TETRA TECH NUS

PHIL-22097

TO: RUSS TURNER **DATE: MAY 15, 2008**

FROM: MEGAN N. RITCHIE **COPIES: FILE**

SUBJECT: INORGANIC DATA VALIDATION – TOTAL/DISSOLVED METALS AND HEXAVALENT CHROMIUM
NAS JRB WILLOW GROVE SITE 3, WILLOW GROVE, PENNSYLVANIA
SDG NO. TWK-003

SAMPLES: 2/Aqueous/

03MW01SI FB-20080320

*The sample date was truncated for clarity.

OVERVIEW

The sample set for the NAS JRB Willow Grove Site 3 Interim Groundwater Monitoring (IGWM) – Willow Grove, PA, SDG TWK-003 consists of one aqueous environmental sample (designated 03MW-) and one field quality control (QC) blank (designated FB-). No samples were designated as the matrix spike and matrix spike duplicate (MS/MSD) for this sample set. No field duplicate pairs were included in this sample set. All samples were analyzed for target analyte list (TAL) total and dissolved metals. The field blank analyzed for hexavalent chromium.

The samples were collected by Tetra Tech NUS on March 20, 2008 and analyzed by Analytical Laboratory Services, Inc. (ALSI) of Middletown, Pennsylvania.

EPA SW-846 Methods were conducted using 6010C for ICP-AES metals, 6020 for ICP-MS metals, 7470D for mercury, and 7196A for hexavalent chromium.

SUMMARY

All analytes were successfully analyzed in all samples. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, calibration data, laboratory blank results, ICP interference check samples, matrix spike (MS) and matrix spike duplicate (MSD) results, laboratory control spike (LCS) results, field duplicate results, ICP serial dilution results, detection limits, and analyte quantitation.

Areas of concern with respect to data quality are listed below as follows:

MINOR PROBLEMS

- The following table summarizes the analytes detected as contaminants in the field blank at the maximum concentration indicated:

Analyte	Total Maximum Concentration	Total Action Level	Dissolved Maximum Concentration	Dissolved Action Level
Barium	0.0004 mg/L	0.002 mg/L	---	---
Cadmium	0.0001 mg/L	0.0005 mg/L	---	---
Calcium	0.07 mg/L	0.35 mg/L	---	---
Copper	---	---	0.0009 mg/L	0.0045 mg/L
Lead	0.00007 mg/L	0.00035 mg/L	---	---
Nickel	0.00008 mg/L	0.0004 mg/L	---	---
Silver	0.0006 mg/L	0.003 mg/L	---	---
Vanadium	0.0003 mg/L	0.0015 mg/L	0.0006 mg/L	0.003 mg/L

Samples affected: The action levels apply to all aqueous environmental samples. The total action levels apply to the total metals fraction only. The dissolved metals apply to the dissolved metals fraction only.

Dilution factors and sample preparation volumes were taken into account during application of action levels. Results reported at concentrations within the action level are qualified (B) and are considered to be false positives (artifacts of blank contamination). No action was taken for barium, cadmium, calcium, copper, lead, and nickel because the results exceeded the action level or there were no positive results for these analytes.

- Positive results at concentrations less than the reporting limits (RLs) were qualified as estimated (J).

NOTES

The ICP-MS interference check recoveries for aluminum in solutions A and AB were below the lower QC limit of 80%. The ICP-MS interference check recoveries exceeded QC criteria of 120% for chromium, manganese, and zinc for the total metals fraction. The ICP-MS interference check recovery for cadmium exceeded the 120% criteria in the dissolved metals fraction. No action was taken for these exceedances because there were no analyte concentrations in the samples that caused interference.

No analytes were detected in the laboratory blanks.

The mercury and hexavalent chromium data are acceptable as reported by the laboratory.

EXECUTIVE SUMMARY

Laboratory Performance: The ICP-MS interference check recoveries for aluminum, cadmium, chromium, manganese, and zinc were outside QC limits.

Other Factors Affecting Data Quality: Several analytes were present in the field blank.

The data for these analyses were reviewed with reference to the EPA "Functional Guidelines for Inorganic Data Review", as amended for use within EPA Region 3 (4/93).

The text of this report has been formatted to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the Functional Guidelines and the Quality Assurance Project Plan (QAPjP)."

R Sloboda for M. Ritchie

Megan N. Ritchie
Chemist

Tetra Tech NUS, Inc.
Russ Sloboda
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

Qualified Analytical Results

PROJ_NO: 00845

SDG: TWK003 MEDIA: WATER DATA FRACTION: M

nsample	03MW01SI-20080320
samp_date	3/20/2008
lab_id	9728539003
qc_type	NM
units	MG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.107		
BERYLLIUM	0.001	U	
CADMIUM	0.0011		
CALCIUM	17		
CHROMIUM	0.0015	J	P
COBALT	0.006	U	
COPPER	0.0004	J	P
IRON	0.07	U	
LEAD	0.002	U	
MAGNESIUM	2.67		
MANGANESE	0.0004	J	P
MERCURY	0.0005	U	
NICKEL	0.0017	J	P
POTASSIUM	0.56	U	
SELENIUM	0.002	J	P
SILVER	0.0006	B	B
SODIUM	9.57		
THALLIUM	0.001	U	
VANADIUM	0.0004	B	B
ZINC	0.006	U	

nsample	FB-20080320
samp_date	3/20/2008
lab_id	9728539002
qc_type	FB
units	MG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.0004	J	P
BERYLLIUM	0.001	U	
CADMIUM	0.0001	J	P
CALCIUM	0.07	J	P
CHROMIUM	0.002	U	
COBALT	0.006	U	
COPPER	0.006	U	
IRON	0.07	U	
LEAD	0.00007	J	P
MAGNESIUM	0.11	U	
MANGANESE	0.006	U	
MERCURY	0.0005	U	
NICKEL	0.00008	J	P
POTASSIUM	0.56	U	
SELENIUM	0.006	U	
SILVER	0.0006	J	P
SODIUM	0.56	U	
THALLIUM	0.001	U	
VANADIUM	0.0003	J	P
ZINC	0.006	U	

PROJ_NO: 00845

SDG: TWK-003 MEDIA: WATER DATA FRACTION: MF

nsample	03MW01SI-20080320	nsample	FB-20080320
samp_date	3/20/2008	samp_date	3/20/2008
lab_id	9728539003	lab_id	9728539002
qc_type	NM	qc_type	FB
units	MG/L	units	MG/L
Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.106		
BERYLLIUM	0.001	U	
CADMIUM	0.0012		
CALCIUM	19		
CHROMIUM	0.0013	J	P
COBALT	0.005	U	
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	2.96		
MANGANESE	0.0012	J	P
MERCURY	0.0005	U	
NICKEL	0.0013	J	P
POTASSIUM	0.58		
SELENIUM	0.003	J	P
SILVER	0.001	U	
SODIUM	11.4		
THALLIUM	0.001	U	
VANADIUM	0.0008	B	B
ZINC	0.0006	J	P

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.005	U	
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	0.1	U	
CHROMIUM	0.002	U	
COBALT	0.005	U	
COPPER	0.0009	J	P
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	0.1	U	
MANGANESE	0.004	U	
MERCURY	0.0005	U	
NICKEL	0.005	U	
POTASSIUM	0.5	U	
SELENIUM	0.005	U	
SILVER	0.001	U	
SODIUM	0.5	U	
THALLIUM	0.001	U	
VANADIUM	0.0006	J	P
ZINC	0.005	U	

PROJ_NO: 00845

SDG: TWK003 MEDIA: WATER DATA FRACTION: MISC

nsample	FB-20080320
samp_date	3/20/2008
lab_id	9728539002
qc_type	FB
Pct_Solids	
DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
HEXAVALENT CHROMIUM	MG/L	0.01	U	

Qualifier Codes:

a	=	Lab Blank Contamination
b	=	Field Blank Contamination
c	=	Calibration (i.e., %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
d	=	MS/MSD Noncompliance
e	=	LSC/LSCD Noncompliance
f	=	Laboratory Duplicate Imprecision
g	=	Field Duplicate Imprecision
h	=	Holding Time Exceedance
i	=	ICP Serial Dilution Noncompliance
j	=	GFAA PDS – GFAA MSA's r<0.995 (correlation coefficient)
k	=	ICP Interference – include ICSAB %Rs
l	=	Instrument Calibration Range Exceedance
m	=	Sample Preservation
n	=	Internal Standard Noncompliance
o	=	Poor Instrument Performance (i.e. baseline drifting)
p	=	Uncertainty Near Detection Limit (<2 x IDL for inorganics and < CRQL for organics)
q	=	Other Problems (can encompass of number of issues)
r	=	Surrogates Recovery Noncompliance
s	=	Pesticide/PCB Resolution
t	=	% Breakdown Noncompliance for DDT and Endrin
u	=	Pesticide/PCB % Difference Between Columns for Positive Results
v	=	Non-linear Calibrations, Tuning r <0.995 (correlation coefficient)

Data Qualifier Key:

B	- Positive result is considered to be an artifact of blank contamination and should not be considered present.
J	- Value is considered estimated due to exceedance of technical quality control or because result is less than the Contract Required Quantitation Limit (CRQL).
L	- Positive result is considered biased low due to exceedance of technical quality control criteria.
U	- Value is a non-detected result as reported by the laboratory.
UL	- Non-detected result is considered biased low due to exceedance of technical quality control criteria.

APPENDIX B

Results as Reported by the Laboratory

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

ANALYTICAL RESULTS

Workorder: 9728539 TWK003|GW NASJRB CTO 0412

Lab ID: **9728539003** Date Collected: 3/20/2008 14:25 Matrix: Ground Water

Sample ID: **03MW01SI-20080320** Date Received: 3/21/2008 11:14

Parameters	Results	Units	Footnotes	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
1,1,1-Trichloroethane	ND	ug/L		1.0	0.2	SW846 8260B			4/1/08 10:49	JAH	A
1,1,2-Trichloroethane	ND	ug/L		1.0	0.2	SW846 8260B			4/1/08 10:49	JAH	A
Trichloroethene	ND	ug/L		1.0	0.2	SW846 8260B			4/1/08 10:49	JAH	A
Trichlorofluoromethane	ND	ug/L		1.0	0.3	SW846 8260B			4/1/08 10:49	JAH	A
Vinyl Chloride	ND	ug/L		1.0	0.2	SW846 8260B			4/1/08 10:49	JAH	A
o-Xylene	ND	ug/L		1.0	0.2	SW846 8260B			4/1/08 10:49	JAH	A
mp-Xylene	ND	ug/L		2.0	0.3	SW846 8260B			4/1/08 10:49	JAH	A
Surrogate Recoveries	*Results*	*Units*	*Footnotes*	*Limits*		*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	92	%		62-133		SW846 8260B			4/1/08 10:49	JAH	A
Dibromofluoromethane (S)	94	%		78-116		SW846 8260B			4/1/08 10:49	JAH	A
Toluene-d8 (S)	108	%		76-127		SW846 8260B			4/1/08 10:49	JAH	A
4-Bromofluorobenzene (S)	94	%		79-114		SW846 8260B			4/1/08 10:49	JAH	A
SEMIVOLATILES											
1,4-Dioxane	ND	ug/L		2.9	0.6	SW846 8270D	3/27/08	CAC	4/1/08 05:16	DHF	D1
Surrogate Recoveries	*Results*	*Units*	*Footnotes*	*Limits*		*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2,4,6-Tribromophenol (S)	66	%		40-125		SW846 8270D	3/27/08	CAC	4/1/08 05:16	DHF	D1
Terphenyl-d14 (S)	77	%		27-136		SW846 8270D	3/27/08	CAC	4/1/08 05:16	DHF	D1
Phenol-d5 (S)	30	%		10-49		SW846 8270D	3/27/08	CAC	4/1/08 05:16	DHF	D1
Nitrobenzene-d5 (S)	78	%		31-110		SW846 8270D	3/27/08	CAC	4/1/08 05:16	DHF	D1
2-Fluorobiphenyl (S)	82	%		32-108		SW846 8270D	3/27/08	CAC	4/1/08 05:16	DHF	D1
2-Fluorophenol (S)	50	%		20-70		SW846 8270D	3/27/08	CAC	4/1/08 05:16	DHF	D1
METALS											
Aluminum, Total	ND	mg/L		0.080		SW846 6020	3/28/08	MNP	4/1/08 12:09	LAM	F1
Aluminum, Dissolved	ND	mg/L		0.080	0.002	SW846 6020	4/8/08	LAM	4/16/08 12:12	LAM	G3
Antimony, Total	ND	mg/L		0.0020	0.00005	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Antimony, Dissolved	ND	mg/L		0.0020	0.0004	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Arsenic, Total	ND	mg/L		0.0060	0.0004	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Arsenic, Dissolved	ND	mg/L		0.0030	0.0007	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Barium, Total	0.107	mg/L		0.0060	0.00005	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Barium, Dissolved	0.106	mg/L		0.0050	0.0003	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Beryllium, Total	ND	mg/L		0.0010	0.00007	SW846 6020	3/28/08	MNP	4/1/08 12:09	LAM	F1
Beryllium, Dissolved	ND	mg/L		0.0010	0.0002	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Cadmium, Total	0.0011	mg/L		0.0010	0.00001	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Cadmium, Dissolved	0.0012	mg/L		0.0010	0.0002	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Calcium, Total	17.0	mg/L	1	0.11	0.003	SW846 6010C	4/2/08	SRT	4/2/08 16:18	TED	F2
Calcium, Dissolved	19.0	mg/L		0.10	0.03	SW846 6010C	3/25/08	JWK	3/25/08 16:18	JWK	G1
Chromium, Total	0.0015J	mg/L		0.0020	0.00006	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Chromium, Dissolved	0.0013J	mg/L		0.0020	0.0001	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Cobalt, Total	ND	mg/L		0.0060	0.00003	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Cobalt, Dissolved	ND	mg/L		0.0050	0.0001	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Copper, Total	0.0004J	mg/L		0.0060	0.00006	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Copper, Dissolved	ND	mg/L		0.0050	0.0004	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Iron, Total	ND	mg/L		0.07	0.02	SW846 6010C	4/2/08	SRT	4/2/08 16:18	TED	F2

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ANALYTICAL RESULTS

Workorder: 9728539 TWK003|GW NASJRB CTO 0412

Lab ID: **9728539003** Date Collected: 3/20/2008 14:25 Matrix: Ground Water

Sample ID: **03MW01SI-20080320** Date Received: 3/21/2008 11:14

Parameters	Results	Units	Footnotes	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
Iron, Dissolved	ND	mg/L		0.06	0.009	SW846 6010C	3/25/08	JWK	3/25/08 16:18	JWK	G1
Lead, Total	ND	mg/L		0.0020	0.00002	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Lead, Dissolved	ND	mg/L		0.0020	0.0001	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Magnesium, Total	2.67	mg/L		0.11	0.01	SW846 6010C	4/2/08	SRT	4/2/08 16:18	TED	F2
Magnesium, Dissolved	2.96	mg/L		0.10	0.006	SW846 6010C	3/25/08	JWK	3/25/08 16:18	JWK	G1
Manganese, Total	0.0004J	mg/L		0.0060	0.00004	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Manganese, Dissolved	0.0012J	mg/L		0.0040	0.00001	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Mercury, Total	ND	mg/L		0.0005	0.00003	SW846 7470A	4/2/08	CMD	4/2/08 16:29	CMD	F3
Mercury, Dissolved	ND	mg/L		0.0005	0.00003	SW846 7470A	4/2/08	CMD	4/2/08 18:45	CMD	G2
Nickel, Total	0.0017J	mg/L		0.0060	0.00006	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Nickel, Dissolved	0.0013J	mg/L		0.0050	0.0004	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Potassium, Total	ND	mg/L		0.56		SW846 6010C	4/2/08	SRT	4/4/08 03:48	TED	F2
Potassium, Dissolved	0.58	mg/L		0.50	0.1	SW846 6010C	3/25/08	JWK	3/25/08 16:18	JWK	G1
Selenium, Total	0.002J	mg/L		0.006	0.001	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Selenium, Dissolved	0.003J	mg/L		0.005	0.001	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Silver, Total	0.0006J	mg/L		0.0010	0.00004	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Silver, Dissolved	ND	mg/L		0.0010	0.0003	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Sodium, Total	9.57	mg/L		0.56		SW846 6010C	4/2/08	SRT	4/4/08 03:48	TED	F2
Sodium, Dissolved	11.4	mg/L		0.50	0.05	SW846 6010C	3/25/08	JWK	3/25/08 16:18	JWK	G1
Thallium, Total	ND	mg/L		0.0010	0.00002	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Thallium, Dissolved	ND	mg/L		0.0010	0.0001	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Vanadium, Total	0.0004J	mg/L		0.0010	0.00003	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Vanadium, Dissolved	0.0008J	mg/L		0.0010	0.0001	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3
Zinc, Total	ND	mg/L		0.0060	0.002	SW846 6020	3/28/08	MNP	3/31/08 23:20	SRT	F1
Zinc, Dissolved	0.0006J	mg/L		0.0050	0.0002	SW846 6020	4/8/08	LAM	4/11/08 19:37	LAM	G3

Sample Comments:

Raymond J. Martrano
Laboratory Manager

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ANALYTICAL RESULTS

Workorder: 9728539 TWK003|GW NASJRB CTO 0412

Lab ID: **9728539002** Date Collected: 3/20/2008 11:23 Matrix: Ground Water
Sample ID: **FB-20080320** Date Received: 3/21/2008 11:14

Parameters	Results	Units	Footnotes	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
1,1,1-Trichloroethane	ND	ug/L		1.0	0.2	SW846 8260B			4/1/08 10:15	JAH	A
1,1,2-Trichloroethane	ND	ug/L		1.0	0.2	SW846 8260B			4/1/08 10:15	JAH	A
Trichloroethene	ND	ug/L		1.0	0.2	SW846 8260B			4/1/08 10:15	JAH	A
Trichlorofluoromethane	ND	ug/L		1.0	0.3	SW846 8260B			4/1/08 10:15	JAH	A
Vinyl Chloride	ND	ug/L		1.0	0.2	SW846 8260B			4/1/08 10:15	JAH	A
o-Xylene	ND	ug/L		1.0	0.2	SW846 8260B			4/1/08 10:15	JAH	A
mp-Xylene	ND	ug/L		2.0	0.3	SW846 8260B			4/1/08 10:15	JAH	A
Surrogate Recoveries	*Results*	*Units*	*Footnotes*	*Limits*		*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	91	%		62-133		SW846 8260B			4/1/08 10:15	JAH	A
Toluene-d8 (S)	108	%		76-127		SW846 8260B			4/1/08 10:15	JAH	A
4-Bromofluorobenzene (S)	91	%		79-114		SW846 8260B			4/1/08 10:15	JAH	A
Dibromofluoromethane (S)	94	%		78-116		SW846 8260B			4/1/08 10:15	JAH	A
SEMIVOLATILES											
1,4-Dioxane	ND	ug/L		2.9	0.6	SW846 8270D	3/27/08	CAC	3/31/08 20:11	DHF	D2
Surrogate Recoveries	*Results*	*Units*	*Footnotes*	*Limits*		*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2,4,6-Tribromophenol (S)	66	%		40-125		SW846 8270D	3/27/08	CAC	3/31/08 20:11	DHF	D2
2-Fluorobiphenyl (S)	81	%		32-108		SW846 8270D	3/27/08	CAC	3/31/08 20:11	DHF	D2
2-Fluorophenol (S)	52	%		20-70		SW846 8270D	3/27/08	CAC	3/31/08 20:11	DHF	D2
Nitrobenzene-d5 (S)	84	%		31-110		SW846 8270D	3/27/08	CAC	3/31/08 20:11	DHF	D2
Phenol-d5 (S)	31	%		10-49		SW846 8270D	3/27/08	CAC	3/31/08 20:11	DHF	D2
Terphenyl-d14 (S)	70	%		27-136		SW846 8270D	3/27/08	CAC	3/31/08 20:11	DHF	D2
METALS											
Aluminum, Total	ND	mg/L		0.080		SW846 6020	3/28/08	MNP	4/1/08 12:06	LAM	F1
Aluminum, Dissolved	ND	mg/L		0.080	0.002	SW846 6020	4/8/08	LAM	4/16/08 12:09	LAM	G3
Antimony, Total	ND	mg/L		0.0020	0.00005	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Antimony, Dissolved	ND	mg/L		0.0020	0.0004	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Arsenic, Total	ND	mg/L		0.0060	0.0004	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Arsenic, Dissolved	ND	mg/L		0.0030	0.0007	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Barium, Total	0.0004J	mg/L		0.0060	0.00005	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Barium, Dissolved	ND	mg/L		0.0050	0.0003	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Beryllium, Total	ND	mg/L		0.0010	0.00007	SW846 6020	3/28/08	MNP	4/1/08 12:06	LAM	F1
Beryllium, Dissolved	ND	mg/L		0.0010	0.0002	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Cadmium, Total	0.0001J	mg/L		0.0010	0.00001	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Cadmium, Dissolved	ND	mg/L		0.0010	0.0002	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Calcium, Total	0.07J	mg/L	1	0.11	0.003	SW846 6010C	4/2/08	SRT	4/2/08 16:12	TED	F2
Calcium, Dissolved	ND	mg/L		0.10	0.03	SW846 6010C	3/25/08	JWK	3/25/08 16:14	JWK	G1
Chromium, Total	ND	mg/L		0.0020	0.00006	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Chromium, Dissolved	ND	mg/L		0.0020	0.0001	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Cobalt, Total	ND	mg/L		0.0060	0.00003	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Cobalt, Dissolved	ND	mg/L		0.0050	0.0001	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Copper, Total	ND	mg/L		0.0060	0.00006	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Copper, Dissolved	0.0009J	mg/L		0.0050	0.0004	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Iron, Total	ND	mg/L		0.07	0.02	SW846 6010C	4/2/08	SRT	4/2/08 16:12	TED	F2

0029

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

ANALYTICAL RESULTS

Workorder: 9728539 TWK003|GW NASJRB CTO 0412

Lab ID: **9728539002** Date Collected: 3/20/2008 11:23 Matrix: Ground Water

Sample ID: **FB-20080320** Date Received: 3/21/2008 11:14

Parameters	Results	Units	Footnotes	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
Iron, Dissolved	ND	mg/L		0.06	0.009	SW846 6010C	3/25/08	JWK	3/25/08 16:14	JWK	G1
Lead, Total	0.00007J	mg/L		0.0020	0.00002	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Lead, Dissolved	ND	mg/L		0.0020	0.0001	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Magnesium, Total	ND	mg/L		0.11	0.01	SW846 6010C	4/2/08	SRT	4/2/08 16:12	TED	F2
Magnesium, Dissolved	ND	mg/L		0.10	0.006	SW846 6010C	3/25/08	JWK	3/25/08 16:14	JWK	G1
Manganese, Total	ND	mg/L		0.0060	0.00004	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Manganese, Dissolved	ND	mg/L		0.0040	0.00001	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Mercury, Total	ND	mg/L		0.0005	0.00003	SW846 7470A	4/2/08	CMD	4/2/08 16:25	CMD	F3
Mercury, Dissolved	ND	mg/L		0.0005	0.00003	SW846 7470A	4/2/08	CMD	4/2/08 18:42	CMD	G2
Nickel, Total	0.00008J	mg/L		0.0060	0.00006	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Nickel, Dissolved	ND	mg/L		0.0050	0.0004	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Potassium, Total	ND	mg/L		0.56		SW846 6010C	4/2/08	SRT	4/4/08 03:45	TED	F2
Potassium, Dissolved	ND	mg/L		0.50	0.1	SW846 6010C	3/25/08	JWK	3/25/08 16:14	JWK	G1
Selenium, Total	ND	mg/L		0.006	0.001	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Selenium, Dissolved	ND	mg/L		0.005	0.001	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Silver, Total	0.0006J	mg/L		0.0010	0.00004	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Silver, Dissolved	ND	mg/L		0.0010	0.0003	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Sodium, Total	ND	mg/L		0.56		SW846 6010C	4/2/08	SRT	4/4/08 03:45	TED	F2
Sodium, Dissolved	ND	mg/L		0.50	0.05	SW846 6010C	3/25/08	JWK	3/25/08 16:14	JWK	G1
Thallium, Total	ND	mg/L		0.0010	0.00002	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Thallium, Dissolved	ND	mg/L		0.0010	0.0001	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Vanadium, Total	0.0003J	mg/L		0.0010	0.00003	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Vanadium, Dissolved	0.0006J	mg/L		0.0010	0.0001	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
Zinc, Total	ND	mg/L		0.0060	0.002	SW846 6020	3/28/08	MNP	3/31/08 23:03	SRT	F1
Zinc, Dissolved	ND	mg/L		0.0050	0.0002	SW846 6020	4/8/08	LAM	4/11/08 19:32	LAM	G3
WET CHEMISTRY											
Hexavalent Chromium	ND	mg/L		0.01	0.01	SW846 7196A			3/21/08 10:00	LMM	H

Sample Comments:

Raymond J. Martrano
Laboratory Manager

0030

APPENDIX C

Support Documentation

Report ID: 9728539

9T00

Analytical Laboratory Services, Inc.
Environmental • Industrial Hygiene • Field Services
34 Dogwood Lane • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1
Courier: General Ex
Tracking #: 9646 0967 0

9728539

Co. Name: Tetra Tech NUS
Contact (Report to): Russ Turner Phone: 610 491 9658
Address: 234 Mall Boulevard
Suite 260
King of Prussia PA 19406

Bill to (if different than Report to): Tetra Tech NUS PO#:
Foster Plaza 7
661 Andersen Drive
Project Name/#: Pittsburgh, PA ALSI Quote #:

TAT: [X] Normal-Standard TAT is 10-12 business days. Date Required:
[ ] Rush-Subject to ALSI approval and surcharges. Approved By:

Email? [ ] Y
Fax? [ ] Y No:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	Container Type	Container Size	Preservative	TCL VOC 82608	1,4-Dioxane 8270C	Total TAL Metals	Dissolved TAL Metals	Hexavalent Chromium
						CG	AG	Poly	Poly	Poly			
						40ml	1Liter	500ml	500ml	1Liter			
						HCl	4°C	HNO3	HNO3	4°C			
1 TB 20080320	3/20/08 1114 3/21/08 DS 3/21	3/20/08	0425	G	AQ	2							
2 FB-20080320		3/20/08	1123	G	AQ	2	2	1	1	1			
3 OS1MW01SE-20080320		3/20/08	1425	G	GW	2	2	1	1				
4													
5													
6													
7													
8													

Internal COC Required!

ANALYSES/METHOD REQUESTED

Enter Number of Containers Per Analysis

Preserved In: MeOH DI
Cooler Temp: 3.0C
Therm. ID: 5160 3859
No. of Cooliers:
Notes:

Correct containers?	Correct sample volume?	Correct preservation?	Headspace/Volatiles?	Circle appropriate Y or N.
Y	Y	Y	Y	Y
Custody seals Present?	If present) Seals intact?	Received on Ice?	COC/Labels complete/accurate?	Container in good condition?
N	N	Y	N	Y

SAMPLED BY (Please Print): Charles Meyer
LOGGED BY (signature): 3/21/08
REVIEWED BY (signature): 3/24/08

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 TT NUS	3/20/08	1700	2		
3			4	3/21/08	1114
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] If yes, format type:
EDDs Required?
SDWA Forms?→ yes yes yes yes
State Sample's Collected In? MD NJ NY PA Other
Site Specific
QQD Criteria Required?

ALSI FIELD SERVICES
[ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

*G=Grab; C=Composite **Matrix: A=Air; DW=Drinking Water; GW=Groundwater; O=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY ***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.
Rev 6/07

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Tetra Tech NUS, Inc.
NASJRB Willow Grove, PA
CTO-0412

Analytical Laboratory Services Inc.
Analytical Narrative
TWK-003

Sample Management

This report contains the results of the analysis of three (3) water samples collected on March 20, 2008. Analytical results and quality control information are summarized in this data package.

Sample Receipt

Samples arrived at ALSI via courier on March 21, 2008. Upon receipt, the samples were inspected and compared to the enclosed chain of custody. All sample bottles were preserved properly. Each sample was assigned a unique identification number (see Certificates of Analysis). The sample information was entered into the computer system and the samples were released for analysis.

Volatile Organics by SW-846 Method 8260

Sample Handling. Three (3) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds on MS05. All analyses were performed within the holding time.

Initial Calibrations. A six-point calibration was analyzed on MS05 on March 11, 2008. This calibration was used to quantitate the samples, blank and spikes. The initial calibration met method criteria for all target analytes.

Continuing Calibration Checks. A continuing calibration check standard was analyzed on MS05 April 1, 2008. The continuing calibration check met method criteria for all target analytes.

Blanks. One method blank, identified as 454433, was analyzed with the samples and included in this deliverable group. No target analytes were detected in the method blank.

Surrogates. A four-component surrogate mix was added to each sample, blank and spike. All samples, blanks and spikes had surrogate recoveries within QC limits.

Internal Standards. A three-component internal standard mix was added to each sample, blank and spike. The internal standards were recovered within QC limits in all of the samples and associated QC.

Spiked Blanks. One spiked blank, identified as 454434, was analyzed with the samples. All target analyte recoveries were within QC limits in the spiked blanks with the exception of Chloromethane, Freon 113, and Methyl acetate which were recovered above QC limits in the spiked blank. These analytes were not detected in the project samples at any level, indicating no impact from the apparent high bias.

Semi-volatile Organic Chemicals by Method 8270

Sample Handling. Two (2) water samples were extracted by SW-846 Method 3510 and the extract was analyzed by SW-846 Method 8270 for semi-volatile organic chemicals. The samples,

extraction blanks and spikes were analyzed on MS02. All extractions and analyses were performed within holding time.

Initial Calibrations. An eight-point calibration for SW-846 Method 8270 was analyzed on MS02 on March 6, 2008. This calibration was used for the analyses of the samples, blank and spikes. The initial calibration met method criteria for the target analyte.

Calibration Checks. Calibration check standards for SW-846 Method 8270 were analyzed properly. The calibration checks met method criteria for the target analyte.

Blanks. One method blank, identified as 453008, was extracted and analyzed with the samples. The target compound was not detected in the method blank.

Surrogates. An eight-component surrogate mix was added to the sample, blank and spikes. All surrogate recoveries were within QC limits in the sample, blank and spikes.

Internal Standards. A six-component internal standard mix was added to each sample, blank and spike for SW-846 Method 8270. All internal standards had recoveries within QC limits.

Blank Spikes. One blank spike, identified as 453009, was spiked at 100 ug/L and was extracted and analyzed with the samples by method 8270. All target analyte recoveries were within QC limits for the spiked blank.

Total Metals by EPA Method 6010C

Sample handling. Two (2) water samples were analyzed for total metals on the TJA TRACE ICP using EPA Method 6010C. The samples were analyzed within the six-month holding time established for the method.

Calibration. The day that the samples were analyzed, an initial four-point calibration was properly established and verified through the analysis of a second source calibration verification standard (QCS), an initial calibration blank (S0), an initial performance check (IPC), a reporting limit standard, an interference check standard (ICSA), and an interference check standard (ICSAB). Calibration checks were analyzed every ten samples and at the conclusion of the run. All criteria associated with the calibration and check standards were within the control limits for this method. Please note that the reporting limit standard was recovered outside of DOD recovery limits, but met method criteria. Data were not impacted.

Blanks. Reagent (calibration) blanks were analyzed following the calibrations, after every ten samples, and at the conclusion of each run. Metals were not present in any of the reagent blanks at a detectable level. A method blank, identified as sample 454457-MB, was digested and analyzed with the samples in this deliverable group. Metals were not found at detectable levels in the method blank.

Laboratory Control Sample. A laboratory control sample, identified as 454458-LCS, was digested and analyzed with the samples in this deliverable group. All LCS spike recoveries were within the control limits of 80-120%.

Total Sodium and Potassium by EPA Method 6010C

Sample handling. Two (2) water samples were analyzed for total sodium and potassium on the TJA IRIS ICP using EPA Method 6010C. The samples were analyzed within the six-month holding time established for the method.

Calibration. Each day that the samples were analyzed, an initial four-point calibration was properly established and verified through the analysis of a second source calibration verification

standard (QCS), an initial calibration blank (S0), an initial performance check (IPC), a reporting limit standard, an interference check standard (ICSA), and an interference check standard (ICSAB). Calibration checks were analyzed every ten samples and at the conclusion of the run. All criteria associated with the calibration and check standards were within the control limits for this method.

Blanks. Reagent (calibration) blanks were analyzed following the calibrations, after every ten samples, and at the conclusion of each run. Metals were not present in any of the reagent blanks at a detectable level. A method blank, identified as sample 454457-MB, was digested and analyzed with the samples in this deliverable group. Metals were not found at detectable levels in the method blank.

Laboratory Control Sample. A laboratory control sample, identified as 454458-LCS, was digested and analyzed with the samples in this deliverable group. All LCS spike recoveries were within the control limits of 80-120%.

Dissolved Metals by EPA Method 6010C

Sample handling. Two (2) water samples were analyzed for dissolved metals on the ThermoFisher ICP6500 using EPA Method 6010C. The samples were analyzed within the six-month holding time established for the method.

Calibration. The day that the samples were analyzed, an initial four-point calibration was properly established and verified through the analysis of a second source calibration verification standard (QCS), an initial calibration blank (S0), an initial performance check (IPC), a reporting limit standard, and an interference check standard (ICSAB). Calibration checks were analyzed every ten samples and at the conclusion of the run. All criteria associated with the calibration and check standards were within the control limits for this method.

Blanks. Reagent (calibration) blanks were analyzed following the calibration, after every ten samples, and at the conclusion of the run. Metals were not present in any of the reagent blanks at a detectable level. A method blank, identified as sample 452139-MB, was analyzed with the samples in this deliverable group. Metals were not found at detectable levels in the method blank.

Laboratory Control Sample. A laboratory control sample, identified as 452140-LCS, was also analyzed with the samples in this deliverable group. All LCS spike recoveries were within the control limits of 80-120%.

TOTAL METALS by SW-846 Method 6020

Sample handling. Two (2) aqueous samples were analyzed for total metals on the ELAN 6000 ICP-MS and Elan DRCe ICP-MS using SW-846 Method 6020A. The samples were analyzed within the six-month holding time established for this method.

Calibration. Prior to calibration, mass calibration and resolution checks were conducted on the instrument. All criteria associated with the mass calibration and resolution checks were within control. The instrument was calibrated for metals using a blank and five to seven calibration standards. The calibration was verified prior to running samples through the analysis of a second source standard. A continuing calibration standard was analyzed every ten samples and at the conclusion of the run. All criteria associated with the calibration and calibration verification standards were within control limits.

Blanks. Reagent blanks were analyzed following the calibration, after every ten samples, and at the conclusion of the run. Metals were not present in any of the reagent blanks at a detectable level. A method blank, identified as 452963-MB, was analyzed with the samples in this deliverable group. Metals were not present in the method blank.

Laboratory Control Samples. Laboratory control sample, identified 452964-LCS, was analyzed with the samples in this deliverable group. The LCS recoveries were within the control limits for this method.

DISSOLVED METALS by SW-846 Method 6020

Sample handling. Two (2) aqueous samples were analyzed for dissolved metals on the ELAN 6000 ICP-MS and Elan DRCe ICP-MS using SW-846 Method 6020A. The samples were analyzed within the six-month holding time established for this method.

Calibration. Prior to calibration, mass calibration and resolution checks were conducted on the instrument. All criteria associated with the mass calibration and resolution checks were within control. The instrument was calibrated for metals using a blank and five to seven calibration standards. The calibration was verified prior to running samples through the analysis of a second source standard. A continuing calibration standard was analyzed every ten samples and at the conclusion of the run. All criteria associated with the calibration and calibration verification standards were within control limits.

Blanks. Reagent blanks were analyzed following the calibration, after every ten samples, and at the conclusion of the run. Metals were not present in any of the reagent blanks at a detectable level. Method blanks, identified as 458690-MB and 459726-MB, were analyzed with the samples in this deliverable group. Metals were not present in the method blanks.

Laboratory Control Samples. Laboratory control samples, identified 456891-LCS and 459727-LCS, were analyzed with the samples in this deliverable group. The LCS recoveries were within the control limits for this method.

Total Mercury by Method 7470

Sample handling. Two (2) water samples were analyzed for total mercury on the CETAC Hg Analyzer, using Method 7470. The samples were digested and analyzed within the 28-day holding time established for the method.

Calibration. The day the samples were analyzed, an initial five-point calibration was properly established and verified through the analysis of a second source calibration verification standard. Calibration check standards were analyzed every ten samples and at the conclusion of the run. All criteria associated with the calibration and check standards were within control limits.

Blanks. Reagent (calibration) blanks were analyzed following the calibration, after every ten samples, and at the conclusion of the run. Mercury was not detected in the reagent blanks. One Method Blank, identified as 454534-MB, was digested and analyzed with the samples in this deliverable group. Mercury was not detected in the method blank

Laboratory Control Samples. One-laboratory control sample, identified as 454535-LCS, was digested and analyzed for total mercury with the samples in this deliverable group. The mercury recovery was within the control limit for this method.

Total Mercury by Method 7470D

Sample handling. Two (2) water samples were analyzed for total mercury on the CETAC Hg Analyzer, using Method 7470D. The samples were digested and analyzed within the 28-day holding time established for the method.

Calibration. The day the samples were analyzed, an initial five-point calibration was properly established and verified through the analysis of a second source calibration verification standard.

Calibration check standards were analyzed every ten samples and at the conclusion of the run. All criteria associated with the calibration and check standards were within control limits.

Blanks. Reagent (calibration) blanks were analyzed following the calibration, after every ten samples, and at the conclusion of the run. Mercury was not detected in the reagent blanks. One Method Blank, identified as 454528-MB, was digested and analyzed with the samples in this deliverable group. Mercury was not detected in the method blank

Laboratory Control Samples. One-laboratory control sample, identified as 454529-LCS, was also digested and analyzed for total mercury with the samples in this deliverable group. The mercury recovery was within the control limit for this method.

Hexavalent Chromium by SW-846 7196A

Sample handling. One (1) aqueous sample was analyzed for hexavalent chromium by SW-846 Method 7196A. The sample was analyzed within the 24-hour method-recommended holding time. Please note that this analysis was performed before the sample was officially logged into the computer system, in order to meet the short analytical holding time.

Calibration. A five-point calibration was properly established on 3/21/08, and continuing calibration verification standards were analyzed to verify the calibration. The recoveries were within the QC limits of 90-110%.

Blanks. Initial and continuing blanks were analyzed with the samples. Hexavalent chromium was not detected above the reporting limit in the blanks.

Spikes. A matrix spike and matrix spike duplicate analysis was performed on sample 9728539002 (FB-20080320). The spike recoveries were within the QC limits of 85-115%. The relative percent difference between the results was within the QC limits of 15%.

Form 5B
ICPMS Interference Check A Summary

Analysis Method: 6020
Date Analyzed: 4/16/2008
Instrument ID: ELAN DRCe

SDG No.: TWK-003

Concentration Units: mg/L

Analyte	Int. Check Concentration Added	Initial Analysis					Acceptable Limits (%)
		Int. Check Concentration Found	Recovery (1)		Int. Check Concentration Found	Recovery (1)	
ALUMINUM	100	75.0	75	*			80-120

(1) The following qualifiers are used: * : Value outside of acceptable limits

Comments:

1075

Form 5B2
ICPMS Interference Check AB Summary

Analysis Method: 6020
Date Analyzed: 4/16/2008
Instrument ID: ELAN DRCe

SDG No.: TWK-003

Concentration Units: mg/L

Analyte	Int. Check Concentration Added	Initial Analysis						Acceptable Limits (%)
		Int. Check Concentration Found	Recovery	(1)	Int. Check Concentration Found	Recovery	(1)	
ALUMINUM	100	70.0	70	*				80-120

(1) The following qualifiers are used: * : Value outside of acceptable limits

Comments:
NOTE:

1076

Form 5B
ICPMS Interference Check A Summary

Analysis Method: 6020
Date Analyzed: 3/31/2008
Instrument ID: ELAN DRCe

SDG No.: TWK-003

Concentration Units: mg/L

Analyte	Int. Check Concentration Added	Initial Analysis						Acceptable Limits (%)
		Int. Check Concentration Found	Recovery	(1)	Int. Check Concentration Found	Recovery	(1)	
BERYLLIUM	0.0	-0.000200						(-.001 to .001)
ALUMINUM	100	87.2	87					80-120
VANADIUM	0.0	-0.000153						(-.002 to .002)
CHROMIUM	0.0	0.002968		*				(-.002 to .002)
MANGANESE	0.0	0.005218		*				(-.005 to .005)
COBALT	0.0	0.001809						(-.005 to .005)
NICKEL	0.0	0.005104		*				(-.005 to .005)
COPPER	0.0	0.002959						(-.005 to .005)
ZINC	0.0	0.004896						(-.005 to .005)
ARSENIC	0.0	0.000304						(-.005 to .005)
SELENIUM	0.0	-0.000731						(-.005 to .005)
MOLYBDENUM	2.00	2.20	110					80-120
SILVER	0.0	0.000617						(-.001 to .001)
CADMIUM	0.0	0.000380						(-.001 to .001)
ANTIMONY	0.0	0.000095						(-.002 to .002)
BARIUM	0.0	0.000999						(-.005 to .005)
THALLIUM	0.0	-0.000322						(-.001 to .001)
LEAD	0.0	-0.000136						(-.002 to .002)

(1) The following qualifiers are used: * : Value outside of acceptable limits

Comments:

0924

Form 5B2
ICPMS Interference Check AB Summary

Analysis Method: 6020
Date Analyzed: 3/31/2008
Instrument ID: ELAN DRCe

SDG No.: TWK-003

Concentration Units: mg/L

Analyte	Int. Check Concentration Added	Initial Analysis					Acceptable Limits (%)
		Int. Check Concentration Found	Recovery	(1)	Int. Check Concentration Found	Recovery	(1)	
BERYLLIUM	0.0	-0.000193						(-.001 to .001)
ALUMINUM	100	88.7	89					80-120
VANADIUM	0.040	0.0415	104					80-120
CHROMIUM	0.020	0.0263	131	*				80-120
MANGANESE	0.020	0.0250	125	*				80-120
COBALT	0.040	0.0442	110					80-120
NICKEL	0.040	0.0473	118					80-120
COPPER	0.020	0.0231	116					80-120
ZINC	0.020	0.0276	138	*				80-120
ARSENIC	0.020	0.0220	110					80-120
SELENIUM	0.020	0.0228	114					80-120
MOLYBDENUM	2.00	2.15	108					80-120
SILVER	0.020	0.0194	97					80-120
CADMIUM	0.010	0.0100	100					80-120
ANTIMONY	0.0	-0.000089						(-.002 to .002)
BARIUM	0.0	0.000398						(-.005 to .005)
THALLIUM	0.0	-0.000299						(-.001 to .001)
LEAD	0.0	0.000884						(-.002 to .002)

(1) The following qualifiers are used: * : Value outside of acceptable limits

Comments:
NOTE:

0925

Form 5B
ICPMS Interference Check A Summary

Analysis Method: 6020
Date Analyzed: 4/11/2008
Instrument ID: ELAN DRCe

SDG No.: TWK-003

Concentration Units: mg/L

Analyte	Int. Check Concentration Added	Initial Analysis					Acceptable Limits (%)
		Int. Check Concentration Found	Recovery	(1)	Int. Check Concentration Found	Recovery (1)	
BERYLLIUM	0	0.000045					(-.001 to .001)
ALUMINUM	100	82.9	83				80-120
VANADIUM	0	0.000449					(-.002 to .002)
CHROMIUM	0	0.001959					(-.002 to .002)
MANGANESE	0	0.005583		*			(-.004 to .004)
COBALT	0	0.001652					(-.005 to .005)
NICKEL	0	0.003690					(-.005 to .005)
COPPER	0	0.002749					(-.005 to .005)
ZINC	0	0.004363					(-.005 to .005)
ARSENIC	0	0.000104					(-.005 to .005)
SELENIUM	0	-0.000553					(-.005 to .005)
SILVER	0	-0.000360					(-.001 to .001)
CADMIUM	0	0.004531		*			(-.001 to .001)
ANTIMONY	0	0.001504					(-.002 to .002)
BARIUM	0	0.001005					(-.005 to .005)
THALLIUM	0	-0.000248					(-.001 to .001)
LEAD	0	-0.000048					(-.002 to .002)

(1) The following qualifiers are used: * : Value outside of acceptable limits

Comments:

1071

Form 5B2
ICPMS Interference Check AB Summary

Analysis Method: 6020
Date Analyzed: 4/11/2008
Instrument ID: ELAN DRCe

SDG No.: TWK-003

Concentration Units: mg/L

Analyte	Int. Check Concentration Added	Initial Analysis					Acceptable Limits (%)
		Int. Check Concentration Found	Recovery	(1)	Int. Check Concentration Found	Recovery (1)	
BERYLLIUM	0.0	0.000050					(-.001 to .001)
ALUMINUM	100	84.4	84				80-120
VANADIUM	0.040	0.0428	107				80-120
CHROMIUM	0.020	0.0215	107				80-120
MANGANESE	0.020	0.0259	129	*			80-120
COBALT	0.040	0.0438	110				80-120
NICKEL	0.040	0.0409	102				80-120
COPPER	0.020	0.0210	105				80-120
ZINC	0.020	0.0241	120				80-120
ARSENIC	0.020	0.0199	100				80-120
SELENIUM	0.020	0.0187	94				80-120
SILVER	0.020	0.0186	93				80-120
CADMIUM	0.010	0.0138	138	*			80-120
ANTIMONY	0	0.000707					(-.002 to .002)
BARIUM	0	0.000384					(-.005 to .005)
THALLIUM	0	-0.000237					(-.001 to .001)
LEAD	0	0.000963					(-.002 to .002)

(1) The following qualifiers are used: * : Value outside of acceptable limits

Comments:
NOTE:

1072