>See Cover</u>

The correlation coefficient (r) for the calibration of  $\underline{C}$  was recalculated. Calibration date:  $\underline{O} = 0$ 

Where,

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

%R = Found X 100

True

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 <sup>2</sup>	r or r <sup>2</sup>	(Y/N)
Initial calibration		s1	0.05	0.0319887			
		s2	0.1	0.0661265	0.99992	0.99992	
	Crip	s3	0.2	0.1472828			C
		\$4	0.5	0.3840763			
		s5	1	0.7518733			1
		s6	2	1.5481016			
ICU 11:20	~ +0	Found	True				
Calibration verification	Cr	0.5226 majuri	0. Snafml		104.5%R	104.5%8	
CCU 121-38 Calibration verification	Cx26	0.5258.rejml	O.Svqlml		105.2%	105.2%	J
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# 34039AV

#### VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: <u>of</u> <u></u> Reviewer: <u>50</u> 2nd Reviewer: <u>6</u>

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 x 100 Where, True 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 = <u> S-D </u> x 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 12:06	Laboratory control sample	Cr+10	1.06 ng/m)	1.00 vojm)	106%2	106%2	J
N	Matrix spike sample		(SSR-SR)				
DUR 13:09	Duplicate sample	Ţ	0.0492ng/m3	0.0492vg/m3	D%RRD	0% RD	J

Comments: \_\_\_\_\_\_

LDC # 34039 AV

#### VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification



(Y/N)

YX

S

Y+K

J

J

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?  $\nabla$ N N/A Are all detection limits below the CRQL? \_\_\_\_\_reported with a positive detect were  $Concentration = (A - C_0) | C_1 \quad uf = |0m|^{\text{Recalculation:}} (0.0702549 - (-9.ME-03)) = 0.103 | ng/m' \\ A = 0.0702549 \qquad m^3 = 21.52 \qquad 0.716/26 \qquad = 0.103 | ng/m' \\ C_0 = -9.77E - 03 \qquad (ng/m1)(uf) \qquad (0.103 | ng/m1)(10m) \\ C_1 = 0.716/26 \qquad m^3 = ng/m^3 \qquad (0.103 | ng/m1)(10m) \\ Z_1 - 52 m^3 = 0.0476 ng/m^3 \\ \hline \end{array}$ Reported Calculated Concentration Concentration Acceptable # Sample ID Analyte (nalm3) (nalm3) l  $\rightarrow \phi$ 0.0389 10479 2 O. OUNA 2 0.0492 OU97 4 19461 ).04000.0386 2.0386 0.046 0467 1.0802 0.0802 ろろ ND 4 NO CCC 1 Note:
# ERG

## CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream I	⊃arkway, Suite 400					REPORT	ED:	04/07/15 12:'	3
Malvern, PA 19355					SUBMITTED: 04/01/15				
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912				AQS SITE	E DE:	ŀ	loneywell Hex Chrome Study
Description:	OAM 1	La	ab ID:	5040133-0	)1				Sampled: 03/31/15 14:53
Matrix:	Air	Sa	ample Vo	lume:	21.54	m³			Received: 04/01/15 13:20
Comments:	Start Time 3/30/15 14:58						_		Analysis Date: 04/02/15 13:37
		Hexa	valent C	hromium l	by SO	P ERG-M	10R-0	63	
				<u>Results</u>				MDL	
<u>Analyte</u>		CAS Number	1	ng/m³ Air		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium	I.	1854-02-99		0.0389				0.0038	

APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Re	c	FILE #	FILE #: 3926.00				
75 Valley Stream I	Parkway, Suite 400			REPOR	RTED:	04/07/15 12:1	3
Malvern, PA 1935	5			SUBMI	TTED:	04/01/15	
<b>ATTN:</b> Mr. Jeff B <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912		AQS S	ITE ODE:	ŀ	loneywell Hex Chrome Study
Description:	OAM 2	Lab I	<b>D:</b> 5040133	-02			Sampled: 03/31/15 15:12
Matrix:	Air	Samp	ole Volume:	21.52 r	n³		Received: 04/01/15 13:20
Comments:	Start Time 3/30/15 15:18						Analysis Date: 04/02/15 13:48
		Hexaval	ent Chromium	by SOP ERG	-MOR	-063	
			<u>Results</u>			<u>MDL</u>	
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flac</u>	L	<u>ng/m³ Air</u>	
Hexavalent Chromium	1	1854-02-99	0.0479			0.0038	

APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					I	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					I	REPORTED: 04/07/15 12:13			
Malvern, PA 19355					:	SUBMITTED: 04/01/15			
ATTN: Mr. Jeff Bo PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	)) 266-8912			1	AQS SITE	E DE:	ł	Honeywell Hex Chrome Study
Description:	PAM-1	Lal	b ID:	5040133-03	3				Sampled: 03/31/15 15:54
Matrix:	Air	Sai	mple Vo	lume: 2	21.6	m³			Received: 04/01/15 13:20
Comments:	Col 1 Start Time 3/30/15	15:54							Analysis Date: 04/02/15 12:59
		Hexav	alent Cl	hromium by	y SO	P ERG-M	10R-063		
				<u>Results</u>				MDL	
<u>Analyte</u>		CAS Number	r	<u>1g/m³ Air</u>		<u>Flag</u>	ng	<u>ı/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0492				0.0038	

APR 0 7 2015

Initials: CR

Eastern Research Group

# **NERG**

### CERTIFICATE OF ANALYSIS

Environmental Res	sources Management, In	c	FILE #: 3	FILE #: 3926.00			
75 Valley Stream F	Parkway, Suite 400			REPORTED	<b>):</b> 04/07/15 12:	13	
Malvern, PA 19355					SUBMITTED: 04/01/15		
<b>ATTN:</b> Mr. Jeff Bo <b>PHONE:</b> (443) 8	oggs 03-8495 <b>FAX:</b> (410	)) 266-8912		AQS SITE CODE: SITE CODE	:: H	Honeywell Hex Chrome Study	
Description:	PAM-1D	Lab ID	: 5040133-04			Sampled: 03/31/15 15:55	
Matrix:	Air	Sample	e Volume: 2	1.63 m³		Received: 04/01/15 13:20	
Comments:	Col 2 Start Time 3/30/15	15:53				Analysis Date: 04/02/15 13:18	
		Hexavaler	nt Chromium by	SOP ERG-MO	DR-063		
			<u>Results</u>		MDL		
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99	0.0460		0.0038		

#### APR 0 7 2015

Initials: CR

Eastern Research Group

# **ERG**

### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400					REPORTE	REPORTED: 04/07/15 12:13			
Malvern, PA 19355					SUBMITT	SUBMITTED: 04/01/15			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912				AQS SITE	E DE:	I	Honeywell Hex Chrome Study
Description:	PAM-2	L	ab ID:	5040133-0	)5				Sampled: 03/31/15 15:43
Matrix:	Air	s	Sample Vo	olume:	21.56	m³			Received: 04/01/15 13:20
Comments:	Start Time 3/30/15 15:45								Analysis Date: 04/02/15 13:58
		Hexa	valent (	Chromium I	by SC	P ERG-M	10R-0	63	
				<u>Results</u>				<u>MDL</u>	
<u>Analyte</u>		CAS_Number		<u>nq/m³ Air</u>		<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		0.0386				0.0038	

APR 0 7 2015

Initials: CR

Eastern Research Group

<b>NERC</b>	Ê	CERTIFIC	CATE OF	ANALYS	IS			
Environmental Re	sources Management, In	с	FILE #: 39	FILE #: 3926.00				
75 Valley Stream	Parkway, Suite 400		REPORTED:	REPORTED: 04/07/15 12:13				
Malvern, PA 1935	5		SUBMITTED	SUBMITTED: 04/01/15				
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 303-8495 <b>FAX:</b> (410	)) 266-8912		AQS SITE CODE: SITE CODE:	Hc	neywell Hex Chrome Study		
Description:	PAM-3	Lab ID:	5040133-0	6		Sampled: 03/31/15 15:36		
Matrix:	Air	Sample	Volume:	21.53 m³		Received: 04/01/15 13:20		
Comments:	Start Time 3/30/15 15:40				A	nalysis Date: 04/02/15 14:09		
		Hexavalent	Chromium b	y SOP ERG-MO	R-063			
			<u>Results</u>		<u>MDL</u>			
<u>Analyte</u>		CAS Number	<u>ng/m³ Air</u>	<u>Flag</u>	<u>ng/m³ Air</u>			
Hexavalent Chromium	1	1854-02-99	0.0467		0.0038			

APR 0 7 2015

Initials: CR

Eastern Research Group



Environmental Resources Management, Inc					FILE	FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 04/07/15 12:13			
Malvern, PA 19355					SUB	SUBMITTED: 04/01/15			
ATTN: Mr. Jeff B PHONE: (443) 8	oggs 03-8495 <b>FAX:</b> (410	) 266-8912			AQS SITE	SITE CODE:	ł	Honeywell Hex Chrome Study	
Description:	PAM-4	La	ab ID:	5040133-07	,			Sampled: 03/31/15 15:29	
Matrix:	Air	Sa	ample Vo	olume: 2	1.46	m³		Received: 04/01/15 13:20	
Comments:	Start Time 3/30/15 15:39							Analysis Date: 04/02/15 14:20	
		Hexav	valent C	Chromium by	y SOP ER	G-MOF	R-063		
				<u>Results</u>			MDL		
<u>Analyte</u>		CAS Number		ng/m³ Air	<u>FI</u>	pig	<u>ng/m³ Air</u>		
Hexavalent Chromium		1854-02-99		0.0802			0.0038		

APR 0 7 2015

Initials: CR

Eastern Research Group

# **NERG**

Hexavalent Chromium

### CERTIFICATE OF ANALYSIS

Environmental Resources Management, Inc						FILE #: 3926.00				
75 Valley Stream	Parkway, Suite 400	I				REPORT	ED: (	)4/07/15 12:	13	
Malvern, PA 1935	55					SUBMITT	TED:	04/01/15		
ATTN: Mr. Jeff E PHONE: (443)	Boggs 803-8495 <b>FAX:</b>	(410) 266-8912				AQS SITE	E DE:	1	Honeywell Hex Chrome Study	
Description:	PAM-21		Lab ID:	5040133-	-08				Sampled: 03/31/15 00:00	
Matrix:	Air		Sample Vo	lume:	21.56	m³	3		Received: 04/01/15 13:20	
Comments:									Analysis Date: 04/02/15 14:30	
	Hexavalent Chromium by SOP ERG-MOR-063									
				<u>Results</u>				<u>MDL</u>		
<u>Analyte</u>		CAS Numbe	<u>er 1</u>	ng/m³ Air		Flag		<u>ng/m³ Air</u>		

Ų

0.0038

ND

1854-02-99

APR 0 7 2015

Initials: CR

Eastern Research Group

# **ERG**

### **CERTIFICATE OF ANALYSIS**

Environmental Resources Management, Inc						FILE #: 3926.00			
75 Valley Stream Parkway, Suite 400						REPORTED: 04/07/15 12:13			
Malvern, PA 19355						SUBMITTED: 04/01/15			
ATTN: Mr. Jeff E PHONE: (443)	3oggs 803-8495 <b>FAX</b>	: (410) 266-8912				AQS SITI	E DE:	I	Honeywell Hex Chrome Study
Description:	PAM~31		Lab ID:	5040133	3-09				Sampled: 03/31/15 00:00
Matrix:	Air		Sample Vo	olume:	21.53	m <sup>3</sup>	;		Received: 04/01/15 13:20
Comments:									Analysis Date: 04/02/15 15:03
		He	xavalent C	hromiun	1 by SC	P ERG-N	MOR-0	)63	
				<u>Results</u>				MDL	
<u>Analyte</u>		CAS Numbe	er .	ng/m³ Aiı	r	<u>Flag</u>		<u>ng/m³ Air</u>	
Hexavalent Chromium		1854-02-99		ND		U		0.0038	

Hexavalent Chromium

APR 0 7 2015

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 13