ATTACHMENT F DATA VALIDATION REPORTS

07 July, 2011

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: JCRA – Morris Canal, Laboratory Case NO. E11- 04531

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: JCRA – Morris Canal

<u>Fractions</u>

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

pH/Eh; ORP

Case No.: E11-04531 Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr^{+6}) samples were analyzed using SW-846 methods 3060A and 7196A. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_{4^-}$ / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Page 1 of 4 EQA, Inc. @BCL@180BDF77.doc

Dresdner-Robin Mr. John Tregidgo 07 July, 2011

Sample		Lab ID		Date	Analysis	Cr ⁺⁶	Cr ⁺⁶	Cr ⁺⁶
Prefix	Sample ID	E11-04531-	Matrix	Collected	Hex Cr	Date Rec'd	Prep Date	RunDate
	FB-050911-1	001	Α	05/09/11	Х	05/09/11	n/a	05/09/11
121_	B2_1.5	002	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
121_	B2_4.5	004	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
121_	B2_8.0	007	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
121_	B2_12.0	009	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
121_	B1_1.0	011	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
121_	B1_4.5	013	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
121_	B1_8.0	015	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
121_	B1_12.0	017	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B6_1.0	019	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B6_4.0	021	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B6_8.0	023	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B6_12.0	025	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	REP050911-1	026	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B8_1.0	028	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B8_6.0	031	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B8_9.0	032	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B8_12.0	034	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B9_1.0	036	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	REP050911-2	037	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B9_4.0	039	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B9_8.0	041	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B9_12.0	043	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11
207_	B9_14.5	044	S	05/09/11	Χ	05/09/11	05/12/11	05/12/11

S = Non-Aqueous Matrix

Total Samples = 24

A = Aqueous Matrix

All samples were received on the same day as collected. Samples were received on ice at recorded temperature of 4° C.

<u>SECTION C</u> Hexavalent Chromium

Holding times from sample collection to analysis (\leq 24 hours for aqueous matrix; \leq 30 days for non-aqueous matrix) were met for all samples.

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks were free of contamination. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr⁺⁶ results were randomly verified from the raw data with no disparities between reported and calculated results found.

Page 2 of 4 EQA, Inc. @BCL@180BDF77.doc

Dresdner-Robin Mr. John Tregidgo 07 July, 2011

Cr⁺⁶ was not detected in Field Blank FB-050911-1.

Matrix spike recoveries for soluble and insoluble Cr⁺⁶ in batch QC samples E11-04531-39 (207_B9_4.0) and E11-04531-44 (207_B9_14.5) were below the allowable limit of 75% in both initial and re-analyses, as tabulated below. All associated batch samples were re-digested and re-analyzed with the batch spike samples, per NJDEP and method protocols.

Sample ID	Sol.Recov.	Insol.Recov.
04531-39	41%	86%
re-analysis	51%	82%
04531-44	12%	70%
re-analysis	5%	64%

- QA Action: 1) Qualify Cr⁺⁶ results in batch samples associated with E11-04531-39 (samples 02 39) as estimated, 'UJ', per NJDEP SOP No. 5.A.10, Rev.3, Sect. VI.(D).7.D.8)e).
 - 2) Qualify Cr⁺⁶ results in batch samples associated with E11-04531-44 (samples 41 44) as rejected, 'R', per NJDEP SOP No. 5.A.10, Rev.3, Sect. VI.(D).7.D.8)e).

Samples (REP050911-1 and 207_B6_12.0) and (REP050911-2 and 207_B9_1.0) were identified as collocated field duplicate pairs for this sample group. Results for Cr⁺⁶ in all samples within both field duplicate pairs were reported as non-detect.

SECTION D pH / Eh (ORP)

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution; Zobell's solution) were within acceptable ranges, as were sample duplicate measurements.

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the HCrO₄- / Cr(OH)₃ phase diagram; no disparities relative to reported values and characteristics were found.

Dresdner-Robin Mr. John Tregidgo 07 July, 2011

<u>SECTION E</u> Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

Page 4 of 4 EQA, Inc. @BCL@180BDF77.doc

HEXCR - 1 Page 1 of 10

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code:	n/a
Location:	Site Manager: n/a	
Laboratory Name : <u>IAL</u>	Lead Division / Bureau: n/a	
Reviewer : Chris Taylor	Methodology:	3060 7196A
Date of Review: <u>07/06/11</u>	SDG No.: <u>E1</u>	1-04531
Analysis for Hexavalent Chromium by Method :	See Above	
Yes No A. Permanently Bound ? X	F. Non-Conformance Summary?	Yes No
B. Paginated?	G. Methodology Review?	X
C. Title Page ?	H. Uninitialed Strikeover?	X
D. Table of Contents ? X	I. Legible Xerox?	X
E. Chain of Custody?	J. Consistent Dates ?	X
Describe any deviations from requirements :		

HEXCR - 2 Page 2 of 10

Holding Times for Hexavalent Chromium

Site Name : Morris Canal	Laboratory Name : IAL
	•
Reviewer · Chris Taylor	Date of Review: 7/6/2011

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	X		Sample	Analysis	Time	QA
04531-		Matrix	Collection	Date	Exceeded	Decision
04531-	001	А	05/09/11	05/09/11	0	ACCEPT
04531-	002	S	05/09/11	05/12/11	0	ACCEPT
04531-	004	S	05/09/11	05/12/11	0	ACCEPT
04531-	007	S	05/09/11	05/12/11	0	ACCEPT
04531-	009	S	05/09/11	05/12/11	0	ACCEPT
04531-	011	S	05/09/11	05/12/11	0	ACCEPT
04531-	013	S	05/09/11	05/12/11	0	ACCEPT
04531-	015	S	05/09/11	05/12/11	0	ACCEPT
04531-	017	S	05/09/11	05/12/11	0	ACCEPT
04531-	019	S	05/09/11	05/12/11	0	ACCEPT
04531-	021	S	05/09/11	05/12/11	0	ACCEPT
04531-	023	S	05/09/11	05/12/11	0	ACCEPT
04531-	025	S	05/09/11	05/12/11	0	ACCEPT
04531-	026	S	05/09/11	05/12/11	0	ACCEPT
04531-	028	S	05/09/11	05/12/11	0	ACCEPT
04531-	031	S	05/09/11	05/12/11	0	ACCEPT
04531-	032	S	05/09/11	05/12/11	0	ACCEPT
04531-	034	S	05/09/11	05/12/11	0	ACCEPT
04531-	036	S	05/09/11	05/12/11	0	ACCEPT
04531-	037	S	05/09/11	05/12/11	0	ACCEPT
04531-	039	S	05/09/11	05/12/11	0	ACCEPT
04531-	041	S	05/09/11	05/12/11	0	ACCEPT
04531-	043	S	05/09/11	05/12/11	0	ACCEPT
04531-	044	S	05/09/11	05/12/11	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp: 4°C

Preservation:

Handling Time:

HEXCR - 3 Page 3 of 10

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r ² >0.995 ?) If No, explain and list action :	YES X
Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action:	X
Was the same CCS concentration used throughout the analysis ? If No, list action :	X
Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :	X
Show calculation for the % recovery of Hexavalent Chromium in the CCS standard	I.
Lab CCS value : 0.497 mg/L mg/L Lab value : 99 True CCS value : 0.500 mg/L Calculated value = (Lab / True x 100) 99.3	% recovery
Specific comments :	
Initial calibrations were performed on 05/09/11 (H 2 O), 05/12/11 and 05/14/11 (soil	(e)

HEXCR - 4 Page 4 of 10

Calibration Blanks for Hexavalent Chromium

sociate	d samples : All SDG samples		
		<u>YES</u>	<u>NO</u>
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve?	X	
	If No, list action :		
2.	Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes X	
	If No, list action :		
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL ?	Yes X	
	If No, list action :		
4.	Specific comments :		
•			

HEXCR - 5a Page 5 of 10

Preparation / Reagent Blank Summary for Hexavalent Chromium

	•	or rioxavaiori	it Omomium			
Associated sample matrix : Check one (X)	Soil	<u>Water</u> X	Preparation	/ Reagent Blank ID :	PrepBlank	
Units:	mg/Kg	mg/L X			<u>Yes</u>	<u>No</u>
Did the frequency of the preparation /	reagent bla	nk analysis n	neet metnod r	requirements?	Х	
If No, explain and note a	ction :				_	
		< or = MDL				
CONCENTRATION	Yes	<u> </u>	No	COMMEN	TS / ACTION	
U						
Associated samples : 04531-001		<u>s</u> : < or = MDL : > MDL				
HEXCR - 5b						
		ation / Reage or Hexavalen	ent Blank Sum It Chromium	nmary		
Associated sample matrix : Check one (X)	Soil X	Water	Preparation	/ Reagent Blank ID :	PrepBlank	
Units:	mg/Kg X	mg/L				
					<u>Yes</u>	<u>No</u>
Did the frequency of the preparation / If No, explain and note a		nk analysis n	neet method r	equirements ?	_ X 	
		< or = MDL				
CONCENTRATION	Yes		No	COMMEN	TS / ACTION	
U						
		<u>s</u> : < or = MDL : > MDL				
Associated samples : Soil samples	s for SDG 0	4531 were e	xtracted in tw	o discrete prep batches	s (AP011- 0044 s	and
-0045). 'Met	hod (prep) I	blanks for all	batches were	e non-detect (ND) for Ci	· +6 .	

Pre-digestion Spike Analysis for Non-Aqueous Hexavalent Chromium Samples

Matrix:	Non-Aqueous							
Units:	mg/Kg							
Associated	samples : All SDG so	il samples						
							YES	<u>NO</u>
1.	Was the pre-digestion	spike analysis	performed	at the correc	t frequency?		X]
	If No, note deviations a	nd action :						
2.	Was the pre-digestion s	spike analysis	performed	on a field sar	mple ?		Х]
	If No, qualify all associa	ated samples.						
3.	Was the pre-digestion	spike analysis	performed	at the proper	concentratio	n?	Х	
	If No, list action:							
4.	Did the pre-digestion sp	oike recovery	for Cr +6 me	eet the criteri	a of 75 - 125	% ?		Х
	If No, list action:	Sample ID 04531-39	Sol.Recov. 41%	Insol.Recov 86%	Ox / Red ?			
		re-analysis 04531-44	51% 12%	82% 70%	R			
		re-analysis	5%	64%				
	05431-39 : sample sho	ws reducing t	endency bas	sed on ORP.	Qualify asso	ciated batch	samples (02	2-39).
	Refer to validation narra	ative for data	usability info	rmation base	ed on batch s	ample ORP	characteristi	cs.
	04531-44 : sample sho	ws reducing t	endencies b	ased on ORF	P. Reject 'R' a	associated b	atch sample	s (41-44).
	Refer to validation narra	ative for data	usability info	rmation base	ed on batch s	ample ORP	characteristi	CS.
5.	Show calculation for pre	e-digestion sp	ike recovery	for Cr +6				
	a. Soluble Spike	Sample ID:	04531-39	RE	b. Insoluble	Spike	Sample ID:	04531-44
	Lab spiked sample val		23.7	_	Lab spiked s			1230
	Lab un-spiked sample spike added concentra		0.0 46.7	_	Lab un-spike Spike added			0.0 1760
	Opine added concentra	illori .	40.7	=	Орікс асасс	2 CONCENTIALI	OII.	1700
	Calculated value = (Spiked - Unspiked	50.7 / Spike Adde	% recovery ed x 100)			ed value = · Unspiked)	69.9 / Spike Adde	% recovery ed x 100)
	Lab value	: 51	% recovery			Lab value :	70	% recovery
	Verified ?	yes	-			Verified ?	yes	-
6.	Specific comments :				ifies data qua			
		batch spike	recoveries.	Data usability	/ is addresse	d in the data	validation na	arrative.

HEXCR - 7 Page 7 of 10

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS	analysis pe	rformed on sample(s)	: -	04531-39 04531-44		Matrix:	Non-Aqueo	us
% Solids :	n/a	_	_	04551-44		Units:	mg/Kg	_
Associated	samples :	All SDG soil sample	es					
							<u>YES</u>	<u>NO</u>
1.	the proper	VS analysis performer concentration? (for 0 mg/Kg or 2x sample	H2O, 3	30 ug/L or 2x sa			X	Ι
	If No, note	deviations and action	n: _			-		
2.	Was the P	VS analysis performe	ed on a	field sample ?		-	Х	I
	If No, qual	ify all associated sam	ples.					
3. a.	Did the PV	/S recovery for Cr +6	meet tl	ne criteria of 85	- 115% ?		X]
	If No, list a	ction :				-		
3. b.	If the % rethe aliquot	covery was less than	85% di	d the laboratory	re-spike and re-anal	yze	n/a]
	If No, list a	ction:				-		
	Did the %	recovery for the rean	alysis m	neet the criteria	of 85 - 115% ?	_	n/a	Ι
	If No, list a	ction :				-		
5.	Show calc	ulation for PVS % red	covery 1	or Cr +6.		_	_	
	Lab spiked Lab un-spi	: 04531-039 d sample value : iked sample value : ed concentration :	- - -	42.3 0.0 46.7	Lab spiked Lab un-spik	04531-44 sample valued sample valued sample valued sample valued	 ue : /alue :	62.6 0.0 72.9
		ated value = 90 d - Unspiked) / Spike		% recovery x 100)		ted value = - Unspiked)	85.9 / Spike Adde	_% recovery d x 100)
		Lab value : 9°	<u> </u>	% recovery		Lab value	:86	% recovery
		Verified ?ye	s			Verified ?	yes	-
6.	Specific co	omments :						_
								_
								-
								-

Duplicate Analysis for Hexavalent Chromium

pilou	te analysis performed on sample(s) : 04531-039	_ Matrix :	Non-Aqueo
		Units:	mg/Kg
ciate	d samples : All SDG soil samples		
		<u>YES</u>	<u>NO</u>
1.	Was the duplicate analysis performed at the correct frequency?	X	
	If No, note deviations and action :	-	
		-	
2.	Was the duplicate analysis performed on a field sample?	Х	
	If No, qualify all associated samples.		
3.	Did the duplicate results for Cr +6 meet the QC control limits? (20% RPD for all Aqueous samples & Non-aqueous > or = 8 ppm) (+ / - 2 ppm for Non-aqueous samples if either or both are < 8.0 ppm)	X	
	If No, list action :	-	
		- -	
4.	Show calculation for % RPD for Cr+6.		
	Sample ID: 04531-39 Lab sample value : ND Lab duplicate value : ND Sample ID: Lab sample Lab sample Lab duplicate		_ _
	Calculated value = no calc % RPD Calculated	value = no calc	_ % RPD
	% RPD = Sample - Duplicate	Sample - Duplicate (Sample + Duplicate)/2	x 100
5.	Specific comments : ND = Not Detected		_
ο.			
Э.			<u> </u>

Laboratory Control Sample (LCS)

Matrix:	Non-Aqueous						
Units:	mg/Kg						
Associated	samples : <u>All soi</u>	l samples.					
						<u>YES</u>	<u>NO</u>
1.	Was the LCS perfe	ormed at the correct	frequency?			X	
	If No, note deviation	ns and action :					
2.	Does the LCS med	et the QC limit of 80	- 120% ?			X	
	If No, list the %Red	covery and action tal	ken.				
3	Show calculation f	or LCS recovery for	Cr+6.				
	Lab LCS value :	37.1		Lab value :_	93	% Recovery	
	LCS true value :	40.0		Calculated value = _	92.8	% Recovery	
9	% Recovery = <u>Labora</u> LCS to	atory LCS result: rue value	x 100				
5.	Specific comment	s : Soil samples	were extracted	l in two separate batch	es; a soil	LCS was	
		prepared and	analyzed for e	each extraction batch.	All LCS re	ecoveries	
		were within a	cceptable limit	s of 80 - 120%.			

Sample Result Verification for Hexavalent Chromium

ssociate	d samples :	All SDG sam	ples					
1.		nples reported			ge?		YES X	NO
2.		data free of a	-				Х	
3.		a package free	-		ranscription errors ?		Х	
4.	within the me (Method 306	ethod requirem 30 : non-aqued	ients ? ous samples	must be adju	or all samples, and ested to pH 7.0 - 8.0) usted to pH 1.6 - 2.2)		Х	
5.	Were hotplat (At least 60	e temperature minutes, and l	s provided, petween 90	and within me to 95 degrees	othod requirements ?		Х	
6.	Show the cal	culation for %		_	Sample ID:	04531-39		
	Sample dry v Sample wet v Calculated %	weight	4.10 4.79 85.6	- - -	Lab value : % Solids =	Sample de Sample we		x 100
7.		Chromium in a		reported on a	·	04531-39	Soluble Spike	
		% Solids =	85.6	_ %	Lab value : Calculated value =	19.1	mg/Kg mg/Kg	
nple C	onc., mg/Kg =	curve mg/L 0.40854073 0.0025 wetwgt, Kg	dig.vol, L 0.100 0.856 %sol/100	dilution 1.0	= 19.091 <i>mg/Kg</i>	Resu	Ilt verified ?	Yes

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: JCRA – Morris Canal, Laboratory Case NO. E11- 04574

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: JCRA – Morris Canal

Fractions

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

pH/Eh; ORP

Case No.: E11-04574 Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr^{+6}) samples were analyzed using SW-846 methods 3060A and 7196A. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_{4^-}$ / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Dresdner-Robin Mr. John Tregidgo 11 July, 2011

Sample		Lab ID		Date	Analysis	Cr ⁺⁶	Cr ⁺⁶	Cr ⁺⁶
Prefix	Sample ID	E11-04574-	Matrix	Collected	Hex Cr	Date Rec'd	Prep Date	RunDate
	FB-051011-1	001	Α	05/10/11	Х	05/10/11	n/a	05/10/11
121_	B12_1.0	002	S	05/10/11	Х	05/11/11	05/13/11	05/13/11
121_	B12_5.5	004	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B12_9.5	006	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B12_13.0	800	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B12_17.0	010	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B11_1.0	011	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B11_5.5	013	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B11_9.5	015	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B11_13.5	017	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B11_17.0	019	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	REP051011-1	020	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B9_1.5	021	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B9_5.5	023	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B9_9.5	025	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B9_13.5	027	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B9_17.0	029	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B10_1.0	030	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	REP051011-2	031	S	05/10/11	Χ	05/11/11	05/13/11	05/13/11
121_	B10_5.5	033	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	B10_9.5	035	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	B10_13.5	037	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	B10_17.0	039	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	B13_1.0	040	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	B13_5.5	042	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	B13_8.5	044	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	B13_12.5	046	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	B13_16.0	048	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	B5_1.0	049	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	B5_7.5	052	S	05/10/11	Х	05/11/11	05/16/11	05/16/11
121_	B5_9.5	053	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	REP051011-3	054	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	B5_13.5	056	S	05/10/11	Χ	05/11/11	05/16/11	05/16/11
121_	B5_17.0	058	S	05/10/11	X	05/11/11	05/16/11	05/16/11

S = Non-Aqueous Matrix A = Aqueous Matrix

Total Samples = 34 Dresdner-Robin Mr. John Tregidgo 11 July, 2011

Soil samples were received one day after collection, while associated field blanks were received on the same day as collection due to the short (24-hour) holding time for aqueous hexavalent chromium samples. Samples were received on ice at recorded temperature of 4°C.

<u>SECTION C</u> Hexavalent Chromium

Holding times from sample collection to analysis (\leq 24 hours for aqueous matrix; \leq 30 days for non-aqueous matrix) were met for all samples.

All calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, duplicate precision, and matrix and post-spike recoveries. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr⁺⁶ results were randomly verified from the raw data with no disparities between reported and calculated results found.

Cr⁺⁶ was not detected in Field Blank FB-051011-1.

Samples (REP051011-1 and 121_B11_17.0), (REP051011-2 and 121_B10_1.0) and (REP051011-3 and 121_B5_9.5) were identified as collocated field duplicate pairs for this sample group. Results for Cr⁺⁶ in all samples within all field duplicate pairs were reported as non-detect.

SECTION D pH / Eh (ORP)

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution; Zobell's solution) were within acceptable ranges, as were sample duplicate measurements.

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_4$ - / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found.

<u>SECTION E</u> Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

HEXCR - 1 Page 1 of 10

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code:n/a		
Location:	Site Manager: n/a		
Laboratory Name : IAL	Lead Division / Bureau: n/a		
Reviewer : Chris Taylor	Methodology: 3060	7196A	
Date of Review: <u>07/11/11</u>	SDG No.: <u>E11-04574</u>		
Analysis for Hexavalent Chromium by Method :	See Above		
Yes No A. Permanently Bound ? X	F. Non-Conformance Summary?	Yes X	No
B. Paginated?	G. Methodology Review?	X	
C. Title Page ?	H. Uninitialed Strikeover?		Х
D. Table of Contents ? X	I. Legible Xerox?	X	
E. Chain of Custody?	J. Consistent Dates ?	X	
Describe any deviations from requirements :			

Holding Times for Hexavalent Chromium

Morris Canal	Laboratory Name : IAL			
Chris Taylor	Date of Review: 7/11/2011			

X	(X)		Date of	Cr +6	Holding	
Matrix Collection Date Exceeded Decision					•	OA
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40 S 05/10/11 05/16/11 0 ACCEPT 42 S 05/10/11 05/16/11 0 ACCEPT 44 S 05/10/11 05/16/11 0 ACCEPT 46 S 05/10/11 05/16/11 0 ACCEPT 48 S 05/10/11 05/16/11 0 ACCEPT 49 S 05/10/11 05/16/11 0 ACCEPT 52 S 05/10/11 05/16/11 0 ACCEPT 53 S 05/10/11 05/16/11 0 ACCEPT 54 S 05/10/11 05/16/11 0 ACCEPT 56 S 05/10/11 05/16/11 0 ACCEPT	37	S	05/10/11	05/16/11	0	ACCEPT
42 S 05/10/11 05/16/11 0 ACCEPT 44 S 05/10/11 05/16/11 0 ACCEPT 46 S 05/10/11 05/16/11 0 ACCEPT 48 S 05/10/11 05/16/11 0 ACCEPT 49 S 05/10/11 05/16/11 0 ACCEPT 52 S 05/10/11 05/16/11 0 ACCEPT 53 S 05/10/11 05/16/11 0 ACCEPT 54 S 05/10/11 05/16/11 0 ACCEPT 56 S 05/10/11 05/16/11 0 ACCEPT	39	S	05/10/11	05/16/11	0	ACCEPT
44 S 05/10/11 05/16/11 0 ACCEPT 46 S 05/10/11 05/16/11 0 ACCEPT 48 S 05/10/11 05/16/11 0 ACCEPT 49 S 05/10/11 05/16/11 0 ACCEPT 52 S 05/10/11 05/16/11 0 ACCEPT 53 S 05/10/11 05/16/11 0 ACCEPT 54 S 05/10/11 05/16/11 0 ACCEPT 56 S 05/10/11 05/16/11 0 ACCEPT	40	S	05/10/11	05/16/11	0	ACCEPT
46 S 05/10/11 05/16/11 0 ACCEPT 48 S 05/10/11 05/16/11 0 ACCEPT 49 S 05/10/11 05/16/11 0 ACCEPT 52 S 05/10/11 05/16/11 0 ACCEPT 53 S 05/10/11 05/16/11 0 ACCEPT 54 S 05/10/11 05/16/11 0 ACCEPT 56 S 05/10/11 05/16/11 0 ACCEPT	42	S	05/10/11	05/16/11	0	ACCEPT
46 S 05/10/11 05/16/11 0 ACCEPT 48 S 05/10/11 05/16/11 0 ACCEPT 49 S 05/10/11 05/16/11 0 ACCEPT 52 S 05/10/11 05/16/11 0 ACCEPT 53 S 05/10/11 05/16/11 0 ACCEPT 54 S 05/10/11 05/16/11 0 ACCEPT 56 S 05/10/11 05/16/11 0 ACCEPT	44	S	05/10/11	05/16/11	0	ACCEPT
49 S 05/10/11 05/16/11 0 ACCEPT 52 S 05/10/11 05/16/11 0 ACCEPT 53 S 05/10/11 05/16/11 0 ACCEPT 54 S 05/10/11 05/16/11 0 ACCEPT 56 S 05/10/11 05/16/11 0 ACCEPT	46		05/10/11		0	ACCEPT
49 S 05/10/11 05/16/11 0 ACCEPT 52 S 05/10/11 05/16/11 0 ACCEPT 53 S 05/10/11 05/16/11 0 ACCEPT 54 S 05/10/11 05/16/11 0 ACCEPT 56 S 05/10/11 05/16/11 0 ACCEPT	48				0	
52 S 05/10/11 05/16/11 0 ACCEPT 53 S 05/10/11 05/16/11 0 ACCEPT 54 S 05/10/11 05/16/11 0 ACCEPT 56 S 05/10/11 05/16/11 0 ACCEPT						
53 S 05/10/11 05/16/11 0 ACCEPT 54 S 05/10/11 05/16/11 0 ACCEPT 56 S 05/10/11 05/16/11 0 ACCEPT						
54 S 05/10/11 05/16/11 0 ACCEPT 56 S 05/10/11 05/16/11 0 ACCEPT						
56 S 05/10/11 05/16/11 0 ACCEPT						

ples that exceeded the holding time, and the QA action taken:

Cooler Temp:	4°C
Preservation:	
Handling Time:	

HEXCR - 3 Page 3 of 10

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r ² >0.995 ?) If No, explain and list action :	YES X
Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action:	X
Was the same CCS concentration used throughout the analysis ? If No, list action :	X
Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :	X
Show calculation for the % recovery of Hexavalent Chromium in the CCS standard	
Lab CCS value : 0.497 mg/L Lab value : 99 True CCS value : 0.500 mg/L Calculated value = (Lab / True x 100) 99.3	% recovery
Specific comments :	
Initial calibrations were performed on 05/10/11 (H 2 O), 05/13/11 and 05/16/11 (soil	(e)

Calibration Blanks for Hexavalent Chromium

ociate	d samples : All SDG samples		
		YES	NO
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	X	
	If No, list action :		
2.	Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes X	
	If No, list action :		
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL ?	Yes X	
	If No, list action :		
4.	Specific comments :		

HEXCR - 5a Page 5 of 10

Preparation / Reagent Blank Summary for Hexavalent Chromium

Associated sample matrix : Check one (X) Units Did the frequency of the preparat If No, explain and no	ion / reagent bla	Water X <u>mg/L</u> X ank analysis r		/ Reagent Blank ID : requirements ?	PrepBlank Yes X	<u>No</u>
CONCENTRATION U	Yes	< or = MDL	= No	COMMEN	NTS / ACTION	
Associated samples : <u>04574-0</u>	No	<u>s</u> : < or = MDL : > MDL	-			
HEXCR - 5b		ation / Reago	ent Blank Sum at Chromium	nmary		
Associated sample matrix : Check one (X) Units	Soil X mg/Kg	<u>Water</u> mg/L	Preparation	/ Reagent Blank ID :	PrepBlank	
Did the frequency of the preparat If No, explain and no	ion / reagent bla	nk analysis r	neet method r	equirements ?	Yes X	<u>No</u>
CONCENTRATION U	Yes	< or = MDL	= No	COMMEN	ITS / ACTION	
MDL Codes Yes: < or = MDL No: > MDL Soil samples for SDG 04574 were extracted in two discrete prep batches (AP011- 0047 and						
-0049).	'Method (prep)	blanks for all	batches were	e non-detect (ND) for C	r ⁺⁶ .	

HEXCR - 6 Page 6 of 10

Pre-digestion Spike Analysis for Non-Aqueous Hexavalent Chromium Samples

Matrix:	Non-Aqueous				
Units:	mg/Kg				
Associated	samples : All SDG soil samples				
				<u>YES</u>	<u>NO</u>
1.	Was the pre-digestion spike analysis p	performed at the correc	t frequency?	X	
	If No, note deviations and action :				
2.	Was the pre-digestion spike analysis p	performed on a field sai	mple ?	X	
	If No, qualify all associated samples.				
3.	Was the pre-digestion spike analysis p	performed at the proper	concentration?	X	
	If No, list action :				
4.	Did the pre-digestion spike recovery for	or Cr +6 meet the criteri	a of 75 - 125% ?	X	
5.	Show calculation for pre-digestion spi	ke recovery for Cr +6			
	a. Soluble Spike Sample ID: _ Lab spiked sample value : _ Lab un-spiked sample value : _ Spike added concentration : _	04574-31 36.2 0.0 43.7	b. Insoluble Spike Lab spiked sample value Lab un-spiked sample value Spike added concentra	/alue:	04574-58 942 0.0 1100
	Calculated value = 82.8 (Spiked - Unspiked) / Spike Added	% recovery d x 100)	Calculated value = (Spiked - Unspiked)		% recovery d x 100)
	Lab value : 83	% recovery	Lab value	:86	% recovery
	Verified ? yes		Verified ?	yes	
6.	•		cifies data qualification ac		
	<u>patch spike r</u>	ecovenes. Data usabilit	y is addressed in the data	a valiuation na	nauve.

HEXCR - 7 Page 7 of 10

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS analysis performed on sample(s):		04574-31 04574-58	Matrix	Non-Aqueous		
% Solids :	n/a	_		Units :	mg/Kg	
Associated	samples :	All SDG soil samples				
					YES NO	<u> </u>
1.	the proper	VS analysis performed at concentration? (for H2C) mg/Kg or 2x sample, w/e), 30 ug/L or 2x sample,		X	
	If No, note	deviations and action :				
2.	Was the P	VS analysis performed or	a field sample ?		X	
	If No, quali	fy all associated samples.				
3. a.	Did the PV	'S recovery for Cr +6 mee	t the criteria of 85 - 115	% ?	X	
	If No, list a	ction :				
3. b.	If the % rec	covery was less than 85%	did the laboratory re-sp	ike and re-analyze	n/a	
	If No, list a	ction :				
	Did the %	recovery for the reanalysis	s meet the criteria of 85	- 115% ?	n/a	
	If No, list a	ction :				
5.	Show calc	ulation for PVS % recover	y for Cr +6.			
	Lab spiked Lab un-spi	: 04574-31 I sample value : ked sample value : ed concentration :	38.3 0.0 43.7	Sample ID: 04574-5 Lab spiked sample va Lab un-spiked sample Spike added concentr	llue : 38.0 value : 0.0)
		ated value = 87.6 I - Unspiked) / Spike Add	_% recovery ed x100)	Calculated value = (Spiked - Unspiked	86.6 % reco	
		Lab value : 88	_ % recovery	Lab valu	e : <u>87</u> % reco	very
		Verified ? yes	_	Verified ?	yes	
6.	Specific co	omments :				

Duplicate Analysis for Hexavalent Chromium

uplica	te analysis performed on sample(s) :	04574-31 04574-58		Matrix Units :	
ociate	d samples : All SDG soil samples				
				YES	<u>NO</u>
1.	Was the duplicate analysis performe	ed at the correct free	uency ?	X	
	If No, note deviations and action :				
2.	Was the duplicate analysis performe	ed on a field sample	?	X	
	If No, qualify all associated samples				
3.	Did the duplicate results for Cr +6 m (20% RPD for all Aqueous samples (+ / - 2 ppm for Non-aqueous samp	& Non-aqueous > o	or = 8 ppm) are < 8.0 ppm)	X	
4.	Show calculation for % RPD for Cr+	6.			
	Sample ID: 04574-31 Lab sample value : ND Lab duplicate value : ND	- -	Sample ID: <u>0</u> Lab sample va Lab duplicate	alue : ND	
	Calculated value = no calc	_ % RPD	Calculated val	lue = <u>no calc</u>	: % RPD
	% RPD = Sample - Duplicate (Sample + Duplicate)/2	_ x 100		Sample - Duplicate Sample + Duplicate)	x 100
5.	Specific comments : $ND = Not D$	Detected			

Laboratory Control Sample (LCS)

Matrix:	Non-Aqueous		
Units:	mg/Kg		
ssociate	d samples : All soil samples.		
1.	Was the LCS performed at the correct frequency?	YES X	<u>NO</u>
	If No, note deviations and action :		
2.	Does the LCS meet the QC limit of 80 - 120% ?	Х	
	If No, list the %Recovery and action taken.		
3	Show calculation for LCS recovery for Cr+6. Lab LCS value: 37.6 Lab value:	% Recovery	
	% Recovery = Laboratory LCS result x 100 LCS true value		
5.	Specific comments : Soil samples were extracted in two separate batch prepared and analyzed for each extraction batch.	_	
	were within acceptable limits of 80 - 120%.		

Sample Result Verification for Hexavalent Chromium

Associated	d samples :	All SDG sam	ples					
1.		aples reported			ge?		YES X	<u>NO</u>
2.		data free of a	-				X	
3.		a package free	-		transcription errors ?		X	
4.	within the me (Method 306 (Method 719	ethod requirem 60 : non-aqued 96A : all analyt	ents ? ous samples ical solution	must be adjust must be adjust	or all samples, and usted to pH 7.0 - 8.0) justed to pH 1.6 - 2.2)		Х	
5.	Were hotplat (At least 60	e temperature minutes, and l	s provided, petween 90	and within me to 95 degrees	ethod requirements ? s C)		X	
6.		culation for %	Solids for o	ne sample.	Sample ID:	04574-31	_	
	Sample dry v Sample wet v Calculated %	weight	4.37 4.77 91.6	- - -	Lab value : % Solids =			x 100
7.	-	chromium in a	0.8287	_ mg/L	a dry-weight basis by rec Sample ID: Lab value :		ne result for Soluble Spike mg/Kg	
		% Solids =	91.6	_ %	Calculated value =		mg/Kg	
Sample Co	onc., mg/Kg =	0.82866347 0.0025 wetwgt, Kg	0.100 0.916 %sol/100	dilution 1.0	= 36.186 <i>mg/Kg</i>	Res	ult verified ?	Yes

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: JCRA – Morris Canal, Laboratory Case NO. E11- 04630

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: JCRA – Morris Canal

<u>Fractions</u>

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

pH/Eh; ORP

Case No.: E11-04630 Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr^{+6}) samples were analyzed using SW-846 methods 3060A and 7196A. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_4$ - / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Page 1 of 4 EQA, Inc. @BCL@180B3A69.doc

Sample		Lab ID		Date	Analysis	Cr ⁺⁶	Cr ⁺⁶	Cr ⁺⁶
Prefix	Sample ID	E11-04630-	Matrix	Collected	Hex Cr	Date Rec'd	Prep Date	RunDate
	FB-051111-1	001	Α	05/11/11	Х	05/11/11	n/a	05/11/11
121_	B7_1.0	002	S	05/11/11	Х	05/12/11	05/17/11	05/17/11
121_	B7_5.5	004	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
121_	B7_9.5	006	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
121_	B7_13.0	800	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
121_	B6_1.0	010	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
121_	REP051111-1	011	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
121_	B6_5.5	013	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
121_	B6_9.5	015	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
121_	B6_13.5	017	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
121_	B6_17.5	019	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
P6_	B1_1.0	020	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
P6_	B1_5.5	022	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
P6_	REP051111-2	023	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
P6_	B1_9.5	025	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
P6_	B1_13.0	027	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
P6_	B1_17.5	029	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
P3_	B1_3.5	032	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
P3_	B1_5.5	033	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
P3_	B1_9.5	035	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
P3_	B1_13.5	037	S	05/11/11	Χ	05/12/11	05/17/11	05/17/11
P3_	B1_17.5	039	S	05/11/11	Χ	05/12/11	05/17/11	05/18/11
P8_	<i>B5</i> _1.0	041	S	05/11/11	Χ	05/12/11	05/17/11	05/18/11
P8_	REP051111-3	042	S	05/11/11	Χ	05/12/11	05/17/11	05/18/11
P8_	B5_5.5	044		05/11/11	Χ	05/12/11	05/17/11	05/18/11
P8_	B5_9.5	046		05/11/11	Χ	05/12/11	05/17/11	05/18/11
P8_	B5_13.5	048		05/11/11	Χ	05/12/11	05/17/11	05/18/11
P8_	B5_17.5	050		05/11/11	Χ	05/12/11	05/17/11	05/18/11
207_	B17_1.0	052		05/11/11	Χ	05/12/11	05/17/11	05/18/11
207_	REP051111-4	053		05/11/11	Χ	05/12/11	05/17/11	05/18/11
207_	B17_5.5	055		05/11/11	Χ	05/12/11	05/17/11	05/18/11
207_	B17_9.5	057		05/11/11	Χ	05/12/11	05/17/11	05/18/11
207_	B17_13.5	059		05/11/11	Χ	05/12/11	05/17/11	05/18/11
207_	B17_17.5	061		05/11/11	Χ	05/12/11	05/17/11	05/18/11
207_	B16_1.5	063		05/11/11	Χ	05/12/11	05/17/11	05/18/11
207_	B16_5.5	065		05/11/11	Χ	05/12/11	05/17/11	05/18/11
207_	B16_9.5	067		05/11/11	Χ	05/12/11	05/17/11	05/18/11
207_	B16_13.5	069		05/11/11	Χ	05/12/11	05/17/11	05/18/11
207_	B16_17.5	071		05/11/11	X	05/12/11	05/17/11	05/18/11

Dresdner-Robin Mr. John Tregidgo 11 July, 2011

S = Non-Aqueous Matrix

Total Samples = 39

A = Aqueous Matrix

Soil samples were received one day after collection, while associated field blanks were received on the same day as collection due to the short (24-hour) holding time for aqueous hexavalent chromium samples. Samples were received on ice at recorded temperature of 4° C.

SECTION C Hexavalent Chromium

Holding times from sample collection to analysis (\leq 24 hours for aqueous matrix; \leq 30 days for non-aqueous matrix) were met for all samples.

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks were free of contamination. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr⁺⁶ results were randomly verified from the raw data with no disparities between reported and calculated results found.

Cr⁺⁶ was not detected in Field Blank FB-051111-1.

Matrix spike recoveries for soluble Cr⁺⁶ in batch QC samples E11-04630-37 (P3_B1_13.5) and E11-04630-71 (207_B16_17.5) were below the allowable limit of 75% in both initial and re-analyses, as tabulated below. All associated batch samples were re-digested and re-analyzed with the batch spike samples, per NJDEP and method protocols.

Sample ID	Sol.Recov.	Insol.Recov.
04630-37	53%	92%
re-analysis	34%	87%
04630-71	10%	86%
re-analysis	22%	82%

• QA Action: Qualify Cr⁺⁶ results in batch samples associated with E11-04630-37 and -71 (all soil samples) as rejected, 'R', per NJDEP SOP No. 5.A.10, Rev.3, Sect. VI.(D).7.D.8)e).

• Data Usability: Eh / pH results were evaluated to determine ReDox characteristics of batch samples as an indicator of ability to support Cr^{+6} . All SDG Cr^{+6} samples were characterized as "Reducing" based upon the Method 3060A, Table 2 phase diagram, with the exception of the following samples: 04630-2, -10, -11, -13, -39 and -42, which were characterized as "Oxidizing". The samples designated as "reducing" are not likely to support the presence of Cr^{+6} .

Dresdner-Robin Mr. John Tregidgo 11 July, 2011

Samples (REP051111-1 and 121_B6_1.0), (REP051111-2 and P6_B1_5.5), (REP051111-3 and P8_B5_1.0) and (REP051111-4 and 207_B17_1.0) were identified as collocated field duplicate pairs for this sample group. For the first noted set, results were 0.92 J and 0.83 J mg/Kg, which is within the acceptable \pm 2x RL limit. Results for Cr⁺⁶ in all samples within the remaining field duplicate pairs were reported as non-detect.

SECTION D pH / Eh (ORP)

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution; Zobell's solution) were within acceptable ranges, as were sample duplicate measurements.

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the HCrO₄- / Cr(OH)₃ phase diagram; no disparities relative to reported values and characteristics were found.

SECTION E Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

Page 4 of 4 EQA, Inc. @BCL@180B3A69.doc

HEXCR - 1 Page 1 of 10

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code:n/a	
Location:	Site Manager: n/a	
Laboratory Name : IAL	Lead Division / Bureau: n/a	
Reviewer : Chris Taylor	Methodology: 3060	7196A
Date of Review: <u>07/11/11</u>	SDG No.: <u>E11-0463</u> 0)
Analysis for Hexavalent Chromium by Method :	See Above	
Yes No A. Permanently Bound ? X	F. Non-Conformance Summary?	Yes No
B. Paginated?	G. Methodology Review?	X
C. Title Page ?	H. Uninitialed Strikeover?	X
D. Table of Contents ? X	I. Legible Xerox?	X
E. Chain of Custody?	J. Consistent Dates ?	X
Describe any deviations from requirements :		

HEXCR - 2 Page 2 of 10

Holding Times for Hexavalent Chromium

Site Name : Morris Canal Laboratory Name : IAL

Reviewer : Chris Taylor Date of Review: 7/11/2011

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	`x´		Sample	Analysis	Time	QA
04630-		Matrix	Collection	Date	Exceeded	Decision
04630-	001	А	05/11/11	05/11/11	0	ACCEPT
04630-	2	S	05/11/11	05/17/11	0	ACCEPT
04630-	4	S	05/11/11	05/17/11	0	ACCEPT
04630-	6	S	05/11/11	05/17/11	0	ACCEPT
04630-	8	S	05/11/11	05/17/11	0	ACCEPT
04630-	10	S	05/11/11	05/17/11	0	ACCEPT
04630-	11	S	05/11/11	05/17/11	0	ACCEPT
04630-	13	S	05/11/11	05/17/11	0	ACCEPT
04630-	15	S	05/11/11	05/17/11	0	ACCEPT
04630-	17	S	05/11/11	05/17/11	0	ACCEPT
04630-	19	S	05/11/11	05/17/11	0	ACCEPT
04630-	20	S	05/11/11	05/17/11	0	ACCEPT
04630-	22	S	05/11/11	05/17/11	0	ACCEPT
04630-	23	S	05/11/11	05/17/11	0	ACCEPT
04630-	25	S	05/11/11	05/17/11	0	ACCEPT
04630-	27	S	05/11/11	05/17/11	0	ACCEPT
04630-	29	S	05/11/11	05/17/11	0	ACCEPT
04630-	32	S	05/11/11	05/17/11	0	ACCEPT
04630-	33	S	05/11/11	05/17/11	0	ACCEPT
04630-	35	S	05/11/11	05/17/11	0	ACCEPT
04630-	37	S	05/11/11	05/17/11	0	ACCEPT
04630-	39	S	05/11/11	05/18/11	0	ACCEPT
04630-	41	S	05/11/11	05/18/11	0	ACCEPT
04630-	42	S	05/11/11	05/18/11	0	ACCEPT
04630-	44	0	05/11/11	05/18/11	0	ACCEPT
04630-	46	0	05/11/11	05/18/11	0	ACCEPT
04630-	48	0	05/11/11	05/18/11	0	ACCEPT
04630-	50	0	05/11/11	05/18/11	0	ACCEPT
04630-	52	0	05/11/11	05/18/11	0	ACCEPT
04630-	53	0	05/11/11	05/18/11	0	ACCEPT
04630-	55	0	05/11/11	05/18/11	0	ACCEPT
04630-	57	0	05/11/11	05/18/11	0	ACCEPT
04630-	59	0	05/11/11	05/18/11	0	ACCEPT
04630-	61	0	05/11/11	05/18/11	0	ACCEPT
04630-	63	0	05/11/11	05/18/11	0	ACCEPT
04630-	65	0	05/11/11	05/18/11	0	ACCEPT
04630-	67	0	05/11/11	05/18/11	0	ACCEPT
04630-	69	0	05/11/11	05/18/11	0	ACCEPT
04630-	71	0	05/11/11	05/18/11	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp:	4°C
Preservation:	
Handling Time:	

HEXCR - 3 Page 3 of 10

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r^2 >0.995 ?) If No, explain and list action :	YES X
Was the CCS analyzed at the proper frequency ? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action :	X
Was the same CCS concentration used throughout the analysis ? If No, list action :	X
Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :	X
Show calculation for the % recovery of Hexavalent Chromium in the CCS standard	
Lab CCS value : 0.497 mg/L Lab value : 99 True CCS value : 0.500 mg/L Calculated value = (Lab / True x 100) 99.48	% recovery
Specific comments :	
Initial calibrations were performed on 05/11/11 (H 2 O), 05/17/11 and 05/18/11 (soil	(0)

HEXCR - 4 Page 4 of 10

Calibration Blanks for Hexavalent Chromium

ociate	d samples : All SDG samples		
		<u>YES</u>	<u>NO</u>
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	X	
	If No, list action :		
2.	Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes X	
	If No, list action :		
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL ?	Yes X	
	If No, list action :		
4.	Specific comments :		

HEXCR - 5a Page 5 of 10

Preparation / Reagent Blank Summary for Hexavalent Chromium

Associated sample matrix : Check one (X) Units : Did the frequency of the preparation /	mg/Kg mg/L X / reagent blank analysis meet method			/ Reagent Blank ID : equirements ?	<u>PrepBlank</u> <u>Yes</u> X	<u>No</u>
		< or = MDL			_	
CONCENTRATION	Yes		No	COMMEN	TS / ACTION	
U						
Associated samples : <u>04630-001</u>		S < or = MDL > MDL				
HEXCR - 5b						
		ation / Reage or Hexavalen	ent Blank Sum It Chromium	nmary		
	Soil	Water				
Associated sample matrix : Check one (X)	Х		Preparation	/ Reagent Blank ID :	PrepBlank	
Units:	mg/Kg X	mg/L				
Did the frequency of the preparation /	reagent blar	nk analysis n	neet method r	equirements ?	<u>Yes</u> X	<u>No</u>
If No, explain and note a	ction :				<u>_</u>	
					_	
CONCENTRATION	Yes	< or = MDL	- No	COMMEN	TS / ACTION	
U						
		s < or = MDL > MDL				
Associated samples : Soil samples	s for SDG 04	4630 were e	xtracted in tw	o discrete prep batches	(AP011- 0054 a	and
-0055). 'Met	hod (prep) b	olanks for all	batches were	e non-detect (ND) for Cr	.+6	

Pre-digestion Spike Analysis for Non-Aqueous Hexavalent Chromium Samples

Matrix:	Non-Aqueous							
Units:	mg/Kg							
Associated	samples : All SDG so	il samples						
							YES	NO
1.	Was the pre-digestion s	spike analysis	performed	at the correc	t frequency?		X	
	If No, note deviations a	nd action :						
2.	Was the pre-digestion s	spike analysis	s performed	on a field sar	mple ?	1	Х	ĺ
	If No, qualify all associa	ited samples.						
3.	Was the pre-digestion s	spike analysis	performed	at the proper	concentratio	n ?	X	
	If No, list action:							
4.	Did the pre-digestion sp	oike recovery	for Cr +6 me	eet the criteri	a of 75 - 125	% ?		Х
	If No, list action:	Sample ID 04630-37	Sol.Recov.	Insol.Recov	Ox / Red ?			
		re-analysis	34%	87%				
		04630-71 re-analysis	10% 22%	86% 82%	R			
	004630-37 : sample sh				Paiact 'R' a	secciated ba	atch samples	: (02-37)
	Refer to validation narra							
	04630-71 : sample sho	we roducing t	andonaiae h	acad on OPI	D Poinct 'P'	accociated b	atch cample	c (20.71)
	Refer to validation narra							
5.	Show calculation for pre	e-digestion sp	ike recovery	for Cr +6				
	a. Soluble Spike	Sample ID:	04630-37	RE	b. Insoluble	Spike	Sample ID:	04630-71
	Lab spiked sample val	ue:	17.3	- -	Lab spiked s	sample value	e:	1010
	Lab un-spiked sample		0.0	_	Lab un-spike			0.0
	Spike added concentra	tion :	51.7	_	Spike added	l concentrati	on:	1180
	Calculated value =	33.5	% recovery		Calculate	ed value =	85.6	% recovery
	(Spiked - Unspiked	/ Spike Add	ed x 100)		(Spiked -	Unspiked)	/ Spike Adde	ed x 100)
	Lab value	: 34	% recovery			Lab value :	86	% recovery
	Verified ?	yes	-			Verified ?	yes	
6.	Specific comments :				ifies data qua			
		batch spike	recoveries.	Data usability	/ is addresse	d in the data	validation na	arrative.

HEXCR - 7

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

Page 7 of 10

PVS	analysis pe	rformed on sample(s):	04630-37 04630-71		Matrix:	Non-Aqueou	IS
% Solids :	n/a	_	04030-71		Units:	mg/Kg	
Associated	samples :	All SDG soil samples	S				
						<u>YES</u>	<u>NO</u>
1.	the proper	PVS analysis performed concentration? (for Home)	12O, 30 ug/L or 2x sa			Х	
	If No, note	deviations and action :	:				
2.	Was the P	PVS analysis performed	on a field sample?			X	
	If No, qual	ify all associated sample	es.				
3. a.	Did the PV	/S recovery for Cr +6 m	neet the criteria of 85	- 115% ?		Х	
	If No, list a	action :					
3. b.	If the % retthe aliquot	covery was less than 85	5% did the laboratory	re-spike and re-analy	ze	n/a	
	If No, list a	action :					
	Did the %	recovery for the reanaly	ysis meet the criteria o	of 85 - 115% ?		n/a	
	If No, list a	action:					
5.	Show calc	culation for PVS % reco	overy for Cr +6.	-		_	
	Lab spiked Lab un-spi	b: 04630-37 d sample value : iked sample value : ed concentration :	48.0 0.0 51.7	Sample ID: Lab spiked s Lab un-spike Spike added	ample valued sample v	 ue : /alue :	44.6 0.0 49.1
		ated value = 92.8 d - Unspiked) / Spike A			ed value = Unspiked)	90.8 / Spike Added	% recovery 1 x 100)
		Lab value : 93	% recovery		Lab value	: 91	% recovery
		Verified ? yes			Verified ?	yes	
6.	Specific co	omments :					

Duplicate Analysis for Hexavalent Chromium

plicat	te analysis performed on sample(s) : 04630-37 04630-71		Matrix : Units :	Non-Aqueou mg/Kg
ciated	d samples : All SDG soil samples			
			YES	<u>NO</u>
1.	Was the duplicate analysis performed at the correct frequency	cy?	X	
	If No, note deviations and action :			
				_
2.	Was the duplicate analysis performed on a field sample?		X	
	If No, qualify all associated samples.			
3.	Did the duplicate results for Cr +6 meet the QC control limits (20% RPD for all Aqueous samples & Non-aqueous > or = 8 ($+$ / $-$ 2 ppm for Non-aqueous samples if either or both are <	3 ppm)	X	
	If No, list action :			
4.	Show calculation for % RPD for Cr+6.			
	Sample ID: 04630-37 Lab sample value : ND Lab duplicate value : ND	Sample ID: 04630 Lab sample value : Lab duplicate value	ND	_ _
	Calculated value = no calc % RPD	Calculated value =	no calc	_ % RPD
	% RPD = Sample - Duplicate x 100 (Sample + Duplicate)/2	% RPD = Samp (Samp	ele - Duplicate le + Duplicate)/2	_ x 100
5.	Specific comments : ND = Not Detected			_
				_
				_

Laboratory Control Sample (LCS)

Matrix:	Non-Aqueous		
Units:	mg/Kg		
ssociated	d samples : All soil samples.		
1.	Was the LCS performed at the correct frequency?	YES X	<u>NO</u>
	If No, note deviations and action :		
2.	Does the LCS meet the QC limit of 80 - 120% ?	X	
	If No, list the %Recovery and action taken.		
3	Show calculation for LCS recovery for Cr+6. Lab LCS value: 37.6 Lab value: Lab value: Calculated value =	% Recovery	
•	% Recovery = Laboratory LCS result x 100 LCS true value		
5.	Specific comments: Soil samples were extracted in two separate batch prepared and analyzed for each extraction batch.	_	
	were within acceptable limits of 80 - 120%.		

Sample Result Verification for Hexavalent Chromium

ssociate	d samples :	All SDG sam	ples					
1.		nples reported			e?		YES X	<u>NO</u>
2.		data free of a	-			[Х	
3.		a package free	-		ranscription errors ?	[Х	
4.	within the me (Method 306	ethod requirem 30 : non-aqued	ients ? ous samples	must be adju	r all samples, and sted to pH 7.0 - 8.0) usted to pH 1.6 - 2.2)		Х	
5.	Were hotplat (At least 60	ected samples e temperature minutes, and l	s provided, petween 90	and within me to 95 degrees	thod requirements ?	[Х	
6.		culation for %		ne sample.	Sample ID:		W 0 F I	
	Sample dry v Sample wet v Calculated %	weight	3.84 4.96 77.4	- - -	Lab value : % Solids =	Sample dr Sample we		x 100
7.		Chromium in a		reported on a mg/L	dry-weight basis by red Sample ID: Lab value :		e result for Soluble Spike mg/Kg	
		% Solids =	77.4	_ %	Calculated value =	27.3	mg/Kg	
nple C	onc., mg/Kg =	curve mg/L 0.52879412 0.0025 wetwgt, Kg	dig.vol, L 0.100 0.774 %sol/100	dilution 1.0	= 27.328 mg/Kg	Resu	It verified ?	Yes

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: JCRA – Morris Canal, Laboratory Case NO. E11- 04676

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: JCRA – Morris Canal

<u>Fractions</u>

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

pH/Eh; ORP

Case No.: E11-04676 Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr^{+6}) samples were analyzed using SW-846 methods 3060A and 7196A. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_{4^-}$ / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Page 1 of 4 EQA, Inc. @BCL@180B495E.doc

Dresdner-Robin Mr. John Tregidgo 11 July, 2011

Sample		Lab ID		Date	Analysis	Cr ⁺⁶	Cr ⁺⁶	Cr ⁺⁶
Prefix	Sample ID	E11-04676-	Matrix	Collected	Hex Cr	Date Rec'd	Prep Date	RunDate
	FB-051211-1	001	Α	05/12/11	Х	05/12/11	n/a	05/13/11
207_	B18_1.0	2	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	REP051211-1	3	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B18_5.5	5	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B18_9.5	7	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B18_13.0	9	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B18_16.5	11	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B19_1.0	12	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B1_5.5	14	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B19_9.5	16	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B19_13.0	18	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B19_16.5	20	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B5_1.0	21	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	REP051211-2	22	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B5_5.5	24	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B5_9.5	26	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B5_13.0	28	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B5_16.5	30	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B4_1.0	31	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B4_5.5	33	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B4_9.5	35	S	05/12/11	Χ	05/13/11	05/20/11	05/21/11
207_	B4_13.0	37	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11
207_	B4_16.5	39	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11
207_	B2_1.0	40	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11
207_	B2_5.5	42	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11
207_	B2_9.5	44	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11
207_	B2_13.0	46	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11
207_	B2_16.5	48	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11
207_	B3_1.0	49	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11
207_	B3_5.5	51	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11
207_	B3_9.5	53	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11
207_	B3_13.0	55	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11
207_	REP051211-3	56	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11
207_	B3_16.5	58	S	05/12/11	Χ	05/13/11	05/20/11	05/22/11

S = Non-Aqueous Matrix

A = Aqueous Matrix

Total Samples = 34

Dresdner-Robin Mr. John Tregidgo 11 July, 2011

All samples were received one day after collection. Samples were received on ice at recorded temperature of 4°C.

SECTION C Hexavalent Chromium

Holding times from sample collection to analysis (\leq 24 hours for aqueous matrix; \leq 30 days for non-aqueous matrix) were met for all samples.

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks were free of contamination. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found.

Cr⁺⁶ was not detected in Field Blank FB-051211-1.

Matrix spike recoveries for soluble Cr⁺⁶ in batch QC samples E11-04676-35 (207_B4_9.5) and E11-04676-37 (207_B4_13.0) were below the allowable limit of 75% in both initial and re-analyses, as tabulated below. All associated batch samples were re-digested and re-analyzed with the batch spike samples, per NJDEP and method protocols.

Sample ID	Sol.Recov.	Insol.Recov.
04676-35	41%	83%
re-analysis	39%	84%
04676-37	22%	89%
re-analysis	35%	88%

• QA Action: Qualify Cr⁺⁶ results in batch samples associated with E11-04676-35 and -37 (all soil samples) as rejected, 'R', per NJDEP SOP No. 5.A.10, Rev.3, Sect. VI.(D).7.D.8)e).

• Data Usability: Eh / pH results were evaluated to determine ReDox characteristics of batch samples as an indicator of ability to support Cr⁺⁶. All SDG Cr⁺⁶ samples were characterized as "Reducing" based upon the Method 3060A, Table 2 phase diagram, with the exception of the following samples: 04676-21, -22, -24 and -49, which were characterized as "Oxidizing". The samples designated as "reducing" are not likely to support the presence of

 Cr^{+6} .

Samples (REP051211-1 and 207_B18_1.0), (REP051211-2 and 207_B5_1.0) and (REP051211-3 and 207_B3_13.0) were identified as collocated field duplicate pairs for this sample group. Results for Cr⁺⁶ in all samples within all field duplicate pairs were reported as non-detect.

Page 3 of 4 EQA, Inc. @BCL@180B495E.doc

Dresdner-Robin Mr. John Tregidgo 11 July, 2011

SECTION D pH / Eh (ORP)

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution; Zobell's solution) were within acceptable ranges, as were sample duplicate measurements.

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the HCrO₄- / Cr(OH)₃ phase diagram; no disparities relative to reported values and characteristics were found.

<u>SECTION E</u> Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

Page 4 of 4 EQA, Inc. @BCL@180B495E.doc

HEXCR - 1 Page 1 of 10

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code: n/a	
Location:	Site Manager: n/a	
Laboratory Name : IAL	Lead Division / Bureau: n/a	
Reviewer : Chris Taylor	Methodology: 3060 7196A	
Date of Review: 07/11/11	SDG No.: <u>E11-04676</u>	
Analysis for Hexavalent Chromium by Method :	See Above	
Yes No A. Permanently Bound ? X	F. Non-Conformance Summary ? Yes No	
B. Paginated?	G. Methodology Review?	
C. Title Page ?	H. Uninitialed Strikeover?	
D. Table of Contents ? X	I. Legible Xerox ?	
E. Chain of Custody?	J. Consistent Dates ?	
Describe any deviations from requirements :		

HEXCR - 2 Page 2 of 10

Holding Times for Hexavalent Chromium

Site Name : Morris Canal Laboratory Name : IAL

Reviewer : Chris Taylor Date of Review: 7/11/2011

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	Χ		Sample	Analysis	Time	QA
04676-		Matrix	Collection	Date	Exceeded	Decision
04676-	001	Α	05/12/11	05/13/11	0	ACCEPT
04676-	2	S	05/12/11	05/21/11	0	ACCEPT
04676-	3	S	05/12/11	05/21/11	0	ACCEPT
04676-	5	S	05/12/11	05/21/11	0	ACCEPT
04676-	7	S	05/12/11	05/21/11	0	ACCEPT
04676-	9	S	05/12/11	05/21/11	0	ACCEPT
04676-	11	S	05/12/11	05/21/11	0	ACCEPT
04676-	12	S	05/12/11	05/21/11	0	ACCEPT
04676-	14	S	05/12/11	05/21/11	0	ACCEPT
04676-	16	S	05/12/11	05/21/11	0	ACCEPT
04676-	18	S	05/12/11	05/21/11	0	ACCEPT
04676-	20	S	05/12/11	05/21/11	0	ACCEPT
04676-	21	S	05/12/11	05/21/11	0	ACCEPT
04676-	22	S	05/12/11	05/21/11	0	ACCEPT
04676-	24	S	05/12/11	05/21/11	0	ACCEPT
04676-	26	S	05/12/11	05/21/11	0	ACCEPT
04676-	28	S	05/12/11	05/21/11	0	ACCEPT
04676-	30	S	05/12/11	05/21/11	0	ACCEPT
04676-	31	S	05/12/11	05/21/11	0	ACCEPT
04676-	33	S	05/12/11	05/21/11	0	ACCEPT
04676-	35	S	05/12/11	05/21/11	0	ACCEPT
04676-	37	S	05/12/11	05/22/11	0	ACCEPT
04676-	39	S	05/12/11	05/22/11	0	ACCEPT
04676-	40	S	05/12/11	05/22/11	0	ACCEPT
04676-	42	0	05/12/11	05/22/11	0	ACCEPT
04676-	44	0	05/12/11	05/22/11	0	ACCEPT
04676-	46	0	05/12/11	05/22/11	0	ACCEPT
04676-	48	0	05/12/11	05/22/11	0	ACCEPT
04676-	49	0	05/12/11	05/22/11	0	ACCEPT
04676-	51	0	05/12/11	05/22/11	0	ACCEPT
04676-	53	0	05/12/11	05/22/11	0	ACCEPT
04676-	55	0	05/12/11	05/22/11	0	ACCEPT
04676-	56	0	05/12/11	05/22/11	0	ACCEPT
04676-	58	0	05/12/11	05/22/11	0	ACCEPT

LI	st	be	low	any	samp	oles	that	exceed	ed ti	ne I	holding	tıme,	and	the	QΑ	action	า ta	iken:
----	----	----	-----	-----	------	------	------	--------	-------	------	---------	-------	-----	-----	----	--------	------	-------

Cooler Temp:	4°C
Preservation:	
Handling Time:	

HEXCR - 3 Page 3 of 10

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r ² >0.995 ?) If No, explain and list action :		YES X
Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action:		X
Was the same CCS concentration used throughout the analysis ? If No, list action :		X
Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :		X
Show calculation for the % recovery of Hexavalent Chromium in the CCS standa	ard.	
Lab CCS value : 0.498 mg/L Lab value : 10 True CCS value : 0.500 mg/L Calculated value = (Lab / True x 100) 99.6	00	_ % recovery
Specific comments :		
Initial calibrations were performed on 05/13/11 (H $_2$ O), 05/21/11 and 05/22/11 (s	oils)	

Calibration Blanks for Hexavalent Chromium

sociate	d samples : All SDG samples		
		<u>YES</u>	<u>NO</u>
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve?	X	
	If No, list action :		
2.	Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes X	
	If No, list action :		
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL ?	Yes X	
	If No, list action :		
4.	Specific comments :		
•			

HEXCR - 5a Page 5 of 10

Preparation / Reagent Blank Summary for Hexavalent Chromium

Associated sample matrix: Check one (X) Units: Did the frequency of the preparation	on / reagent bla	Water X mg/L X nk analysis r		/ Reagent Blank ID : requirements ?	<u>PrepBlank</u> <u>Yes</u> X	<u>No</u>
CONCENTRATION	Yes	< or = MDl	= No	COMMEN	 ITS / ACTION	
U						
Associated samples : <u>04676-00</u>	No	<u>S</u> : < or = MDL : > MDL	-			
			ent Blank Sum nt Chromium	nmary		
Associated sample matrix : Check one (X)	<u>Soil</u> X <u>mg/Kg</u>	<u>Water</u> mg/L	Preparation	/ Reagent Blank ID :	PrepBlank	
Units: Did the frequency of the preparation If No, explain and note	X X on / reagent bla		neet method r	requirements ?	Yes X	<u>No</u>
					_	
CONCENTRATION U	Yes	< or = MDL	= No	COMMEN	ITS / ACTION	
	No soles for SDG 0	: < or = MDL : > MDL 4630 were e	extracted in tw	o discrete prep batche:		and

Pre-digestion Spike Analysis for Non-Aqueous Hexavalent Chromium Samples

Matrix:	Non-Aqueous							
Units:	mg/Kg							
Associated	samples : All SDG so	il samples						
							<u>YES</u>	<u>NO</u>
1.	Was the pre-digestion s	spike analysis	s performed	at the correc	t frequency?		Х	
	If No, note deviations a	nd action :						
2.	Was the pre-digestion s	spike analysis	performed	on a field sar	mple ?		X	
	If No, qualify all associa	ited samples.						
3.	Was the pre-digestion s	spike analysis	s performed	at the proper	concentratio	n?	Х	
	If No, list action:							
4.	Did the pre-digestion sp	oike recovery	for Cr +6 me	eet the criteri	a of 75 - 125	% ?	ĺ	Х
							·	
	If No, list action :	Sample ID 04676-35	Sol.Recov. 41%	Insol.Recov 83%	Ox / Red ?			
		re-analysis	39%	84%				
		04676-37	22%	89%	R			
		re-analysis	35%	88%				
	004070.05		ta a da a sa da) Daire (ID)		-1-1	(00.05)
	004676-35 : sample sh Refer to validation narra							
	Trefer to validation harr	alive for data	usability ii ii o	illiation base	on baton s	ample Orti	Characteristic	
	04676-37 : sample sho	ws reducing t	endencies b	ased on ORF	P. Reject 'R'	associated b	oatch sample:	s (37-58).
	Refer to validation narra	ative for data	usability info	rmation base	ed on batch s	ample ORP	characteristic	CS.
5.	Show calculation for pre	e-digestion sp	ike recovery	for Cr +6				
	a. Soluble Spike	Sample ID:	04676-35		b. Insoluble	Spike	Sample ID:	04676-37
	Lab spiked sample val	•	20.5	-	Lab spiked s			957
	Lab un-spiked sample		0.0	=	Lab un-spike			0.0
	Spike added concentra		50.3	_	Spike added			1070
				_				
	Calculated value = (Spiked - Unspiked	40.8 / Spike Add	_% recovery ed x 100)			ed value = Unspiked)	89.4 / Spike Adde	% recovery d x 100)
	Lab value	:41	% recovery			Lab value :	89	% recovery
	Verified ?	yes	-			Verified ?	yes	
6.	Specific comments :	NJDEP SO	P No. 5.A.10	, Rev.3 spec	rifies data qua	alification ac	tions based u	ipon
	•						a validation na	

HEXCR - 7 Page 7 of 10

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS	analysis pe	rformed on sample(s) :	: <u>04676-35</u> 04676-37		Matrix:	Non-Aqueou	IS
% Solids :	n/a	<u></u>	04070-37		Units:	mg/Kg	
Associated	samples :	All SDG soil samples	s				
						YES	<u>NO</u>
1.	the proper	PVS analysis performed concentration? (for FO) mg/Kg or 2x sample,	H2O, 30 ug/L or 2x s			X	
	If No, note	deviations and action	:				
2.	Was the P	PVS analysis performed	d on a field sample ?	,	•	X	
	If No, qual	ify all associated samp	les.				
3. a.	Did the PV	/S recovery for Cr +6 n	meet the criteria of 8	5 - 115% ?		Х	
	If No, list a	action:			-		
3. b.	If the % retthe aliquot	-	35% did the laborato	ry re-spike and re-anal	yze	n/a	
	If No, list a	action :					
	Did the %	recovery for the reanal	lysis meet the criteria	a of 85 - 115% ?	-	n/a	
	If No, list a	action :			-		
5.	Show calc	culation for PVS % reco	overy for Cr +6.		-	_	
	Lab spiked Lab un-spi	b: _04676-35_ d sample value : iked sample value : ed concentration :	44.5 0.0 50.3	Sample ID: Lab spiked s Lab un-spik Spike added	sample valued sample v	_ ue : <i>r</i> alue :	41.7 0.0 44.6
		ated value = 88.5 d - Unspiked) / Spike A			ed value = · Unspiked)	93.5 / Spike Added	% recovery d x 100)
		Lab value : 88	% recovery		Lab value	: 93	% recovery
		Verified ? yes	3		Verified ?	yes	
6.	Specific co	omments :					

Duplicate Analysis for Hexavalent Chromium

uplica	te analysis performed on sample(s) :	04676-35 04676-37		Matrix : Units :	Non-Aqueou
ociate	d samples : All SDG soil samples				
				VEQ	NO
1.	Was the duplicate analysis performe	ed at the correct freq	uency ?	YES X	<u>NO</u>
	If No, note deviations and action :				
2.	Was the duplicate analysis performe	ed on a field sample	?	X	
	If No, qualify all associated samples				-
3.	Did the duplicate results for Cr +6 m (20% RPD for all Aqueous samples (+ / - 2 ppm for Non-aqueous samp	& Non-aqueous > c	r = 8 ppm) re < 8.0 ppm)	X	
4.	Show calculation for % RPD for Cr+	-6.			
	Sample ID: 04676-35 Lab sample value : ND Lab duplicate value : ND	- -	Sample ID: 04 Lab sample value Lab duplicate value	ue: ND	-
	Calculated value = no calc	_ % RPD	Calculated value	e =no calc	_ % RPD
	% RPD = Sample - Duplicate (Sample + Duplicate)/2	_ x 100		ample - Duplicate ample + Duplicate)/2	_ x 100
5.	Specific comments : $ND = Not D$	Detected			_
					_
					_

Laboratory Control Sample (LCS)

Matrix:	Non-Aqueous
Units:	mg/Kg
ssociate	d samples : All soil samples.
1.	YES NO Was the LCS performed at the correct frequency? X
	If No, note deviations and action :
2.	Does the LCS meet the QC limit of 80 - 120% ? If No, list the %Recovery and action taken.
3	Show calculation for LCS recovery for Cr+6. Lab LCS value: 37.8 Lab value: 94 % Recovery LCS true value: 40.0 Calculated value = 94.5 % Recovery
	% Recovery = <u>Laboratory LCS result</u> x 100 LCS true value
5.	Specific comments : Soil samples were extracted in two separate batches; a soil LCS was prepared and analyzed for each extraction batch. All LCS recoveries
	were within acceptable limits of 80 - 120%.

Sample Result Verification for Hexavalent Chromium

ssociate	d samples :	All SDG sam	ples					
1.		nples reported			e?		YES X	<u>NO</u>
2.		data free of a	-				Х	
3.		a package free	-		ranscription errors ?		X	
4.	within the me (Method 306	ethod requirem 30 : non-aqued	ients ? ous samples	must be adju	r all samples, and sted to pH 7.0 - 8.0) usted to pH 1.6 - 2.2)		Х	
5.	Were hotplat (At least 60	e temperature minutes, and l	s provided, petween 90	and within me to 95 degrees	thod requirements ?		X	
6.		culation for %		ne sample.	Sample ID:	04676-35		
	Sample dry v Sample wet v Calculated %	weight	3.99 5.02 79.5	- - -	Lab value : % Solids =	Sample de		x 100
7.		Chromium in a		reported on a	dry-weight basis by red Sample ID: Lab value :		e result for Soluble Spike mg/Kg	
		% Solids =	79.5	_ %	Calculated value =	20.5	mg/Kg	
nple C	onc., mg/Kg =	curve mg/L 0.40683427 0.0025 wetwgt, Kg	dig.vol, L 0.100 0.795 %sol/100	dilution 1.0	= 20.470 mg/Kg	Resu	ult verified ?	Yes

12 July, 2011

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: JCRA – Morris Canal, Laboratory Case NO. E11- 04702

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: JCRA – Morris Canal

<u>Fractions</u>

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

pH/Eh; ORP

Case No.: E11-04702 Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr^{+6}) samples were analyzed using SW-846 methods 3060A and 7196A. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_{4^-}$ / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Dresdner-Robin Mr. John Tregidgo 12 July, 2011

Sample		Lab ID		Date	Analysis	Cr ⁺⁶	Cr ⁺⁶	Cr ⁺⁶
Prefix	Sample ID	E11-04702-	Matrix	Collected	Hex Cr	Date Rec'd	Prep Date	RunDate
	FB-051311-1	001	Α	05/13/11	Х	05/13/11	n/a	05/13/11
MC_	012V_8.5	004	S	05/13/11	Χ	05/16/11	05/24/11	05/24/11
MC_	012V_10.5	005	S	05/13/11	Χ	05/16/11	05/24/11	05/24/11
MC_	008Z_5.5	010	S	05/13/11	Χ	05/16/11	05/24/11	05/24/11
MC_	008 Z _8.0	011	S	05/13/11	Χ	05/16/11	05/24/11	05/24/11
MC_	REP051311-1	014	S	05/13/11	Χ	05/16/11	05/24/11	05/24/11

S = Non-Aqueous Matrix

Total Samples = 6

A = Aqueous Matrix

Soil samples were received three days after collection, while associated field blanks were received on the same day as collection due to the short (24-hour) holding time for aqueous hexavalent chromium samples. Samples were received on ice at recorded temperature of 4°C.

<u>SECTION C</u> Hexavalent Chromium

Holding times from sample collection to analysis (\leq 24 hours for aqueous matrix; \leq 30 days for non-aqueous matrix) were met for all samples.

All calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, duplicate precision, and matrix and post-spike recoveries. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr⁺⁶ results were randomly verified from the raw data with no disparities between reported and calculated results found.

Cr⁺⁶ was not detected in Field Blank FB-051311-1.

Samples (REP051311-1 and MC_008Z_5.5) were identified as a collocated field duplicate pair for this sample group. Results for Cr^{+6} in both samples within this field duplicate pair were reported as non-detect.

SECTION D pH / Eh (ORP)

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution; Zobell's solution) were within acceptable ranges, as were sample duplicate measurements.

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_4$ - / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found.

<u>SECTION E</u> Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

Page 3 of 3 EQA, Inc. @BCL@180B828D.doc

HEXCR - 1 Page 1 of 10

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code:n/a	
Location:	Site Manager: n/a	
Laboratory Name : IAL	Lead Division / Bureau: n/a	
Reviewer : Chris Taylor	Methodology: 3060	7196A
Date of Review: <u>07/12/11</u>	SDG No.: <u>E11-04702</u>	
Analysis for Hexavalent Chromium by Method :	See Above	
Yes No A. Permanently Bound ? X	F. Non-Conformance Summary?	Yes No
B. Paginated?	G. Methodology Review?	X
C. Title Page ?	H. Uninitialed Strikeover?	X
D. Table of Contents ? X	I. Legible Xerox?	X
E. Chain of Custody?	J. Consistent Dates ?	Х
Describe any deviations from requirements :		

HEXCR - 2 Page 2 of 10

Holding Times for Hexavalent Chromium

Site Name : Morris Canal	Laboratory Name : IAL
Reviewer : Chris Taylor	Date of Review: 7/12/2011

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	Χ		Sample	Analysis	Time	QA
04702-		Matrix	Collection	Date	Exceeded	Decision
04702-	1	Α	05/13/11	05/13/11	0	ACCEPT
04702-	4	S	05/13/11	05/24/11	0	ACCEPT
04702-	5	S	05/13/11	05/24/11	0	ACCEPT
04702-	10	S	05/13/11	05/24/11	0	ACCEPT
04702-	11	S	05/13/11	05/24/11	0	ACCEPT
04702-	14	S	05/13/11	05/24/11	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp:	4°C
Preservation:	
Handling Time:	

HEXCR - 3 Page 3 of 10

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

YES YES
Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r^2 >0.995 ?) If No, explain and list action :
Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action :
Was the same CCS concentration used throughout the analysis? X If No, list action :
Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :
Show calculation for the % recovery of Hexavalent Chromium in the CCS standard.
Lab CCS value : 0.500 mg/L Lab value : 100 % recovery True CCS value : 0.500 mg/L
Calculated value =
Specific comments :

HEXCR - 4 Page 4 of 10

Calibration Blanks for Hexavalent Chromium

ed samples : All SDG samples		
	<u>YES</u>	<u>NO</u>
Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	Х	
If No, list action :		
Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes	
If No, list action :		
Was the value for Hexavalent Chromium in the calibration blank below the MDL ?	Yes	
If No, list action :		
Specific comments :		
	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve? If No, list action: Was a calibration blank analyzed after each calibration check standard (CCS)? If No, list action: Was the value for Hexavalent Chromium in the calibration blank below the MDL? If No, list action:	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve? If No, list action: Was a calibration blank analyzed after each calibration check standard (CCS)? X If No, list action: Yes Was the value for Hexavalent Chromium in the calibration blank below the MDL? X If No, list action:

HEXCR - 5a Page 5 of 10

Preparation / Reagent Blank Summary for Hexavalent Chromium

Associated sample matrix :	<u>Soil</u>	<u>Water</u> X	Preparation /	Reagent Blank ID :	PrepBlank	
Check one (X) Units: Did the frequency of the preparation /	mg/Kg reagent blar	<u>mg/L</u> X nk analysis r	neet method re	equirements ?	<u>Yes</u> X	<u>No</u>
If No, explain and note ad	ction :				_	
CONCENTRATION U	Yes	< or = MDL	- No	COMMEN	TS / ACTION	
Associated samples : 04702-001		< or = MDL > MDL				
HEXCR - 5b						
			ent Blank Sum nt Chromium	mary		
Associated sample matrix : Check one (X)	<u>Soil</u> X	<u>Water</u>	Preparation /	Reagent Blank ID :	PrepBlank	
Units : Did the frequency of the preparation /	mg/Kg X	mg/L	neet method re	aguiromente 2	Yes X	<u>No</u>
If No, explain and note ac		III allalysis i	neet method to	equirements :	_	
CONCENTRATION	Yes	< or = MDL	- No	COMMEN	TS / ACTION	
U	100		110	COMMEN	10771011	
Associated samples : All SDG soil	No :	< or = MDL > MDL				

HEXCR - 6 Page 6 of 10

Pre-digestion Spike Analysis for Non-Aqueous Hexavalent Chromium Samples

Matrix:	Non-Aqueous			
Units:	mg/Kg			
ssociated	samples : All SDG soil samples			
			<u>YES</u>	<u>NO</u>
1.	Was the pre-digestion spike analysis performed at the correct	frequency?	Х	
	If No, note deviations and action :			
2.	Was the pre-digestion spike analysis performed on a field same	 ıple ?	X	
	If No, qualify all associated samples.			
3.	Was the pre-digestion spike analysis performed at the proper	concentration?	X	
	If No, list action :			
4.	Did the pre-digestion spike recovery for Cr +6 meet the criteria	a of 75 - 125% ?	X	
5.	Show calculation for pre-digestion spike recovery for Cr +6			
		b. Insoluble Spike	Sample ID:	04784-04
	· · · · · · · · · · · · · · · · · · ·	Lab spiked sample valu	-	1040
		Lab un-spiked sample v		0.61
	Spike added concentration : 48.3	Spike added concentrat	tion :	1160
	Calculated value = 78.9 % recovery	Calculated value =	89.6	% recovery
	(Spiked - Unspiked) / Spike Added x 100)	(Spiked - Unspiked)		
	Lab value : 79 % recovery	Lab value :	90	% recovery
	Verified ?yes	Verified ?	yes	
6.	Specific comments: The batch matrix spike for this SDG v			
	site within the project area; therefore the sample matrix may b	e considered as represe	entative of this	s SDG.

HEXCR - 7 Page 7 of 10

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS	analysis pe	rformed on sar	nple(s):	04784-04	<u>. </u>		Matrix :	Non-Aqueo	us
% Solids :	n/a	_			_		Units:	mg/Kg	
Associated	samples :	All SDG soil	samples						
								YES	<u>NO</u>
1.	the proper	VS analysis per concentration mg/Kg or 2x s	? (for H20	O, 30 ug/L or				X	I
	If No, note	deviations and	daction:				-		
2.	Was the P	VS analysis pe	erformed o	n a field samp	ole ?			Х	
	If No, qual	ify all associate	d samples						
3. a.	Did the PV	/S recovery for	Cr +6 mee	et the criteria	of 85 - 115%	?		X	
	If No, list a	ction:					-		
3. b.	If the % re	covery was les	s than 85%	6 did the labo	ratory re-spike	e and re-anal	yze	n/a	
	If No, list a	ction :					-		
	Did the %	recovery for the	e reanalysi	s meet the cr	iteria of 85 - 1	15% ?	-	n/a	
	If No, list a	ction :					-		
5.	Show calc	ulation for PVS	6 % recove	ry for Cr +6.			-	_	
		: 04784-04				Sample ID:		_	
		d sample value iked sample va		42.8 0.61	_	Lab spiked s Lab un-spik			
		ed concentration		48.3	_ _	Spike added			
		ated value = d - Unspiked) /	87.3 Spike Add	% recovery ded x 100)	/		ed value = · Unspiked)	#DIV/0! / Spike Adde	% recovery d x 100)
		Lab value :	87	% recover	у		Lab value	:	% recovery
		Verified ?	yes	_			Verified ?		
6.	Specific co	omments :							
		·							=
		-							-

Duplicate Analysis for Hexavalent Chromium

Duplica	te analysis performed on sample(s) : 04784-04	_ Matrix :	Non-Aqueous	
ssociate	d samples : All SDG soil samples	_ Units :	mg/Kg	
		YES	<u>NO</u>	
1.	Was the duplicate analysis performed at the correct frequency?	Х		
	If No, note deviations and action :	-		
2.	Was the duplicate analysis performed on a field sample ?	X		
	If No, qualify all associated samples.			
3.	Did the duplicate results for Cr +6 meet the QC control limits ? (20% RPD for all Aqueous samples & Non-aqueous > or = 8 ppm) (+ / - 2 ppm for Non-aqueous samples if either or both are < 8.0 ppm)	X		
	If No, list action :	-		
4.	Show calculation for % RPD for Cr+6.	-		
	Sample ID: 04784-04 Lab sample value: 0.61 Lab duplicate value: 0.70 Sample ID: Lab sample Lab duplicate	value :	_ _	
	Calculated value = no calc % RPD Calculated	value =	_ % RPD	
	% RPD = Sample - Duplicate x 100 % RPD = (Sample + Duplicate)/2	Sample - Duplicate (Sample + Duplicate)/2	_ x 100	
5.	Specific comments : The absolute difference value between the dupli	cate samples is < 2 ppn	<u>1.</u>	
			-	

Matrix:

Non-Aqueous

Laboratory Control Sample (LCS)

Units:	mg/Kg			
ssociate	ed samples : All soil samples.			
1.	Was the LCS performed at the correct frequency? If No, note deviations and action:		YES X	<u>NO</u>
2.	Does the LCS meet the QC limit of 80 - 120% ? If No, list the %Recovery and action taken.		X	
3	Show calculation for LCS recovery for Cr+6. Lab LCS value : 37.7 LCS true value : 40.0	Lab value : _ Calculated value = _	% Recovery % Recovery	
	% Recovery = Laboratory LCS result x 100 LCS true value			
5.	Specific comments :			

Sample Result Verification for Hexavalent Chromium

ssociate	d samples :	All SDG sam	ples					
1.		nples reported			e?	[YES X	<u>NO</u>
2.		data free of a	-			[Х	
3.		a package free	-		ranscription errors ?	[Х	
4.	within the me (Method 306	ethod requirem 30 : non-aqued	ients ? ous samples	must be adju	r all samples, and sted to pH 7.0 - 8.0) usted to pH 1.6 - 2.2)	. [Х	
5.	Were hotplat (At least 60	ected samples e temperature minutes, and l	s provided, petween 90	and within me to 95 degrees	thod requirements ?	[Х	
6.		culation for %			Sample ID:	04784-04		
	Sample dry v Sample wet v Calculated %	weight	4.00 4.83 82.8	- - -	Lab value : % Solids =	Sample dr		x 100
7.		Chromium in a		reported on a	•		Soluble Spike	
		% Solids =	82.8	_ %	Lab value : Calculated value =	38.7	mg/Kg mg/Kg	
nple C	onc., mg/Kg =	curve mg/L 0.80121125 0.0025 wetwgt, Kg	dig.vol, L 0.100 0.828 %sol/100	dilution 1.0	= 38.706 mg/Kg	Resul	It verified ?	Yes

12 July, 2011

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: JCRA – Morris Canal, Laboratory Case NO. E11- 04784

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: JCRA – Morris Canal

<u>Fractions</u>

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

pH/Eh; ORP

Case No.: E11-04784 Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr^{+6}) samples were analyzed using SW-846 methods 3060A and 7196A. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_{4^-}$ / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Page 1 of 3 EQA, Inc. @BCL@180B12A4.doc

Dresdner-Robin Mr. John Tregidgo 12 July, 2011

Sample		Lab ID		Date	Analysis	Cr ⁺⁶	Cr ⁺⁶	Cr ⁺⁶
Prefix	Sample ID	E11-04784-	Matrix	Collected	Hex Cr	Date Rec'd	Prep Date	RunDate
	FB-051611-1	1	Α	05/16/11	Х	05/16/11	n/a	05/16/11
MC_	004XW_3.0	4	S	05/16/11	Χ	05/17/11	05/24/11	05/24/11
MC_	004XW_6.5	5	S	05/16/11	Χ	05/17/11	05/24/11	05/24/11
MC_	004XW_9.0	6	S	05/16/11	Χ	05/17/11	05/24/11	05/24/11
MC_	007V_9.5	8	S	05/16/11	Χ	05/17/11	05/24/11	05/24/11
MC_	007Z_1.5	9	S	05/16/11	Χ	05/17/11	05/24/11	05/24/11
MC_	007Z_5.5	10	S	05/16/11	Χ	05/17/11	05/24/11	05/24/11
MC_	007Z_8.0	11	S	05/16/11	Χ	05/17/11	05/24/11	05/24/11
MC_	008V_6.5	17	S	05/16/11	Χ	05/17/11	05/24/11	05/24/11
MC_	0.8V_8.0	18	S	05/16/11	Χ	05/17/11	05/24/11	05/24/11
MC_	REP051611-1	21	S	05/16/11	Χ	05/17/11	05/24/11	05/24/11

S = Non-Aqueous Matrix

Total Samples = 11

A = Aqueous Matrix

Soil samples were received one day after collection, while associated field blanks were received on the same day as collection due to the short (24-hour) holding time for aqueous hexavalent chromium samples. Samples were received on ice at recorded temperature of 4°C.

SECTION C Hexavalent Chromium

Holding times from sample collection to analysis (\leq 24 hours for aqueous matrix; \leq 30 days for non-aqueous matrix) were met for all samples.

All calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, duplicate precision, and matrix and post-spike recoveries. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr⁺⁶ results were randomly verified from the raw data with no disparities between reported and calculated results found.

Cr⁺⁶ was not detected in Field Blank FB-051611-1.

Samples (REP051611-1 and MC_008V_6.5) were identified as a collocated field duplicate pair for this sample group. Results for Cr^{+6} in both samples within this field duplicate pair were reported as non-detect.

SECTION D pH / Eh (ORP)

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution; Zobell's solution) were within acceptable ranges, as were sample duplicate measurements.

Dresdner-Robin Mr. John Tregidgo 12 July, 2011

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_{4-}$ / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found.

<u>SECTION E</u> <u>Overall Recommendations</u>

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

Page 3 of 3 EQA, Inc. @BCL@180B12A4.doc

HEXCR - 1 Page 1 of 10

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code:n/a	
Location:	Site Manager: n/a	
Laboratory Name : IAL	Lead Division / Bureau: n/a	
Reviewer : Chris Taylor	Methodology: 3060	7196A
Date of Review: <u>07/12/11</u>	SDG No.: <u>E11-0478</u>	4
Analysis for Hexavalent Chromium by Method :	See Above	
Yes No A. Permanently Bound ? X	F. Non-Conformance Summary?	Yes No
B. Paginated?	G. Methodology Review?	X
C. Title Page ?	H. Uninitialed Strikeover?	X
D. Table of Contents ? X	I. Legible Xerox?	X
E. Chain of Custody?	J. Consistent Dates ?	X
Describe any deviations from requirements :		

HEXCR - 2 Page 2 of 10

Holding Times for Hexavalent Chromium

Site Name : Morris Canal Laboratory Name : IAL

Reviewer : Chris Taylor Date of Review: 7/12/2011

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	Х		Sample	Analysis	Time	QA
04784-		Matrix	Collection	Date	Exceeded	Decision
04784-	1	Α	05/16/11	05/16/11	0	ACCEPT
04784-	4	S	05/16/11	05/24/11	0	ACCEPT
04784-	5	S	05/16/11	05/24/11	0	ACCEPT
04784-	6	S	05/16/11	05/24/11	0	ACCEPT
04784-	8	S	05/16/11	05/24/11	0	ACCEPT
04784-	9	S	05/16/11	05/24/11	0	ACCEPT
04784-	10	S	05/16/11	05/24/11	0	ACCEPT
04784-	11	S	05/16/11	05/24/11	0	ACCEPT
04784-	17	S	05/16/11	05/24/11	0	ACCEPT
04784-	18	S	05/16/11	05/24/11	0	ACCEPT
04784-	21	S	05/16/11	05/24/11	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp:	4°C	
Preservation:		
Handling Time:		

HEXCR - 3 Page 3 of 10

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

	YES N
Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r^2 >0.995 ?) If No, explain and list action :	<u>X</u>
Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action:	X
Was the same CCS concentration used throughout the analysis?	X
If No, list action :	
Does the CCS standard meet the QC requirements of 90 - 110% recovery ?	X
If No, list % recovery, and action :	
Show calculation for the % recovery of Hexavalent Chromium in the CCS standard.	
Lab CCS value :0.500mg/L	% recovery
True CCS value : 0.500 mg/L	
Calculated value = 100.0 (Lab / True x 100)	
Specific comments :	

Calibration Blanks for Hexavalent Chromium

Associate	d samples : All SDG samples		
		<u>YES</u>	<u>NO</u>
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	X	
	If No, list action :		
2.	Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes X	
	If No, list action :		
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL ?	Yes X	
	If No, list action :		
4.	Specific comments :		

HEXCR - 5a Page 5 of 10

Preparation / Reagent Blank Summary for Hexavalent Chromium

Associated sample matrix :	<u>Soil</u>	<u>Water</u> X	Preparation /	Reagent Blank ID :	PrepBlank	
Check one (X) Units: Did the frequency of the preparation /	mg/Kg reagent blar	<u>mg/L</u> X nk analysis r	neet method re	equirements ?	<u>Yes</u> X	<u>No</u>
If No, explain and note a	ction :				_	
CONCENTRATION	Vaa	< or = MDL		COMMEN	TC / ACTION	
CONCENTRATION U	Yes		No	COMMEN	TS / ACTION	
Associated samples : 04784-001		< or = MDL > MDL				
HEXCR - 5b						
	fo <u>Soil</u>		ent Blank Sum at Chromium			
Associated sample matrix : Check one (X)	X		Preparation /	Reagent Blank ID :	PrepBlank	
Units: Did the frequency of the preparation /	mg/Kg X reagent blar	<u>mg/L</u> nk analvsis r	neet method re	eauirements ?	Yes X	<u>No</u>
If No, explain and note a					_ _	
		< or = MDL				
CONCENTRATION	Yes		No	COMMEN	TS / ACTION	
U						
Associated samples : <u>All SDG soi</u> l	No :	< or = MDL > MDL				

HEXCR - 6 Page 6 of 10

Pre-digestion Spike Analysis for Non-Aqueous Hexavalent Chromium Samples

Units :r	mg/Kg			
ssociated sam				
	nples : All SDG soil samples			
			<u>YES</u>	<u>NO</u>
1. Wa	as the pre-digestion spike analysis performed at the correct	t frequency?	X	
If N	No, note deviations and action :			
2. Wa	as the pre-digestion spike analysis performed on a field sar	mple ?	X	
lf N	No, qualify all associated samples.			
3. Wa	as the pre-digestion spike analysis performed at the proper	concentration?	X	
If N	No, list action :			
4. Dic	d the pre-digestion spike recovery for Cr +6 meet the criteria	a of 75 - 125% ?	X	
5. Sh	ow calculation for pre-digestion spike recovery for Cr +6			
Lal Lal	Soluble Spike Sample ID: 04784-04 b spiked sample value : 38.7 b un-spiked sample value : 0.61 ike added concentration : 48.3	b. Insoluble Spike Lab spiked sample valu Lab un-spiked sample v Spike added concentrat	/alue :	04784-04 1040 0.61 1160
(Calculated value = 78.9 % recovery (Spiked - Unspiked) / Spike Added x 100)	Calculated value = (Spiked - Unspiked)		•
	Lab value : 79 % recovery	Lab value :	:90	% recovery
	Verified ? <u>yes</u>	Verified ?	yes	
6. Sp	ecific comments :			

HEXCR - 7 Page 7 of 10

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS	analysis pe	rformed on sar	nple(s):	04784-04	<u>. </u>		Matrix :	Non-Aqueo	us
% Solids :	n/a	_			_		Units:	mg/Kg	
Associated	samples :	All SDG soil	samples						
								YES	<u>NO</u>
1.	the proper	VS analysis per concentration mg/Kg or 2x s	? (for H20	O, 30 ug/L or				X	I
	If No, note	deviations and	daction:				-		
2.	Was the P	VS analysis pe	erformed o	n a field samp	ole ?			Х	
	If No, qual	ify all associate	d samples						
3. a.	Did the PV	/S recovery for	Cr +6 mee	et the criteria	of 85 - 115%	?		X	
	If No, list a	ction:					-		
3. b.	If the % re	covery was les	s than 85%	6 did the labo	ratory re-spike	e and re-anal	yze	n/a	
	If No, list a	ction :					-		
	Did the %	recovery for the	e reanalysi	s meet the cr	iteria of 85 - 1	15% ?	-	n/a	
	If No, list a	ction :					-		
5.	Show calc	ulation for PVS	6 % recove	ry for Cr +6.			-	_	
		: 04784-04				Sample ID:		_	
		d sample value iked sample va		42.8 0.61	_	Lab spiked s			
		ed concentration		48.3	_ _	Spike added			
		ated value = d - Unspiked) /	87.3 Spike Add	% recovery ded x 100)	/		ed value = · Unspiked)	#DIV/0! / Spike Adde	% recovery d x 100)
		Lab value :	87	% recover	у		Lab value	:	% recovery
		Verified ?	yes	_			Verified ?		
6.	Specific co	omments :							
		•							<u>-</u>
		-							-

Duplicate Analysis for Hexavalent Chromium

Duplica	ate analysis performed on sample(s) :		Matrix:	Non-Aqueou
ssociate	ed samples : All SDG soil samples		Units :	mg/Kg
			VEC	NO
1.	Was the duplicate analysis performed at the correct frequency	?	YES X	<u>NO</u>]
	If No, note deviations and action :			
2.	Was the duplicate analysis performed on a field sample ?		X	1
2.	If No, qualify all associated samples.			1
3.	Did the duplicate results for Cr +6 meet the QC control limits ? (20% RPD for all Aqueous samples & Non-aqueous > or = 8 pl ($+$ / $-$ 2 ppm for Non-aqueous samples if either or both are $<$ 8.0		X]
	If No, list action :			
4.	Show calculation for % RPD for Cr+6.			
	Lab sample value : 0.61 Lab	ample ID:ab sample value : ab duplicate value :		- -
	Calculated value = <u>no calc</u> % RPD C	alculated value =		% RPD
	% RPD = Sample - Duplicate x 100 (Sample + Duplicate)/2	% RPD = <u>Sample</u> · (Sample +	- Duplicate - Duplicate)/2	x 100
5.	Specific comments : <u>The absolute difference value between</u>	n the duplicate sampl	les is < 2 ppm	<u>-</u>
				-
				_

Matrix: Non-Aqueous

Laboratory Control Sample (LCS)

Units:	mg/Kg			
ssociated	d samples : All soil samples.			
1.	Was the LCS performed at the correct frequency? If No, note deviations and action:		YES X	<u>NO</u>
2.	Does the LCS meet the QC limit of 80 - 120% ? If No, list the %Recovery and action taken.		X	
3	Show calculation for LCS recovery for Cr+6. Lab LCS value : 37.7 LCS true value : 40.0	Lab value : _ Calculated value = _	% Recovery % Recovery	
(% Recovery = <u>Laboratory LCS result</u> x 100 LCS true value			
5.	Specific comments :			

Sample Result Verification for Hexavalent Chromium

ssociate	d samples :	All SDG sam	ples					
1.		aples reported ected samples			e?	-	YES X	<u>NO</u>
2.		data free of a	-			-	Х	
3.		a package free	-		ranscription errors ?	-	X	
4.	within the me (Method 306	ethod requirem 30 : non-aqued	r all samples, and sted to pH 7.0 - 8.0) usted to pH 1.6 - 2.2)	-	Х			
5.	Were hotplat (At least 60	e temperature minutes, and l	s provided, petween 90	and within me to 95 degrees	thod requirements ?	-	X	
6.	Show the cal	culation for %	Solids for o	ne sample.	Sample ID:	04784-04	-	
	Sample dry v Sample wet v Calculated %	weight	4.00 4.83 82.8	- - -	Lab value : % Solids =	Sample d		x 100
7.		Chromium in a		reported on a mg/L	dry-weight basis by red Sample ID:	calculating th	ne result for	
	·	% Solids =	82.8	_ %	Lab value : Calculated value =		mg/Kg mg/Kg	
nple C	onc., mg/Kg =	curve mg/L 0.01269429 0.0025 wetwgt, Kg	dig.vol, L 0.100 0.828 %sol/100	dilution 1.0	= 0.613 mg/Kg	Resi	ult verified ?	Yes

12 July, 2011

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: JCRA – Morris Canal, Laboratory Case NO. E11- 04821

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: JCRA – Morris Canal

<u>Fractions</u>

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

pH/Eh; ORP

Case No.: E11-04821 Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr^{+6}) samples were analyzed using SW-846 methods 3060A and 7196A. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_{4^-}$ / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Page 1 of 3 EQA, Inc. @BCL@180B5084.doc

Dresdner-Robin Mr. John Tregidgo 12 July, 2011

Sample		Lab ID		Date	Analysis	Cr ⁺⁶	Cr ⁺⁶	Cr ⁺⁶
Prefix	Sample ID	E11-04821-	Matrix	Collected	Hex Cr	Date Rec'd	Prep Date	RunDate
	FB-051711-1	001	Α	05/17/11	Х	05/17/11	n/a	05/17/11
MC_	001ZA_5.0	003	S	05/17/11	Χ	05/18/11	05/26/11	05/26/11
MC_	001ZA_7.5	004	S	05/17/11	Χ	05/18/11	05/26/11	05/26/11
MC_	002Z_4.5	800	S	05/17/11	Χ	05/18/11	05/26/11	05/26/11
MC_	002 Z _8.0	009	S	05/17/11	Χ	05/18/11	05/26/11	05/26/11
MC_	003Z_7.5	012	S	05/17/11	Χ	05/18/11	05/26/11	05/26/11
MC_	003Z_8.5	013	S	05/17/11	Χ	05/18/11	05/26/11	05/26/11
MC_	004Z_7.0	017	S	05/17/11	Χ	05/18/11	05/26/11	05/26/11
MC_	004Z_8.0	018	S	05/17/11	Χ	05/18/11	05/26/11	05/26/11
MC_	006Z_3.5	022	S	05/17/11	Χ	05/18/11	05/26/11	05/26/11
MC_	006Z_7.0	023	S	05/17/11	Χ	05/18/11	05/26/11	05/26/11
MC_	REP051711	026	S	05/17/11	Χ	05/18/11	05/26/11	05/26/11

S = Non-Aqueous Matrix

Total Samples =

12

A = Aqueous Matrix

Soil samples were received one day after collection, while associated field blanks were received on the same day as collection due to the short (24-hour) holding time for aqueous hexavalent chromium samples. Samples were received on ice at recorded temperature of 4°C.

<u>SECTION C</u> Hexavalent Chromium

Holding times from sample collection to analysis (\leq 24 hours for aqueous matrix; \leq 30 days for non-aqueous matrix) were met for all samples.

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks were free of contamination. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found.

Cr⁺⁶ was not detected in Field Blank FB-051711-1.

Matrix spike recoveries for soluble and insoluble Cr⁺⁶ in batch QC sample E11-04821-003 (MC_001ZA_5.0) were below the allowable limit of 75% in both initial and re-analyses, as tabulated below. All associated batch samples were re-digested and re-analyzed with the batch spike samples, per NJDEP and method protocols.

Sample ID	Sol.Recov.	Insol.Recov.
04821-003	0%	19%
re-analysis	0%	38%

Dresdner-Robin Mr. John Tregidgo 12 July, 2011

• QA Action: Qualify Cr⁺⁶ results in batch samples associated with E11-04821-003 (all soil samples) as rejected, 'R', per NJDEP SOP No. 5.A.10, Rev.3,

Sect. VI.(D).7.D.8)e).

• Data Usability: Eh / pH results were evaluated to determine ReDox characteristics of batch

samples as an indicator of ability to support Cr⁺⁶. All SDG Cr⁺⁶ samples were characterized as "Reducing" based upon the Method 3060A, Table

2 phase diagram.

The samples designated as "reducing" are not likely to support the presence of

Cr⁺⁶, or if positive, are likely to exhibit low bias.

Samples (REP051711 and MC_002Z_8.0) were identified as a collocated field duplicate pair for this sample group. Results for Cr^{+6} in both samples within this field duplicate pair were reported as non-detect.

SECTION D pH / Eh (ORP)

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution; Zobell's solution) were within acceptable ranges, as were sample duplicate measurements.

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the HCrO₄- / Cr(OH)₃ phase diagram; no disparities relative to reported values and characteristics were found.

SECTION E Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

HEXCR - 1 Page 1 of 10

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code:n/a	
Location:	Site Manager: n/a	
Laboratory Name : IAL	Lead Division / Bureau: n/a	
Reviewer : Chris Taylor	Methodology: 3060	7196A
Date of Review: <u>07/12/11</u>	SDG No.: <u>E11-0482</u>	1
Analysis for Hexavalent Chromium by Method :	See Above	
A. Permanently Bound ? X	F. Non-Conformance Summary?	Yes No
B. Paginated?	G. Methodology Review?	X
C. Title Page ?	H. Uninitialed Strikeover?	X
D. Table of Contents ? X	I. Legible Xerox?	X
E. Chain of Custody?	J. Consistent Dates ?	X
Describe any deviations from requirements :		

HEXCR - 2 Page 2 of 10

Holding Times for Hexavalent Chromium

Site Name : Morris Canal

Laboratory Name : IAL

Reviewer : Chris Taylor

Date of Review: 7/12/2011

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	Χ		Sample	Analysis	Time	QA
04630-		Matrix	Collection	Date	Exceeded	Decision
04630-	1	Α	05/17/11	05/17/11	0	ACCEPT
04630-	3	S	05/17/11	05/26/11	0	ACCEPT
04630-	4	S	05/17/11	05/26/11	0	ACCEPT
04630-	8	S	05/17/11	05/26/11	0	ACCEPT
04630-	9	S	05/17/11	05/26/11	0	ACCEPT
04630-	12	S	05/17/11	05/26/11	0	ACCEPT
04630-	13	S	05/17/11	05/26/11	0	ACCEPT
04630-	17	S	05/17/11	05/26/11	0	ACCEPT
04630-	18	S	05/17/11	05/26/11	0	ACCEPT
04630-	22	S	05/17/11	05/26/11	0	ACCEPT
04630-	23	S	05/17/11	05/26/11	0	ACCEPT
04630-	26	S	05/17/11	05/26/11	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp:	4°C	
Preservation:		
Handling Time:		

HEXCR - 3 Page 3 of 10

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r^2 >0.995 ?) If No, explain and list action :	YES X
Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action:	Х
Was the same CCS concentration used throughout the analysis ? If No, list action :	Х
Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :	X
Show calculation for the % recovery of Hexavalent Chromium in the CCS standard.	
Lab CCS value : 0.493 mg/L Lab value : 99 True CCS value : 0.500 mg/L Calculated value = (Lab / True x 100) 98.64	% recovery
Specific comments :	
Initial calibrations were performed on 05/17/11 (H 2 O), and 05/26/11 (soils).	

Calibration Blanks for Hexavalent Chromium

sociate	d samples : All SDG samples		
		<u>YES</u>	<u>NO</u>
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	Х	
	If No, list action :		
2.	Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes X	
	If No, list action :		
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL?	Yes	
	If No, list action :		
4.	Specific comments :		

HEXCR - 5a Page 5 of 10

Preparation / Reagent Blank Summary for Hexavalent Chromium

Associated sample matrix :	<u>Soil</u>	<u>Water</u> X	Preparation /	/ Reagent Blank ID :	PrepBlank	
Check one (X) Units : Did the frequency of the preparation / If No, explain and note ac		mg/L X nk analysis r	neet method ro	equirements ?	<u>Yes</u> X	<u>No</u>
CONOCNITRATION	V	< or = MDL		COMMENT		
CONCENTRATION U	Yes		No	COMMEN	TS / ACTION	
U						
Associated samples : 04821-001 HEXCR - 5b Associated sample matrix :	No :	< or = MDL > MDL	ent Blank Sum nt Chromium	ımary / Reagent Blank ID :	PrepBlank	
Check one (X)			•	3	· · ·	
Units: Did the frequency of the preparation / If No, explain and note a		<u>mg/L</u> nk analysis r	neet method re	equirements ?	Yes X	<u>No</u>
					_	
CONCENTRATION	Yes	< or = MDL	- No	COMMEN	TS / ACTION	
U						
Associated samples : <u>All SDG soil</u>	No :	< or = MDL > MDL	-			

HEXCR - 6 Page 6 of 10

Pre-digestion Spike Analysis for Non-Aqueous Hexavalent Chromium Samples

Matrix:	Non-Aqueous							
Units:	mg/Kg							
Associated	I samples : All SDG so	oil samples						
							\/50	
_					. •	•	YES	<u>NO</u>
1.	Was the pre-digestion		s performed	at the corre	ct frequency	?	X	
	If No, note deviations a	and action :				-		
						-		
2.	Was the pre-digestion	spike analysi	s performed	on a field sa	ample ?		Х	
	If No, qualify all assoc	iated samples	3.					
3.	Was the pre-digestion	spike analysi	s performed	at the prope	er concentrat	ion ?	X	I
	If No, list action :					-		
4.	Did the pre-digestion s	eniko rogovoru	for Cr. 16 m	and the crite	rio of 75 10	- 050/ 2		Х
4.	Did the pre-digestion s					_		
	If No, list action:	Sample ID 04821-003	Sol.Recov.	Insol.Recov 19%	Ox / Red ?			
		re-analysis	0%	38%]		
	004821-003 : sample :	shows reducir	ng tendency	based on Of	RP. Reject 'F	R' associated	batch samp	oles (03-26).
5.	Show calculation for p		•		Sca on bater	1 Sample Of	ti character	131103.
5.	·	· ·		•	1	.		
	a. Soluble SpikeLab spiked sample va	Sample ID:	04821-3 0.0	_	b. Insoluble Lab spiked	Spike sample vali	Sample ID: ue :	04821-3 226
	Lab un-spiked sample		0.0	-		ed sample v		0.0
	Spike added concentra	ation :	48.1	-	Spike added	d concentrat	ion :	1170
	Calculated value =		% recovery			ted value =	19.3	% recovery
	(Spiked - Unspiked) / Spike Add	led x 100)		(Spiked	- Unspiked)	/ Spike Add	ed x 100)
	Lab value	: 0	% recovery			Lab value :	19	% recovery
	Verified ?	yes	-			Verified ?	yes	-
6.	Specific comments :), Rev.3 spec				
		batch spike	recoveries.	Data usabilit	y is address	ed in the da	ta validation	narrative.

HEXCR - 7 Page 7 of 10

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS	analysis pe	rformed on sar	nple(s):	04821-3	_		Matrix :	Non-Aqueo	JS
% Solids :	n/a	_			_		Units:	mg/Kg	
Associated	samples :	All SDG soil	samples						
								\/F0	NO
								YES	<u>NO</u>
1.	the proper	VS analysis per concentration of mg/Kg or 2x s	? (for H20), 30 ug/L or				X	
	If No, note	deviations and	daction:				-		
2.	Was the P	VS analysis pe	erformed or	n a field samp	le?		•	X	
	If No, quali	ify all associate	d samples						
3. a.	Did the PV	'S recovery for	Cr +6 mee	et the criteria o	of 85 - 115%	?		X	
	If No, list a	ction :					-		
3. b.	If the % rec	covery was les ?	s than 85%	did the labor	atory re-spike	e and re-anal	yze	n/a	
	If No, list a	ction :					-		
	Did the %	recovery for th	e reanalysi	s meet the cri	teria of 85 - 1	15% ?	-	n/a	
	If No, list a	ction :							
5.	Show calc	ulation for PVS	S % recove	ry for Cr +6.			-	_	
	Sample ID	: 04821-3				Sample ID:		_	
		l sample value ked sample va		43.6 0.0	_	Lab spiked s Lab un-spike			
		ed concentration		48.1	-	Spike added			
		ated value = I - Unspiked)	90.6 Spike Add	% recovery led x 100)			ed value = · Unspiked)	#DIV/0! / Spike Adde	% recovery d x 100)
		Lab value :	91	_ % recovery	′		Lab value	: <u> </u>	% recovery
		Verified ?	yes	_			Verified ?		
6.	Specific co	omments :							
		•							•

Duplicate Analysis for Hexavalent Chromium

uplica	te analysis performed on sample(s) :	Matrix :	Non-Aqueou
ociate	d samples : All SDG soil samples	Units :	mg/Kg
		YES	<u>NO</u>
1.	Was the duplicate analysis performed at the correct frequency?	X	
	If No, note deviations and action :	_	
2.	Was the duplicate analysis performed on a field sample ?	X	7
	If No, qualify all associated samples.		_
3.	Did the duplicate results for Cr +6 meet the QC control limits ? (20% RPD for all Aqueous samples & Non-aqueous > or = 8 ppm) ($+$ / - 2 ppm for Non-aqueous samples if either or both are < 8.0 ppm) If No, list action :	X	
		_ _	
4.	Show calculation for % RPD for Cr+6.		
	Sample ID: 04821-3 Lab sample value: ND Lab sample Lab duplicate value: ND Lab duplic		-
	Calculated value = <u>no calc</u> % RPD Calculated	value =no calc	_ % RPD
	% RPD = Sample - Duplicate x 100 % RPD = (Sample + Duplicate)/2	Sample - Duplicate (Sample + Duplicate)/2	_ x 100
5.	Specific comments : ND = Not Detected		_
			_

Matrix: Non-Aqueous

Laboratory Control Sample (LCS)

Units:	mg/Kg			
ssociated	d samples : All soil samples.			
1.	Was the LCS performed at the correct frequency? If No, note deviations and action:		YES X	<u>NO</u>
2.	Does the LCS meet the QC limit of 80 - 120% ? If No, list the %Recovery and action taken.		X	
3	Show calculation for LCS recovery for Cr+6. Lab LCS value : 36.8 LCS true value : 40.0	Lab value : _ Calculated value = _	% Recovery % Recovery	
C	% Recovery = <u>Laboratory LCS result</u> x 100 LCS true value			
5.	Specific comments :			

Sample Result Verification for Hexavalent Chromium

sociate	d samples :	All SDG sam	ples					
1.		nples reported			e?		YES X	<u>NO</u>
2.		data free of a	-				Х	
3.		a package free	-		ranscription errors ?		X	
4.	within the me (Method 306	ethod requirem 30 : non-aqued	r all samples, and sted to pH 7.0 - 8.0) usted to pH 1.6 - 2.2)		X			
5.	Were hotplat (At least 60	ected samples e temperature minutes, and l	s provided, petween 90	and within me to 95 degrees	thod requirements ?		X	
6.	Show the cal	culation for %	Solids for o	ne sample.	Sample ID:	04821-22		
	Sample dry v Sample wet v Calculated %	weight	4.93 5.79 85.1	- - -	Lab value : % Solids =	Sample de Sample we		x 100
7.		Chromium in a		reported on a	dry-weight basis by red Sample ID:		e result for	
		% Solids =	85.1	_ %	Lab value : Calculated value =	9.58 9.58	mg/Kg mg/Kg	
nple C	onc., mg/Kg =	curve mg/L 0.20385228 0.0025 wetwgt, Kg	dig.vol, L 0.100 0.851 %sol/100	dilution 1.0	= 9.582 mg/Kg	Resu	ult verified ?	Yes

13 July, 2011

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: JCRA – Morris Canal, Laboratory Case NO. E11- 04868

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: JCRA – Morris Canal

<u>Fractions</u>

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

pH/Eh; ORP

Case No.: E11-04868 Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr^{+6}) samples were analyzed using SW-846 methods 3060A and 7196A. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_{4^-}$ / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Page 1 of 3 EQA, Inc. @BCL@180BF468.doc

Dresdner-Robin Mr. John Tregidgo 13 July, 2011

Sample		Lab ID		Date	Analysis	Cr ⁺⁶	Cr ⁺⁶	Cr ⁺⁶
Prefix	Sample ID	E11-04868-	Matrix	Collected	Hex Cr	Date Rec'd	Prep Date	RunDate
	FB051811	001	Α	05/18/11	Х	05/18/11	n/a	05/18/11
MC-	006X_1.5	002	S	05/18/11	Χ	05/19/11	06/07/11	06/07/11
MC-	006X_3.5	003	S	05/18/11	Χ	05/19/11	05/26/11	05/27/11
MC-	006X_7.5	005	S	05/18/11	Χ	05/19/11	05/26/11	05/27/11
MC-	REP051811-1	006	S	05/18/11	Χ	05/19/11	05/26/11	05/27/11
MC-	006X_11.5	800	S	05/18/11	Χ	05/19/11	05/26/11	05/27/11
MC-	006X_13.5	009	S	05/18/11	Χ	05/19/11	05/26/11	05/27/11
MC-	006X_17.5	011	S	05/18/11	Χ	05/19/11	05/26/11	05/27/11
207_	B1_1.0	012	S	05/18/11	Χ	05/19/11	05/26/11	05/27/11
207_	B1_5.5	014	S	05/18/11	Χ	05/19/11	05/26/11	05/27/11
207_	B1_8.5	016	S	05/18/11	Χ	05/19/11	05/26/11	05/27/11
207_	B1_13.5	017	S	05/18/11	Χ	05/19/11	05/26/11	05/27/11
207_	REP051811-2	018	S	05/18/11	Χ	05/19/11	05/26/11	05/27/11
207_	B1_17.5	020	S	05/18/11	Χ	05/19/11	05/26/11	05/27/11

S = Non-Aqueous Matrix

Total Samples = 14

A = Aqueous Matrix

Soil samples were received one day after collection, while associated field blanks were received on the same day as collection due to the short (24-hour) holding time for aqueous hexavalent chromium samples. Samples were received on ice at recorded temperature of 4°C.

<u>SECTION C</u> Hexavalent Chromium

Holding times from sample collection to analysis (\leq 24 hours for aqueous matrix; \leq 30 days for non-aqueous matrix) were met for all samples.

All calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, duplicate precision, and matrix and post-spike recoveries. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr⁺⁶ results were randomly verified from the raw data with no disparities between reported and calculated results found.

It is noted that sample E11-04868-002 (MC-006X_1.5) was extracted separately from the remainder of this SDG's soil samples. The batch QC spike associated with this sample was not of this SDG, and may not be representative of this sample's / SDG's matrix characteristics. Although the batch QC spike failed recovery (both initially and on re-extraction / re-analysis), no QA action was taken for MC-006X_1.5, because of the noted uncertainty of matrix representativeness.

Cr⁺⁶ was not detected in Field Blank FB-051811.

Dresdner-Robin Mr. John Tregidgo 13 July, 2011

Samples (REP051811-1 and MC-006X_11.5) and (REP051811-2 and 207_B1_13.5) were identified as collocated field duplicate pairs for this sample group. (REP051811-2 and 207_B1_13.5) were reported as non-detects. (REP051811-1 and MC-006X_11.5) exhibited positive Cr⁺⁶ concentrations of 4190 and 3150 mg/Kg, respectively, yielding a calculated RPD value of 25.2%, which is below the EPA regional DV guidance threshold for qualification for soil samples of 35% RPD. No QA action was necessary.

SECTION D pH / Eh (ORP)

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution; Zobell's solution) were within acceptable ranges, as were sample duplicate measurements.

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the HCrO₄- / Cr(OH)₃ phase diagram; no disparities relative to reported values and characteristics were found.

SECTION E Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

Page 3 of 3 EQA, Inc. @BCL@180BF468.doc

HEXCR - 1 Page 1 of 10

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code:n/a	
Location:	Site Manager: n/a	
Laboratory Name : IAL	Lead Division / Bureau: n/a	
Reviewer : Chris Taylor	Methodology: 3060	7196A
Date of Review: <u>07/13/11</u>	SDG No.: <u>E11-04868</u>	
Analysis for Hexavalent Chromium by Method :	See Above	
Yes No A. Permanently Bound ? X	F. Non-Conformance Summary?	Yes No
B. Paginated?	G. Methodology Review?	X
C. Title Page ?	H. Uninitialed Strikeover?	X
D. Table of Contents ? X	I. Legible Xerox?	X
E. Chain of Custody?	J. Consistent Dates ?	Х
Describe any deviations from requirements :		

HEXCR - 2 Page 2 of 10

Holding Times for Hexavalent Chromium

Site Name : Morris Canal	Laboratory Name : IAL
Reviewer : Chris Taylor	Date of Review: 7/13/2011

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	Х		Sample	Analysis	Time	QA
04868		Matrix	Collection	Date	Exceeded	Decision
04868	001	Α	05/18/11	05/18/11	0	ACCEPT
04868	2	S	05/18/11	06/07/11	0	ACCEPT
04868	3	S	05/18/11	05/27/11	0	ACCEPT
04868	5	S	05/18/11	05/27/11	0	ACCEPT
04868	6	S	05/18/11	05/27/11	0	ACCEPT
04868	8	S	05/18/11	05/27/11	0	ACCEPT
04868	9	S	05/18/11	05/27/11	0	ACCEPT
04868	11	S	05/18/11	05/27/11	0	ACCEPT
04868	12	S	05/18/11	05/27/11	0	ACCEPT
04868	14	S	05/18/11	05/27/11	0	ACCEPT
04868	16	S	05/18/11	05/27/11	0	ACCEPT
04868	17	S	05/18/11	05/27/11	0	ACCEPT
04868	18	S	05/18/11	05/27/11	0	ACCEPT
04868	20	S	05/18/11	05/27/11	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp: 4°C
Preservation:
Handling Time:

HEXCR - 3 Page 3 of 10

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r^2 >0.995 ?) If No, explain and list action :	YES X
Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action:	X
Was the same CCS concentration used throughout the analysis ? If No, list action :	X
Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :	X
Show calculation for the % recovery of Hexavalent Chromium in the CCS standard	d.
Lab CCS value : 0.492 mg/L Lab value : 99 True CCS value : 0.500 mg/L Calculated value = (Lab / True x 100) 98.5	% recovery
Specific comments :	
Initial calibrations were performed on 05/18/11 (H 2 O), 05/27/11 and 06/07/11 (so	ile)

Calibration Blanks for Hexavalent Chromium

ociate	d samples : All SDG samples		
		YES	NO
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	X	
	If No, list action :		
2.	Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes X	
	If No, list action :		
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL ?	Yes X	
	If No, list action :		
4.	Specific comments :		

HEXCR - 5a Page 5 of 10

Preparation / Reagent Blank Summary for Hexavalent Chromium

Associated sample matrix : Check one (X) Units Did the frequency of the preparati	on / reagent bla	Water X <u>mg/L</u> X nk analysis n		/ Reagent Blank ID :	PrepBlank Yes X	<u>No</u>	
CONCENTRATION	Yes	< or = MDL	= No	COMMEN	ITS / ACTION		
U							
Associated samples : <u>04868-0</u>	No :	: < or = MDL : > MDL	ent Blank Sum	nmary			
			nt Chromium	inary			
Associated sample matrix : Check one (X)	Soil X	Water	Preparation	/ Reagent Blank ID :	PrepBlank		
Units Did the frequency of the preparati	on / reagent bla	<u>mg/L</u> nk analysis n	neet method r	requirements ?	Yes X	<u>No</u>	
If No, explain and note action :							
CONCENTRATION	Yes	< or = MDL	- No	COMMEN	ITS / ACTION		
U					-		
MDL Codes Yes: < or = MDL No: > MDL Soil samples for SDG 04868 were extracted in two discrete prep batches (AP011- 0064 and -0068). 'Method (prep) blanks for all batches were non-detect (ND) for Cr ⁺⁶ .							

HEXCR - 6 Page 6 of 10

Pre-digestion Spike Analysis for Non-Aqueous Hexavalent Chromium Samples

Matrix:	Non-Aqueous	
Units:	mg/Kg	
ssociated	samples : All SDG soil samples	
		<u>YES</u> <u>NO</u>
1.	Was the pre-digestion spike analysis performed at the corr	rect frequency?
	If No, note deviations and action :	
2.	Was the pre-digestion spike analysis performed on a field	sample? X
	If No, qualify all associated samples.	
3.	Was the pre-digestion spike analysis performed at the pro-	per concentration ?
	If No, list action :	
4.	Did the pre-digestion spike recovery for Cr +6 meet the cri	teria of 75 - 125% ?
	If No, list action :	
	004868-2 : this SDG sample was extracted in a separate b	
	which was not from this SDG. Therefore, the matrix may n	
	The sample was re-extracted and re-analyzed along with the action was taken, based on uncertainty of matrix representations.	
5.	Show calculation for pre-digestion spike recovery for Cr +6	
	a. Soluble Spike Sample ID: 04868-3	b. Insoluble Spike Sample ID: 04868-3
	Lab spiked sample value : 14400	Lab spiked sample value : 6440
	Lab un-spiked sample value : 4820.0	Lab un-spiked sample value : 4820.0
	Spike added concentration : 9790.0	Spike added concentration : 2050
	Calculated value = 97.9 % recovery	Calculated value = 79.0 % recovery
	(Spiked - Unspiked) / Spike Added x 100)	(Spiked - Unspiked) / Spike Added x 100)
	Lab value :98 % recovery	Lab value :% recovery
	Verified ?yes	Verified ?yes
6.	Specific comments :	

HEXCR - 7 Page 7 of 10

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS	analysis pe	rformed on san	nple(s):	04868-3	_		Matrix :	Non-Aqueo	JS
% Solids :	n/a	_			_		Units:	mg/Kg	
Associated	samples :	All SDG soil	samples						
								VES	NO
								YES	<u>NO</u>
1.	the proper	VS analysis pe concentration mg/Kg or 2x s	? (for H2C), 30 ug/L or				X	
	If No, note	deviations and	action :						
2.	Was the P	VS analysis pe	rformed or	a field samp	le?			Х	[
	If No, quali	ify all associate	d samples.						
3. a.	Did the PV	S recovery for	Cr +6 mee	et the criteria o	of 85 - 115%	?		Х	
	If No, list a	ction :							
3. b.	If the % rec	covery was less ?	s than 85%	did the labor	atory re-spike	e and re-anal	yze	n/a	
	If No, list a	ction :							
	Did the %	recovery for the	e reanalysis	s meet the cri	teria of 85 - 1	15% ?	•	n/a	
	If No, list a	ction :					-		
5.	Show calc	ulation for PVS	5 % recove	ry for Cr +6.				_	
	•	: 04868-3				Sample ID:		_	
		d sample value iked sample va		14500 4820	_	Lab spiked s Lab un-spike			
		ed concentration		9790	- -	Spike added			
		ated value = I - Unspiked)/	98.9 Spike Add	_% recovery ed x 100)			ed value = · Unspiked)	#DIV/0! / Spike Adde	% recovery d x 100)
		Lab value :	99	_ % recovery	,		Lab value	:	% recovery
		Verified ?	yes	_			Verified ?		
6.	Specific co	omments :							
		_							
		_							
		-							•

Duplicate Analysis for Hexavalent Chromium

	te analysis performed on sample(s) :04868-3		Matrix:	Non-Aqueo
			Units:	mg/Kg
ciate	d samples : All SDG soil samples			
			YES	<u>NO</u>
١.	Was the duplicate analysis performed at the correct frequency?		X	
	If No, note deviations and action :			
2.	Was the duplicate analysis performed on a field sample?		X	
	If No, qualify all associated samples.			
3.	Did the duplicate results for Cr +6 meet the QC control limits? (20% RPD for all Aqueous samples & Non-aqueous > or = 8 ppm) ($+$ / - 2 ppm for Non-aqueous samples if either or both are < 8.0 ppm))	Х	
	If No, list action :			
١.	Show calculation for % RPD for Cr+6.			
		ID: ple value : icate value :		_ _
	Calculated value = 2.1 % RPD Calculate	ed value =		_ % RPD
	% RPD = Sample - Duplicate x 100 % RPD (Sample + Duplicate)/2		- Duplicate + Duplicate)/2	_ x 100
5.	Specific comments :			_
5.	Specific comments :			_

Laboratory Control Sample (LCS)

Matrix:	Non-Aqueous			
Units:	mg/Kg			
ssociate	ed samples : All soil samples.			
1.	Was the LCS performed at the correct frequency?		YES X	<u>NO</u>
	If No, note deviations and action :			
2.	Does the LCS meet the QC limit of 80 - 120% ?		X	
	If No, list the %Recovery and action taken.			
3	Show calculation for LCS recovery for Cr+6.			
			% Recovery	
	% Recovery = <u>Laboratory LCS result</u> x 100 LCS true value			
5.	Specific comments : Soil samples were extracted in two separate batch			
	prepared and analyzed for each extraction batch.	All LCS r	recoveries	
	were within acceptable limits of 80 - 120%.			

Sample Result Verification for Hexavalent Chromium

ssociate	d samples :	All SDG sam	ples					
1.	Were all samples reported within the calibration range? If No, list affected samples and action :						YES X	<u>NO</u>
2.	Was the raw data free of any anomalies ? If No, list affected samples and action :							
3.	Was the data package free of any computational or transcription errors ? If No, list affected samples and action :						X	
4.	Were both 3060 and 7196A pH readings provided for all samples, and within the method requirements? (Method 3060: non-aqueous samples must be adjusted to pH 7.0 - 8.0) (Method 7196A: all analytical solutions must be adjusted to pH 1.6 - 2.2) If No, list affected samples and action: Were hotplate temperatures provided, and within method requirements? (At least 60 minutes, and between 90 to 95 degrees C) If No, list affected samples and action:					X		
5.								
6.	Show the cal	culation for %	Solids for o	ne sample.	Sample ID:	04868-3		
	Sample dry v Sample wet v Calculated %	weight	2.67 5.04 53.0	- -	Lab value : % Solids =	Sample de		x 100
7.	Verify that non-aqueous samples were reported on a dry-weight basis Hexavalent Chromium in a sample. Sample Sample result, wet: 0.6382 mg/L						e result for	
	,	% Solids =	53.0	_ %	Lab value : Calculated value =	4820 4816	mg/Kg mg/Kg	
nple C	onc., mg/Kg =	curve mg/L 0.63816835 0.0025 wetwgt, Kg	dig.vol, L 0.100 0.530 %sol/100	dilution 100.0	= 4816.365 mg/Kg	Resu	Ilt verified?	Yes

26 August, 2011

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: Morris Canal, Laboratory Case NO. E11- 04232

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: Morris Canal

Fractions

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

Case No.: E11-04232 Matrix: Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr⁺⁶) samples were analyzed using SW-846 method 7196A.

The laboratory deliverables initially provided did not contain raw QC or calibration / sample results. An expanded report was requested from the laboratory and received on 08/25/2011.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Page 1 of 3 EQA, Inc. @BCL@040D0B3F.doc

Dresdner-Robin Mr. John Tregidgo 26 August, 2011

Sample ID	Lab ID		Date	Analysis	Cr+6	Cr+6
Client	04232-	Matrix	Collected	Hex Cr	Date Rec'd	RunDate
MW-8-1	001	A	05/02/11	X	05/02/11	05/03/11
MW-7-1	002	Α	05/02/11	X	05/02/11	05/03/11
MW-7-2	003	Α	05/02/11	X	05/02/11	05/03/11
MW-3-1	004	Α	05/02/11	X	05/02/11	05/03/11
FB050211	005	Α	05/02/11	X	05/02/11	05/03/11
REP050211	006	Α	05/02/11	X	05/02/11	05/03/11

A = Aqueous Matrix

Total Samples = 6

Samples were received on the same day as collection. Samples were received on ice at recorded temperature of 4°C.

<u>SECTION C</u> Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix) were met for all samples.

All calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, duplicate precision, and post-spike recovery. Reported spike recovery, duplicate precision values and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found.

For the aqueous spike sample, the spike added concentration should be the greater of 30 ug/L or 2x the native sample concentration. In this case, the native (unspiked) sample Cr⁺⁶ concentration was ND (not detected), and the sample was spiked with 50 ug/L. It is noted that the batch QC spike sample was not from this SDG; although spike recovery was acceptable, this sample may not be representative of this SDG's matrix characteristics. No action was taken.

QA Action:

• Qualify reported Cr⁺⁶ results for all SDG samples ('UJ' or 'J'), as quantitatively estimated RL values or estimated values; bias direction is indeterminate.

Cr⁺⁶ was not detected in Field Blank FB050211.

For this SDG, REP050211 was identified as a field duplicate of MW-3-1. Results for both collocated samples were non-detects (U).

SECTION D pH / Eh (ORP) Dresdner-Robin Mr. John Tregidgo 26 August, 2011

No information regarding pH / Eh measurements were found in the deliverables forwarded to the reviewer. Therefore, the reviewer is unable to determine reductive or oxidative characteristics of the samples. These values are only used for data assessment purposes when Cr⁺⁶ sample spike recoveries are outside acceptable recovery ranges; reported spike recoveries were within specified limits.

SECTION E Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

Page 3 of 3 EQA, Inc. @BCL@040D0B3F.doc

HEXCR - 1 Page 1 of 8

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code: n/a	
Location:	Site Manager: n/a	
Laboratory Name : IAL	Lead Division / Bureau: n/a	
Reviewer : Chris Taylor	Methodology: 7196A	
Date of Review: 08/13/11 08/26/11	SDG No.: <u>E11-04232</u>	
Analysis for Hexavalent Chromium by Method :	See Above	
Yes No A. Permanently Bound ? n/a	F. Non-Conformance Summary ? Yes No	
B. Paginated?	G. Methodology Review?	
C. Title Page ?	H. Uninitialed Strikeover ?	_
D. Table of Contents?	I. Legible Xerox ?	
E. Chain of Custody?	J. Consistent Dates ?	
Describe any deviations from requirements :	The initial data deliverables package did not contain raw QC or	
	calibration results. An expanded deliverables package was received	
	on 08/25/11.	

HEXCR - 2 Page 2 of 8

Holding Times for Hexavalent Chromium

Laboratory Name : IAL
Date of Review: 8/13/2011

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	X		Sample	Analysis	Time	QA
04232-		Matrix	Collection	Date	Exceeded	Decision
04232-	001	Α	05/02/11	05/03/11	0	ACCEPT
04232-	002	А	05/02/11	05/03/11	0	ACCEPT
04232-	003	А	05/02/11	05/03/11	0	ACCEPT
04232-	004	Α	05/02/11	05/03/11	0	ACCEPT
04232-	005	А	05/02/11	05/03/11	0	ACCEPT
04232-	006	Α	05/02/11	05/03/11	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp:	4° C
Preservation:	
Handling Time:	

HEXCR - 3 Page 3 of 8

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r^2 >0.995 ?) If No, explain and list action :	YES X
Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action:	Х
Was the same CCS concentration used throughout the analysis ? If No, list action :	X
Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :	X
Show calculation for the % recovery of Hexavalent Chromium in the CCS standard	
Lab CCS value : 0.4943 mg/L Lab value : 99 True CCS value : 0.500 mg/L Calculated value = (Lab / True x 100) 98.9	% recovery
Specific comments :	
Initial calibration was performed on 05/03/11 (H $_2$ O).	

HEXCR - 4 Page 4 of 8

Calibration Blanks for Hexavalent Chromium

sociate	d samples : All SDG samples		
		<u>YES</u>	<u>NO</u>
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	Х	
	If No, list action :		
2.	Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes	
	If No, list action :		
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL?	Yes	
	If No, list action :		
4.	Specific comments :		
4.	Specific comments :		

HEXCR - 5a Page 5 of 8

Preparation / Reagent Blank Summary for Hexavalent Chromium

	IC	or Hexavaie	nt Chromium					
Associated sample matrix :	<u>Soil</u>	<u>Water</u> X	Preparation ,	/ Reagent Blank ID :	PrepBlank			
Check one (X) Units : Did the frequency of the preparation	mg/Kg / reagent bla	mg/ <u>L</u> X ank analysis	meet method	requirements ?	<u>Yes</u> X	<u>No</u>		
If No, explain and note	If No, explain and note action :							
					_			
		< or = MDl	_					
CONCENTRATION	Yes	Yes No C		COMMEN	ITS / ACTION			
U								
		< or = MDL > MDL	-					
Associated samples : All SDG sa	mples.							

HEXCR - 7 Page 6 of 8

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS	analysis pe	erformed on sample(s) : <u>04226-004</u>	Matrix:	Water	
		_	Units:	ug/L	
ssociated	samples :	All aqueous SDG samples. See Comments below.			
				VEC	
				<u>YES</u>	<u>NO</u>
1.		VS analysis performed at the correct frequency and at			Χ
		concentration? (for H2O, 30 ug/L or 2x sample, w/e is >)			
	(IOI SOII, 40	O mg/Kg or 2x sample, w/e is >)			
	If No, note	deviations and action: The native sample concentration			
		not detected), and spike added concentration 50 ug/L. This			
		ne specified concentration for spike addition. Associated			
	samples a	re flagged as estimated (UJ or J), with indeterminate bias.			
2.	Was the P	VS analysis performed on a field sample ?		X	
	If No, qual	ify all associated samples.			
3. a.	Did the PV	'S recovery for Cr +6 meet the criteria of 85 - 115% ?		X	
	If No, list a	action :			
3. b.	If the % re the aliquot	covery was less than 85% did the laboratory re-spike and re-ana	lyze	n/a	
	If No, list a	action:			
	Did the %	recovery for the reanalysis meet the criteria of 85 - 115% ?		n/a	
	If No, list a	action:			
5.	Show calc	ulation for PVS % recovery for Cr +6.		_	
	Camarla ID	. 04000 004			
		: 04226-004 I sample value : 50 ug/L			
		d sample_value :50ug/L ked sample value :U_ug/L			
		ed concentration :ug/L			
		ated value = 100.0 % recovery I - Unspiked) / Spike Added x 100)			
		Lab value : 100 % recovery			
		Verified ?yes			
6.	Specific co	omments: The batch QC spike was not from this SDG and ma	ay not rep	present	
		this SDG's matrix characteristics.			

Duplicate Analysis for Hexavalent Chromium

Duplica	te analysis performed on	sample :	04226-004			-	Matrix:	Water
						_	Units:	ug/L
Associate	d samples : All aqueous	SDG samp	oles. See Comm	nents belov	N.			
							<u>YES</u>	<u>NO</u>
1.	Was the duplicate analy	sis perform	ed at the correc	ct frequenc	y?		Х	
	If No, note deviations a	nd action :						
						-		
						<u>-</u>		
2.	Was the duplicate analy	sis perform	ed on a field sa	mple ?			X	
	If No, qualify all associa	ited sample:	S.					
3.	Did the duplicate result: (20% RPD for all Aque (+ / - 2 ppm for Non-ac	ous sample	s & Non-aqueo	us > or = 8	ppm)		X	
	If No, list action :					-		
						-		
4.	Show calculation for %	RPD for Cr	+6.					
	Sample ID: 04226-004	_			Sample ID:		<u></u>	
	Lab sample value : Lab duplicate value :	50 49	ug/L ug/L		Lab sample Lab duplicat			_ug/L _ug/L
	Calculated value =	2.02	_ % RPD		Calculated v	/alue =	#DIV/0!	_ % RPD
	% RPD = Sample - (Sample +	Duplicate Duplicate)/2	x 100		% RPD =	Sample - (Sample +	Duplicate Duplicate)/2	_ x 100
5.	Specific comments :	The batch	QC duplicate w	as not froi	m this SDG a	and may no	t represent	_
		this SDG's	s matrix charact	eristics.				_

Sample Result Verification for Hexavalent Chromium

No, list affe	ples reported		libration rar	nge?		[YES X	<u>NO</u>
No, list affe			libration rar	nge?		Ī		<u>NO</u>
No, list affe			libration rar	nge?		[X	
	ected samples	and action :						
as the raw								
	data free of a	ny anomalies	3?			[Х	
No, list affe	ected samples	and action :						
as the data	a package free	of any comp	outational o	r transcriptio	on errors ?	[X	
No, list affe	ected samples	and action :						
quired rang	je ?					Ì	X	
No, list affe	cted samples	and action:						
			ctly reporte	ed by recalcu				
ample resu	lt, wet :	0.0940	mg/L		Lab value :	0.940	mg/L	
				Calcu	ılated value = _	0.940	mg/L	
, mg/L =	curve mg/L 0.09395	dilution 10	=	0.940 mg/L		Resu	Ilt verified?	Yes
	No, list affer as the data No, list affer 7196A quired rang Method 719 No, list affer arify that acceptant Complete results	No, list affected samples as the data package free No, list affected samples ere 7196A pH readings paired range? Method 7196A: all analyt No, list affected samples erify that aqueous sample exavalent Chromium in a ample result, wet:	No, list affected samples and action: as the data package free of any complex and action: Yere 7196A pH readings provided for a quired range? Method 7196A: all analytical solutions No, list affected samples and action: erify that aqueous samples were correct exavalent Chromium in a sample. ample result, wet: O.0940 curve mg/L dilution	as the data package free of any computational of No, list affected samples and action: There 7196A pH readings provided for all samples, quired range? Method 7196A: all analytical solutions must be action. Perify that aqueous samples and action: Perify that aqueous samples were correctly reported exavalent Chromium in a sample. Perify that aqueous samples were correctly reported exavalent Chromium in a sample. Perify that aqueous samples were correctly reported exavalent Chromium in a sample.	No, list affected samples and action: 'as the data package free of any computational or transcription No, list affected samples and action: 'ere 7196A pH readings provided for all samples, and within the quired range? 'Method 7196A: all analytical solutions must be adjusted to phoson, list affected samples and action: 'erify that aqueous samples were correctly reported by recalculation and the computation of transcription. 'erify that aqueous samples were correctly reported by recalculation and the computation of transcription. 'erify that aqueous samples were correctly reported by recalculation and the computation of transcription. 'erify that aqueous samples were correctly reported by recalculation and the computation of the computation of transcription. 'erify that aqueous samples were correctly reported by recalculation and the computation of t	No, list affected samples and action: "as the data package free of any computational or transcription errors? No, list affected samples and action: "ere 7196A pH readings provided for all samples, and within the method quired range? Method 7196A: all analytical solutions must be adjusted to pH 1.6 - 2.2) No, list affected samples and action: erify that aqueous samples were correctly reported by recalculating the result exavalent Chromium in a sample. Sample ID: ample result, wet: Calculated value = curve mg/L dilution mg/L = 0.09395 10 = 0.940	No, list affected samples and action: // as the data package free of any computational or transcription errors? No, list affected samples and action: // ere 7196A pH readings provided for all samples, and within the method quired range? // Method 7196A: all analytical solutions must be adjusted to pH 1.6 - 2.2) No, list affected samples and action: erify that aqueous samples were correctly reported by recalculating the result for exavalent Chromium in a sample. Sample ID: O4232-001 ample result, wet: O.0940 Calculated value = O.940 Resulting the result for exavalent Chromium in a sample. Calculated value = O.940 Resulting The first and action : O.940 Calculated value = O.940 Resulting The first and action : O.940 Calculated value = O.940 Resulting The first and action : O.940 Calculated value = O.940 O.940	No, list affected samples and action: Zas the data package free of any computational or transcription errors? X No, list affected samples and action: Zere 7196A pH readings provided for all samples, and within the method quired range? Method 7196A: all analytical solutions must be adjusted to pH 1.6 - 2.2) No, list affected samples and action: Zerify that aqueous samples were correctly reported by recalculating the result for exavalent Chromium in a sample. Sample ID: D4232-001 Lab value: D.940 mg/L Calculated value = 0.940 mg/L Result verified? Result verified?

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: Morris Canal, Laboratory Case NO. E11- 04283

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: Morris Canal

Fractions

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

Case No.: E11-04283 Matrix: Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr⁺⁶) samples were analyzed using SW-846 method 7196A.

The laboratory deliverables initially provided did not contain raw QC or calibration / sample results. An expanded report was requested from the laboratory and received on 08/25/2011.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Page 1 of 3 EQA, Inc. @BCL@040DBF58.doc

Dresdner-Robin Mr. John Tregidgo 27 August, 2011

Sample ID	Lab ID		Date	Analysis	Cr+6	Cr+6
Client	04283-	Matrix	Collected	Hex Cr	Date Rec'd	RunDate
MW-3-2	001	A	05/03/11	X	05/03/11	05/04/11
MW-5-1	002	A	05/03/11	X	05/03/11	05/04/11
MW-6-1	003	A	05/03/11	X	05/03/11	05/04/11
MW-4-1	004	A	05/03/11	X	05/03/11	05/04/11
MW-5-2	005	A	05/03/11	X	05/03/11	05/04/11
MW-9-1	006	A	05/03/11	X	05/03/11	05/04/11
MW-12-1	007	A	05/03/11	X	05/03/11	05/04/11
REP050311	008	A	05/03/11	X	05/03/11	05/04/11
FB050311	009	A	05/03/11	X	05/03/11	05/04/11
TB050211	010	A	05/03/11	X	05/03/11	05/04/11

A = Aqueous Matrix

Total Samples = 10

Samples were received on the same day as collection. Samples were received on ice at recorded temperature of 4°C.

SECTION C Hexavalent Chromium

Holding times from sample collection to analysis (<24 hours for aqueous matrix) were met for all samples.

All calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, duplicate precision, and post-spike recovery. Reported spike recovery, duplicate precision values and reported Cr⁺⁶ results were randomly verified from the raw data with no disparities between reported and calculated results found.

For the aqueous spike sample, the spike added concentration should be the greater of 30 ug/L or 2x the native sample concentration. In this case, the native (unspiked) sample Cr^{+6} concentration was ND (not detected), and the sample was spiked with 50 ug/L.

QA Action:

• Qualify reported Cr⁺⁶ results for all SDG samples ('UJ' or 'J'), as quantitatively estimated RL values or estimated values; bias direction is indeterminate.

Cr⁺⁶ was not detected in Field Blank FB050311.

For this SDG, REP050311 was identified as a field duplicate of MW-6-1. Results for both collocated samples were non-detects (U).

SECTION D pH / Eh (ORP) Dresdner-Robin Mr. John Tregidgo 27 August, 2011

No information regarding pH / Eh measurements were found in the deliverables forwarded to the reviewer. Therefore, the reviewer is unable to determine reductive or oxidative characteristics of the samples. These values are only used for data assessment purposes when Cr⁺⁶ sample spike recoveries are outside acceptable recovery ranges; reported spike recoveries were within specified limits.

SECTION E Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

Page 3 of 3 EQA, Inc. @BCL@040DBF58.doc

HEXCR - 1 Page 1 of 8

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code:n/a
Location:	Site Manager: n/a
Laboratory Name : IAL	Lead Division / Bureau: n/a
Reviewer : Chris Taylor	Methodology: 7196A
Date of Review: 08/15/11 08/27/11	SDG No.: <u>E11-04283</u>
Analysis for Hexavalent Chromium by Method :	See Above
Yes No A. Permanently Bound ? n/a	F. Non-Conformance Summary ? Yes No X
B. Paginated ? X	G. Methodology Review?
C. Title Page ?	H. Uninitialed Strikeover?
D. Table of Contents?	I. Legible Xerox ?
E. Chain of Custody?	J. Consistent Dates?
Describe any deviations from requirements :	The initial data deliverables package did not contain raw QC or
	calibration results. An expanded deliverables package was received
	on 08/25/11.

HEXCR - 2 Page 2 of 8

Holding Times for Hexavalent Chromium

Site Name : Morris Canal Laboratory Name : IAL

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	Χ		Sample	Analysis	Time	QA
04283-		Matrix	Collection	Date	Exceeded	Decision
04283-	001	Α	05/03/11	05/04/11	0	ACCEPT
04283-	002	Α	05/03/11	05/04/11	0	ACCEPT
04283-	003	А	05/03/11	05/04/11	0	ACCEPT
04283-	004	Α	05/03/11	05/04/11	0	ACCEPT
04283-	005	Α	05/03/11	05/04/11	0	ACCEPT
04283-	006	А	05/03/11	05/04/11	0	ACCEPT
04283-	007	Α	05/03/11	05/04/11	0	ACCEPT
04283-	800	Α	05/03/11	05/04/11	0	ACCEPT
04283-	009	А	05/03/11	05/04/11	0	ACCEPT
04283-	010	Α	05/03/11	05/04/11	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp:	4° C	
Preservation:		
Handling Time:		

HEXCR - 3 Page 3 of 8

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

1.	Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r^2 >0.995 ?) If No, explain and list action :	YES N
2.	Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action:	X
3.	Was the same CCS concentration used throughout the analysis ? If No, list action :	X
l.	Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :	X
5.	Show calculation for the % recovery of Hexavalent Chromium in the CCS standard.	
	Lab CCS value : 0.4949 mg/L mg/L Lab value : 99 True CCS value : 0.500 mg/L Calculated value = (Lab / True x 100) 99.0	% recovery
6.	Specific comments :	
	Initial calibration was performed on 05/03/11 (H $_2$ O).	

HEXCR - 4 Page 4 of 8

Calibration Blanks for Hexavalent Chromium

sociate	d samples : All SDG samples		
		YES	<u>NO</u>
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	X	
	If No, list action :		
2.	Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes	
	If No, list action :		
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL?	Yes	
	If No, list action :		
4.	Specific comments :		
4.	Specific comments :		

HEXCR - 5a Page 5 of 8

Preparation / Reagent Blank Summary for Hexavalent Chromium

		Ji i icxavaici	it Officialities			
Associated sample matrix :	<u>Soil</u>	Water X	Preparation	/ Reagent Blank ID :	PrepBlank	
Check one (X) Units :	mg/Kg	mg/L X			V	N.s.
Did the frequency of the preparation	ı / reagent bla	ank analysis	meet method	requirements?	<u>Yes</u> X	<u>No</u>
If No, explain and note	action :				_	
CONCENTRATION	Yes	< or = MDL	No	COMMEN	TS / ACTION	
U						
MDL Codes Yes: < or = MDL No: > MDL						
Associated samples : All SDG samples.						
_						

HEXCR - 7 Page 6 of 8

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS	analysis pe	erformed on sample(s): 04283-001	Matrix :	Water	
		_	Units:	ug/L	
sociated	samples :	All aqueous SDG samples.			
		·			
				<u>YES</u>	<u>NO</u>
1.	the proper	VS analysis performed at the correct frequency and at concentration? (for H2O, 30 ug/L or 2x sample, w/e is >) mg/Kg or 2x sample, w/e is >)			Х
	was 'ND' (rexceeds the	deviations and action: The native sample concentration not detected), and spike added concentration 50 ug/L. This he specified concentration for spike addition. Associated re flagged as estimated (UJ or J), with indeterminate bias.	- - -		
2.	Was the P	VS analysis performed on a field sample ?		X	
	If No, qual	ify all associated samples.			
3. a.	Did the PV	'S recovery for Cr +6 meet the criteria of 85 - 115%?		X	
	If No, list a	action:	-		
3. b.	If the % rethe aliquot	covery was less than 85% did the laboratory re-spike and re-ar	nalyze	n/a	
	If No, list a	ection :	-		
	Did the %	recovery for the reanalysis meet the criteria of 85 - 115% ?	-	n/a	
	If No, list a	ction:	-		
5.	Show calc	ulation for PVS % recovery for Cr +6.		_	
	Lab spiked Lab un-spi	: 04283-001_d sample value :			
		ated value = 98.0 % recovery 1 - Unspiked) / Spike Added x 100)			
		Lab value : % recovery			
		Verified ?yes			
6.	Specific co	omments :			

Duplicate Analysis for Hexavalent Chromium

Duplica	te analysis performed on sample : 04283-001			Matrix:	Water
				Units:	ug/L
Associate	d samples : All aqueous SDG samples.				
				YES	<u>NO</u>
1.	Was the duplicate analysis performed at the correct frequen	ncy?		Х	
	If No, note deviations and action :				
2.	Was the duplicate analysis performed on a field sample?			X]
	If No, qualify all associated samples.				
3.	Did the duplicate results for Cr +6 meet the QC control limits (20% RPD for all Aqueous samples & Non-aqueous > or = (+ / - 2 ppm for Non-aqueous samples if either or both are	8 ppm)		Х	
	If No, list action :				
4.	Show calculation for % RPD for Cr+6.				
	Sample ID: 04283-001	Sample ID: _		_	
	Lab sample value : 49 ug/L Lab duplicate value : 50 ug/L	Lab sample v Lab duplicate			_ug/L _ug/L
	Calculated value = 2.0 % RPD	Calculated va	alue =	#DIV/0!	_ % RPD
	% RPD = Sample - Duplicate x 100 (Sample + Duplicate)/2	% RPD =(Duplicate Duplicate)/2	_ x 100
5.	Specific comments :				_
					_
	·				_

Sample Result Verification for Hexavalent Chromium

ssociated	samples : All SDG samples	
1.	Were all samples reported within the calibration range? If No, list affected samples and action :	YES NO
2.	Was the raw data free of any anomalies ? If No, list affected samples and action :	X
3.	Was the data package free of any computational or transcription errors ? If No, list affected samples and action :	X
4.	Were 7196A pH readings provided for all samples, and within the method required range ? (Method 7196A : all analytical solutions must be adjusted to pH 1.6 - 2.2)	X
5	If No, list affected samples and action : Verify that aqueous samples were correctly reported by recalculating the restlem that advantage in a sample. Sample ID Sample result, wet: 0.0951 mg/L	sult for : <u>04283-005</u>
	Lab value Calculated value =	= 2.38 mg/L
mple C	curve mg/L dilution onc., mg/L = 0.09511 25 = 2.378 mg/L	Result verified ? Yes

27 August, 2011

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: Morris Canal, Laboratory Case NO. E11- 04546

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: Morris Canal

Fractions

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

Case No.: E11-04546 Matrix: Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr⁺⁶) samples were analyzed using SW-846 method 7196A.

The laboratory deliverables initially provided did not contain raw QC or calibration / sample results. An expanded report was requested from the laboratory and received on 08/25/2011.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Page 1 of 3 EQA, Inc. @BCL@040D0B8A.doc

Dresdner-Robin Mr. John Tregidgo 27 August, 2011

Sample ID	Lab ID		Date	Analysis	Cr+6	Cr+6
Client	04546-	Matrix	Collected	Hex Cr	Date Rec'd	RunDate
MW-10-1	001	A	05/09/11	X	05/09/11	05/10/11
REP050911	002	A	05/09/11	X	05/09/11	05/10/11
FB050911	003	A	05/09/11	X	05/09/11	05/10/11

A = Aqueous Matrix

Total Samples = 3

Samples were received on the same day as collection. Samples were received on ice at recorded temperature of 4°C.

<u>SECTION C</u> Hexavalent Chromium

Holding times from sample collection to analysis (\leq 24 hours for aqueous matrix) were met for all samples.

All calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, duplicate precision, and post-spike recovery. Reported spike recovery, duplicate precision values and reported Cr⁺⁶ results were randomly verified from the raw data with no disparities between reported and calculated results found.

For the aqueous spike sample, the spike added concentration should be the greater of 30 ug/L or 2x the native sample concentration. In this case, the native (unspiked) sample Cr^{+6} concentration was ND (not detected), and the sample was spiked with 50 ug/L.

QA Action:

• Qualify reported Cr⁺⁶ results for all SDG samples ('UJ' or 'J'), as quantitatively estimated RL values or estimated values; bias direction is indeterminate.

Cr⁺⁶ was not detected in Field Blank FB050911.

REP050911 was identified as a field duplicate of MW-10-1. Hexavalent chromium was reported as not-detected in both collocated samples.

SECTION D pH / Eh (ORP)

No information regarding pH / Eh measurements were found in the deliverables forwarded to the reviewer. Therefore, the reviewer is unable to determine reductive or oxidative characteristics of the samples. These values are only used for data assessment purposes when Cr⁺⁶ sample spike recoveries are outside acceptable recovery ranges; reported spike recoveries were within specified limits.

<u>SECTION E</u> Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

Page 3 of 3 EQA, Inc. @BCL@040D0B8A.doc

HEXCR - 1 Page 1 of 8

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code:n/a	
Location:	Site Manager: n/a	
Laboratory Name : IAL	Lead Division / Bureau: n/a	
Reviewer : Chris Taylor	Methodology: 7196A	
Date of Review: 08/15/11 08/27/11	SDG No.: <u>E11-04546</u>	
Analysis for Hexavalent Chromium by Method :	See Above	
Yes No A. Permanently Bound ? n/a	F. Non-Conformance Summary ? Yes No	
B. Paginated?	G. Methodology Review?	
C. Title Page ?	H. Uninitialed Strikeover?	
D. Table of Contents?	I. Legible Xerox ?	
E. Chain of Custody?	J. Consistent Dates ?	
Describe any deviations from requirements :	The initial data deliverables package did not contain raw QC or	
	calibration results. An expanded deliverables package was received	
	on 08/25/11.	

HEXCR - 2 Page 2 of 8

Holding Times for Hexavalent Chromium

Site Name : Morris Canal	Laboratory Name : IAL
	
Reviewer: Chris Taylor	Date of Review: 8/15/2011

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	X		Sample	Analysis	Time	QA
04546-		Matrix	Collection	Date	Exceeded	Decision
04546-	001	Α	05/09/11	05/10/11	0	ACCEPT
04546-	002	А	05/09/11	05/10/11	0	ACCEPT
04546-	003	Α	05/09/11	05/10/11	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp: 4° C
Preservation:
Handling Time:

HEXCR - 3 Page 3 of 8

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; $r^{^2} > 0.995$?) If No, explain and list action :	YES X
Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action:	X
Was the same CCS concentration used throughout the analysis ? If No, list action :	X
Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :	X
Show calculation for the % recovery of Hexavalent Chromium in the CCS standard	d.
Lab CCS value : 0.4998 mg/L Lab value : 100 True CCS value : 0.500 mg/L Calculated value = (Lab / True x 100) 100.0	% recovery
Specific comments :	
Initial calibration was performed on 05/10/11 (H $_2$ O).	

HEXCR - 4 Page 4 of 8

Calibration Blanks for Hexavalent Chromium

sociate	d samples : All SDG samples		
		<u>YES</u>	<u>NO</u>
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	X	
	If No, list action :		
2.	Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes X	
	If No, list action :		
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL ?	Yes X	
	If No, list action :		
4.	Specific comments :		

HEXCR - 5a Page 5 of 8

Preparation / Reagent Blank Summary for Hexavalent Chromium

	fo	r Hexavale	nt Chromium			
Associated sample matrix :	<u>Soil</u>	<u>Water</u> X	Preparation	/ Reagent Blank ID :	PrepBlank	
Check one (X) Units :	mg/Kg	mg/L X			<u>Yes</u>	<u>No</u>
Did the frequency of the preparation	/ reagent bla	ınk analysis	meet method	I requirements?	X	
If No, explain and note a	If No, explain and note action :					
					<u> </u>	
						1
CONCENTRATION	Yes	< or = MDL	- No	COMMEN	TS / ACTION	
U						
Associated samples : <u>All SDG aq</u> ı	No :	< or = MDL > MDL				

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS	analysis pe	erformed on sample	(s): <u>0456</u>	64-001		Matrix:	Water	
		_				Units:	ug/L	
ssociated	samples :	All aqueous SDG	samples					
							VE0.	NO
							<u>YES</u>	<u>NO</u>
1.		VS analysis perform concentration? (for						Х
	(for soil, 40) mg/Kg or 2x samp	ole, w/e is >)					
	was 'ND' (leached street)	deviations and acti not detected), and s ne specified concer re flagged as estim	spike added atration for s	pike addition. A	50 ug/L. This Associated	- - -		
2.	Was the P	VS analysis perforn	ned on a fiel	ld sample ?			X	
	If No, qual	ify all associated sa	imples.					
3. a.	Did the PV	'S recovery for Cr +	6 meet the	criteria of 85 -	115% ?		Х	
	If No, list a	ction :				-		
3. b.	If the % re the aliquot	covery was less tha ?	ın 85% did t	he laboratory r	e-spike and re-ar	nalyze	n/a	
	If No, list a	ction:				-		
	Did the %	recovery for the rea	nalysis mee	et the criteria of	85 - 115% ?	-	n/a	
	If No, list a	ction:				-		
5.	Show calc	ulation for PVS % r	ecovery for	Cr +6.			_	
	Lab spiked Lab un-spi	: 04564-001 I sample value : ked sample value : ed concentration :	1	51 ug/L ND ug/L 50 ug/L				
		ated value = 10 I - Unspiked) / Spik		covery 100)				
		Lab value : 10	2.0 % re	covery				
		Verified ?y	es					
6.	Specific co	omments :						
		_						

Duplicate Analysis for Hexavalent Chromium

Duplicate	e analysis performed on sample : 04564-001		Matrix:	Water
			Units:	ug/L
Associated	samples : All aqueous SDG samples			
			<u>YES</u>	<u>NO</u>
1.	Was the duplicate analysis performed at the correct frequer	ncy?	X	7
	If No, note deviations and action :			_
2.	Was the duplicate analysis performed on a field sample?		Х]
	If No, qualify all associated samples.			_
3.	Did the duplicate results for Cr +6 meet the QC control limits	s?	X]
	(20% RPD for all Aqueous samples & Non-aqueous > or = (+ / - 2 ppm for Non-aqueous samples if either or both are			_
	If No, list action :			
4.	Show calculation for % RPD for Cr+6.			
	Sample ID: <u>04564-001</u>	Sample ID:		
	Lab sample value :51ug/L Lab duplicate value :53ug/L	Lab sample value Lab duplicate val		_ug/L ug/L
	Calculated value = 3.85 % RPD	Calculated value	= #DIV/0!	% RPD
	% RPD = Sample - Duplicate x 100		mple - Duplicate	_ x 100
	(Sample + Duplicate)/2	(Sar	nple + Duplicate)/2	
5.	Specific comments :			_
				_
				_

Sample Result Verification for Hexavalent Chromium

Associated	d samples :	All SDG sam	ples						
1.		mples reported ected samples		ibration rar	nge?			YES X	<u>NO</u>
2.		v data free of a		?			[X	
3.		a package free		outational o	r transcriptio	n errors ?	· [X	
4.	required ran (Method 71	96A : all analyt	ical solutions				[X	
5	Verify that a	ected samples queous sample Chromium in a ult, wet:	es were corre	ctly reporte mg/L	ed by recalcu		ult for 04564-001 0.051	S mg/L	
Sample C	conc., mg/L =	curve mg/L 0.05095	dilution 1	=	0.051 mg/L	lated value =		mg/L	Yes

15 August, 2011

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: Morris Canal, Laboratory Case NO. E11- 05682

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: Morris Canal (Berry Lane)

Fractions

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

Case No.: E11-05682 Matrix: Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr⁺⁶) samples were analyzed using SW-846 method 7196A.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Dresdner-Robin Mr. John Tregidgo 15 August, 2011

Sample ID	Lab ID		Date	Analysis	Cr+6	Cr+6
Client	05682-	Matrix	Collected	Hex Cr	Date Rec'd	RunDate
MW-8-1	001	A	06/10/11	X	06/10/11	06/10/11
MW-7-2	002	A	06/10/11	X	06/10/11	06/10/11
MW-10-1	003	A	06/10/11	X	06/10/11	06/10/11
FB061011	004	A	06/10/11	Χ	06/10/11	06/10/11

A = Aqueous Matrix

Total Samples = 4

Samples were received on the same day as collection. Samples were received on ice at recorded temperature of 4°C.

<u>SECTION C</u> Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix) were met for all samples.

All calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, duplicate precision, and post-spike recovery. Reported spike recovery, duplicate precision values and reported Cr⁺⁶ results were randomly verified from the raw data with no disparities between reported and calculated results found.

For the aqueous spike sample, the spike added concentration should be the greater of 30 ug/L or 2x the native sample concentration. In this case, the native (unspiked) sample Cr^{+6} concentration was ND (not detected), and the sample was spiked with 500 ug/L.

QA Action:

• Qualify reported Cr⁺⁶ results for all SDG samples ('UJ' or 'J'), as quantitatively estimated RL values or estimated values; bias direction is indeterminate.

Cr⁺⁶ was not detected in Field Blank FB061011.

No collocated field duplicate samples were identified for this sample group.

SECTION D pH / Eh (ORP)

No information regarding pH / Eh measurements were found in the deliverables forwarded to the reviewer. Therefore, the reviewer is unable to determine reductive or oxidative characteristics of the samples. These values are only used for data assessment purposes when Cr⁺⁶ sample spike recoveries are outside acceptable recovery ranges; reported spike recoveries were within specified limits.

<u>SECTION E</u> Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

Page 3 of 3 EQA, Inc. @BCL@040DBC8B.doc

HEXCR - 1 Page 1 of 8

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code:n/	<u>a</u>
Location:	Site Manager: n/a	
Laboratory Name : IAL	Lead Division / Bureau: n/a	
Reviewer : Chris Taylor	Methodology:719	6A
Date of Review:08/13/11	SDG No.: <u>E11-0</u>	5682
Analysis for Hexavalent Chromium by Method :	See Above	
Yes No A. Permanently Bound ? n/a	F. Non-Conformance Summary?	Yes No
B. Paginated?	G. Methodology Review?	X
C. Title Page ?	H. Uninitialed Strikeover?	X
D. Table of Contents ? X	I. Legible Xerox?	X
E. Chain of Custody?	J. Consistent Dates ?	X
Describe any deviations from requirements :		

HEXCR - 2 Page 2 of 8

Holding Times for Hexavalent Chromium

Site Name : Morris Canal	Laboratory Name : IAL
Reviewer : Chris Taylor	Date of Review: 8/13/2011

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	Χ		Sample	Analysis	Time	QA
05682-		Matrix	Collection	Date	Exceeded	Decision
05682-	001	А	06/10/11	06/10/11	0	ACCEPT
05682-	002	Α	06/10/11	06/10/11	0	ACCEPT
05682-	003	Α	06/10/11	06/10/11	0	ACCEPT
05682-	004	Α	06/10/11	06/10/11	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp: 4° C
Preservation:
Handling Time:

HEXCR - 3 Page 3 of 8

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r^2 >0.995 ?) If No, explain and list action :	YES X
Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action:	X
Was the same CCS concentration used throughout the analysis ? If No, list action :	X
Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :	X
Show calculation for the % recovery of Hexavalent Chromium in the CCS standard.	
Lab CCS value : 0.5001 mg/L Lab value : 100 True CCS value : 0.500 mg/L Calculated value = (Lab / True x 100) 100.0	% recovery
Specific comments :	
Initial calibration was performed on 06/10/11 (H_2 O).	

HEXCR - 4 Page 4 of 8

Calibration Blanks for Hexavalent Chromium

sociate	d samples : All SDG samples		
		<u>YES</u>	<u>NO</u>
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	Х	
	If No, list action :		
2.	Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes	
	If No, list action :		
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL?	Yes	
	If No, list action :		
4.	Specific comments :		
4.	Specific comments :		

HEXCR - 5a Page 5 of 8

Preparation / Reagent Blank Summary for Hexavalent Chromium

	fo	r Hexavale	nt Chromium			
Associated sample matrix : Check one (X)	<u>Soil</u>	<u>Water</u> X	Preparation	/ Reagent Blank ID :	PrepBlank	
Units:	<u>mg/Kg</u> / reagent bla	<u>mg/L</u> X nk analysis	meet method	I requirements ?	Yes X	<u>No</u>
If No, explain and note a	ction :				<u> </u>	
					_	
CONCENTRATION	Yes	< or = MDI	= No	COMMEN	ITS / ACTION	
U						
Associated samples : <u>All SDG aq</u> u	No :	< or = MDL > MDL amples.	-			

HEXCR - 7

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

analysis pe	formed on sample(s) : <u>05682-002</u>		Matrix:	Water	
	-		Units:	ug/L	
samples :	All aqueous SDG samples				
				<u>YES</u>	<u>NO</u>
					Х
	,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Was the P	/S analysis performed on a field sample?			Х	
If No, qual	y all associated samples.				
Did the PV	S recovery for Cr +6 meet the criteria of 85	- 115% ?		X	
If No, list a	etion :				
	· · · · · · · · · · · · · · · · · · ·	re-spike and re-an	alyze	n/a	
If No, list a	etion :				
Did the %	ecovery for the reanalysis meet the criteria	of 85 - 115% ?		n/a	
If No, list a	etion :				
Show calc	lation for PVS % recovery for Cr +6.	-		_	
Sample ID	05682-002				
	Lab value : 98.6 % recovery				
	Verified ?yes				
Specific co	mments :				
	samples: Was the P\ the proper of (for soil, 40) If No, note was 'ND' (note was	Was the PVS analysis performed at the correct frequent the proper concentration? (for H ₂ O, 30 ug/L or 2x sample for soil, 40 mg/Kg or 2x sample, w/e is >) If No, note deviations and action: The native sample was 'ND' (not detected), and spike added concentration exceeds the specified concentration for spike addition. samples are flagged as estimated (UJ or J), with indeted was the PVS analysis performed on a field sample? If No, qualify all associated samples. Did the PVS recovery for Cr +6 meet the criteria of 85 did the laboratory the aliquot? If No, list action: Did the % recovery was less than 85% did the laboratory the aliquot? If No, list action: Did the % recovery for the reanalysis meet the criteria did the spiked sample value: Show calculation for PVS % recovery for Cr +6. Sample ID: 05682-002 Lab spiked sample value: 493 ug/L Lab un-spiked sample value: ND ug/L Spike added concentration: 500 ug/L Calculated value = 98.6 % recovery (Spiked - Unspiked) / Spike Added x 100) Lab value: 98.6 % recovery	Was the PVS analysis performed at the correct frequency and at the proper concentration ? (for H ₂ O, 30 ug/L or 2x sample, w/e is >) (for soil, 40 mg/Kg or 2x sample, w/e is >) If No, note deviations and action: The native sample concentration was 'ND' (not detected), and spike added concentration 500 ug/L. This exceeds the specified concentration for spike addition. Associated samples are flagged as estimated (UJ or J), with indeterminate bias. Was the PVS analysis performed on a field sample? If No, qualify all associated samples. Did the PVS recovery for Cr +6 meet the criteria of 85 - 115%? If No, list action: If the % recovery was less than 85% did the laboratory re-spike and re-anthe aliquot? If No, list action: Did the % recovery for the reanalysis meet the criteria of 85 - 115%? If No, list action: Show calculation for PVS % recovery for Cr +6. Sample ID: 05682-002 Lab spiked sample value: 493 ug/L Lab un-spiked sample value: ND ug/L Spike added concentration: 500 ug/L Calculated value = 98.6 % recovery (Spiked - Unspiked) / Spike Added x 100) Lab value: 98.6 % recovery Verified? yes	Was the PVS analysis performed at the correct frequency and at the proper concentration? (for H ₂ O, 30 ug/L or 2x sample, w/e is >) If No, note deviations and action: The native sample concentration was 'ND' (not detected), and spike added concentration 500 ug/L. This exceeds the specified concentration for spike addition. Associated samples are flagged as estimated (UJ or J), with indeterminate bias. Was the PVS analysis performed on a field sample? If No, qualify all associated samples. Did the PVS recovery for Cr +6 meet the criteria of 85 - 115%? If No, list action: If the % recovery was less than 85% did the laboratory re-spike and re-analyze the aliquot? If No, list action: Did the % recovery for the reanalysis meet the criteria of 85 - 115%? If No, list action: Show calculation for PVS % recovery for Cr +6. Sample ID: 05682-002 Lab spiked sample value: 493 ug/L Lab un-spiked sample value: 100 ug/L Spike added concentration: 100 ug/L Calculated value = 98.6 % recovery (Spiked - Unspiked) / Spike Added x 100) Lab value: 98.6 % recovery Verified? yes	Samples: All aqueous SDG samples YES Was the PVS analysis performed at the correct frequency and at the proper concentration? (for H ₂ O, 30 ug/L or 2x sample, w/e is >) (for soil, 40 mg/Kg or 2x sample, w/e is >) If No, note deviations and action: The native sample concentration was YD/ (not detected), and spike added concentration 500 ug/L. This exceeds the specified concentration for spike addition. Associated samples are flagged as estimated (UU or J), with indeterminate bias. Was the PVS analysis performed on a field sample? If No, qualify all associated samples. Did the PVS recovery for Cr +6 meet the criteria of 85 - 115%? If No, list action: If the % recovery was less than 85% did the laboratory re-spike and re-analyze the aliquot? If No, list action: Did the % recovery for the reanalysis meet the criteria of 85 - 115%? If No, list action: Show calculation for PVS % recovery for Cr +6. Sample ID: 05682-002 Lab spiked Sample value: 493 ug/L Lab un-spiked sample value: 493 ug/L Lab un-spiked sample value: ND ug/L Spike added concentration: 500 ug/L Calculated value = 98.6 % recovery (Spiked - Unspiked) / Spike Added x 100) Lab value: 98.6 % recovery Verified? yes

Duplicate Analysis for Hexavalent Chromium

Duplicate	analysis performed on sample : 05682-002		latrix:	Water
		_ (Jnits :	ug/L
Associated	samples : All aqueous SDG samples			
			YES	NO
1.	Was the duplicate analysis performed at the correct frequency?		X	
	If No, note deviations and action :			!
		-		
		_		
2.	Was the duplicate analysis performed on a field sample ?	-	X	
	If No, qualify all associated samples.			
3.	Did the duplicate results for Cr +6 meet the QC control limits? (20% RPD for all Aqueous samples & Non-aqueous > or = 8 ppm) (+ / - 2 ppm for Non-aqueous samples if either or both are < 8.0 ppm)		X	
	If No, list action :	_		
		-		
4.	Show calculation for % RPD for Cr+6.	-		
	Sample ID: <u>05682-002</u> Sample ID:			
	Lab sample value : 493 ug/L Lab sample Lab duplicate value : 490 ug/L Lab duplicate			ug/L ug/L
	Calculated value = 0.61 % RPD Calculated	value = #	OIV/0!	% RPD
	% RPD = Sample - Duplicate x 100 % RPD = (Sample + Duplicate)/2	Sample - Dupl (Sample + Dupl		x 100
5.	Specific comments :			

Sample Result Verification for Hexavalent Chromium

Associate	d samples :	All SDG sam	ples						
1.	Were all sa	mples reported	within the ca	libration ran	ae?			<u>YES</u>	<u>NO</u>
		fected samples					[X	
2.	Was the rav	w data free of a	any anomalies	;?			[Х	
	If No, list aff	fected samples	and action :						
3.	Was the da	ta package fre	e of any comp	outational or	r transcriptio	n errors ?	[X	
	If No, list aff	fected samples	and action :						
4.	required rar	A pH readings nge ? 96A : all analy					[X	
	If No, list aff	fected samples	and action :						
5		aqueous sampl Chromium in a		ctly reporte	d by recalcu	lating the result			
	Sample res	ult, wet :	0.5898	mg/L		Sample ID: 0	1.18	mg/L	
					Calcu	lated value =	1.18	mg/L	
Sample C	Conc., mg/L =	curve mg/L 0.58976	dilution 2	=	1.180 mg/L		Resu	It verified?	Yes

15 August, 2011

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: Morris Canal, Laboratory Case NO. E11- 05759

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: Morris Canal (Berry Lane)

Fractions

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

Case No.: E11-05759 Matrix: Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr⁺⁶) samples were analyzed using SW-846 method 7196A.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Dresdner-Robin Mr. John Tregidgo 15 August, 2011

Sample ID	Lab ID		Date	Analysis	Cr+6	Cr+6
(Client)	05759-	Matrix	Collected	Hex Cr	Date Rec'd	RunDate
MW-10-1-D	001	A	06/13/11	X	06/13/11	06/14/11
MW-3-2	002	A	06/13/11	X	06/13/11	06/14/11
MW-5-1	003	A	06/13/11	X	06/13/11	06/14/11
MW-9-1	004	A	06/13/11	X	06/13/11	06/14/11
FB061311	005	A	06/13/11	X	06/13/11	06/14/11

A = Aqueous Matrix

Total Samples = 5

Samples were received on the same day as collection. Samples were received on ice at recorded temperature of 4°C.

SECTION C Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix) were met for all samples.

All calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, duplicate precision, and post-spike recovery. Reported spike recovery, duplicate precision values and reported Cr⁺⁶ results were randomly verified from the raw data with no disparities between reported and calculated results found.

For the aqueous spike sample, the spike added concentration should be the greater of 30 ug/L or 2x the native sample concentration. In this case, the native (unspiked) sample Cr⁺⁶ concentration was ND (not detected), and the sample was spiked with 500 ug/L.

QA Action:

• Qualify reported Cr⁺⁶ results for all SDG samples ('UJ' or 'J'), as quantitatively estimated RL values or estimated values; bias direction is indeterminate.

Cr⁺⁶ was not detected in Field Blank FB061311.

No collocated field duplicate samples were identified for this sample group.

SECTION D pH / Eh (ORP)

No information regarding pH / Eh measurements were foundfin the deliverables forwarded to the reviewer. Therefore, the reviewer is unable to determine reductive or oxidative characteristics of the samples. These values are only used for data assessment purposes when Cr⁺⁶ sample spike recoveries are outside acceptable recovery ranges; reported spike recoveries were within specified limits.

<u>SECTION E</u> Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

HEXCR - 1 Page 1 of 8

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code:n/a	
Location:	Site Manager: n/a	
Laboratory Name : <u>IAL</u>	Lead Division / Bureau: n/a	
Reviewer : Chris Taylor	Methodology: 7196A	
Date of Review: 08/13/11	SDG No.: <u>E11-05759</u>	
Analysis for Hexavalent Chromium by Method :	See Above	
Yes No A. Permanently Bound ? n/a	F. Non-Conformance Summary ?	Yes No
B. Paginated?	G. Methodology Review?	X
C. Title Page ?	H. Uninitialed Strikeover?	X
D. Table of Contents ? X	I. Legible Xerox?	X
E. Chain of Custody?	J. Consistent Dates ?	Х
Describe any deviations from requirements :		

HEXCR - 2 Page 2 of 8

Holding Times for Hexavalent Chromium

Site Name : Morris Canal	Laboratory Name : IAL
Reviewer : Chris Taylor	Date of Review: 8/13/2011

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	Χ		Sample	Analysis	Time	QA
05759-		Matrix	Collection	Date	Exceeded	Decision
05759-	001	Α	06/13/11	06/14/11	0	ACCEPT
05759-	002	Α	06/13/11	06/14/11	0	ACCEPT
05759-	003	Α	06/13/11	06/14/11	0	ACCEPT
05759-	004	Α	06/13/11	06/14/11	0	ACCEPT
05759-	005	Α	06/13/11	06/14/11	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp:	4° C
Preservation:	
Handling Time:	

HEXCR - 3 Page 3 of 8

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

1.	Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r^2 >0.995 ?) If No, explain and list action :	YES N
2.	Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action:	X
3.	Was the same CCS concentration used throughout the analysis ? If No, list action :	X
l.	Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :	X
5.	Show calculation for the % recovery of Hexavalent Chromium in the CCS standard.	
	Lab CCS value : 0.4947 mg/L Lab value : 99 True CCS value : 0.500 mg/L Calculated value = (Lab / True x 100) 98.9	% recovery
5.	Specific comments :	
	Initial calibration was performed on 06/14/11 (H ₂ O).	

HEXCR - 4 Page 4 of 8

Calibration Blanks for Hexavalent Chromium

ssociate	d samples : All SDG samples		
		<u>YES</u>	<u>NO</u>
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	X	
	If No, list action :		
		Yes	
2.	Was a calibration blank analyzed after each calibration check standard (CCS)?	X	
	If No, list action :		
		Yes	
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL?	X	
	If No, list action :		
4.	Specific comments :		

HEXCR - 5a Page 5 of 8

Preparation / Reagent Blank Summary for Hexavalent Chromium

	fo	r Hexavale	nt Chromium			
Associated sample matrix:	<u>Soil</u>	<u>Water</u> X	Preparation .	/ Reagent Blank ID :	PrepBlank	
Check one (X) Units : Did the frequency of the preparation	<u>mg/Kg</u> / reagent bla	mg/ <u>L</u> X ank analysis	meet method	I requirements ?	Yes X	<u>No</u>
If No, explain and note a	action:					
CONCENTRATION	V	< or $=$ MDL		COMMEN	ITO / A OTION	
CONCENTRATION U	Yes		No	COMMEN	ITS / ACTION	
0						
MDL Codes Yes: < or = MDL No: > MDL Associated samples: All SDG aqueous Cr ⁺⁶ samples.						

HEXCR - 7 Page 6 of 8

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS	analysis pe	erformed on sample(s) : <u>05759-001</u>	Matrix:	Water	
		_	Units:	ug/L	
ssociated	samples :	All aqueous SDG samples			
				<u>YES</u>	<u>N</u>
1.		VS analysis performed at the correct frequency and at)
		concentration? (for H2O, 30 ug/L or 2x sample, w/e is >) 0 mg/Kg or 2x sample, w/e is >)			
	(101 5011, 40	o flig/kg of 2x sample, w/e is >)			
		deviations and action : The native sample concentration			
		not detected), and spike added concentration 500 ug/L. This he specified concentration for spike addition. Associated			
		re flagged as estimated (UJ or J), with indeterminate bias.			
2.	Was the P	VS analysis performed on a field sample ?		X	
	If No. gual	ify all associated samples.			
	·				
3. a.	Did the PV	S recovery for Cr +6 meet the criteria of 85 - 115%?		X	
	If No, list a	action:			
3. b.	If the 0/ re	covery was less than 950/ did the laboratory re-spike and re-sp	olyzo		
3. D.	the aliquot	covery was less than 85% did the laboratory re-spike and re-an	aıyze	n/a	
	•				
	If No, list a	action:			
	-				
	Did the %	recovery for the reanalysis meet the criteria of 85 - 115% ?		n/a	
	If No, list a	action :			
	II INO, IISI a				
	-				
5.	Show calc	ulation for PVS % recovery for Cr +6.		_	
	Sample ID	9: 05759-001			
	•	d sample value : 491 ug/L			
	Lab un-spi	iked sample value : ND ug/L			
	Spike add	ed concentration:500ug/L			
	Calcula	ated value = 98.2 % recovery			
		d - Unspiked) / Spike Added x 100)			
		Lab value : 98.2 % recovery			
		Verified ? yes			
					
6.	Specific co				

Duplicate Analysis for Hexavalent Chromium

Duplica	te analysis performed on sample : 05759-001 S		Matrix : Water
			Units: ug/L
Associate	d samples : All aqueous SDG samples		
			YES NO
1.	Was the duplicate analysis performed at the correct	frequency?	X
	If No, note deviations and action :		
2.	Was the duplicate analysis performed on a field sam	pple ?	Х
	If No, qualify all associated samples.		
3.	Did the duplicate results for Cr +6 meet the QC conti	rol limits ?	Х
	(20% RPD for all Aqueous samples & Non-aqueous (+ / - 2 ppm for Non-aqueous samples if either or bo	s > or = 8 ppm)	
	If No, list action :		
4.	Show calculation for % RPD for Cr+6.		
	Sample ID: 05759-001 S	Sample ID:	
	Lab sample value : 491 ug/L Lab duplicate value : 495 ug/L	Lab sample value : Lab duplicate value :	 ug/L ug/L
	<u> </u>	·	
	Calculated value = 0.81 % RPD	Calculated value =	#DIV/0! % RPD
	$\% RPD = \frac{Sample - Duplicate}{(Sample + Duplicate)/2} \times 100$	% RPD = <u>Sample</u> (Sample	e - Duplicate x 100 + Duplicate)/2
5.	Specific comments :		

Sample Result Verification for Hexavalent Chromium

SSOCIALEC	d samples :	All SDG sam	ples						
								<u>YES</u>	<u>NO</u>
1.		mples reported		libration rar	ige?			X	
	If No, list af	fected samples	and action :						
2.	Was the rav	w data free of a	any anomalies	s?			•	X	
	If No, list af	fected samples	and action:						
3.	Was the da	ta package fre	o of any com	outational o	r transcriptio	an arrore 2		Х	
3.		fected samples		outational o	i iianscripiid	in enois :		^	
	ii ivo, iist aii	rected samples	and action.						
4.	required rar	A pH readings nge ? 196A : all analy						X	
	If No, list af	fected samples	and action :						
5		aqueous sample Chromium in a		ctly reporte	d by recalcu	-			
	Sample res	ult, wet :	0.4910	mg/L		Sample ID:		_	
						Lab value :	0.491	_ mg/L	
					Calcu	ılated value =	0.491	_ mg/L	
mple Ce	onc., mg/L =	curve mg/L 0.49095	dilution 1	=	0.491		Res	ult verified?	Yes

15 August, 2011

Dresdner-Robin Environmental Management Att: Mr. John Tregidgo, Project Manager 371 Warren Street Jersey City, New Jersey 07302

Re: Morris Canal, Laboratory Case NO. E11- 05788

Dear Mr. Tregidgo,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: Morris Canal (Berry Lane)

Fractions

Hexavalent chromium (Cr⁺⁶) Laboratory: Integrated Analytical Laboratories, LLC

Case No.: E11-05788 Matrix: Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

487 Shoddy Hollow Road Middletown, New York 10940

SECTION A Sample Information

The above-noted Case Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), Randolph, NJ (NJ Laboratory ID Cert. No. 14751). Hexavalent chromium (Cr⁺⁶) samples were analyzed using SW-846 method 7196A.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD) listed.

Page 1 of 3 EQA, Inc. @BCL@040D55C0.doc

Dresdner-Robin Mr. John Tregidgo 15 August, 2011

Sample ID	Lab ID		Date	Analysis	Cr+6	Cr+6
Client	05788-	Matrix	Collected	Hex Cr	Date Rec'd	RunDate
MW-7-1	001	A	06/14/11	X	06/14/11	06/15/11
MW-3-1	002	A	06/14/11	X	06/14/11	06/15/11
MW-5-2	003	A	06/14/11	X	06/14/11	06/15/11
MW-6-1	004	A	06/14/11	Χ	06/14/11	06/15/11
MW-12-1	005	A	06/14/11	Χ	06/14/11	06/15/11
REP061411	006	A	06/14/11	Χ	06/14/11	06/15/11
FB061411	007	A	06/14/11	Χ	06/14/11	06/15/11

A = Aqueous Matrix

Total Samples = 7

Samples were received on the same day as collection. Samples were received on ice at recorded temperature of 4° C.

<u>SECTION C</u> Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix) were met for all samples.

All calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, duplicate precision, and post-spike recovery. Reported spike recovery, duplicate precision values and reported Cr⁺⁶ results were randomly verified from the raw data with no disparities between reported and calculated results found.

For the aqueous spike sample, the spike added concentration should be the greater of 30 ug/L or 2x the native sample concentration. In this case, the native (unspiked) sample Cr^{+6} concentration was ND (not detected), and the sample was spiked with 500 ug/L.

QA Action:

• Qualify reported Cr⁺⁶ results for all SDG samples ('UJ' or 'J'), as quantitatively estimated RL values or estimated values; bias direction is indeterminate.

Cr⁺⁶ was not detected in Field Blank FB061411.

REP061411 was identified as a field duplicate of MW-12-1. Hexavalent chromium was reported as not-detected in both samples.

SECTION D pH / Eh (ORP)

No information regarding pH / Eh measurements were found in the deliverables forwarded to the reviewer. Therefore, the reviewer is unable to determine reductive or oxidative characteristics of the samples. These values are only used for data assessment purposes when Cr⁺⁶ sample spike recoveries are outside acceptable recovery ranges; reported spike recoveries were within specified limits.

<u>SECTION E</u> Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours, Environmental Quality Associates, Inc.

Chris W. Taylor Vice President

Page 3 of 3 EQA, Inc. @BCL@040D55C0.doc

HEXCR - 1 Page 1 of 8

Data Deliverable Requirements - Hexavalent Chromium

Site Name : Morris Canal	Job Code: <u>n/a</u>		
Location:	Site Manager: n/a		
Laboratory Name : IAL	Lead Division / Bureau: n/a		
Reviewer : Chris Taylor	Methodology: 7196A		
Date of Review: 08/15/11	SDG No.: <u>E11-05788</u>		
Analysis for Hexavalent Chromium by Method :	See Above		
Yes No A. Permanently Bound ? n/a	F. Non-Conformance Summary ?	Yes X	No
B. Paginated?	G. Methodology Review?	X	
C. Title Page ?	H. Uninitialed Strikeover?		Χ
D. Table of Contents ? X	I. Legible Xerox?	Х	
E. Chain of Custody?	J. Consistent Dates ?	Х	
Describe any deviations from requirements :			

HEXCR - 2 Page 2 of 8

Holding Times for Hexavalent Chromium

Site Name : Morris Canal	Laboratory Name : IAL
Reviewer · Chris Taylor	Date of Review: 8/15/2011

Check one:	(X)		Date of	Cr +6	Holding	
Lab ID	Χ		Sample	Analysis	Time	QA
05788-		Matrix	Collection	Date	Exceeded	Decision
05788-	001	Α	06/14/11	06/15/11	0	ACCEPT
05788-	002	Α	06/14/11	06/15/11	0	ACCEPT
05788-	003	А	06/14/11	06/15/11	0	ACCEPT
05788-	004	Α	06/14/11	06/15/11	0	ACCEPT
05788-	005	Α	06/14/11	06/15/11	0	ACCEPT
05788-	006	А	06/14/11	06/15/11	0	ACCEPT
05788-	007	Α	06/14/11	06/15/11	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp: 4° C	
Preservation:	
Handling Time:	
	_

HEXCR - 3 Page 3 of 8

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

	Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r ^{x²} >0.995 ?) If No, explain and list action :	<u>ES</u>	<u>N</u>
	Was the CCS analyzed at the proper frequency? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action:	<	
•	Was the same CCS concentration used throughout the analysis?	(
	If No, list action :		
	Does the CCS standard meet the QC requirements of 90 - 110% recovery ?	<	
	If No, list % recovery, and action :		
	Show calculation for the % recovery of Hexavalent Chromium in the CCS standard.		
	Lab CCS value :	overy	
	True CCS value :0.500mg/L		
	Calculated value = 98.7 (Lab / True x 100)		
	Specific comments :		
	Initial calibration was performed on 06/15/11 (H ₂ O).		

HEXCR - 4 Page 4 of 8

Calibration Blanks for Hexavalent Chromium

sociate	d samples : All SDG samples		
		<u>YES</u>	<u>NO</u>
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	X	
	If No, list action :		
		Yes	
2.	Was a calibration blank analyzed after each calibration check standard (CCS)?	X	
	If No, list action :		
		Yes	
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL?	X	
	If No, list action :		
4.	Specific comments :		

HEXCR - 5a Page 5 of 8

Preparation / Reagent Blank Summary for Hexavalent Chromium

	fo	r Hexavalei	nt Chromium			
Associated sample matrix : Check one (X)	<u>Soil</u>	Water X	Preparation	/ Reagent Blank ID :	PrepBlank	
Units :	mg/Kg	mg/L X			<u>Yes</u> X	<u>No</u>
Did the frequency of the preparation	/ reagent bla	ınk analysis	meet method	d requirements?	X	
If No, explain and note a	ction:				_	
				_		
CONCENTRATION	Yes	< or = MDL	- No	COMMEN	TS / ACTION	
U						
		< or = MDL > MDL				
Associated samples : All SDG aqu	ueous Cr ⁺⁶ sa	amples.				

HEXCR - 7

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS	analysis pe	erformed on sample(s) : <u>05788-001</u>	Matrix:	Water	
		_	Units:	ug/L	
ssociated	samples :	All aqueous SDG samples			
				\/FQ	NO
				<u>YES</u>	<u>NO</u>
1.	the proper	VS analysis performed at the correct frequency and at concentration? (for H ₂ O, 30 ug/L or 2x sample, w/e is >) mg/Kg or 2x sample, w/e is >)			Х
	If No, note was 'ND' (lexceeds the	deviations and action : The native sample concentration not detected), and spike added concentration 500 ug/L. This ne specified concentration for spike addition. Associated re flagged as estimated (UJ or J), with indeterminate bias.			
2.	Was the P	VS analysis performed on a field sample ?		X	
	If No, qual	ify all associated samples.			
3. a.	Did the PV	'S recovery for Cr +6 meet the criteria of 85 - 115%?		X	
	If No, list a	ction :			
3. b.	If the % re the aliquot	covery was less than 85% did the laboratory re-spike and re-ana?	alyze	n/a	
	If No, list a	ection :			
	Did the %	recovery for the reanalysis meet the criteria of 85 - 115%?		n/a	
	If No, list a	oction :			
5.	Show calc	ulation for PVS % recovery for Cr +6.		_	
	Lab spiked Lab un-spi	: 05788-001 I sample value : 496 ug/L ked sample value : ND ug/L ed concentration : 500 ug/L			
		ated value = 99.2 % recovery I - Unspiked) / Spike Added x 100)			
		Lab value : 99.2 % recovery			
		Verified ?yes			
6.	Specific co	omments :			

Duplicate Analysis for Hexavalent Chromium

Duplica	te analysis performed on sample : 05788-001 S		Matrix : Water
			Units: ug/L
Associate	d samples : All aqueous SDG samples		
			YES NO
1.	Was the duplicate analysis performed at the correc	t frequency?	X
	If No, note deviations and action :	· · ·	
2.	Was the duplicate analysis performed on a field sar	mple ?	X
	If No, qualify all associated samples.		
3.	Did the duplicate results for Cr +6 meet the QC cor	ntrol limits ?	X
	(20% RPD for all Aqueous samples & Non-aqueou (+ / - 2 ppm for Non-aqueous samples if either or b		
	If No, list action :		
4.	Show calculation for % RPD for Cr+6.		
	Sample ID: <u>05788-001</u> S	Sample ID:	
	Lab sample value :496ug/L Lab duplicate value :494ug/L	Lab sample value : Lab duplicate value :	ug/L ug/L
	Calculated value = 0.40 % RPD	Calculated value =	#DIV/0! % RPD
	% RPD = Sample - Duplicate x 100	% RPD = Sampl	
	(Sample + Duplicate)/2	(Sample	e + Duplicate)/2
5.	Specific comments :		

Sample Result Verification for Hexavalent Chromium

Associate	d samples :	All SDG sam	ples						
								<u>YES</u>	<u>NO</u>
1.	Were all sa	mples reported	within the ca	libration ran	nge?		[Х	
	If No, list aff	ected samples	and action :						
2.	Was the rav	v data free of a	any anomalies	s?			[X	
	If No, list aff	ected samples	and action :						
3.	Was the da	ta package fre	e of any comp	outational o	r transcriptio	n errors ?	[Х	
	If No, list aff	ected samples	and action :						
4.	required rar	A pH readings nge ? 96A : all analy					[Х	
	If No, list aff	ected samples	and action :						
5		iqueous sample Chromium in a		ctly reporte	d by recalcu				
	Sample res	ult, wet :	0.5784	mg/L		Sample ID: _ Lab value : _	14.46	mg/L	
					Calcu	lated value =	14.46	mg/L	
Sample C	Conc., mg/L =	curve mg/L 0.57835	dilution 25	=	14.459 mg/L		Resu	lt verified?	Yes