



**Data Validation Report
Tennessee Valley Authority
John Sevier Fossil Plant
Environmental Investigation Plan
Groundwater Samples**

Chain-of-Custody Number: JSF_GW_20190812_1A

This quality assurance (QA) review is based upon an examination of the data generated from the analyses of the five groundwater samples and four aqueous blanks collected on August 12 and 13, 2019, at the Tennessee Valley Authority (TVA) John Sevier Fossil Plant facility. These samples were collectively analyzed by Eurofins TestAmerica, of Pittsburgh, Pennsylvania, for total and dissolved metals by SW-846 Method 6020A; for total and dissolved mercury by SW-846 Method 7470A; for anions (specifically, chloride, fluoride, and sulfate) by SW-846 Method 9056A; for alkalinity by Standard Method (SM) 2320B; and for total dissolved solids by SM 2540C.

This review was performed in accordance with the Environmental Investigation Plan for the Tennessee Valley Authority John Sevier Fossil Plant Environmental Investigation (JSF EIP, Revision 3, October 2018). This review was performed with guidance from the National Functional Guidelines for Inorganic Data Review (US EPA, October 2004); the US EPA Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (November 2001); and the US EPA Region IV Data Validation Standard Operating Procedures. These validation guidance documents specifically address analyses performed in accordance with the Contract Laboratory Program (CLP) analytical methods and are not completely applicable to the type of analyses and analytical protocols performed for the SW-846 Standard Methods utilized by the laboratory for these samples. Environmental Standards, Inc. (Environmental Standards) used professional judgment to determine the usability of the analytical results and compliance relative to the SW-846 and Standard Methods utilized by the laboratory.

Summary

The analytical results and associated laboratory quality control (QC) samples were reviewed to determine the integrity of the reported analytical results and to ensure that the data met the established data quality objectives. This QA review includes all samples in Eurofins TestAmerica Job Number 180-94071-1.

The samples that have undergone Stage 4 data validation are listed below:

Sample Identification	Laboratory Sample Identification	Job Number	Matrix	Date Sample Collected	Parameters Examined
JSF-GW-FB01-20190812 (Field Blank)	180-94071-1	180-94071-1	Aq	8/12/19	M, Hg, A, Alk, TDS
JSF-GW-026-20190812	180-94071-2	180-94071-1	Aq	8/12/19	M, M*, Hg, Hg*, A, Alk, TDS
JSF-GW-TUB01-20190812 (Tubing Blank)	180-94071-3	180-94071-1	Aq	8/13/19	M, Hg
JSF-GW-FLB01-20190812 (Filter Blank)	180-94071-4	180-94071-1	Aq	8/13/19	M ¹ , Hg ¹
JSF-GW-022-20190813	180-94071-5	180-94071-1	Aq	8/13/19	M, Hg, A, Alk, TDS
JSF-GW-DUP01-20190813 (Field Duplicate of JSF-GW-022-20190813)	180-94071-6	180-94071-1	Aq	8/13/19	M, Hg, A, Alk, TDS
JSF-GW-027-20190813	180-94071-7	180-94071-1	Aq	8/13/19	M, Hg, A, Alk, TDS
JSF-GW-030-20190813	180-94071-8	180-94071-1	Aq	8/13/19	M, Hg, A, Alk, TDS
JSF-GW-FB02-20190813 (Field Blank)	180-94071-9	180-94071-1	Aq	8/13/19	M, Hg, A, Alk, TDS

Parameters Examined

- M - Total Metals by SW-846 Method 6020A.
- M* - Dissolved Metals by SW-846 Method 6020A.
- Hg - Total Mercury by SW-846 Method 7470A.
- Hg* - Dissolved Mercury by SW-846 Method 7470A.
- A - Anions (specifically, chloride, fluoride, and sulfate) by SW-846 Method 9056A.
- Alk - Alkalinity by SM 2320B.
- TDS - Total Dissolved Solids by SM 2540C.
- Aq - Aqueous.

Items Reviewed	
Holding Times	Instrument Tuning and Calibrations
Sample Preservation	Reporting Limit (RL) Standard Recoveries
Chain-of-Custody (COC) Record and Case Narrative	Internal Standard Recoveries
Blank Results	Sample Preparation
Laboratory Control Sample (LCS) Results	Analytical Sequence
Laboratory and Field Duplicate Results	Total vs. Dissolved Results Comparison
Quantitation of Positive Results	

Comments and Exceptions

- All analyses performed for the sampling event were in compliance with the requirements set forth in the EIP.

Qualifier Summary

Analyte(s)	Job Number	Sample(s)	Validation Qualifier(s)	Reason(s) for Qualification
total chromium and total vanadium	180-94071-1	All samples, except blanks	U*	BE, BF
total arsenic	180-94071-1	All samples, except blanks	U*	BE
total boron	180-94071-1	JSF-GW-022-20190813, JSF-GW-DUP01-20190813, and JSF-GW-030-20190813	U*	BE
total copper	180-94071-1	JSF-GW-026-20190812, JSF-GW-022-20190813, and JSF-GW-DUP01-20190813	U*	BE
total lithium	180-94071-1	JSF-GW-026-20190812, JSF-GW-027-20190813, and JSF-GW-030-20190813	U*	BE
total nickel	180-94071-1	JSF-GW-027-20190813	U*	BE
dissolved copper and dissolved nickel	180-94071-1	JSF-GW-026-20190812	U*	BF
dissolved chromium, dissolved vanadium, and dissolved zinc	180-94071-1	JSF-GW-026-20190812	U*	BE, BF
total zinc	180-94071-1	All samples, except blanks	U*	BF

Analyte(s)	Job Number	Sample(s)	Validation Qualifier(s)	Reason(s) for Qualification
total arsenic and total cobalt	180-94071-1	JSF-GW-030-20190813	U*	BL

Unless otherwise qualified, all positive results reported between the method detection limit (MDL) and quantitation limit (QL) should be considered estimated and have been flagged "J" on the data tables. (Reason Code: RL)

Review performed by: Jessica Mayberry, Quality Assurance Chemist

Review reviewed by: Amanda J. Cover, Senior Quality Assurance Chemist

Review approved by: Andrew L. Piasecki, Senior Quality Assurance Chemist

Review approved by: Rock J. Vitale, CEAC, Technical Director of Chemistry/Principal

Date review completed: 10/9/19

SECTION 2

ANALYTICAL RESULTS

INORGANIC DATA QUALIFIERS

- U* This result should be considered "not-detected" because it was detected in a rinsate blank or laboratory blank at a similar level.
- UR Unreliable reporting limit; analyte may or may not be present in sample.
- R Unreliable positive result; analyte may or may not be present in sample.
- J Quantitation is approximate due to limitations identified during data validation.
- UJ This analyte was not detected, but the reporting limit may or may not be higher due to a bias identified during data validation.

REASON CODES AND EXPLANATIONS

Reason Code	Explanation
BE	Equipment blank contamination. The result should be considered "not-detected."
BF	Field blank contamination. The result should be considered "not-detected."
BL	Laboratory blank contamination. The result should be considered "not-detected."
BN	Negative laboratory blank contamination.
C	Initial and/or Continuing Calibration issue, indeterminate bias.
C+	Initial and/or Continuing Calibration issue. The result may be biased high.
C-	Initial and/or Continuing Calibration issue. The result may be biased low.
FD	Field duplicate imprecision.
FG	Total versus Dissolved Imprecision.
H	Holding time exceeded.
I	Internal standard recovery outside of acceptance limits.
L	LCS and LCSD recoveries outside of acceptance limits, indeterminate bias.
L+	LCS and/or LCSD recoveries outside of acceptance limits. The result may be biased high.
L-	LCS and/or LCSD recoveries outside of acceptance limits. The result may be biased low.
LD	Laboratory duplicate imprecision.
LP	LCS/LCSD imprecision.
M	MS and MSD recoveries outside of acceptance limits, indeterminate bias.
M+	MS and/or MSD recoveries outside of acceptance limits. The result may be biased high.
M-	MS and/or MSD recoveries outside of acceptance limits. The result may be biased low.
MP	MS/MSD imprecision.
P	Post-digestion spike recoveries outside of acceptance limits, indeterminate bias.
P+	Post-digestion spike recovery outside of acceptance limits. The result may be biased high.
P-	Post-digestion spike recovery outside of acceptance limits. The result may be biased low.
Q	Chemical Preservation issue.
R	RL standards outside of acceptance limits, indeterminate bias.
R+	RL standard(s) outside of acceptance limits. The result may be biased high.
R-	RL standard(s) outside of acceptance limits. The result may be biased low.
RL	Reported result between the MDL and the QL.
T	Temperature preservation issue.
SD	Serial Dilution imprecision.
X	Percent solids < 50%.
Y+	Chemical Yield outside of acceptance limits. The result may be biased high.
Y-	Chemical yield outside of acceptance limits. The result may be biased low.
Z	ICP or ICP/MS Interference.
ZZ	Other.

Lab Sample ID	180-94071-1									
Sys Sample Code	JSF-GW-FB01-20190812									
Sample Name	JSF-GW-FB01-20190812									
Sample Date	8/12/2019 3:50:00 PM									
Location	JSF-110									
Sample Type	FB									
Parent Sample										
Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
MG/L		U		5.00	5.00	5.00	N	Yes	1	NA
MG/L		U		5.00	5.00	5.00	N	Yes	1	NA
MG/L		U		5.00	5.00	5.00	N	Yes	1	NA
MG/L		U		10.0	10.0	10.0	N	Yes	1	NA
UG/L		U		0.378	0.378	2.00	N	Yes	1	NA
UG/L		U		0.323	0.323	1.00	N	Yes	1	NA
UG/L		U		1.60	1.60	10.0	N	Yes	1	NA
UG/L		U		0.182	0.182	1.00	N	Yes	1	NA
UG/L		U		38.6	38.6	80.0	N	Yes	1	NA
UG/L		U		0.125	0.125	1.00	N	Yes	1	NA
UG/L		U		127	127	500	N	Yes	1	NA
UG/L	2.19			1.53	1.53	2.00	Y	Yes	1	NA
UG/L		U		0.0750	0.0750	0.500	N	Yes	1	NA
UG/L		U		0.627	0.627	2.00	N	Yes	1	NA
UG/L		U		0.128	0.128	1.00	N	Yes	1	NA
UG/L		U		3.39	3.39	5.00	N	Yes	1	NA
UG/L		U		82.7	82.7	500	N	Yes	1	NA
UG/L		U		0.610	0.610	5.00	N	Yes	1	NA
UG/L		U		0.336	0.336	1.00	N	Yes	1	NA
UG/L		U		156	156	500	N	Yes	1	NA
UG/L		U		1.51	1.51	5.00	N	Yes	1	NA
UG/L		U		0.177	0.177	1.00	N	Yes	1	NA
UG/L		U		348	348	500	N	Yes	1	NA
UG/L		U		0.148	0.148	1.00	N	Yes	1	NA
UG/L	1.22			0.991	0.991	1.00	Y	Yes	1	NA
UG/L	3.93	J	RL	3.22	3.22	5.00	Y	Yes	1	NA
UG/L		U		0.101	0.101	0.200	N	Yes	1	NA
MG/L		U		0.715	0.715	1.00	N	Yes	1	NA
MG/L		U		0.0263	0.0263	0.100	N	Yes	1	NA
MG/L		U		0.380	0.380	1.00	N	Yes	1	NA

				Lab Sample ID	180-94071-2									
				Sys Sample Code	JSF-GW-026-20190812									
				Sample Name	JSF-GW-026-20190812									
				Sample Date	8/12/2019 4:05:00 PM									
				Location	JSF-110									
				Sample Type	N									
				Parent Sample										
Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
SM2320B	Alkalinity, Carbonate	CARB	N	MG/L		U		5.00	5.00	5.00	N	Yes	1	NA
	Alkalinity, Total as	ALK	N	MG/L	31.4			5.00	5.00	5.00	Y	Yes	1	NA
	Alkalinity,Bicarbonate	BICARB	N	MG/L	31.4			5.00	5.00	5.00	Y	Yes	1	NA
SM2540C	Total Dissolved	TDS	T	MG/L	55.0			10.0	10.0	10.0	Y	Yes	1	NA
SW-846 6020A	Antimony	7440-36-0	D	UG/L		U		0.378	0.378	2.00	N	Yes	1	NA
			T	UG/L		U		0.378	0.378	2.00	N	Yes	1	NA
	Arsenic	7440-38-2	D	UG/L		U		0.323	0.323	1.00	N	Yes	1	NA
			T	UG/L		U*	BE	0.413	0.413	1.00	N	Yes	1	NA
	Barium	7440-39-3	D	UG/L	41.7			1.60	1.60	10.0	Y	Yes	1	NA
			T	UG/L	45.1			1.60	1.60	10.0	Y	Yes	1	NA
	Beryllium	7440-41-7	D	UG/L		U		0.182	0.182	1.00	N	Yes	1	NA
			T	UG/L		U		0.182	0.182	1.00	N	Yes	1	NA
	Boron	7440-42-8	D	UG/L		U		38.6	38.6	80.0	N	Yes	1	NA
			T	UG/L		U		38.6	38.6	80.0	N	Yes	1	NA
	Cadmium	7440-43-9	D	UG/L		U		0.125	0.125	1.00	N	Yes	1	NA
			T	UG/L		U		0.125	0.125	1.00	N	Yes	1	NA
	Calcium	7440-70-2	D	UG/L	11400			127	127	500	Y	Yes	1	NA
			T	UG/L	11300			127	127	500	Y	Yes	1	NA
	Chromium	7440-47-3	D	UG/L		U*	BE,BF	2.87	2.87	2.87	N	Yes	1	NA
			T	UG/L		U*	BE,BF	3.84	3.84	3.84	N	Yes	1	NA
	Cobalt	7440-48-4	D	UG/L	2.17			0.0750	0.0750	0.500	Y	Yes	1	NA
			T	UG/L	2.73			0.0750	0.0750	0.500	Y	Yes	1	NA
	Copper	7440-50-8	D	UG/L		U*	BF	4.40	4.40	4.40	N	Yes	1	NA
			T	UG/L		U*	BE	1.20	1.20	2.00	N	Yes	1	NA
	Lead	7439-92-1	D	UG/L		U		0.128	0.128	1.00	N	Yes	1	NA
			T	UG/L	0.537	J	RL	0.128	0.128	1.00	Y	Yes	1	NA
	Lithium	7439-93-2	D	UG/L		U		3.39	3.39	5.00	N	Yes	1	NA
			T	UG/L		U*	BE	4.47	4.47	5.00	N	Yes	1	NA
	Magnesium	7439-95-4	D	UG/L	754			82.7	82.7	500	Y	Yes	1	NA
			T	UG/L	817			82.7	82.7	500	Y	Yes	1	NA
	Molybdenum	7439-98-7	D	UG/L		U		0.610	0.610	5.00	N	Yes	1	NA
			T	UG/L		U		0.610	0.610	5.00	N	Yes	1	NA

				Lab Sample ID	180-94071-2									
				Sys Sample Code	JSF-GW-026-20190812									
				Sample Name	JSF-GW-026-20190812									
				Sample Date	8/12/2019 4:05:00 PM									
				Location	JSF-110									
				Sample Type	N									
				Parent Sample										
Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
SW-846 6020A	Nickel	7440-02-0	D	UG/L		U*	BF	3.15	3.15	3.15	N	Yes	1	NA
			T	UG/L	20.2			0.336	0.336	1.00	Y	Yes	1	NA
	Potassium	7440-09-7	D	UG/L	571			156	156	500	Y	Yes	1	NA
			T	UG/L	725			156	156	500	Y	Yes	1	NA
	Selenium	7782-49-2	D	UG/L		U		1.51	1.51	5.00	N	Yes	1	NA
			T	UG/L		U		1.51	1.51	5.00	N	Yes	1	NA
	Silver	7440-22-4	D	UG/L		U		0.177	0.177	1.00	N	Yes	1	NA
			T	UG/L		U		0.177	0.177	1.00	N	Yes	1	NA
	Sodium	7440-23-5	D	UG/L	2220			348	348	500	Y	Yes	1	NA
			T	UG/L	2160			348	348	500	Y	Yes	1	NA
SW-846 7470A	Thallium	7440-28-0	D	UG/L		U		0.148	0.148	1.00	N	Yes	1	NA
			T	UG/L		U		0.148	0.148	1.00	N	Yes	1	NA
	Vanadium	7440-62-2	D	UG/L		U*	BE,BF	1.34	1.34	1.34	N	Yes	1	NA
			T	UG/L		U*	BE,BF	2.56	2.56	2.56	N	Yes	1	NA
	Zinc	7440-66-6	D	UG/L		U*	BE,BF	16.8	16.8	16.8	N	Yes	1	NA
			T	UG/L		U*	BF	11.1	11.1	11.1	N	Yes	1	NA
	Mercury	7439-97-6	D	UG/L		U		0.101	0.101	0.200	N	Yes	1	NA
			T	UG/L		U		0.101	0.101	0.200	N	Yes	1	NA
SW-846 9056A	Chloride	16887-00-6	N	MG/L	2.32			0.715	0.715	1.00	Y	Yes	1	NA
	Fluoride	16984-48-8	N	MG/L	0.0346	J	RL	0.0263	0.0263	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	MG/L	4.80			0.380	0.380	1.00	Y	Yes	1	NA

	Lab Sample ID	180-94071-3												
	Sys Sample Code	JSF-GW-TUB01-20190812												
	Sample Name	JSF-GW-TUB01-20190812												
	Sample Date	8/12/2019 4:22:00 PM												
	Location	JSF-110												
	Sample Type	TB												
	Parent Sample													
Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
SW-846 6020A	Antimony	7440-36-0	T	UG/L		U		0.378	0.378	2.00	N	Yes	1	NA
	Arsenic	7440-38-2	T	UG/L		U		0.323	0.323	1.00	N	Yes	1	NA
	Barium	7440-39-3	T	UG/L		U		1.60	1.60	10.0	N	Yes	1	NA
	Beryllium	7440-41-7	T	UG/L		U		0.182	0.182	1.00	N	Yes	1	NA
	Boron	7440-42-8	T	UG/L		U		38.6	38.6	80.0	N	Yes	1	NA
	Cadmium	7440-43-9	T	UG/L		U		0.125	0.125	1.00	N	Yes	1	NA
	Calcium	7440-70-2	T	UG/L	147	J	RL	127	127	500	Y	Yes	1	NA
	Chromium	7440-47-3	T	UG/L	1.93	J	RL	1.53	1.53	2.00	Y	Yes	1	NA
	Cobalt	7440-48-4	T	UG/L		U		0.0750	0.0750	0.500	N	Yes	1	NA
	Copper	7440-50-8	T	UG/L		U		0.627	0.627	2.00	N	Yes	1	NA
	Lead	7439-92-1	T	UG/L		U		0.128	0.128	1.00	N	Yes	1	NA
	Lithium	7439-93-2	T	UG/L		U		3.39	3.39	5.00	N	Yes	1	NA
	Magnesium	7439-95-4	T	UG/L		U		82.7	82.7	500	N	Yes	1	NA
	Molybdenum	7439-98-7	T	UG/L		U		0.610	0.610	5.00	N	Yes	1	NA
	Nickel	7440-02-0	T	UG/L		U		0.336	0.336	1.00	N	Yes	1	NA
	Potassium	7440-09-7	T	UG/L		U		156	156	500	N	Yes	1	NA
	Selenium	7782-49-2	T	UG/L		U		1.51	1.51	5.00	N	Yes	1	NA
	Silver	7440-22-4	T	UG/L		U		0.177	0.177	1.00	N	Yes	1	NA
	Sodium	7440-23-5	T	UG/L		U		348	348	500	N	Yes	1	NA
	Thallium	7440-28-0	T	UG/L		U		0.148	0.148	1.00	N	Yes	1	NA
	Vanadium	7440-62-2	T	UG/L	1.09			0.991	0.991	1.00	Y	Yes	1	NA
	Zinc	7440-66-6	T	UG/L	9.02			3.22	3.22	5.00	Y	Yes	1	NA
SW-846 7470A	Mercury	7439-97-6	T	UG/L		U		0.101	0.101	0.200	N	Yes	1	NA

	Lab Sample ID	180-94071-4												
	Sys Sample Code	JSF-GW-FLB01-20190812												
	Sample Name	JSF-GW-FLB01-20190812												
	Sample Date	8/12/2019 4:25:00 PM												
	Location	JSF-110												
	Sample Type	FLB												
	Parent Sample													
Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
SW-846 6020A	Antimony	7440-36-0	D	UG/L		U		0.378	0.378	2.00	N	Yes	1	NA
	Arsenic	7440-38-2	D	UG/L		U		0.323	0.323	1.00	N	Yes	1	NA
	Barium	7440-39-3	D	UG/L		U		1.60	1.60	10.0	N	Yes	1	NA
	Beryllium	7440-41-7	D	UG/L		U		0.182	0.182	1.00	N	Yes	1	NA
	Boron	7440-42-8	D	UG/L		U		38.6	38.6	80.0	N	Yes	1	NA
	Cadmium	7440-43-9	D	UG/L		U		0.125	0.125	1.00	N	Yes	1	NA
	Calcium	7440-70-2	D	UG/L		U		127	127	500	N	Yes	1	NA
	Chromium	7440-47-3	D	UG/L	1.95	J	RL	1.53	1.53	2.00	Y	Yes	1	NA
	Cobalt	7440-48-4	D	UG/L		U		0.0750	0.0750	0.500	N	Yes	1	NA
	Copper	7440-50-8	D	UG/L	1.03	J	RL	0.627	0.627	2.00	Y	Yes	1	NA
	Lead	7439-92-1	D	UG/L		U		0.128	0.128	1.00	N	Yes	1	NA
	Lithium	7439-93-2	D	UG/L		U		3.39	3.39	5.00	N	Yes	1	NA
	Magnesium	7439-95-4	D	UG/L		U		82.7	82.7	500	N	Yes	1	NA
	Molybdenum	7439-98-7	D	UG/L		U		0.610	0.610	5.00	N	Yes	1	NA
	Nickel	7440-02-0	D	UG/L	0.679	J	RL	0.336	0.336	1.00	Y	Yes	1	NA
	Potassium	7440-09-7	D	UG/L		U		156	156	500	N	Yes	1	NA
	Selenium	7782-49-2	D	UG/L		U		1.51	1.51	5.00	N	Yes	1	NA
	Silver	7440-22-4	D	UG/L		U		0.177	0.177	1.00	N	Yes	1	NA
	Sodium	7440-23-5	D	UG/L		U		348	348	500	N	Yes	1	NA
	Thallium	7440-28-0	D	UG/L		U		0.148	0.148	1.00	N	Yes	1	NA
	Vanadium	7440-62-2	D	UG/L	1.08			0.991	0.991	1.00	Y	Yes	1	NA
	Zinc	7440-66-6	D	UG/L	8.61			3.22	3.22	5.00	Y	Yes	1	NA
SW-846 7470A	Mercury	7439-97-6	D	UG/L		U		0.101	0.101	0.200	N	Yes	1	NA

Lab Sample ID	180-94071-5									
Sys Sample Code	JSF-GW-022-20190813									
Sample Name	JSF-GW-022-20190813									
Sample Date	8/13/2019 8:20:00 AM									
Location	JSF-106									
Sample Type	N									
Parent Sample										
Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
MG/L		U		5.00	5.00	5.00	N	Yes	1	NA
MG/L	218			5.00	5.00	5.00	Y	Yes	1	NA
MG/L	218			5.00	5.00	5.00	Y	Yes	1	NA
MG/L	464			10.0	10.0	10.0	Y	Yes	1	NA
UG/L		U		0.378	0.378	2.00	N	Yes	1	NA
UG/L		U*	BE	0.492	0.492	1.00	N	Yes	1	NA
UG/L	76.4			1.60	1.60	10.0	Y	Yes	1	NA
UG/L		U		0.182	0.182	1.00	N	Yes	1	NA
UG/L		U*	BE	308	308	308	N	Yes	1	NA
UG/L		U		0.125	0.125	1.00	N	Yes	1	NA
UG/L	123000			127	127	500	Y	Yes	1	NA
UG/L		U*	BE,BF	2.99	2.99	2.99	N	Yes	1	NA
UG/L	2.06			0.0750	0.0750	0.500	Y	Yes	1	NA
UG/L		U*	BE	1.52	1.52	2.00	N	Yes	1	NA
UG/L		U		0.128	0.128	1.00	N	Yes	1	NA
UG/L		U		3.39	3.39	5.00	N	Yes	1	NA
UG/L	13800			82.7	82.7	500	Y	Yes	1	NA
UG/L		U		0.610	0.610	5.00	N	Yes	1	NA
UG/L	3.14			0.336	0.336	1.00	Y	Yes	1	NA
UG/L	2820			156	156	500	Y	Yes	1	NA
UG/L		U		1.51	1.51	5.00	N	Yes	1	NA
UG/L		U		0.177	0.177	1.00	N	Yes	1	NA
UG/L	44800			348	348	500	Y	Yes	1	NA
UG/L		U		0.148	0.148	1.00	N	Yes	1	NA
UG/L		U*	BE,BF	1.66	1.66	1.66	N	Yes	1	NA
UG/L		U*	BF	5.87	5.87	5.87	N	Yes	1	NA
UG/L		U		0.101	0.101	0.200	N	Yes	1	NA
MG/L	9.71			0.715	0.715	1.00	Y	Yes	1	NA
MG/L	0.0791	J	RL	0.0263	0.0263	0.100	Y	Yes	1	NA
MG/L	113			0.380	0.380	1.00	Y	Yes	1	NA

				Lab Sample ID	180-94071-6									
				Sys Sample Code	JSF-GW-DUP01-20190813									
				Sample Name	JSF-GW-DUP01-20190813									
				Sample Date	8/13/2019 12:00:00 AM									
				Location	JSF-106									
				Sample Type	FD									
				Parent Sample	JSF-GW-022-20190813									
Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
SM2320B	Alkalinity, Carbonate	CARB	N	MG/L		U		5.00	5.00	5.00	N	Yes	1	NA
	Alkalinity, Total as	ALK	N	MG/L	223			5.00	5.00	5.00	Y	Yes	1	NA
	Alkalinity,Bicarbonate	BICARB	N	MG/L	223			5.00	5.00	5.00	Y	Yes	1	NA
SM2540C	Total Dissolved	TDS	T	MG/L	470			10.0	10.0	10.0	Y	Yes	1	NA
SW-846 6020A	Antimony	7440-36-0	T	UG/L		U		0.378	0.378	2.00	N	Yes	1	NA
	Arsenic	7440-38-2	T	UG/L		U*	BE	0.401	0.401	1.00	N	Yes	1	NA
	Barium	7440-39-3	T	UG/L	72.9			1.60	1.60	10.0	Y	Yes	1	NA
	Beryllium	7440-41-7	T	UG/L		U		0.182	0.182	1.00	N	Yes	1	NA
	Boron	7440-42-8	T	UG/L		U*	BE	297	297	297	N	Yes	1	NA
	Cadmium	7440-43-9	T	UG/L		U		0.125	0.125	1.00	N	Yes	1	NA
	Calcium	7440-70-2	T	UG/L	119000			127	127	500	Y	Yes	1	NA
	Chromium	7440-47-3	T	UG/L		U*	BE,BF	2.64	2.64	2.64	N	Yes	1	NA
	Cobalt	7440-48-4	T	UG/L	1.96			0.0750	0.0750	0.500	Y	Yes	1	NA
	Copper	7440-50-8	T	UG/L		U*	BE	1.30	1.30	2.00	N	Yes	1	NA
	Lead	7439-92-1	T	UG/L		U		0.128	0.128	1.00	N	Yes	1	NA
	Lithium	7439-93-2	T	UG/L		U		3.39	3.39	5.00	N	Yes	1	NA
	Magnesium	7439-95-4	T	UG/L	13400			82.7	82.7	500	Y	Yes	1	NA
	Molybdenum	7439-98-7	T	UG/L		U		0.610	0.610	5.00	N	Yes	1	NA
	Nickel	7440-02-0	T	UG/L	2.98			0.336	0.336	1.00	Y	Yes	1	NA
	Potassium	7440-09-7	T	UG/L	2720			156	156	500	Y	Yes	1	NA
	Selenium	7782-49-2	T	UG/L		U		1.51	1.51	5.00	N	Yes	1	NA
	Silver	7440-22-4	T	UG/L		U		0.177	0.177	1.00	N	Yes	1	NA
	Sodium	7440-23-5	T	UG/L	43000			348	348	500	Y	Yes	1	NA
	Thallium	7440-28-0	T	UG/L		U		0.148	0.148	1.00	N	Yes	1	NA
	Vanadium	7440-62-2	T	UG/L		U*	BE,BF	1.45	1.45	1.45	N	Yes	1	NA
	Zinc	7440-66-6	T	UG/L		U*	BF	9.00	9.00	9.00	N	Yes	1	NA
SW-846 7470A	Mercury	7439-97-6	T	UG/L		U		0.101	0.101	0.200	N	Yes	1	NA
SW-846 9056A	Chloride	16887-00-6	N	MG/L	9.68			0.715	0.715	1.00	Y	Yes	1	NA
	Fluoride	16984-48-8	N	MG/L	0.0801	J	RL	0.0263	0.0263	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	MG/L	113			0.380	0.380	1.00	Y	Yes	1	NA

Lab Sample ID	180-94071-7									
Sys Sample Code	JSF-GW-027-20190813									
Sample Name	JSF-GW-027-20190813									
Sample Date	8/13/2019 11:20:00 AM									
Location	JSF-206									
Sample Type	N									
Parent Sample										
Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
MG/L		U		5.00	5.00	5.00	N	Yes	1	NA
MG/L	249			5.00	5.00	5.00	Y	Yes	1	NA
MG/L	249			5.00	5.00	5.00	Y	Yes	1	NA
MG/L	353			10.0	10.0	10.0	Y	Yes	1	NA
UG/L		U		0.378	0.378	2.00	N	Yes	1	NA
UG/L		U*	BE	0.638	0.638	1.00	N	Yes	1	NA
UG/L	163			1.60	1.60	10.0	Y	Yes	1	NA
UG/L		U		0.182	0.182	1.00	N	Yes	1	NA
UG/L		U		38.6	38.6	80.0	N	Yes	1	NA
UG/L		U		0.125	0.125	1.00	N	Yes	1	NA
UG/L	112000			127	127	500	Y	Yes	1	NA
UG/L		U*	BE,BF	2.23	2.23	2.23	N	Yes	1	NA
UG/L	1.19			0.0750	0.0750	0.500	Y	Yes	1	NA
UG/L		U		0.627	0.627	2.00	N	Yes	1	NA
UG/L		U		0.128	0.128	1.00	N	Yes	1	NA
UG/L		U*	BE	10.0	10.0	10.0	N	Yes	1	NA
UG/L	6770			82.7	82.7	500	Y	Yes	1	NA
UG/L		U		0.610	0.610	5.00	N	Yes	1	NA
UG/L		U*	BE	1.25	1.25	1.25	N	Yes	1	NA
UG/L	993			156	156	500	Y	Yes	1	NA
UG/L		U		1.51	1.51	5.00	N	Yes	1	NA
UG/L		U		0.177	0.177	1.00	N	Yes	1	NA
UG/L	9460			348	348	500	Y	Yes	1	NA
UG/L		U		0.148	0.148	1.00	N	Yes	1	NA
UG/L		U*	BE,BF	1.15	1.15	1.15	N	Yes	1	NA
UG/L		U*	BF	3.24	3.24	5.00	N	Yes	1	NA
UG/L		U		0.101	0.101	0.200	N	Yes	1	NA
MG/L	15.9			0.715	0.715	1.00	Y	Yes	1	NA
MG/L	0.0507	J	RL	0.0263	0.0263	0.100	Y	Yes	1	NA
MG/L	47.8			0.380	0.380	1.00	Y	Yes	1	NA

Lab Sample ID	180-94071-8									
Sys Sample Code	JSF-GW-030-20190813									
Sample Name	JSF-GW-030-20190813									
Sample Date	8/13/2019 3:10:00 PM									
Location	JSF-209									
Sample Type	N									
Parent Sample										
Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
MG/L		U		5.00	5.00	5.00	N	Yes	1	NA
MG/L	233			5.00	5.00	5.00	Y	Yes	1	NA
MG/L	233			5.00	5.00	5.00	Y	Yes	1	NA
MG/L	361			10.0	10.0	10.0	Y	Yes	1	NA
UG/L		U		0.378	0.378	2.00	N	Yes	1	NA
UG/L		U*	BE,BL	0.983	0.983	1.00	N	Yes	1	NA
UG/L	35.0			1.60	1.60	10.0	Y	Yes	1	NA
UG/L		U		0.182	0.182	1.00	N	Yes	1	NA
UG/L		U*	BE	117	117	117	N	Yes	1	NA
UG/L		U		0.125	0.125	1.00	N	Yes	1	NA
UG/L	85200			127	127	500	Y	Yes	1	NA
UG/L		U*	BE,BF	2.06	2.06	2.06	N	Yes	1	NA
UG/L		U*	BL	0.474	0.474	0.500	N	Yes	1	NA
UG/L		U		0.627	0.627	2.00	N	Yes	1	NA
UG/L		U		0.128	0.128	1.00	N	Yes	1	NA
UG/L		U*	BE	5.74	5.74	5.74	N	Yes	1	NA
UG/L	4690			82.7	82.7	500	Y	Yes	1	NA
UG/L	1.24	J	RL	0.610	0.610	5.00	Y	Yes	1	NA
UG/L		U		0.336	0.336	1.00	N	Yes	1	NA
UG/L	749			156	156	500	Y	Yes	1	NA
UG/L		U		1.51	1.51	5.00	N	Yes	1	NA
UG/L		U		0.177	0.177	1.00	N	Yes	1	NA
UG/L	21100			348	348	500	Y	Yes	1	NA
UG/L		U		0.148	0.148	1.00	N	Yes	1	NA
UG/L		U*	BE,BF	1.05	1.05	1.05	N	Yes	1	NA
UG/L		U*	BF	4.32	4.32	5.00	N	Yes	1	NA
UG/L		U		0.101	0.101	0.200	N	Yes	1	NA
MG/L	3.71			0.715	0.715	1.00	Y	Yes	1	NA
MG/L	0.0602	J	RL	0.0263	0.0263	0.100	Y	Yes	1	NA
MG/L	64.4			0.380	0.380	1.00	Y	Yes	1	NA

Lab Sample ID	180-94071-9									
Sys Sample Code	JSF-GW-FB02-20190813									
Sample Name	JSF-GW-FB02-20190813									
Sample Date	8/13/2019 3:48:00 PM									
Location	JSF-209									
Sample Type	FB									
Parent Sample										
Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
MG/L		U		5.00	5.00	5.00	N	Yes	1	NA
MG/L		U		5.00	5.00	5.00	N	Yes	1	NA
MG/L		U		5.00	5.00	5.00	N	Yes	1	NA
MG/L		U		10.0	10.0	10.0	N	Yes	1	NA
UG/L		U		0.378	0.378	2.00	N	Yes	1	NA
UG/L		U		0.323	0.323	1.00	N	Yes	1	NA
UG/L		U		1.60	1.60	10.0	N	Yes	1	NA
UG/L		U		0.182	0.182	1.00	N	Yes	1	NA
UG/L		U		38.6	38.6	80.0	N	Yes	1	NA
UG/L		U		0.125	0.125	1.00	N	Yes	1	NA
UG/L		U		127	127	500	N	Yes	1	NA
UG/L	2.97			1.53	1.53	2.00	Y	Yes	1	NA
UG/L		U		0.0750	0.0750	0.500	N	Yes	1	NA
UG/L		U		0.627	0.627	2.00	N	Yes	1	NA
UG/L		U		0.128	0.128	1.00	N	Yes	1	NA
UG/L		U		3.39	3.39	5.00	N	Yes	1	NA
UG/L		U		82.7	82.7	500	N	Yes	1	NA
UG/L		U		0.610	0.610	5.00	N	Yes	1	NA
UG/L		U		0.336	0.336	1.00	N	Yes	1	NA
UG/L		U		156	156	500	N	Yes	1	NA
UG/L		U		1.51	1.51	5.00	N	Yes	1	NA
UG/L		U		0.177	0.177	1.00	N	Yes	1	NA
UG/L		U		348	348	500	N	Yes	1	NA
UG/L		U		0.148	0.148	1.00	N	Yes	1	NA
UG/L	1.44			0.991	0.991	1.00	Y	Yes	1	NA
UG/L	7.74			3.22	3.22	5.00	Y	Yes	1	NA
UG/L		U		0.101	0.101	0.200	N	Yes	1	NA
MG/L		U		0.715	0.715	1.00	N	Yes	1	NA
MG/L		U		0.0263	0.0263	0.100	N	Yes	1	NA
MG/L		U		0.380	0.380	1.00	N	Yes	1	NA

SECTION 3

SUPPORTING DOCUMENTATION FOR QUALIFIERS



INORGANIC ANALYSIS SUPPORT DOCUMENTATION

ESI project name: TVA JSF EI
 Sample Collection Dates: 8/12/19 and 8/13/19
 Job Number: 20188396.A000
 Project Manager: Amanda Cover
 Laboratory: Eurofins TA- Pitt

Reviewed by: JM
 Approved by: ASL
 Completion Date: 10/22/19

Applicable Sample No's (x)

Refer to Table 1 in the Quality Assurance Review

		<u>SDG No.</u>	<u>Lab Control No.</u>
Deliverable:	CLP-like(Full) ()	180-94071-1	
	Level IV (Full) (x)		
Limited	()		
Other:			

The following table indicates criteria that were examined, the identified problems, and support documentation attachments

	Criteria Examined in Detail				Problems Identified				Support Documentation Attachments			
	Metals	Mercury	Gen Chem		Metals	Mercury	Gen Chem		Metals	Mercury	Gen Chem	
Holding Times	x	x	x									
Blank Analysis Results	x	x	x		x				x			
Matrix Spike (Predigestion) Results				x								
Duplicate Analysis: (x) Field (x) Lab				x								
Quantitation of Results	x	x	x									
Detection Limit/Sensitivity	x	x	x									
Initial Calibrations	x	x	x									
Continuing Calibrations	x	x	x									
Laboratory Control Standard (LCS)	x	x	x									
ICP Linear Range Analysis	x											
ICP Interference Checks												
ICP Serial Dilutions												
ICP/ICPMS Post-Digestion Spike												
ICPMS Internal Standards	x											
GFAA Post Digestion Spikes												
GFAA Duplicate Injections												
ICP Multiple Exposures												
GFAA Standard Additions												
CRDL Standards	x	x	x									
Condition on Receipt	x	x	x									
Percent Solids							x					
Others: total vs dissolved	x					x			x			

Comments:



BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

Matrix (Aq., S.)	Blank Type					Blank Sample Number	Contaminant	Concentration (ug/L)	Qualification limit (5x)
	Method	ICB	CCB	Prep.	Trip	Equip	Field		
Aq				x		JSF-GW-EB01-20190815	Sb	0.661	3.305
Aq				x		JSF-GW-EB01-20190815	As	0.418	2.09
Aq				x		JSF-GW-EB01-20190815	Be	0.361	1.805
Aq				x		JSF-GW-EB01-20190815	Be	74.7	373.5
Aq				x		JSF-GW-EB01-20190815	Cr	2.69	13.45
Aq				x		JSF-GW-EB01-20190815	Cu	2.76	13.8
Aq				x		JSF-GW-EB01-20190815	Li	4.18	20.9
Aq				x		JSF-GW-EB01-20190815	Ni	0.394	1.97
Aq				x		JSF-GW-EB01-20190815	Tl	0.243	1.215
Aq				x		JSF-GW-EB01-20190815	V	1.53	7.65
									0
Aq				x		JSF-GW-FB01-20190812	Cr	2.19	10.95
Aq				x		JSF-GW-FB01-20190812	V	1.22	6.1
Aq				x		JSF-GW-FB01-20190812	Zn	3.93	19.65
									0
Aq				x		JSF-GW-TUB01-20190812	Ca	147	735
Aq				x		JSF-GW-TUB01-20190812	Cr	1.93	9.65
Aq				x		JSF-GW-TUB01-20190812	V	1.09	5.45
Aq				x		JSF-GW-TUB01-20190812	Zn	9.02	45.1
									0
Aq				x		JSF-GW-FLB01-20190812	diss Cr	1.95	9.75
Aq				x		JSF-GW-FLB01-20190812	diss Cu	1.03	5.15
Aq				x		JSF-GW-FLB01-20190812	diss Ni	0.679	3.395
Aq				x		JSF-GW-FLB01-20190812	diss V	1.08	5.4
Aq				x		JSF-GW-FLB01-20190812	diss Zn	8.61	43.05
									0
Aq				x		JSF-GW-FB02-20190813	Cr	2.97	14.85
Aq				x		JSF-GW-FB02-20190813	V	1.44	7.2
Aq				x		JSF-GW-FB02-20190813	Zn	7.74	38.7
									0
Aq		X				MB 180-288786/1-A	Hg	0.11	0.55
									0

Aq = Aqueous, S = Solid

Notes: _____



BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

Aq = Aqueous; S = Solid

Notes:

**ENVIRONMENTAL STANDARDS, INC.
EVALUATION OF DUPLICATE RESULTS**

NOTES:

Qual: Qualifier(s) based on evaluation(s) other than Total/ vs. Dissolved comparison, if applicable (J, U, U* or B)

RPD: Relative Percent Difference

QL: Quantitation Limit

MDL: Method Detection Limit

RL: Reporting Limit. RL = QL for QL reporting and MDL for MDL reporting

J: The analyte concentration should be considered estimated

U: The analyte was not detected in the sample at or above the RL indicated. The RL will be used for comparison purposes.

UJ: The analyte was not detected in the sample at or above the Reporting Limit Indicated. The RL is approximate.

R: The analyte was analyzed for and detected, but sample results are unreliable. The presence or absence of the analyte cannot be verified.

UR: The analyte was analyzed for and not detected, but the determination that the analyte was not present in the sample is unreliable. The presence or absence of the analyte cannot be verified.

U* The result was blank qualified. The RL will be used for comparison purposes.

NA: The MDL (for QL reporting), RPD or Difference is not applicable

Comments:

EB

Client Sample Results

Client: Environmental Standards Inc.
 Project/Site: JSF_GW_20190815_1A

Job ID: 180-94261-1

Client Sample ID: JSF-GW-EB01-20190815 ~ JSF-207

Lab Sample ID: 180-94261-3

Date Collected: 08/15/19 09:50

Matrix: Water

Date Received: 08/16/19 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00	0.715	mg/L			08/26/19 22:02	1
Fluoride	ND		0.100	0.0263	mg/L			08/26/19 22:02	1
Sulfate	ND		1.00	0.380	mg/L			08/26/19 22:02	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony - no qual, all ND	0.661	J X S = 3.305	2.00	0.378	ug/L			08/31/19 11:16	1
Arsenic - qual all samples	0.418	J X S = 2.09	1.00	0.323	ug/L			08/31/19 11:16	1
Barium	ND		10.0	1.60	ug/L			08/31/19 11:16	1
Beryllium - no qual, all ND	0.361	J X S = 1.805	1.00	0.182	ug/L			08/31/19 11:16	1
Boron - qual sample 5, 14, 18	74.7	J X S = 373.5	80.0	38.6	ug/L			08/31/19 11:16	1
Cadmium	ND		1.00	0.125	ug/L			08/31/19 11:16	1
Calcium	ND		500	127	ug/L			08/31/19 11:16	1
Chromium - qual all samples	2.69 X S = 13.45		2.00	1.53	ug/L			08/31/19 11:16	1
Cobalt	ND		0.500	0.0750	ug/L			08/31/19 11:16	1
Copper qual sample 2, 5, 14	2.76 X S = 13.0		2.00	0.627	ug/L			08/31/19 11:16	1
Lead	ND		1.00	0.128	ug/L			08/31/19 11:16	1
Lithium qual sample 2, 7, 18	4.18 J X S = 20.9		5.00	3.39	ug/L			08/31/19 11:16	1
Magnesium	ND		500	82.7	ug/L			08/31/19 11:16	1
Molybdenum	ND		5.00	0.610	ug/L			08/31/19 11:16	1
Nickel qual sample 7	0.394	J X S = 20.9	1.00	0.336	ug/L			08/31/19 11:16	1
Potassium	ND	1.47	500	156	ug/L			08/31/19 11:16	1
Selenium	ND		5.00	1.51	ug/L			08/31/19 11:16	1
Silver	ND		1.00	0.177	ug/L			08/31/19 11:16	1
Sodium	ND		500	348	ug/L			08/31/19 11:16	1
Thallium - no qual, all ND	0.243	J X S = 1.215	1.00	0.148	ug/L			08/31/19 11:16	1
Vanadium - qual all samples	1.53 X S = 7.65		1.00	0.991	ug/L			08/31/19 11:16	1
Zinc	ND		5.00	3.22	ug/L			08/31/19 11:16	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.101	ug/L		08/23/19 10:50	08/27/19 12:33	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10.0	10.0	mg/L			08/22/19 16:20	1
Total Alkalinity as CaCO ₃ to pH 4.5	ND		5.00	5.00	mg/L			08/22/19 01:24	1
Bicarbonate Alkalinity as CaCO ₃	ND		5.00	5.00	mg/L			08/22/19 01:24	1
Carbonate Alkalinity as CaCO ₃	ND		5.00	5.00	mg/L			08/22/19 01:24	1

"U*" (Reason code: PBE)

Eurofins TestAmerica, Pittsburgh

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: JSF_GW_20190812_1A

Job ID: 180-94071-1

Client Sample ID: JSF-GW-FB01-20190812 ~ JSF-110

Lab Sample ID: 180-94071-1

Matrix: Water

Date Collected: 08/12/19 15:50
Date Received: 08/14/19 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00	0.715	mg/L			08/24/19 16:07	✓ 1
Fluoride	ND		0.100	0.0263	mg/L			08/24/19 16:07	✓ 1
Sulfate	ND		1.00	0.380	mg/L			08/24/19 16:07	✓ 1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00	0.378	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Arsenic	ND		1.00	0.323	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Barium	ND		10.0	1.60	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Beryllium	ND		1.00	0.182	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Boron	ND		80.0	38.6	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Cadmium	ND		1.00	0.125	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Calcium	ND		500	127	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Chromium	2.19	qual sample 2 ✓	2.00	1.53	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Cobalt	ND		0.500	0.0750	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Copper	ND		2.00	0.627	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Lead	ND		1.00	0.128	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Lithium	ND		5.00	3.39	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Magnesium	ND		500	82.7	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Molybdenum	ND		5.00	0.610	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Nickel	ND		1.00	0.336	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Potassium	ND		500	156	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Selenium	ND		5.00	1.51	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Silver	ND		1.00	0.177	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Sodium	ND		500	348	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Thallium	ND		1.00	0.148	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Vanadium	1.22	qual sample 2 ✓	1.00	0.991	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1
Zinc	3.93	qual sample 2 ✓	5.00	3.22	ug/L		08/19/19 11:38	08/22/19 15:14	✓ 1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.101	ug/L		08/21/19 09:29	08/22/19 09:29	✓ 1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10.0	10.0	mg/L			08/15/19 10:12	✓ 1
Total Alkalinity as CaCO ₃ to pH 4.5	ND		5.00	5.00	mg/L			08/21/19 12:52	✓ 1
Bicarbonate Alkalinity as CaCO ₃	ND		5.00	5.00	mg/L			08/21/19 12:52	✓ 1
Carbonate Alkalinity as CaCO ₃	ND		5.00	5.00	mg/L			08/21/19 12:52	✓ 1

Eurofins TestAmerica, Pittsburgh

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: JSF_GW_20190812_1A

Job ID: 180-94071-1

Client Sample ID: JSF-GW-TUB01-20190812 ~ JSF-110

Lab Sample ID: 180-94071-3

Matrix: Water

Date Collected: 08/12/19 16:22
Date Received: 08/14/19 09:00

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable						
Analyte	Result	Qualifier	RL	MDL	Unit	D
Antimony	ND		2.00	0.378	ug/L	08/19/19 11:38
Arsenic	ND		1.00	0.323	ug/L	08/19/19 11:38
Barium	ND		10.0	1.60	ug/L	08/19/19 11:38
Beryllium	ND		1.00	0.182	ug/L	08/19/19 11:38
Boron	ND		80.0	38.6	ug/L	08/19/19 11:38
Cadmium	ND		1.00	0.125	ug/L	08/19/19 11:38
Calcium - no qual, >5x	✓ 147	J XS 785	500	127	ug/L	08/19/19 11:38
Chromium Qual sample 2	✓ 1.93 J	XS 9.45	2.00	1.53	ug/L	08/19/19 11:38
Cobalt	ND		0.500	0.0750	ug/L	08/19/19 11:38
Copper	ND		2.00	0.627	ug/L	08/19/19 11:38
Lead	ND		1.00	0.128	ug/L	08/19/19 11:38
Lithium	ND		5.00	3.39	ug/L	08/19/19 11:38
Magnesium	ND		500	82.7	ug/L	08/19/19 11:38
Molybdenum	ND		5.00	0.610	ug/L	08/19/19 11:38
Nickel	ND		1.00	0.336	ug/L	08/19/19 11:38
Potassium	ND		500	156	ug/L	08/19/19 11:38
Selenium	ND		5.00	1.51	ug/L	08/19/19 11:38
Silver	ND		1.00	0.177	ug/L	08/19/19 11:38
Sodium	ND		500	348	ug/L	08/19/19 11:38
Thallium	ND		1.00	0.148	ug/L	08/19/19 11:38
Vanadium	✓ 1.09	Z qual sample 2 / XS 5.45	1.00	0.991	ug/L	08/19/19 11:38
Zinc	✓ 9.02	Z qual sample 2 / XS 45.1	5.00	3.22	ug/L	08/19/19 11:38

Method: EPA 7470A - Mercury (CVAA)						
Analyte	Result	Qualifier	RL	MDL	Unit	D
Mercury	ND		0.200	0.101	ug/L	08/21/19 09:29

qual dissolved parameters

"U"

(Reason code: BB)

Eurofins TestAmerica, Pittsburgh

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: JSF_GW_20190812_1A

Job ID: 180-94071-1

Client Sample ID: JSF-GW-FLB01-20190812 ~ JSF-110

Lab Sample ID: 180-94071-4

Matrix: Water

Date Collected: 08/12/19 16:25
Date Received: 08/14/19 09:00

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Method: EPA 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00	0.378	ug/L		08/19/19 11:38	08/22/19 15:25	1
Arsenic	ND		1.00	0.323	ug/L		08/19/19 11:38	08/22/19 15:25	1
Barium	ND		10.0	1.60	ug/L		08/19/19 11:38	08/22/19 15:25	1
Beryllium	ND		1.00	0.182	ug/L		08/19/19 11:38	08/22/19 15:25	1
Boron	ND		80.0	38.6	ug/L		08/19/19 11:38	08/22/19 15:25	1
Cadmium	ND		1.00	0.125	ug/L		08/19/19 11:38	08/22/19 15:25	1
Calcium	ND		500	127	ug/L		08/19/19 11:38	08/22/19 15:25	1
Chromium - qual sample 2 ✓	1.95	J X5 9.75	2.00	1.53	ug/L		08/19/19 11:38	08/22/19 15:25	1
Cobalt	ND		0.500	0.0750	ug/L		08/19/19 11:38	08/22/19 15:25	1
Copper - qual sample 2 ✓	1.03	J X5 5.15	2.00	0.627	ug/L		08/19/19 11:38	08/22/19 15:25	1
Lead	ND		1.00	0.128	ug/L		08/19/19 11:38	08/22/19 15:25	1
Lithium	ND		5.00	3.39	ug/L		08/19/19 11:38	08/22/19 15:25	1
Magnesium	ND		500	82.7	ug/L		08/19/19 11:38	08/22/19 15:25	1
Molybdenum	ND		5.00	0.610	ug/L		08/19/19 11:38	08/22/19 15:25	1
Nickel - qual sample J ✓	0.679	J X5 3.39S	1.00	0.336	ug/L		08/19/19 11:38	08/22/19 15:25	1
Potassium	ND		500	156	ug/L		08/19/19 11:38	08/22/19 15:25	1
Selenium	2	ND	5.00	1.51	ug/L		08/19/19 11:38	08/22/19 15:25	1
Silver	ND		1.00	0.177	ug/L		08/19/19 11:38	08/22/19 15:25	1
Sodium	ND		500	348	ug/L		08/19/19 11:38	08/22/19 15:25	1
Thallium	ND		1.00	0.148	ug/L		08/19/19 11:38	08/22/19 15:25	1
Vanadium	✓ 1.08	X5 5.4	1.00	0.091	ug/L		08/19/19 11:38	08/22/19 15:25	1
Zinc	3 qual sample 2 ✓	8.61 X5 43.05	5.00	3.22	ug/L		08/19/19 11:38	08/22/19 15:25	1

Method: EPA 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.101	ug/L		08/21/19 09:29	08/22/19 09:33	1

Diss metals only

Eurofins TestAmerica, Pittsburgh

FB

- used to evaluate
blank contamination for samples collected
Client Sample Results
8/13

Client: Environmental Standards Inc.
Project/Site: JSF_GW_20190812_1A

Job ID: 180-94071-1

Client Sample ID: JSF-GW-FB02-20190813 ~ JSF-209

Lab Sample ID: 180-94071-9

Matrix: Water

Date Collected: 08/13/19 15:48
Date Received: 08/14/19 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00	0.715	mg/L			08/24/19 17:10	✓ 1
Fluoride	ND		0.100	0.0263	mg/L			08/24/19 17:10	✓ 1
Sulfate	ND		1.00	0.380	mg/L			08/24/19 17:10	✓ 1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND ✓		2.00	0.378	ug/L		08/19/19 11:38	08/22/19 15:48	✓ 1
Arsenic	ND		1.00	0.323	ug/L		08/19/19 11:38	08/22/19 15:48	1
Barium	ND		10.0	1.60	ug/L		08/19/19 11:38	08/22/19 15:48	1
Beryllium	ND		1.00	0.182	ug/L		08/19/19 11:38	08/22/19 15:48	1
Boron	ND		80.0	38.6	ug/L		08/19/19 11:38	08/22/19 15:48	1
Cadmium	ND		1.00	0.125	ug/L		08/19/19 11:38	08/22/19 15:48	1
Calcium	ND ✓		500	127	ug/L		08/19/19 11:38	08/22/19 15:48	1
Chromium	2.97 ✓	X S = 14.85	2.00	1.53	ug/L		08/19/19 11:38	08/22/19 15:48	✓ 1
Cobalt	ND ✓	5, 6, 7, 8	0.500	0.0750	ug/L		08/19/19 11:38	08/22/19 15:48	✓ 1
Copper	ND		2.00	0.627	ug/L		08/19/19 11:38	08/22/19 15:48	✓ 1
Lead	ND		1.00	0.128	ug/L		08/19/19 11:38	08/22/19 15:48	✓ 1
Lithium	ND ✓		5.00	3.39	ug/L		08/19/19 11:38	08/22/19 15:48	1
Magnesium	ND		500	82.7	ug/L		08/19/19 11:38	08/22/19 15:48	1
Molybdenum	ND		5.00	0.610	ug/L		08/19/19 11:38	08/22/19 15:48	1
Nickel	ND		1.00	0.336	ug/L		08/19/19 11:38	08/22/19 15:48	1
Potassium	ND		500	156	ug/L		08/19/19 11:38	08/22/19 15:48	1
Selenium	ND		5.00	1.51	ug/L		08/19/19 11:38	08/22/19 15:48	1
Silver	ND		1.00	0.177	ug/L		08/19/19 11:38	08/22/19 15:48	1
Sodium	ND		500	348	ug/L		08/19/19 11:38	08/22/19 15:48	1
Thallium	ND		1.00	0.148	ug/L		08/19/19 11:38	08/22/19 15:48	1
Vanadium	1.44 ✓	X S = 7.2	1.00	0.991	ug/L		08/19/19 11:38	08/22/19 15:48	1
Zinc	3 qual samples ✓	5, 6, 7, 8 ✓	7.74	5.00	3.22 ug/L		08/19/19 11:38	08/22/19 15:48	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.101	ug/L		08/21/19 09:29	08/22/19 09:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		✓ 10.0	✓ 10.0	mg/L			08/15/19 10:12 ✓	1
Total Alkalinity as CaCO ₃ to pH 4.5	ND		5.00	5.00	mg/L			08/21/19 16:16	1
Bicarbonate Alkalinity as CaCO ₃	ND		5.00	✓ 5.00	mg/L			08/21/19 16:16 ✓	1
Carbonate Alkalinity as CaCO ₃	ND		5.00	5.00	mg/L			08/21/19 16:16	1

Qual Samples "J#"
(Reason Code: BF)

Eurofins TestAmerica, Pittsburgh

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: Eurofins TestAmerica, Pittsburgh

Job No.: 180-94071-1

SDG No.:

Concentration Units: ug/L

*associated with samples
180-94071-8, -9, -2 (diss)
ortho*

Analyte	RL	CCB 180-289116/138 08/22/2019 15:42		CCB 180-289116/147 08/22/2019 16:12					
		Found	C	Found	C	Found	C	Found	C
Antimony	2.00	ND		✓ ND					
Arsenic	1.00	ND		✓ 0.6750	J	$\times 5 = 3.375$			
Barium	10.0	ND		ND					
Beryllium	1.00	ND		ND					
Boron	80.0	ND		ND					
Cadmium	1.00	ND		✓ 0.1710	J	$\times 5 = 0.855$			
Calcium	500	ND		ND					
Chromium	2.00	ND		ND					
Cobalt	0.500	ND		✓ 0.3050	J	$\times 5 = 1.525$			
Copper	2.00	ND		ND					
Lead	1.00	ND		✓ 0.2440	J	$\times 5 = 1.22$			
Lithium	5.00	ND		ND					
Magnesium	500	ND		ND					
Molybdenum	5.00	ND		ND					
Nickel	1.00	ND		ND					
Potassium	500	ND		ND					
Selenium	5.00	ND		ND					
Silver	1.00	ND		ND					
Sodium	500	ND		ND					
Thallium	1.00	ND		✓ 0.3640	J	$\times 5 = 1.82$			
Vanadium	1.00	ND		ND					
Zinc	5.00	ND		ND					

all/(<) < 2 + MDL

AS - qual sample -8

Cd - All ND, no qual

Co - qual sample -8

Pb - all ND ; no qual

Th - all ND no qual

Italicized analytes were not requested for this sequence.

SECTION 4

CASE NARRATIVE AND CHAIN-OF-CUSTODY RECORD

Case Narrative

Client: Environmental Standards Inc.
Project/Site: JSF_GW_20190812_1A

Job ID: 180-94071-1

Job ID: 180-94071-1

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Laboratory: Eurofins TestAmerica, Pittsburgh

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Narrative

Job Narrative
180-94071-1

Revised Report

This report was revised to include the method 6020 metals QC. This replaces the previous final report.

Receipt

The samples were received on 8/14/2019 9:00 AM; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.5° C and 2.0° C. <6°

GC Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: Environmental Standards Inc.
Project/Site: JSF_GW_20190812_1A

Job ID: 180-94071-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-94071-1	JSF-GW-FB01-20190812 ~ JSF-110	Water	08/12/19 15:50	08/14/19 09:00	
180-94071-2	JSF-GW-026-20190812 ~ JSF-110	Water	08/12/19 16:05	08/14/19 09:00	
180-94071-3	JSF-GW-TUB01-20190812 ~ JSF-110	Water	08/12/19 16:22	08/14/19 09:00	
180-94071-4	JSF-GW-FLB01-20190812 ~ JSF-110	Water	08/12/19 16:25	08/14/19 09:00	
180-94071-5	JSF-GW-022-20190813 ~ JSF-106	Water	08/13/19 08:20	08/14/19 09:00	
180-94071-6	JSF-GW-DUP01-20190813 ~ NA	Water	08/13/19 00:00	08/14/19 09:00	
180-94071-7	JSF-GW-027-20190813 ~ JSF-206	Water	08/13/19 11:20	08/14/19 09:00	
180-94071-8	JSF-GW-030-20190813 ~ JSF-209	Water	08/13/19 15:10	08/14/19 09:00	
180-94071-9	JSF-GW-FB02-20190813 ~ JSF-209	Water	08/13/19 15:48	08/14/19 09:00	

All samples analyzed < HT ; no qual

* ~~Palladium~~
 * ~~Metals~~ elements
 Antimony < 28 days
 ALIC < 14 days
 TDS < 7 days

Method Summary

Client: Environmental Standards Inc.
Project/Site: JSF_GW_20190812_1A

Job ID: 180-94071-1

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 7470A	Mercury (CVAA)	SW846	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
SM2320 B	Alkalinity, Total	SM18	TAL PIT
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT

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Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SM18 = "Standard Methods For The Examination Of Water And Wastewater", 18th Edition, 1992.

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TVA Environmental Investigations

Tennessee Valley Authority

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Required Site to Lab		Required Project Info/Location:		Required Sample Info/Information			
Lab Name:	TestAmerica Pittsburgh	Site ID #:	John Sevier Forest Plant	Sampler:	A. Wilson / S. Blair		
Lab Address:	301 Alpha Drive Pittsburgh, PA 15238	Project #: 17066825		Sampling Company:	Starline		
		Site Address:	PLANT 611 CUC HWY 1C E	Address:	101 Greenway Park Rd, Suite 22		
		City:	Ridgeville	State/Zip:	Pittsburgh, PA	Postal Code:	15238-1444
Lab Manager Contact Information							
Lab P/M:	GBI Lab	Site P/M Name:	Roy Quinn	Sampling Team Number/C:			
Phone/Fax:	815-301-5741/815-728-3604	Phone/Fax:	423-751-3753	Send EDCA/Hard Copy to:			
Lab Email:		Site P/M Email:		Analysis Turnaround Time			
				24 HOURS	48 HOURS	72 HOURS	96 HOURS
				CALENDAR DAYS	REGULAR DAYS	REGULAR DAYS	REGULAR DAYS

COOLER No.:		of	Z
COC No.:	JSF	GW	20190812_1A
1	of	1	Pages
Task Desc.:	JSF_GW		

Rev. I

2/19/1

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ITEM #	SAMPLE ID Samples ID's MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth		MATRIX CODE	G= GRAB C=C/NP	SAMPLE TYPE	3 Business Days 5 Business Days - 10 Business Days			
			Depth Unit	Select Unit				SAMPLE DATE	BALANCE TIME	4 OF CONTAINERS	Comments/ Lab Sample I.D.
		Start Depth	End Depth					48HR	24HR	12HR	8HR
	JSF-GW-FB01-20190812	JSF-110	NA	NA	AQ	G	FB	8/12/2019	1550	3	None
	JSF-GW-026-20190812	JSF-110	17.0'	NA	GW	G	N	8/12/2019	1605	4	pH: 5.15
	JSF-GW-TU801-20190812	JSF-110	NA	NA	AQ	G	TUB	8/12/2019	1622	1	None
	JSF-GW-FLB01-20190812	JSF-110	NA	NA	AQ	G	FLB	8/12/2019	1625	1	None
	JSF-GW-022-20190813	JSF-106	15.0'	NA	GW	G	N	8/13/2019	0820	3	pH: 6.43
	JSF-GW-DUP01-20190813	NA	NA	NA	GW	G	FD	8/13/2019	NA	3	None
	JSF-GW-027-20190813	JSF-206	28.5'	NA	GW	G	N	8/13/2019	1120	3	pH: 6.87
	JSF-GW-030-20190813	JSF-209	32.5'	NA	GW	G	N	8/13/2019	1510	3	pH: 7.25
	JSF-GW-FB02-20190813	JSF-209	NA	NA	AQ	G	FB	8/13/2019	1548	3	None

Additional Comments/Special Instructions:

Additional volume collected should be used for MS/MSDs.

GW: Anions, alkalinity, and TDS, unpreserved; Metals preserved w/ HNO3

GW-Tubing: Total metals only



180-94071 Chain of Custody

TVA Environmental Investigations

Tennessee Valley Authority

Chain-of-Custody / Analytical Request Document	
Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate	

COOLER No.:	of	2
COC No.:	JSF_GW_20190812_1A	
1 of 1 Pages		
Task Desc.:	JSF_GW	

Required Ship to Lab:		Required Project Information:		Required Sampler Information:	
Lab Name:	TestAmerica Pittsburgh	Site ID #:	John Sevier Fossil Plant	Sampler:	A. Wilson / S. Stahl
Lab Address:	301 Alpha Drive Pittsburgh, PA 15238	Project #:	175580225	Sampling Company:	Stantec
		Site Address:	PLANT 811 OLD HWY 70 S	Address:	601 Grassmere Park Rd, Suite 22
		City:	Rogersville	City/State:	Nashville, TN
		Site PM Name:	Roy Quinn	Phone:	(615) 885-1144
Lab Manager Contact Information					
Lab PM:	Gail Lago	Phone/Fax:	423-751-3753	Sampling Team Number:	1
Phone/Fax:	615-301-5741/615-728-3424	Site PM Email:		Send EDG/Hard Copy to:	
Lab Email:					

Analysis Turnaround Time

CALENDAR DAYS 2 WORKING DAYS

TAT if different from Below

24 Hours

3 Business Days

5 Business Days

- 10 Business Days

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth		MATRIX CODE G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Analyst
			Start Depth	End Depth								
1	JSF-GW-FB01-20190812	JSF-110	NA	NA	AQ G	FB	8/12/2019	1550	3	None		
2	JSF-GW-026-20190812	JSF-110	17.0'	NA	GW G	N	8/12/2019	1605	4	pH: 5.15		X
3	JSF-GW-TUB01-20190812	JSF-110	NA	NA	AQ G	TUB	8/12/2019	1622	1	None		X
4	JSF-GW-FLB01-20190812	JSF-110	NA	NA	AQ G	FLB	8/12/2019	1625	1	None		X
5	JSF-GW-022-20190813	JSF-106	16.0'	NA	GW G	N	8/13/2019	0820	3	pH: 6.43		X
6	JSF-GW-DUP01-20190813	NA	NA	NA	GW G	FD	8/13/2019	NA	3	None		X
7	JSF-GW-027-20190813	JSF-206	28.5'	NA	GW G	N	8/13/2019	1120	3	pH: 6.87		X
8	JSF-GW-030-20190813	JSF-209	32.5'	NA	GW G	N	8/13/2019	1510	3	pH: 7.25		X
9	JSF-GW-FB02-20190813	JSF-209	NA	NA	AQ G	FB	8/13/2019	1548	3	None		X

Additional Comments/Special Instructions

Additional volume collected should be used for MS/MSDs.

GW: Anions, alkalinity, and TDS, unpreserved;
Metals preserved w/ HNO3

RELINQUISHED BY AFFILIATION		DATE	TIME	ACCEPTED BY AFFILIATION	DATE	TIME	Sample Receipt Conditions					
Anne Wilson / Stantec	<i>Amber</i>	8/13/2019	18:00	<i>Paul Miller</i>	8/14/2019	9:00	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	
							<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	
							<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	
							<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	
							<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	
							<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	
SHIPPING METHOD		SAMPLER NAME AND SIGNATURE				Temperature In °C	Sample on Ice?	Sample Infect?	Trip Blank?			
FedEx		Anne Wilson / <i>Amber</i>		Stantec Stahl / <i>Amber</i>								



180-94071 Chain of Custody

TVA Environmental Investigations

Tennessee Valley Authority

Chain-of-Custody / Analytical Request Document									
Chain-of-Custody Is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.									

COOLER No.:	7	of	2
DOC No.:	JSF GW 20190812_1A		
1 of 1 Pages			
Task Desc:	JSF_GW		

Required Ship to Lab:		Required Project Information				Required Sampler Information				
Lab Name:	TestAmerica Pittsburgh	Site ID #:	John Sevier Fossil Plant			Sampler:	A. Wilson / S. Stahl			
Lab Address:	301 Alpha Drive Pittsburgh PA 15238	Project #:	175568225			Sampling Company:	Sterntec			
City:	Rogersville	Site Address:	PLANT 511 OLD HWY 70 S			Address:	601 Grassmere Park Rd, Suite 22			
Lab Manager Contact Information		Site PM Name:	Roy Quinn			City/State:	Nashville, TN Phone: (615) 885-1144			
Lab PW:	Gail Lage	Phone/Fax:	423-751-3753			Sampling Team Number:	1			
Phone/Fax:	615-301-5741/615-726-3404			Site PM Email:	Send EDD/Hard Copy to:					
Lab Email:										

Analysis Turnaround Time
 CALENDAR DAYS WORKING DAYS
 TAT if different from Below _____
 24 Hours
 3 Business Days
 5 Business Days
 - 10 Business Days

ITEMS #		SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth		MATRIX CODE	G=GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Preserve Specimens in Column A		Analysis	
				Start Depth	End Depth									Cry	Cry Disinfected	UV	UV Disinfected
1		JSF-GW-FB01-20190812	JSF-110	NA	NA	AQ	G	FB	8/12/2019	1550	3	None		X			
2		JSF-GW-TUB01-20190812	JSF-110	17.0	NA	GW	G	N	8/12/2019	1605	4	pH: 5.15		X X			
3		JSF-GW-TUB01-20190812	JSF-110	NA	NA	AQ	G	TUB	8/12/2019	1622	1	None		X			
4		JSF-GW-FLB01-20190812	JSF-110	NA	NA	AQ	G	FLB	8/12/2019	1625	1	None		X			
5		JSF-GW-022-20190813	JSF-106	16.0'	NA	GW	G	N	8/13/2019	0820	3	pH: 6.43		X			
6		JSF-GW-DUP01-20190813	NA	NA	NA	GW	G	FD	8/13/2019	NA	3	None		X			
7		JSF-GW-027-20190813	JSF-206	28.5'	NA	GW	G	N	8/13/2019	1120	3	pH: 6.87		X			
8		JSF-GW-030-20190813	JSF-209	32.5'	NA	GW	G	N	8/13/2019	1510	3	pH: 7.25		X			
9		JSF-GW-FB02-20190813	JSF-209	NA	NA	AQ	G	FB	8/13/2019	1548	3	None		X			

Additional Comments/Special Instructions:

Additional volume collected should be used for MS/MSDs.

GW: Anions, alkalinity, and TDS, unpreserved.
Metals preserved w/ HNO3

RElinquished by / AFFILIATION:

Anna Wilson / Sterntec *Amber*

DATE

TIME

ACCEPTED BY / AFFILIATION

DATE

TIME

Sample Receipt Conditions

1 Yes 2 No 3 Yes 4 No

5 Yes 6 No 7 Yes 8 No

9 Yes 10 No 11 Yes 12 No

13 Yes 14 No 15 Yes 16 No

17 Yes 18 No 19 Yes 20 No

21 Yes 22 No 23 Yes 24 No

25 Yes 26 No 27 Yes 28 No

29 Yes 30 No 31 Yes 32 No

33 Yes 34 No 35 Yes 36 No

37 Yes 38 No 39 Yes 40 No

41 Yes 42 No 43 Yes 44 No

45 Yes 46 No 47 Yes 48 No

50 Yes 51 No 52 Yes 53 No

55 Yes 56 No 57 Yes 58 No

59 Yes 60 No 61 Yes 62 No

63 Yes 64 No 65 Yes 66 No

67 Yes 68 No 69 Yes 70 No

71 Yes 72 No 73 Yes 74 No

76 Yes 77 No 78 Yes 79 No

81 Yes 82 No 83 Yes 84 No

86 Yes 87 No 88 Yes 89 No

91 Yes 92 No 93 Yes 94 No

96 Yes 97 No 98 Yes 99 No

101 Yes 102 No 103 Yes 104 No

Filtered	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N
----------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

SHIPPING METHOD

FeOx

Stainless Steel

SAMPLER NAME AND SIGNATURE

Anna Wilson / *Amber*

Stefan Stahl / *Amber*

Temperature in

°C

Sample on Ice?

Yes

No

Sample intact?

Yes

No

Trip Blank?

Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 180-94071-1

Login Number: 94071

List Source: Eurofins TestAmerica, Pittsburgh

List Number: 1

Creator: Say, Thomas C

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

