Data Validation Report
SDG 160-18590-1

Characterization of Structures, Items, Solutions, and Soil at the Proposed Outfall 200 Treatment System Sites Y-12 National Security Complex

Revision 0

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SCOPE

This report contains Level 3 data validation results for analytical data for SDG 160-18590-1 for three concrete composite samples collected at the Proposed Outfall 200 Mercury Treatment Facility located at the Y-12 National Security Complex, Oak Ridge, Tennessee. The evaluation covers analyses for Total Characteristic Leaching Procedure (TCLP) Metals, Polychlorinated Biphenyls (PCBs) and the following radionuclide analyses: Americium 241, Neptunium-237, isotopic Plutonium, isotopic Thorium, isotopic Uranium, Carbon-14, Total Beta Strontium, Technetium-99, Tritium, and Radium-226 (Ra-226).

METHOD

The analytical data were validated using applicable portions of the following guidelines:

- *Characterization of Structures, Items, Solutions, and Soils at the Proposed Outfall 200 Treatment Systems Site Work Plan* (AC-4326-002-WP, July 2016)
- *Sampling and Analysis Plan/Quality Assurance Project Plan for Geotechnical and Waste Characterization of the Outfall 200 Mercury Treatment Facility Area at the National Security Complex, Oak Ridge, Tennessee* (DOE/OR-01-2657&D1, November 2015) (SAP/QAPP).
- *Guidance on Environmental Data Verification and Data Validation - EPA QA/G-8,* EP A/240/R-02/004, United States Environmental Protection Agency, Washington D.C
- National Functional Guidelines for Superfund Organic Methods Data Review (September 2016)
- National Functional Guidelines for Inorganic Superfund Data Review (September 2016)
- Verification and Validation of Radiological Data for Use in Waste Management and Environmental Remediation. ANSI/ANS-41.5-2012. (February, 2012)
- Multi-Agency Radiological Laboratory Analytical Protocols Manual (July, 2004)

VERIFICATION AND VALIDATION RESULTS

Completeness

Results for three composite concrete samples were evaluated. The TCLP Metals, PCB, Total Beta Strontium, Tecnetium-99 (Tc-99), Tritium, and Ra-226 analyses were performed by TestAmerica in Earth City, Missouri (TA-St. Louis). The analyses for Americium-241, Neptunium-237, isotopic Plutonium, isotopic Thorium, isotopic Uranium, and Carbon-14 were subcontracted to and performed by TestAmerica in Richland, Washington (TA-RL), Washington. The following lists analytical methods and sample numbers for reported results.

Project Sample ID	Laboratory Sample ID	Analysis
YMTFA63C	160-18590-01	PCBs TCLP Metals/Mercury Tritium Total Beta Strontium Tc-99 Ra-226 Americium-241 Neptunium-237 Isotopic Plutonium Isotopic Thorium Isotopic Uranium Carbon-14

Project Sample ID	Laboratory Sample ID	Analysis
YMTFA64C	160-18590-02	PCBs TCLP Metals/Mercury Tritium Total Beta Strontium Tc-99 Ra-226 Americium-241 Neptunium-237 Isotopic Plutonium Isotopic Thorium Isotopic Uranium Carbon-14
YMTFA83 UNK2C	160-18590-03	PCBs TCLP Metals/Mercury Tritium Total Beta Strontium Tc-99 Ra-226 Americium-241 Neptunium-237 Isotopic Plutonium Isotopic Thorium Isotopic Uranium Carbon-14

Holding times

Based on evaluation of the date of sample collection (08/10/16) and date of sample analyses, all recommended holding times per the analytical methods were met.

Preservation and Laboratory Sample Receipt

All samples arrived at TA-St. Louis and TA-RL intact and in good condition under valid chain of custody (COC). The COC was signed indicating the samples were appropriately relinquished by the field personnel and accepted by the analytical laboratory.

Samples were not shipped on ice. Sample temperature at receipt was recorded by the laboratory as 18 °C. Although this is a SAP/QAPP deviation, no impact upon target analyte recoveries is anticipated based on this temperature. No qualifications were assigned.

Analytical Methods, Reporting Units, and Detection Limits

All analytical methods specified (or equivalent to those specified) on the COC (COC No. 160-4422-2174.2) were utilized for the analyses. All results were reported in appropriate units. Detection limits were appropriate for all methods.

Trip Blank

Not Applicable.

Equipment Blanks (EB)

Not applicable.

Field Blank (FB)

Not applicable.

Field Duplicates

Not applicable.

Laboratory Case Narratives

The following issues were noted in the case narratives:

General

- These concrete core samples were disaggregated, dried, and then puck milled and split for a variety of analyses. The possible heat generation may have compromised the Tritium, Carbon-14 and Technetium-99 native to these samples.

Organics

PCBs:

- The matrix spike duplicate (MSD) recovery for PCB-1260 was outside control limits, and the matrix spike (MS)/MSD relative percent differences (RPDs) for PCB-106 and PCB-1260 were outside the control imit. Matrix interference is suspected. (Validator note: the MS/MSD was performed on a sample not evaluated for this data validation report [DVR]).
- Due to presence of multiple PCBs, less than 5 peaks were used for quantitation for a sample not evaluated for this DVR.

Inorganics

TCLP Metals (ICP) and Mercury:

- The samples were diluted due to the nature of the sample matrix. Samples are high in salts. Elevated reporting limits (RLs) are provided.
- The samples were re-digested/re-extracted due to a timer failure resulting in the samples digesting longer than permitted by the SOP. Therefore the MS/MSD was spiked after preservation. (Validator note: the MS/MSD was performed on a sample not evaluated for this DVR).

Radionuclides

Ra-226

- The samples could not be thoroughly homogenized before sub-sampling was performed due to sample matrix. The samples were of varying colors and contained rocks.
- The sample duplicate precision (RER/RPD) was outside of the control limits: (RER: 3.83, RPD: 115%).

Total Beta Strontium

- Sample YMTFA83 UNK2 C (160-18590-3) was inadvertently traced with double the usual amount of strontium carrier. The appropriate values were adjusted in TALS (Validator note: TALS was not defined).

Tc-99

- The samples counted off the upper end of the quench curve parameter. A small amount (10 uL) of quenching agent (nitromethane) was added to the affected vials and recounted. The recount results were within the quench curve parameter and are reported.
- The duplicate had Tc-99 tracer recoveries below the 30% quality control (QC) limit. (Validator note: the duplicate analysis was performed on a sample not evaluated for this DVR).

Verification/Validation Checklists, Data Qualifiers, and Qualifier Definitions
Verification and validation checklists are presented in Appendix A and Appendix B. Applicable validation qualifier codes are defined in the table below.

Qualifier	Definition
J	Result is estimated
U	Analyte is not detected at or above the stated reporting limit
R	Result is rejected
UJ	Analyte is not detected but there is uncertainty about the reporting limit

General
As noted in the laboratory case narrative, these samples were disaggregated, dried, and then puck milled and split for a variety of analyses. The possible heat generation may have compromised the Tritium, Carbon-14 and Tc-99 native to these samples. The nondetect results for Tritium, Carbon-14 and Tc-99 were therefore qualified as estimated (UJ) in all samples.

TCLP Extractions
Three composite concrete samples were extracted by SW-846 Method 1311 with appropriate batch QCs. There were no problems noted during the extraction.

Polychlorinated Biphenyls by Gas Chromatography (GC)
Three composite concrete samples were extracted and analyzed for PCBs by SW-846 Method 8082A. Holding times and initial and continuing calibrations were acceptable. Batch QC (method blank, laboratory control sample [LCS], MS/MSD) were acceptable except for the PCB-1260 recoveries in the MSD and the RPDs for PCB-1016 and PCB-1260. The MS/MSD was performed on a sample not evaluated for this DVR. No qualifications were assigned. The samples QCs (surrogates, internal standards) were acceptable.

TCLP Metals by Inductively Coupled Plasma (ICP) and Mercury by Cold Vapor Atomic Absorption (CVAA)

TCLP extracts of three composite concrete samples were extracted and analyzed for Metals and Mercury by SW-846 Method 6010C and 7470A. Holding times, initial and continuing calibrations, batch QCs (blank, LCS, MS/MSD) were acceptable.

Radionuclides
Three composite concrete samples were analyzed for the following radionuclides (Environmental Measurements Laboratory [EML]/HASL method/methodology in parenthesis):

- Tritium (H3-04-RC/liquid scintillation counting [LSC]),
- Total Beta Strontium (Method SR-03-RC/gas flow proportional counter [GFPC]),
- Tc-99 (Method TC-02-RC/LSC),
- Ra-226 (ST-RC-0301/Alpha Spectrometry),
- Americium-241 (RL-ALP-001/Alpha Spectroscopy),
- Neptunium-237 (RL-ALP-013/Alpha Spectroscopy),
- Isotopic Plutonium (RL-ALP-002/Alpha Spectroscopy),
- Isotopic Thorium (RL-ALP-001/Alpha Spectroscopy),
- Isotopic Uranium (RL-ALP-009/Alpha Spectroscopy), and
- Carbon-14 (RL-LSC-008/LSC).

Holding times, applicable instrument calibrations, and sample and batch QCs (LCS, duplicates, and MS where applicable) were acceptable for all methods, except as noted below. Traceable standard certificates were acceptable. Tracer and chemical recoveries and yields were acceptable, except as noted below.

Alpha Spectrometry
Ra-226 was detected in the method blank at 0.2498 pCi/g, and the normalized difference was calculated by the validator to be between 0 and 1.96 for all samples. The Ra-226 relative error ratio (RER) was reported by the laboratory as greater than 1 at 3.83 for the duplicate, which was performed using sample YMTFA63C. The Ra-226 results were qualified as estimated (J) for all three samples.

Liquid Scintillation Counter
The Tc-99 duplicate tracer recovery was less than the 30% limit; however, the duplicate was performed using a sample not evaluated for this DVR so no qualifications were required.

Summary

- Possible heat generation from puck-mill grinding may have compromised the Tritium, Carbon-14 and Tc-99 native to these samples. The nondetect results for Tritium, Carbon-14 and Tc-99 were therefore qualified as estimated (UJ) in all three samples.
- Ra-226 was detected in the method blank at 0.2498 pCi/g and the normalized difference was between 0 and 1.96 for all three samples. The RER for the Ra-226 duplicate was > 1. Therefore, Ra-226 was qualified as estimated (J) in all three samples.

Summary of Result Qualifiers

Sample No.	Parameter	Laboratory Result	Qualified Result	Units	Laboratory Qualifier	Validation Qualifier
YMTFA63C	Tritium	0.190	0.190	pCi/g	U	UJ
YMTFA63C	Ra-226	**0.589**	**0.589**	pCi/g		J
YMTFA63C	Tc-99	-0.223	-0.223	pCi/g	U	UJ
YMTFA63C	Carbon-14	-3.49E-02	-3.49E-02	pCi/g	U	UJ
YMTFA64C	Tritium	0.0948	0.0948	pCi/g	U	UJ
YMTFA64C	Ra-226	**0.466**	**0.466**	pCi/g		J
YMTFA64C	Tc-99	-0.126	-0.126	pCi/g	U	UJ
YMTFA64C	Carbon-14	3.24E-02	3.24E-02	pCi/g	U	UJ
YMTFA83 UNK2C	Tritium	0.0505	0.0505	pCi/g	U	UJ
YMTFA83 UNK2C	Ra-226	**0.734**	**0.734**	pCi/g		J
YMTFA83 UNK2C	Tc-99	0.148	0.148	pCi/g	U	UJ
YMTFA83 UNK2C	Carbon-14	6.79E-02	6.79E-02	pCi/g	U	UJ

Appendix A

Verification Summary Tables

Data Verification	Y	N	N/A	Comment
Custody of Samples				
Are samples traceable through inspection of signature records on field and laboratory chains of custody (COCs)?	Y			
Has contractual turn-around time been met for all samples?	Y			
Have all samples been preserved correctly and pertinent documentation included?		N		Samples received at 18ºC; temperature will not have an impact on target analytes. All other criteria were met. No qualifications were assigned.
Is the laboratory log in sample receipt checklist present	Y			
Are any sample receipt non-conformances noted?	Y			
Standard Traceability				
Have certificate(s) been included for the LCS and MS?	Y			
Standards have not exceeded the certificate expiration date	Y			
Are chemical standards and reference materials traceable to a reliable source? (Reagent traceability summary)	Y			
Analytical Completeness				
Are all COC samples and associated analytical results reported in the laboratory data package?	Y			
Data Summaries				
The case narrative is present and summarizes the sample receipt and analysis information including any analytical anomalies for all methods reported in the data package.	Y			
Other data summary forms are present as applicable (detection, sample results, surrogate, tracer/carrier, QC results and association, prep and analysis chronicle, method and sample summaries)	Y			
Sample Data				

Data Verification	Y	N	N/A	Comment
Is the Sample Data included for each COC requested analytical method?	Y			
Is the calibration data included for each method? (ICAL, ICV, CCAL as required for each method)	Y			
Are the QC summary forms included for each method? (MB, ICS/CCB, LCS/LCSD, MS/MSD, surrogates, internal standards, serial dilution as required and applicable for each method)	Y			
Are the method run logs and/or bench sheets included for each method?	Y			
Are the method preparation/extraction logs included for each applicable method?	Y			
Is the sample and QC raw data included for each method?	Y			
Is the internal Laboratory Review documented by checklists and included in the data package?	Y			

Appendix B

Validation Summary Tables

TCLP Extraction	Y	N	N/A	Qualifier	Comment or Reason Code
Was a ZHE vessel used for VOAs?			N/A		
Was ZHE checked for leaks after extraction?			N/A		
Did the lab use proper bottles?					
Was the %solid determined correctly?	Y				
If appropriate, did the lab reduce particle size?	Y				
Was the correct extraction fluid used?	T				
Was the pH of the extraction fluid correct?	Y				
Was the correct weight of extraction fluid used?	Y				
For VOAs, was the sample weight 25 grams or less?			N/A		
Were the TCLP extracts properly preserved?	Y				
Is there a TCLP blank with the TCLP fluid for a batch of up to 20 samples?	Y				

Metals by ICP (SW6010) **Mercury by CVAA (SW7470A)**	Y	N	N/A	Qualifier	Comment or Reason Code
Preservation and Holding Times					
Were samples properly preserved?		N			Samples were received at 18ºC; Analytes of interest are stable at this temp. No qualifications were assigned.
Are sample preparation sheets present and account for all extractions and digestions for reported samples?	Y				
Have the samples been prepared and analyzed within holding times?	Y				
Detection Limits and Target Analytes					
Do all samples show RLs <= the SAP Recommended Reporting Limits?	Y				
Are all the SAP target analytes reported?	Y				
Initial Calibration					
Was the Calibration within acceptance criteria?	Y				
Calibration Verification					
Was a second source ICV analyzed after calibration with recoveries within acceptance criteria?	Y				
Were CCVs analyzed at the required frequency with recoveries within acceptance criteria? For ICP, CCVs and low level CCVs (CCVL) as applicable.	Y				
Are the ICV and CCV/CCVL Summary forms present?	Y				
Was the ICP CRQL Check Standard analyzed with recoveries within acceptance criteria?	Y				
Method Blank and ICB/CCBs					
Has at least one method blank been prepared For each batch of up to 20 samples?	Y				
Is the method blank the same matrix as the samples in the reporting batch?	Y				
Were target analytes detected in the method blank above the MDL?		N			
Were the ICB and CCBs analyzed at the required frequency with results within acceptance criteria?	Y				
Are the Method Blank and ICB/CCB Summary forms present?	Y				

Metals by ICP (SW6010) **Mercury by CVAA (SW7470A)**	Y	N	N/A	Qualifier	Comment or Reason Code
ICP Interference Check Samples					
Were the ICP ICSA/ICSAB interference check standards analyzed as required with results within acceptance criteria?	Y				
LCS/LCSD					
Has at least one LCS been prepared for each preparation batch containing up to 20 samples?	Y				
Is the LCS the same matrix as the samples in the reporting batch?	Y				
Is the LCS spiked with all target analytes listed in the SAP?	Y				
Are the LCS %RECs within the applicable QC criteria?	Y				
Are the LCS/LCSD RPDs within the applicable QC criteria?			N/A		LCS ONLY
Matrix Spike/Matrix Spike Duplicate					
Has at least one MS/MSD pair been prepared for a batch containing up to 20 samples?	Y				Yes; on non-project sample.
Are the MS/MSD spiked with all target analytes listed in the SAP?	Y				
Are MS and MSD %RECs within the applicable QC limits?	Y				
Are MS/MSD RPDs within the applicable QC limits?	Y				
Duplicates					
Has a laboratory duplicate been prepared for a batch containing up to 20 samples? (If an MS/MSD pair has been prepared, the laboratory duplicate is not required.)		N			
If a laboratory duplicate was analyzed, were the RPDs within acceptance criteria?			N/A		
Was a field duplicate analyzed?		N			
If a field duplicate was analyzed, were the RPDs within the 50% acceptance criteria?			N/A		
Serial Dilution					
Was the Serial Dilution within acceptance limits?			N/A		SD on non-project sample; results were NC
Sample Quantitation and Documentation					
Are reported sample concentrations within the instrument linear range?	Y				
Have sample reporting limits and reported concentrations been adjusted for analytical dilutions?	Y				

Metals by ICP (SW6010) **Mercury by CVAA (SW7470A)**	Y	N	N/A	Qualifier	Comment or Reason Code
Are instrument runlogs present and account for all reported sample results?	Y				
Have all Laboratory Case Narrative comments and findings been addressed in the data validation process?	Y				

Polychlorinated Biphenyl	Y	N	N/A	Qualifier	Comment or Reason Code
Preservation and Holding Times					
Were samples properly preserved?		N			Samples received at 18ºC. Temperature is not anticipated to have any impact on PCB recoveries.
Have the samples been analyzed within holding times?	Y				
Detection Limits and Preservation					
Do all laboratory RLs <= recommended reporting limits in the SAP?	Y				
Initial Calibration					
Are minimum calibration curve with minimum 5 points analyzed prior to sample analysis?	Y				
Are %RSDs within method criteria?	Y				
Calibration Verification					
Are calibration verification standard analyzed at the appropriate frequency?	Y				
RT within RT windows established by initial calibration?	Y				
Are %D (difference or drift) within 20% of the average initial calibration factors?	Y				
Method Blank					
Is the Method Blank extracted and analyzed for each analytical batch of up to 20 samples?	Y				
Is the Method Blank Summary form present?	Y				
Is the method blank the same matrix as the samples in the reporting batch?		N			Blank is solid matrix. Samples are crushed concrete. No qualifications assigned.
Is the blank at similar (low, medium, or trace) concentration level?	Y				
Does the blank have any detects above MDL?		N			
Surrogate Recovery					
Are all samples and QCs spiked with surrogate compounds?	Y				
Are percent recoveries within the method criteria results?	Y				
LCS/LCSD					
Has at least one LCS been prepared for each preparation batch containing up to 20 samples?	Y				
Is the LCS the same matrix as the samples in the reporting batch?	Y				
Is the LCS spiked with all target analytes listed in the SAP?	Y				

Polychlorinated Biphenyl	Y	N	N/A	Qualifier	Comment or Reason Code
Are the LCS %RECs within the applicable QC criteria?	Y				
Are the LCS/LCSD RPDs within the applicable QC criteria?			N/A		LCS ONLY
Matrix Spike/Matrix Spike Duplicate					
Has at least one MS/MSD pair been prepared for a batch with sample counts up to 20 samples?	Y				
Are the MS/MSD spiked with target analyte specified in the SAP?	Y				
MS and MSD %RECs within the applicable QC limits?		N			%RECs high for PCB-1016 and PCB-1260; MS/MSD run on non-project sample so matrix issues do not reflect project matrix. No qualifications assigned.
MS/MSD RPDs within the applicable QC limits?		N			Same as above.
Target Analyte Identification					
Do the positively identified compounds meet the identification criteria?			N/A		
Are the RTs of the positively identified target analytes within RT window established by initial calibration standards?			N/A		
Target Analyte Quantitation and Reported Quantitation Limit					
Are the results for all positively identified analytes are calculated correctly?			N/A		Recalculations not performed for Level 3. All results are ND.
Are the reporting limits calculated for the non-detects and reported correctly?			N/A		See above.

Radionuclide Analyses: **Alpha Spectrometry** **Gas Flow Proportional Counting** **Liquid Scintillation Counting**	Y	N	N/A	Qualifier	Comment or Reason Code
Preservation and Holding Times					
Were samples preserved correctly?			N/A		No preservation required for evaluated Rad parameters.
Were samples analyzed within holding times?	Y				
Standard Traceability					
Were all certificates included for the LCS and MS samples?	Y				
Were all standards and reference materials traceable to reliable source material?	Y				
Calibration Verification					
Are efficiencies within tolerance limits?	Y				
Are energies within tolerance limits?	Y				
Are background performance check count rates within tolerance limits?	Y				
Are appropriate peak resolutions within control criteria?	Y				
LCS					
Has at least one LCS been prepared for up to 20 samples?	Y				
Is the LCS the same matrix as the samples in the reporting batch?	Y				
Are LCS %D (or %R) within QC acceptance limit?	Y				
Laboratory Duplicate					
Has at least one laboratory duplicate been prepared for up to 20 samples?	Y				
Are RPD and DER within QC acceptance limit?		N			Tc-99 dupe tracer < 30% limit but is on non-project sample. Ra-226; RER > 1 at 3.83 on sample -01 dupe. Result qualified J in parent sample and across batch due to suspected matrix issues.

Radionuclide Analyses: **Alpha Spectrometry** **Gas Flow Proportional Counting** **Liquid Scintillation Counting**	Y	N	N/A	Qualifier	Comment or Reason Code
Matrix Spike					
Has at least one MS been prepared for up to 20 samples?		N			MS for Tritium only; MS = LCS, in general, for rad. MS is on non-project sample. No qualifications assigned.
Is MS %D (or %R) within QC acceptance limit?			N/A		
Method Blank					
Has at least one method blank been prepared for up to 20 samples?	Y				
Is the method blank the same matrix as the samples in the reporting batch?	Y				
Are the results less than 1.65 * CSU or within control limits?		N			Ra-226 blank only; Ra-226 result = 0.2498 pCi/g - normalized difference is between 0 and 1.96 for all samples; Ra-226 in all 3 samples qualified J
Chemical Yield - Tracers and Carriers					
Is yield reported for all samples and QC samples in the reporting batch?	Y				
Are percent recovery criteria satisfied for all yield results?	Y				

Analytical Data Review
Verification Checklist

Laboratory:	TestAmerica	SOW or Contract No.:	Outfall 200
Verifier Name:	JD Millloway	Date Verified:	10-18-16
SDG No(s).	18590-1		

		Acceptable?				Comments
Item No.	Criteria	Yes	No	NA	NR	
1.	Case Narrative Present	X				
2.	Lab Qualifiers Present	X				
3.	Methods Specified in SAP or Equivalent Methods were Used	X				
4.	Data is Complete for All Requested Analytes with All Samples	X				
5.	Units are as Specified in SOW/Contract or Otherwise are Appropriate	X				
6.	Detection Limits Meet Contract Required Detection Limits or Other Project Defined Limits (e.g., regulatory limits)	X				
7,	Samples IDs and Analytes Agree with those on COCs	X				
8.	Samples IDs Agree Throughout Report	X				
9.	Raw Data Results Agree with Data Reports and Electronic Data	X				
10.	COCs – Samples Traceable	X				
11.	All Samples Preserved Correctly		X			Samples were not cooled to procedural prescribed temperature
12.	Samples Arrived Intact	X				
13.	Custody Seals on Samples			X		COC seals on coolers only
14.	Holding Times Met	X				
	-Metals other than Mercury ≤ 180 days			X		
	-Mercury ≤28 days			X		
	-TCLP Metals other than Mercury to TCLP Extraction ≤180 days	X				
	-TCLP Metals other than Mercury TCLP Extraction to Analysis ≤180 days	X				
	-TCLP Mercury to TCLP Extraction ≤28 days	X				
	-TCLP Mercury TCLP Extraction to Analysis ≤28 days	X				
	-VOAs to Extraction/Analysis ≤14 days	X				

Analytical Data Review
Verification Checklist

Laboratory:	TestAmerica	SOW or Contract No.:	Outfall 200
Verifier Name:	JD Millloway	Date Verified:	10-18-16
SDG No(s).	18590-1		

		Acceptable?				Comments
Item No.	Criteria	Yes	No	NA	NR	
	-SVOAs to Extraction ≤7 days (liquids), ≤14 days (solids)			X		
	-SVOAs Extraction to Analysis ≤40 days			X		
	-Pesticides to Extraction ≤7 days (liquids), ≤14 days (solids)			X		
	-Pesticides Extraction to Analysis ≤40 days			X		
	-Herbicides to Extraction ≤7 days (liquids), ≤14 days (solids)			X		
	-Herbicides Extraction to Analysis ≤40 days			X		
	PCBs - none	X				
	-TCLP VOAs to TCLP Extraction ≤14 days			X		
	-TCLP VOAs TCLP Extraction to Analysis ≤14 days			X		
	-TCLP SVOAs to TCLP Extraction ≤14 days			X		
	-TCLP SVOAs TCLP Extraction to Prep Extraction ≤7 days			X		
	-TCLP SVOAs Prep Extraction to Analysis ≤40 days			X		
	-TCLP Pesticides to TCLP Extraction ≤14 days			X		
	-TCLP Pesticides TCLP Extraction to Prep Extraction ≤7 days			X		
	-TCLP Pesticides Prep Extraction to Analysis ≤40 days			X		
	-TCLP Herbicides to TCLP Extraction ≤14 days			X		
	-TCLP Herbicides TCLP Extraction to Prep Extraction ≤7 days			X		
	-TCLP Herbicides Prep Extraction to Analysis ≤40 days			X		
	TOC ≤28 days			X		

Analytical Data Review
Verification Checklist

Laboratory:	TestAmerica	SOW or Contract No.:	Outfall 200
Verifier Name:	JD Millloway	Date Verified:	10-18-16
SDG No(s).	18590-1		

		Acceptable?				Comments
Item No.	Criteria	Yes	No	NA	NR	
	-Hexane Extractable Material, Oil and Grease ≤28 days			X		
	-Chloride, Fluoride, Nitrate, Sulfate ≤28 days			X		
	-Cyanide ≤14 days			X		
	-Sulfide ≤7 days			X		
	-pH – immediately			X		
	-Specific Conductance - immediately			X		
	-Radionuclides 180 days (best practice)	X				