Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

Case Narrative

November 17, 2005

Subject:

Metals Maralco

Project No: 181705

Officer:

Norm Peck

By:

Dean Momohara

Summary

The samples were analyzed and/or digested using the following methods: EPA method 245.5 (CVAA) for the digestion and analysis of mercury (Hg), EPA method 1311 for the TCLP extraction, EPA 3010 for the TCLP extract digestion, 200.7 (ICP) for the analysis of the TCLP extract, EPA method 3050B and 200.8 (ICPMS) for the digestion and analysis of trace metals, respectively.

All analyses requested were evaluated by established regulatory quality assurance guidelines.

Sample Information

Samples were received by Manchester Environmental Laboratory on 11/02/05. All coolers were received at 18°C, above the proper temperature range of 0°C - 6°C. The samples were received in good condition. Four (4) samples were received and assigned laboratory identification numbers 444006 – 444009.

Holding Times

All analyses were performed within established EPA holding times.

Calibration

Instrument calibrations and calibration checks were performed in accordance with the appropriate method. All initial and continuing calibration checks were within control limits.

ICPMS and CVAA calibration correlation coefficients were within the acceptance range of 1.000 - 0.995. The instruments were calibrated with NIST traceable standards and verified to be in calibration with a second source NIST traceable standard. Soil drying oven temperatures were recorded before and after each analysis batch and were within acceptable limits.

Method Blanks

No analytically significant levels of analyte were detected in the method blanks associated with these samples.

Matrix Spikes

The matrix spike (MS) recoveries for nickel, copper, zinc, lead and chromium were not calculated. The standard spiking level was insufficient for the elevated concentration of analyte in the source sample and no action was taken.

The MS recoveries for antimony and beryllium were less than the lower acceptance limit, possibly due to matrix interference. The source sample results were qualified as estimates.

All other matrix spike recoveries were within the acceptance limits of 75% - 125%

Replicates

All duplicate relative percent differences were within the acceptance range of 0% - 20%.

Laboratory Control Samples

All laboratory control sample recoveries were within the acceptance limits of 85% - 115% for metals and 80% - 120% for Hg.

Other Quality Assurance Measures and Issues

All internal standard recoveries were within acceptance limits.

The samples were initially analyzed for priority pollutant metals. Since concentrations over the RCRW limit were observed for chromium (some samples had high levels of other RCRW metals) in all samples, the samples were TCLP extracted and analyzed. The concentration of mercury in the sample was less that the RCRW limit and the TCLP extracts were not analyzed for this metal.

U - The analyte was not detected at or above the reported result.

J - The analyte was positively identified. The associated numerical result is an estimate.

NC - Not Calculated

bold - The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Please call Dean Momohara at (360) 871-8808 to further discuss this project.

cc: Project File

Beryllium

	Project Name: Maralco		LIMS Project ID:	1817-05
	Project Officer: Norm Peck	Method: EPA200.8		
-	Date Reported: 11/14/05	Analyta Parilium		

Marie Constitution of the	SCHOOL STREET				or Janaanii			
Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
05444006		EB2D	Sediment/Soil	7.0	1	mg/Kg dw	10/19/05	11/09/05
05444007		EB7M	Sediment/Soil	.0.77	,	mg/Kg dw	10/20/05	11/09/05
05444008		EB9M	Sediment/Soil	0.97	J	mg/Kg dw	10/20/05	11/09/05
05444008		X1 (matrix spike)		70		%	10/20/05	11/09/05
2	LM	K2 (matrix spike)		70	•	%	10/20/05	11/09/05
05444009		EB16D	Sediment/Soil	1.60		mg/Kg dw	10/21/05	11/09/05
MB05312I		Lab BLNK	Sediment/Soil	0.10	U	mg/Kg dw		11/09/05
ML05312)	I	Lab LCS-	Sediment/Soil	104		%		11/09/05

Authorized By: Moline Release Date: 11/14/05 Page: 1

Washington State Department of Ecology Manchester Environmental Laboratory

Analysis Report for

Nickel

Project N	ame:	Maralco		,		LIMS Pro	ject ID: 18	17-05	
_	Project Officer: Norm Peck Date Reported: 11/14/05				Method: EPA200.8 Analyte: Nickel		•		
Sample QC Field ID		Matrix	Result	Qualifier	Units	Collected	Analyzed		
05444006		EB2D	Sediment/Soil	31.9		mg/Kg dw	10/19/05	11/09/05	
05444007		EB7M	Sediment/Soil	32.1		mg/Kg dw	10/20/05	11/09/05	
05444008		EB9M	Sediment/Soil	29.4		mg/Kg dw	10/20/05	11/09/05	
05444008	LM	K1 (matrix spike)	•		NC	%	10/20/05	11/09/05	
05444008	LM	K2 (matrix spike)			NC	%	10/20/05	11/09/05	
05444009		EB16D	Sediment/Soil	44.9		mg/Kg dw	10/21/05	11/09/05	
MB05312I	MB05312II Lab BLNK		Sediment/Soil	0.10	U.	mg/Kg dw		11/09/05	
ML053121	1	Lab LCS-	Sediment/Soil	101		%		11/09/05	

Release Date: 11/14/05 Authorized By: Mr- (mee Page: 1

Copper

Project N	lame: Maralco		2.0	LIMS Pro	ject ID: 18	17-05
Project Officer: Norm Peck Date Reported: 11/14/05			Method: EPA200.8 Analyte: Copper			
Sample	QC Field ID	Matrix	Result Qualifi	er Units	Collected	Analyzed
05444006	EB2D	Sediment/Soil	1330	mg/Kg dw	10/19/05	11/09/05
05444007	EB7M	Sediment/Soil	2110	mg/Kg dw	10/20/05	11/09/05
05444008	EB9M	Sediment/Soil	1150	mg/Kg dw	10/20/05	11/09/05
05444008	LMX1 (matrix spike)		NC	%	10/20/05	11/09/05

Sediment/Soil

Sediment/Soil

Sediment/Soil

NC

U

1330

0.10

101

mg/Kg dw

mg/Kg dw

10/20/05

10/21/05

11/09/05

11/09/05

11/09/05

11/09/05

Authorized By: M. Yones

05444008 LMX2 (matrix spike)

EB16D

Lab BLNK

Lab LCS-

05444009

MB05312I1

ML05312I1

Release Date:

11/14/05

Page: 1

Zinc

Project N	ame:	Maralco			1	LIMS Pro	ject ID: 18	17-05
_		r: Norm Peck l: 11/14/05		Method: El Analyte: Zi				
Sample QC Field ID		Matrix	Result	Qualifier	Units	Collected	Analyzed	
05444006		EB2D	Sediment/Soil	920	,	mg/Kg dw	10/19/05	11/09/05
05444007		EB7M	Sediment/Soil	1300		mg/Kg dw	10/20/05	11/09/05
05444008	!	EB9M	Sediment/Soil	720		mg/Kg dw	10/20/05	11/09/05
05444008	LM	X1 (matrix spike)			NC	%	10/20/05	11/09/05
05444008	LM	X2 (matrix spike)		•	NC	%	10/20/05	11/09/05
05444009		EB16D	Sediment/Soil	900		mg/Kg dw	10/21/05	11/09/05
MB053121	1	Lab BLNK	Sediment/Soil	5.0	U	mg/Kg dw		11/09/05
ML05312I1 Lab LCS-		Lab LCS-	Sediment/Soil	110		%		11/09/05

Authorized By: March Release Date: 11/14/05 Page: 1

Arsenic

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SECURIS	Project Name:	Maralco	•	LIMS Project ID:	1817-05

Project Officer: Norm Peck

Date Reported: 11/14/05

Method: EPA200.8

Analyte: Arsenic

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
05444006		EB2D	Sediment/Soil	0.86		mg/Kg dw	10/19/05	11/09/05
05444007		EB7M	Sediment/Soil	1.92		mg/Kg dw	10/20/05	11/09/05
05444008		EB9M	Sediment/Soil	2.18		mg/Kg dw	10/20/05	11/09/05
05444008	LM	K1 (matrix spike)		83		%	10/20/05	11/09/05
05444008	LM	K2 (matrix spike)		88		%	10/20/05	11/09/05
05444009		EB16D	Sediment/Soil	3.84		mg/Kg dw	10/21/05	11/09/05
MB05312I	1	Lab BLNK	Sediment/Soil	0.10	U	mg/Kg dw		11/09/05
ML053121	1	Lab LCS-	Sediment/Soil	104		%		11/09/05

Authorized By: M. Gover Release Date: 11/14/cs Page: 1

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Analysis Report for

Selenium

Project Nam	e: Maraico				LIMS Pro	ject in: 19	1/-05
Project Office Date Report	cer: Norm Peck ed: 11/14/05		Method: EPA200.8 Analyte: Selenium				
Sample QC	C Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
05444006	EB2D	Sediment/Soil	0.50	U	mg/Kg dw	10/19/05	11/09/05

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
05444006		EB2D	Sediment/Soil	0.50	U	mg/Kg dw	10/19/05	11/09/05
05444007		EB7M	Sediment/Soil	0.74		mg/Kg dw	10/20/05	11/09/05
05444008		EB9M	Sediment/Soil	0.60		mg/Kg dw	10/20/05	11/09/05
05444008	LM	X1 (matrix spike)		75		%	10/20/05	11/09/05
05444008	LM	X2 (matrix spike)		79		.%	10/20/05	11/09/05
05444009		EB16D	Sediment/Soil	0.59	•	mg/Kg dw	10/21/05	11/09/05
MB053121	1	Lab BLNK	Sediment/Soil	0.50	U	mg/Kg dw		11/09/05
ML05312	1	Lab LCS-	Sediment/Soil	110		%		11/09/05

Authorized By: M. Junes Release Date: 11/14/05 Page: 1

Silver

Project Name: Maralco LIMS Project ID: 1817-05

Project Officer: Norm Peck Method: EPA200.8

Date Reported: 11/14/05 Analyte: Silver

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Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed		
05444006		EB2D	Sediment/Soil	0.90		mg/Kg dw	10/19/05	11/09/05		
05444007		EB7M	Sediment/Soil	0.55		mg/Kg dw	10/20/05	11/09/05		
05444008		EB9M	Sediment/Soil	0.70		mg/Kg dw	10/20/05	11/09/05		
05444008	LM	X1 (matrix spike)		83		%	10/20/05	11/09/05		
05444008	LM	X2 (matrix spike)	•	83	-	%	10/20/05	11/09/05		
05444009	,	EB16D	Sediment/Soil	0.31	•	mg/Kg dw	10/21/05	11/09/05		
MB05312	[1	Lab BLNK	Sediment/Soil	0.10	U	mg/Kg dw		11/09/05		
MIL05312	1 1	Lab LCS-	Sediment/Soil	99		%		11/09/05		

Authorized By: M. General Release Date: 1/14/05 Page: 1

Cadmium

Project P	vame:	: Maraico				LIMS Pro	lect in: 19	17-05	
	Project Officer: Norm Peck Date Reported: 11/14/05				EPA200.8 Cadmium				
Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed	
05444006		EB2D	Sediment/Soil	0.72	"	mg/Kg dw	10/19/05	11/09/05	
05444007		EB7M	Sediment/Soil	0.73		mg/Kg dw	10/20/05	11/09/05	
05444008		EB9M	Sediment/Soil	0.87	•	mg/Kg dw	10/20/05	11/09/05	
05444008	LM	X1 (matrix spike)		84		%	10/20/05	11/09/05	
05444008	LM	X2 (matrix spike)		85		%	10/20/05	11/09/05	

1.37

0.10

102

U

mg/Kg dw

mg/Kg dw

10/21/05

11/09/05

11/09/05

11/09/05

Sediment/Soil

Sediment/Soil

Sediment/Soil

05444009

MB05312I1

ML05312I1

EB16D

Lab BLNK

Lab LCS-

Authorized By: M. Jane Release Date: 11/14/05 Page: 1

Antimony

Project Name: Maralco LIMS Project ID: 1817-05

Project Officer: Norm Peck

Date Reported: 11/14/05

Method: EPA200.8

Analyte: Antimony

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed	
05444006	;	EB2D	Sediment/Soil	3.33		mg/Kg dw	10/19/05	11/09/05	
05444007		EB7M	Sediment/Soil	2.47		mg/Kg dw	10/20/05	11/09/05	
05444008		EB9M	Sediment/Soil	2.11	J	mg/Kg dw	10/20/05	11/09/05	
05444008	LM	X1 (matrix spike)		27		%	10/20/05	11/09/05	
05444008	LM	X2 (matrix spike)		28		%	10/20/05	11/09/05	
05444009		EB16D	Sediment/Soil	2.74		mg/Kg dw	10/21/05	11/09/05	
MB05312	11	Lab BLNK	Sediment/Soil	0.20	U	mg/Kg dw		11/09/05	
ML05312	IÍ	Lab LCS-	Sediment/Soil	94		%		11/09/05	

Authorized By: M. Green Release Date: 11/14/05 Page: 1

Washington State Department of Ecology Manchester Environmental Laboratory

Analysis Report for

Thallium

Project Name: Maralco LIMS Project ID: 1817-05

Project Officer: Norm Peck

Date Reported: 11/14/05

Method: EPA200.8

Analyte: Thallium

Date Reported: 11/14/05				Analyte: Thamum					
Sample	QC	Field ID	Matrix		Result	Qualifier	Units	Collected	Analyzed
05444006		EB2D	Sediment/Soil		0.10	U	mg/Kg dw	10/19/05	11/09/05
05444007		EB7M	Sediment/Soil		0.10	U 🔩	mg/Kg dw	10/20/05	11/09/05
05444008		EB9M	Sediment/Soil		0.10	U	mg/Kg dw	10/20/05	11/09/05
05444008	LM	X1 (matrix spike)			90		%	10/20/05	11/09/05
05444008	LM	X2 (matrix spike)			92		%	10/20/05	11/09/05
05444009		EB16D	Sediment/Soil		0.10	U	mg/Kg dw	10/21/05	11/09/05
MB05312I	1	Lab BLNK	Sediment/Soil		0.10	U	mg/Kg dw		11/09/05
ML053121	1	Lab LCS-	Sediment/Soil		98		%		11/09/05

Authorized By: M. Jones Release Date: 11/14/05 Page: 1

Lead

Project Name: Maralco LIMS Project ID: 1817-05

Project Officer: Norm Peck

Date Reported: 11/14/05

Method: EPA200.8

Analyte: Lead

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
05444006		EB2D	Sediment/Soil	116		mg/Kg dw	10/19/05	11/09/05
05444007		EB7M	Sediment/Soil	73.3		mg/Kg dw	10/20/05	11/09/05
05444008		EB9M	Sediment/Soil	82.4		mg/Kg dw	10/20/05	11/09/05
05444008	LM	X1 (matrix spike)			NC	%	10/20/05	11/09/05
05444008	LM	X2 (matrix spike)	•		NC	%	10/20/05	11/09/05
05444009		EB16D	Sediment/Soil	89.1		mg/Kg dw	10/21/05	11/09/05
MB053121	1	Lab BLNK	Sediment/Soil	0.10	U	mg/Kg dw		11/09/05
ML05312	[1	Lab LCS-	Sediment/Soil	100		%		11/09/05
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Authorized By: M. Jones

Release Date: 11/14/05

Page: 1

Chromium

Project Name: Maralco		LIMS Pro	oject ID: 1817-05
Project Officer: Norm Peck Date Reported: 11/14/05		Method: EPA200.8 Analyte: Chromium	•
Sample QC Field ID	Matrix	Result Qualifier Units	Collected Analyzed

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
05444006		EB2D	Sediment/Soil	172		mg/Kg dw	10/19/05	11/10/05
05444007		EB7M	Sediment/Soil	106		mg/Kg dw	10/20/05	11/10/05
05444008		EB9M	Sediment/Soil	113		mg/Kg dw	10/20/05	11/10/05
05444008		X1 (matrix spike)	•		NC	%	10/20/05	11/10/05
05444008	LMD	K2 (matrix spike)	•		NC	%	10/20/05	11/10/05
05444009		EB16D	Sediment/Soil	117		mg/Kg dw	10/21/05	11/10/05
MB05312I	-	Lab BLNK	Sediment/Soil	0.50	U	mg/Kg dw		11/10/05
ML053121	1	Lab LCS-	Sediment/Soil	104		%		11/10/05

Authorized By: M. Jones Release Date: 11/14/05 Page: 1

TCLP metals for ICP analysis

Project Name: Maraico				LIMS P	oject ID: 1817-95
Sample: 05444006		Date Collected:	10/19/05	Method:	1311-6010
Field ID: EB2D		Date Prepared:	11/15/05	Matrix:	Sediment/Soil
Project Officer: Norm Peck		Date Analyzed:	11/16/05	Units:	mg/L
Analyte	Result	Qualifier	7,		
Arsenic	0.050	U			
Barium	0.13				
Cadmium	0.0050	U			•
Chromium	0.0520	•			
Lead	0.050	U	,		
Selenium	0.050	Name of States			

0.010

U

Silver

Authorized By: _____ Release Date: _____ Page: 1

TCLP metals for ICP analysis

Project Name: Maralco LIMS Project ID: 1817-05

Sample: 05444007 Date Collected: 10/20/05 Method: 1311-6010 Field ID: EB7M Date Prepared: 11/15/05 Matrix: Sediment/Soil

Project Officer: Norm Peck	*	Date Analyzed: 11/16/05	Units:	mg/L
Analyte	Result	Qualifier		
Arsenic	0.050	U		
Barium	0.47	•		
Cadmium	0.0056			•
Chromium	0.049			
Lead	0.050	U		
Selenium	0.050	U		
Silver	0.010	U	•	
•	-			
		•		

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TCLP metals for ICP analysis

Project Name: Maralco	*			LIMS P	roject ID: 1817-05
Sample: 05444008 Field ID: EB9M Project Officer: Norm Peck		Date 1	Collected: 10/20/05 Prepared: 11/15/05 Analyzed: 11/16/05		1311-6010 Sediment/Soil mg/L
Analyte	Result	Qualifier			
Arsenic	0.050	U			
Barium	0.49				•
Cadmium	0.0085				
Chromium	0.036				
Lead	0.050	U			
Selenium	0.050	U	•		
Silver	0.010	U			

Authorized By: Release Date: White Page: 1

TCLP metals for ICP analysis

Project Name: Maralco			LIMS Project ID: 1817-05
Sample: 05444009 Field ID: EB16D Project Officer: Norm Peck		Date Collected: 10/21/05 Date Prepared: 11/15/05 Date Analyzed: 11/16/05	Method: 1311-6010 Matrix: Sediment/Soil Units: mg/L
Analyte	Result	Qualifier	
Arsenic	0.050	U	·
Barium	0.33		•
Cadmium	0.0084	•	
Chromium	0.0641		
Lead	0.050	U	
Selenium	0.050	U	
Silver	0.010	U	

Authorized By: ______ Release Date: ______ Page: 1

TCLP metals for ICP analysis

Project Name: Maralco

Lims Project ID: 1817-05

Lab ID: MB05319E1

QC Type: Laboratory Method Blank

Project Officer: Norm Peck

Date Analyzed: 11/16/05

Lims Project ID: 1817-05

Method: 1311-6010

Matrix: Sediment/Soil

Units: mg/L

Analyte	Result	Qualifier	
Arsenic	0.050	U	
Barium	0.10	Ū	
Cadmium	0.0050	U	
Chromium	0.0050	U	
Lead	0.050	U	
Selenium	0.050	U	
Silver	0.010	U	

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Analysis Report for

Project Name: Maralco		•	LIMS P	roject ID: 1817-05
Sample: 05444009 (matrix apil	oelimi)	Date Collected: 10/21/05	Method:	1311-6010
Field ID: EB16D		Date Prepared: 11/15/05		Sediment/Soil
Project Officer: Norm Peck		Date Analyzed: 11/16/05	Units:	% Recovery
Analyte	Result Q	ualifier		,
Arsenic	106			:
Barium	98	·		•
Cadmium	110			
Chromium	96		•	
Lead	112			
Selenium	109			
Silver	102			
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Authorized By: <u>MWJelcnalc</u>	Release Date: ////6/25	Page: 1
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TCLP metals for ICP analysis

Project Name: Maraico Sample: 05444009 (matrix spile	e-LMX2)	Date Collected: 10/21/05	LIMS Project ID: 1817-05 Method: 1311-6010
Field ID: EB16D Project Officer: Norm Peck		Date Prepared: 11/15/05 Date Analyzed: 11/16/05	Matrix: Sediment/Soil Units: % Recovery
Analyte	Result Qua	lifier	70 25000 101 9
Arsenic Barium Cadmium Chromium Lead Selenium Silver	110 100 114 97 116 113		
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Authorized By: Sarabeknak Release Date: ////6/05 Page: 1

TCLP metals for ICP analysis

Project Name: Maralco Lab ID: ML05319B1 QC Type: Laboratory Control Project Officer: Norm Peck	Sample	Date Prepared: 11/15/05 Date Analyzed: 11/16/05	LIMS Project ID: 1817-05 Method: 1311-6010 Matrix: Sediment/Soil Units: %		
Analyte	Result	Qualifier	//		
Arsenic Barium Cadmium Chromium Lead Selenium Silver	101 98 100 103 99 101 102				
·					

Authorized By: Release Date: //// Page: 1

Mercury

Project Name: Maralco LIMS Project ID: 1817-05

Project Officer:Norm PeckMethod:EPA245.5Date Reported:11/15/05Analyte:Mercury

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed		
05444006		EB2D	Sediment/Soil	0.060		mg/Kg dw	10/19/05	11/15/05		
05444007		EB7M	Sediment/Soil	0.0060		mg/Kg dw	10/20/05	11/15/05		
05444008		EB9M	Sediment/Soil	0.0050	·U	mg/Kg dw	10/20/05	11/15/05		
05444009		EB16D	Sediment/Soil	0.013		mg/Kg dw	10/21/05	11/15/05		
05444009		(matrix spike)		115		%	10/21/05	11/15/05		
05444009		(2 (matrix spike)		112		%	10/21/05	11/15/05		
MB05318I		Lab BLNK	Sediment/Soil	0.0050	U	mg/Kg dw		11/15/05		
ML05318	H1	Lab LCS-	Sediment/Soil	99		%		11/15/05		

Authorized By: Release Date: 1//15/05 Page: 1