Report Date:
11-Jul-14 15:42

☑ Final Report
☐ Re-Issued Report
☐ Revised Report

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

Laboratory Report

Spectrum Analytical, Inc.
646 Camp Ave.
North Kingstown, RI 02852
Attn: Agnes Huntley

Project: Vanadium Site-NF
Project #: N1152

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SB92572-01	WL-E-R1	Soil	02-Jul-14 10:50	10-Jul-14 16:15
SB92572-02	WL-E-R2	Soil	02-Jul-14 11:20	10-Jul-14 16:15
SB92572-03	WL-E-R3	Soil	02-Jul-14 11:50	10-Jul-14 16:15
SB92572-04	WL-E-T1	Soil	02-Jul-14 13:20	10-Jul-14 16:15
SB92572-05	WL-E-T2	Soil	02-Jul-14 13:50	10-Jul-14 16:15
SB92572-06	WL-E-T3	Soil	02-Jul-14 14:20	10-Jul-14 16:15

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87600/E87936
Maine # MA138
New Hampshire # 2538
New Jersey # MA011/MA012
New York # 11393/11840
Pennsylvania # 68-04426/68-02924
Rhode Island # 98
USDA # S-51435

Authorized by:

Nicole Leja
Laboratory Director

Spectrum Analytical holds certification in the State of New York for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of New York does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.
Please note that this report contains 8 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Spectrum is currently accredited for the specific method or analyte indicated. Please refer to our "Quality" web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey, Pennsylvania and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (NY-11840, NJ-MA012, PA-68-04426 and FL-E87936).

Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

CASE NARRATIVE:

Data has been reported to the RDL. This report includes estimated concentrations detected below the RDL and above the MDL (J-Flag).

The samples were received 2.6 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

There is no relevant protocol-specific QC and/or performance standards non-conformances to report.

Sample Acceptance Check Form

Client:	Spectrum Analytical, Inc. - North Kingstown, RI
Project:	Vanadium Site-NF / N1152
Work Order:	SB92572
Sample(s) received on:	7/10/2014
Received by:	Isabel Melling

The following outlines the condition of samples for the attached Chain of Custody upon receipt.

	Yes	No	N/A
1. Were custody seals present?	☐	☑	☐
2. Were custody seals intact?	☐	☐	☑
3. Were samples received at a temperature of ≤ 6°C?	☑	☐	☐
4. Were samples cooled on ice upon transfer to laboratory representative?	☐	☑	☐
5. Were samples refrigerated upon transfer to laboratory representative?	☑	☐	☐
6. Were sample containers received intact?	☑	☐	☐
7. Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	☑	☐	☐
8. Were samples accompanied by a Chain of Custody document?	☑	☐	☐
9. Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	☐	☑	☐
10. Did sample container labels agree with Chain of Custody document?	☑	☐	☐
11. Were samples received within method-specific holding times?	☑	☐	☐

Sample Identification
WL-E-R1
SB92572-01

Client Project #	Matrix	Collection Date/Time	Received
N1152	Soil	02-Jul-14 10:50	10-Jul-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Total Metals by EPA 6000/7000 Series Methods													
7439-97-6	Mercury	**0.0513**		mg/kg dry	0.0484	0.0048	1	SW846 7471B	10-Jul-14	11-Jul-14	LR	1416000	X
General Chemistry Parameters													
	% Solids	**59.7**		%			1	SM2540 G Mod.	10-Jul-14	10-Jul-14	BD	1416005	

Sample Identification
WL-E-R2
SB92572-02

Client Project #	Matrix	Collection Date/Time	Received
N1152	Soil	02-Jul-14 11:20	10-Jul-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Total Metals by EPA 6000/7000 Series Methods													
7439-97-6	Mercury	**0.397**		mg/kg dry	0.0649	0.0064	1	SW846 7471B	10-Jul-14	11-Jul-14	LR	1416000	X
General Chemistry Parameters													
	% Solids	**45.3**		%			1	SM2540 G Mod.	10-Jul-14	10-Jul-14	BD	1416005	

Sample Identification
WL-E-R3
SB92572-03

Client Project #	Matrix	Collection Date/Time	Received
N1152	Soil	02-Jul-14 11:50	10-Jul-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Total Metals by EPA 6000/7000 Series Methods													
7439-97-6	Mercury	**0.0986**		mg/kg dry	0.0594	0.0058	1	SW846 7471B	10-Jul-14	11-Jul-14	LR	1416000	X
General Chemistry Parameters													
	% Solids	**46.4**		%			1	SM2540 G Mod.	10-Jul-14	10-Jul-14	BD	1416005	

Sample Identification
WL-E-T1
SB92572-04

Client Project #	Matrix	Collection Date/Time	Received
N1152	Soil	02-Jul-14 13:20	10-Jul-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Total Metals by EPA 6000/7000 Series Methods													
7439-97-6	Mercury	**0.0236**	J	mg/kg dry	0.0444	0.0044	1	SW846 7471B	10-Jul-14	11-Jul-14	LR	1416000	X
General Chemistry Parameters													
	% Solids	**61.9**		%			1	SM2540 G Mod.	10-Jul-14	10-Jul-14	BD	1416005	

Sample Identification
WL-E-T2
SB92572-05

Client Project #	Matrix	Collection Date/Time	Received
N1152	Soil	02-Jul-14 13:50	10-Jul-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Total Metals by EPA 6000/7000 Series Methods													
7439-97-6	Mercury	**0.0233**	J	mg/kg dry	0.0530	0.0052	1	SW846 7471B	10-Jul-14	11-Jul-14	LR	1416000	X
General Chemistry Parameters													
	% Solids	**53.6**		%			1	SM2540 G Mod.	10-Jul-14	10-Jul-14	BD	1416005	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
WL-E-T3 SB92572-06	N1152	Soil	02-Jul-14 14:20	10-Jul-14

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Total Metals by EPA 6000/7000 Series Methods													
7439-97-6	Mercury	**0.0510**	J	mg/kg dry	0.0533	0.0052	1	SW846 7471B	10-Jul-14	11-Jul-14	LR	1416000	X
General Chemistry Parameters													
	% Solids	**49.7**		%			1	SM2540 G Mod.	10-Jul-14	10-Jul-14	BD	1416005	

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1416000 - EPA200/SW7000 Series										
Blank (1416000-BLK1)					Prepared: 10-Jul-14 Analyzed: 11-Jul-14					
Mercury	< 0.0270	U	mg/kg wet	0.0270						
Reference (1416000-SRM1)					Prepared: 10-Jul-14 Analyzed: 11-Jul-14					
Mercury	**2.45**	D	mg/kg wet	0.600	3.09		79	71.42-128.46		

General Chemistry Parameters - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1416005 - General Preparation										
Duplicate (1416005-DUP1)			**Source: SB92572-01**			Prepared & Analyzed: 10-Jul-14				
% Solids	**59.8**		%			59.7			0.2	20

Notes and Definitions

D	Data reported from a dilution
J	Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
U	Analyte included in the analysis, but not detected at or above the MDL.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

Validated by:
Nicole Leja

SB92572 mw

CHAIN-OF-CUSTODY RECORD

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

WorkOrder : N1152
Project: Vanadium Site - NF
Report Type : ASP-B
Due Date : 7/15/2014
FAX Due Date : 7/10/2014
Report To : Agnes R Huntley
Purchase Order : N1152
EDD Types : Please generate a Little PEL EDD

Subcontractor:
Spectrum Analytical, Inc. - Agawam, MA
11 Almgren Drive
Agawam, Massachusetts 01001

Phone: (413) 789-9018

EQuISFacilityCode: N/A

= number of containers

Client Sample ID	Collection Date	#	Matrix	DUP/MS/MSD	Mitkem Sample ID	Requested Test: SW7471
WL-E-R1 SB92572-01	07/02/2014 10:50	1	Soil		N1152-01B	X
WL-E-R2 02	07/02/2014 11:20	1	Soil		N1152-02B	X
WL-E-R3 03	07/02/2014 11:50	1	Soil		N1152-03B	X
WL-E-T1 04	07/02/2014 13:20	1	Soil		N1152-04B	X
WL-E-T2 05	07/02/2014 13:50	1	Soil		N1152-05B	X
WL-E-T3 010	07/02/2014 14:20	1	Soil		N1152-06B	X

1) SW7471, MERCURY BY FIA

Use 'Client Sample IDs' when reporting data. If needed, truncate 'Client Sample IDs' to fit on reports. Use full 'Client Sample ID' when generating EDD.

Comments:

		Date/Time			Date/Time
Relinquished by:	Agnes R Huntley	07/10/14 11:42	Received by:		7/10/14 1200
Relinquished by:			Received by:		7/10/14 16:15

Rec

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www.spectrum-analytical.com

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7/10/14