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Kingston Ash Recovery Project
Non-Time-Critical Removal Action

River System Sampling and Analysis Plan
Task Completion Technical Memorandum
Sediment Bioassay and Porewater

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List of Acronyms

AVS/SEM	acid volatile sulfide/simultaneously extracted metals
CoC	chain-of-custody
CRM	Clinch River Mile
DOC	dissolved organic carbon
DO	dissolved oxygen
DQO	data quality objective
EDD	electronic data deliverable
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
ERM	Emory River Mile
FCN	Field Change Notice
Frontier	Frontier Global Services (formerly Frontier GeoSciences)
GEL	GEL Laboratories, LLC
HDPE	high density polyethylene
Jacobs	Jacobs Engineering Group Inc.
KIF	Kingston Fossil Plant
LDPE	low density polyethylene
MDL	method detection limit
mg/kg	milligram per kilogram
mg/L	milligram per liter
MS/MSD	matrix spike/matrix spike duplicate
ND	not detected
ORP	oxidation reduction potential
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PLM	polarized light microscopy
QAPP	Quality Assurance Project Plan
QA	quality assurance
QC	quality control
SAP	Sampling and Analysis Plan
SC	specific conductivity
SOP	Standard Operating Procedure
TSS	total suspended solid
TM	technical memorandum
TVA	Tennessee Valley Authority

1. PURPOSE

The purpose of this Technical Memorandum (TM) is to summarize the completion of the bioassay and sediment porewater sampling tasks as described in the approved *Kingston Ash Recovery Project Non-Time-Critical Removal Action for the River System Sampling and Analysis Plan* (SAP), Rev. 3, May 24, 2010, Document No. EPA-AO-021. This TM is one of a series being prepared to summarize the field work and data collection activities as SAP tasks are completed. The TM series is intended to provide interim presentations of data that are the bases for the nature and extent of contamination section of the River System Engineering Evaluation/Cost Analysis (EE/CA) Report. No data evaluation or conclusions are presented.

2. BACKGROUND

The Data Quality Objective (DQO) problem statement for the Non-Time-Critical SAP is:

> Following the completion of the time-critical removal action, pockets of residual ash may remain in the river system, some of which may have become intermixed or interbedded with natural river sediments. Residual ash deposits may serve as a source for further transport downstream or a continuing source of exposure, and may therefore need to be removed or contained. Naturally-occurring metals (e.g., arsenic, chromium, mercury, and selenium) and radionuclides (e.g., radium-226 and thorium-228) are present within the ash. Sediment may also contain legacy constituents [e.g., polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides (chlordane), mercury, cesium-137, or cobalt-60] from other historical sources. Human and ecological receptors may be potentially exposed to these constituents in the residual ash itself, in submerged and seasonally-exposed sediment, in surface water, or in their diet (fish consumption or food chain prey and forage). Bioavailability and bioaccumulation are significant processes for uptake of ash-related constituents within the food chain. Porewater within the sediment may contain chemical constituents that are bioavailable to benthic invertebrates that inhabit these sediments. Benthic invertebrates are primary consumers and detritivores at the base of the food chain; constituents may bioaccumulate in the invertebrates inhabiting the river system, where they may become available to ecological receptors that regularly consume these organisms or their emergent life stages. The constituents may bioaccumulate in fish in the river systems, where they may become available to humans or ecological receptors that regularly consume fish. The constituents may also bioaccumulate in wildlife (aquatic- or riparian-feeding birds and mammals).

<u>Sediment Bioassay (Bulk Sediment and Bulk Overlay Water)</u>

Section 2.2.3 of the SAP addressed the Study Design for the Sediment Bioassay:

> The second line of evidence for evaluating potential ecological risk involves evaluating the results of laboratory bioassays (toxicity testing) in which benthic invertebrate and larval fish species are exposed to sediment samples in the laboratory and effects on their growth and survivability can be observed. The purpose of this testing is to estimate the bioavailability and risk relative to the presence of ash-related constituents. Reference bioassay tests are used as laboratory controls for comparison with toxic effects due to exposure to ash-related constituents.
>
> Bioassay testing will be done using three indicator species and a combination of short-term chronic and longer duration tests. *Hyalella azteca* is a sensitive species that has been shown to be a good indicator of effects based on testing done to date. *Ceriodaphnia dubia* is a somewhat less sensitive species, but appears to also be less prone to interferences associated with the physical characteristics of the ash, so that effects may be more representative of chemical toxicity. Daphnids have been shown to feed at the sediment surface, thus coming in contact with particulate-bound toxicants, and a standard bioassay protocol is available to test this potential epibenthic exposure

pathway. *Chironomus tentans* is a species of midge with larva that burrow in sediments and represent potential dietary and respiratory exposures to sediment and interstitial water. Bioassays will be conducted in accordance with EPA and American Society for Testing and Materials toxicity testing protocols; 10-day and 28-day tests will be conducted for *H. azteca,*10-day and approximately 28-day (emergence) tests for *C. tentans*, and 7-day tests for *C. dubia*.

The sediment testing strategy will use the results of 10-day screening tests along with preliminary analytical results to select representative sediment samples for use in the longer-term definitive tests (which involve sediment dilutions). The results from the screening tests will undergo hypothesis testing to determine significant differences in survival, growth or reproduction relative to the reference controls. The reference control sediment used in these tests will be a 50:50 composite of the two reference samples of each river.

For each river (i.e., the Emory River and the Clinch River) four samples will be used in definitive tests with the 28-day *H. azteca* and *C. tentans* protocols. Of these four samples from each river, at least one will be selected from among those for which significant effects were not observed in the short-term screening tests and up to three will be selected from among those for which there were significant effects observed in the screening tests. A dilution series will be run for each selected site sample using the composite reference sediment in order to estimate effects concentrations (e.g., LC50, IC25) for each sample.

Sediment Porewater

Section 2.2.4 of the SAP addressed the Study Design for Sediment Porewater:

> Sediment porewater refers to the interstitial water present between grains of sediment that is the primary source of exposure to aquatic plants and benthic invertebrates (particularly burrowing organisms) near the base of the food chain. The purpose of evaluating sediment porewater separately from whole sediment is to understand the factors involved in desorption of constituents from the ash/sediment and toxicity of the chemical constituents apart from any physical effects of ash on benthic growth. For evaluating risk to ecological receptors, a weight-of-evidence process will be used to characterize the magnitude and likelihood of risk. Lines of evidence include: (1) constituent concentrations compared to surface water effects values and (2) biosurveys of benthic communities.

Sediment bioassay and porewater samples were collected at locations in the Emory and Clinch Rivers from affected areas both downstream and upstream of the ash release and from unaffected (by the ash release) reference areas. Bioassay and porewater sample locations were co-located with ash deposit and/or submerged sediment sample locations or were field-located and placed in the proximity of assigned locations as sampling conditions dictated. Sample location assignment was primarily focused on submerged sediment sample locations containing expected proportions of ash (as determined by onsite and offsite polarized light microscopy [PLM] analysis). Sites were selected to represent an equal distribution of ash percentages (e.g., <50%, >50%, etc.) throughout the river system to evaluate the risk associated with varying proportion of ash.

Sediment samples for bioassay testing were collected from the upper 6 inches of sediment using dredge sampling techniques (Wildco Ponar Dredge). Multiple grab sample drops at each site were composited and homogenized to create a sample representative of benthic sediment conditions. The number of drops was dependent on the recovery of sediment per drop to achieve the required volume. The volumes of benthic overlay water used in bioassay testing were collected from an unaffected (by the ash spill) reference site on each river.

Co-located sediment sample cores were collected at each sediment porewater location. Porewater was extracted and analyzed for metals and other constituents of interest within the benthic zone at each location. The upper 4 inches of sediment were defined as the minimum depth at which evaluations and comparisons of ash-containing sediments and benthic porewater constituents would occur. Multiple, co-located samples were collected to provide the volume of sample material necessary for required sample analyses. A total of 20 sediment bioassay and sediment porewater locations were assigned (see Figures 1 and 2).

3. SAMPLING AND ANALYSIS ACTIVITIES

Sediment Bioassay and Porewater Sample Locations

Sediment for laboratory bioassays was collected at 20 locations and porewater samples were collected at 19 locations in the Emory and Clinch Rivers (Figure 1) as follows:

- Reference Locations: Samples from two locations were collected in both the Emory and Clinch Rivers as reference sites, unaffected by the ash release. The two sample locations in the Clinch River upstream of Clinch River Mile (CRM) 4.5 were assigned as CRM6.5, co-located with submerged sediment sample CRM_RR02, and CRM7.5, co-located with submerged sediment sample CRM_RR01. Two sample locations in the Emory River upstream of Emory River Mile (ERM) 6.0 were assigned as follows: ERM8.0 was placed near ash deposit sample ERM_RR05 and ERM10.0 was co-located with submerged sediment sample ERM_RR11. Reference bioassay sediment was collected from the two upstream reference sites in each river and composited at a 1:1 ratio to create a single reference sample for each river. Sediment porewater samples were composited post-porewater extractions in the lab to create a single reference sample for each river. Benthic bioassay overlay water was collected at the mid-point between the two reference sites for each river (CRM7.0 for the Clinch River and ERM9.0 for the Emory River).

- Emory Reach C (ERM 3.5 to 6.0): Co-located sediment and porewater samples for Emory River Reach C were collected at the following locations. ERM5.5 was located in the proximity of submerged sediment sample ERM_C10. ERM4.0 was located between ash deposit sample ERM_C32 and submerged sediment sample ERM_C29.

- Emory Reach B (ERM 1.5 to 3.5): Co-located sediment and porewater samples for Emory River Reach B were collected at the following locations. ERM3.5 was co-located with ash deposit sample ERM_B06 while ERM3.0 was co-located with ash deposit sample ERM_B24, and ERM2.5 was co-located with ash deposit sample ERM_B34.

- Emory Reach A (ERM 0.0 to 1.5): Co-located sediment and porewater samples for Emory River Reach A were collected at the following locations. ERM1.0 was co-located with submerged sediment sample ERM_A09, ERM0.8 was co-located with ash deposit sample ERM_A16, and ERM0.5 was co-located with ash deposit sample ERM_A28.

- Clinch Reach B (CRM 3.0 to 4.5): Co-located sediment and porewater samples for Clinch River Reach B were collected at the following locations. CRM4.5 was co-located with submerged sediment sample CRM_B03. CRM4.0 and CRM3.5 were co-located with ash deposit samples CRM_B23 and CRM_B29, respectively. CRM3.0 was co-located with submerged sediment sample CRM_B36.

- Clinch Reach A (CRM 0.0 to 3.0): Co-located sediment and porewater samples for Clinch River Reach A were collected at the following locations. CRM2.5 and CRM2.0 were co-located with submerged sediment samples CRM_A02 and CRM_A13, respectively. CRM1.5 was co-located with submerged sediment sample CRM_A22 while CRM0.0 was co-located with ash deposit sample CRM_A34.

Sediment Bioassay Sample Collection Methods

Bioassay sediment sampling within the Clinch River was performed between February 7 and 9, 2011, while Emory River sediment was collected between May 23 and 25, 2011. The upper 6 inches of sediment were collected at each location and homogenized. Homogenized bulk sediment samples were shipped to bioassay testing laboratories. Subsamples from each location were collected and analyzed for the following constituents: ash content , grain size analysis, hexavalent chromium, metals and mercury, total organic carbon, fraction of organic carbon, alkylated PAHs, PAHs, PCBs, pesticides, radionuclides (potassium-40, radium-226/228, lead 212/214, thallium-208, isotopic thorium, isotopic uranium, cesium-137, cobalt-60), sequentially extracted metals, and speciation of metals (arsenic, selenium, and mercury). An acid volatile sulfide/simultaneously extracted metals (AVS/SEM) sample of undisturbed sediment was collected at each location.

All bioassay sediment sampling with the exception of the AVS/SEM sampling was performed using a decontaminated Wildco Ponar dredge sampler. Co-located drops of the dredge were performed until the required volume of sediment was collected. Sample material was placed into decontaminated high density polyethylene (HDPE) 5-gallon sample containers for transport to an onsite sample processing facility. The bulk sediment material was placed inside a decontaminated 30-gallon HDPE drum and homogenized using a Morse 201VS-1 drum roller. A Wildco Box Core dredge sampler with a decontaminated acrylic liner was used for collection of AVS/SEM samples. New, decontaminated 2½-inch diameter by 10-inch length acrylic core tubes were used to collect undisturbed sediment from within the box core sample. The overlay water remained in the sealed core tube. Sediment pH and oxidation reduction potential (ORP) readings were taken from the box core material collected for AVS/SEM samples using an Extech PH220A handheld meter.

Bioassay overlay water sampling in the Clinch River was performed between February 2 and May 12, 2011. Overlay water sampling in the Emory River was performed between June 2 and August 31, 2011. Laboratory water requirements for bioassay testing determined the frequency and volume of water collection. Overlay water was collected from the epibenthic zone, approximately 0.5 meters above the stream bed. Water quality parameters (temperature, milligrams per liter dissolved oxygen [DO], percent saturation DO, specific conductivity [SC], turbidity, pH, and ORP) were measured in the field at each sampling location using a standardized HACH® Hydrolab® DS5x, in accordance with Standard Operating Procedures [SOP] TVA-KIF-SOP-01 *Surface Water Sampling* and TVA-KIF-SOP-14 *Hydrolab DataSonde® Standardization and Field Parameter Measurement*.

Overlay water was collected using MP-V400 RolaTec peristaltic pumps and new tubing. New tubing was used for each individual sampling event (batch). New, triple-rinsed 2 ½-gallon low density polyethylene (LDPE) cubitainers were utilized. The total number of cubitainers collected per batch was determined by laboratory needs. An analytical subsample was collected at a later date from each batch and analyzed for the following at TestAmerica-Nashville: total and dissolved metals and mercury, total suspended solids (TSS), and dissolved organic carbon (DOC).

Sediment Porewater Sample Collection Methods

Sediment porewater sampling within the Clinch River began on February 14, 2011 and concluded on February 16, 2011. Sediment porewater sampling in the Emory River began on May 26, 2011 and concluded on May 31, 2011. The upper 4 inches of sediment were collected at each sample location and the porewater was extracted at an offsite laboratory. Sediment porewater samples were analyzed for the following constituents: dissolved metals and mercury, DOC, hardness, major ions (chloride, sulfate), alkalinity, DO, pH, ORP, SC, and arsenic and selenium speciation.

With the exception of CRM6.5, CRM7.5, ERM 3.5, and ERM5.5, all samples were collected using a Wildco Box Core dredge sampler with a decontaminated acrylic liner. New, decontaminated 2½-inch

diameter by 4-inch length acrylic core tubes were used to collect undisturbed sediment samples from within the box core sample. Samples were capped and sealed with new, decontaminated LDPE caps. Sampling conditions (e.g., lack of sediment available for box core dredging) at CRM6.5, CRM7.5, and ERM5.5 dictated that these sediment porewater samples were collected by a manual, hand-push method; however, sediment porewater collection was not possible with either method at ERM3.5 therefore no sample was collected. The sample locations were offset to the shoreline immediately adjacent to the original sample location. All samples were collected to maintain minimal headspace within the core.

Sediment porewater was extracted at TestAmerica-Pittsburgh. Extracted porewater was analyzed at TestAmerica-Pittsburgh for DO, pH, ORP, and SC and at TestAmerica-Nashville for dissolved metals and mercury, DOC, hardness, major ions, and alkalinity. Porewater samples were submitted to Frontier Global Services (Frontier) for arsenic and selenium speciation analyses.

Sampling and analysis were performed in accordance with the *Quality Assurance Project Plan for the Tennessee Valley Authority Kingston Ash Recovery Project* (*QAPP*), hereinafter referred to as the TVA-KIF-QAPP, the listed SOPs, and Work Package WP-1073. Table 1 identifies the applicable TVA documents and SOPs associated with this sediment sampling event. Quality assurance/quality control (QA/QC) samples (field duplicates and matrix spikes/matrix spike duplicates [MS/MSD]) were all collected at 1/20 frequency (5%). QA/QC samples were not collected for field PLM samples. An equipment blank was collected on sampling equipment.

Table 1. Applicable TVA Documents and Standard Operating Procedures

Document	Document Number
TVA KIF Ash Recovery Project Quality Assurance Project Plan (QAPP)	TVA-KIF-QAPP, December 2009
TVA-KIF Work Package WP-1073	WP-1073
STANDARD OPERATING PROCEDURES	
Sediment Sampling	TVA-KIF-SOP-05, Revision 4
Field Documentation	TVA-KIF-SOP-06
Sample Labeling, Packing, and Shipping	TVA-KIF-SOP-07, Revision 3
Decontamination of Equipment	TVA-KIF-SOP-08, Revision 2
Sediment Sampling for AVS/SEM Analysis	TVA-KIF-SOP-09
Field Quality Control Sampling	TVA-KIF-SOP-11
Management of Investigation-Derived Waste	TVA-KIF-SOP-12
Management and Implementation of EQuIS™-based Chain of Custody	TVA-KIF-SOP-18
Photograph Management	TVA-KIF-SOP-26

4. SUMMARY OF CHANGES

Field Change Notices (FCNs) and Change Notices were prepared to document deviations from the SAP. FCNs were prepared and approved for the addition of PLM and metals analysis to support ecological risk assessment. A Change Notice was submitted to address changes in sampling methods performed for sediment porewater collection. The SAP Addendum, Revision 2 was issued on August 24, 2011 to address changes to the list of sample analytes collected.

An objective of the SAP was to determine the concentration of ash-related constituents in sediment porewater to estimate the effects of those constituents on potential ecological receptors. FCN-020 added PLM analysis of the residual sediments from which porewater was extracted to evaluate the relationship between the percentage of ash and constituent concentrations. FCN-021 added metals analysis of residual

porewater sediments. Neither PLM nor metals analysis of residual sediments was explicitly defined in the SAP. Residual sediments were analyzed for metals and mercury by TestAmerica-Nashville; for arsenic and selenium species by Frontier; and for PLM by RJ Lee.

A revised sampling methodology was employed to collect sediment porewater samples after it was determined that analysis of undisturbed, in situ porewater would be more beneficial in the evaluation of ecological risk. The SAP originally stated that sediment porewater extraction would be performed onsite by decanting overlying interstitial water from containers of bulk sediment and then by vacuum filtration of the remaining sediment. Instead, porewater sample sediment cores were collected from undisturbed box core samples that were minimally affected by atmospheric influences and vertical mixing of the sediment. The sediment core tubes were shipped to TestAmerica-Pittsburgh for porewater extraction. The revised sampling methodology was added to standard operating procedure TVA-KIF-SOP-05.

5. ANALYTICAL DATA REVIEW

TVA's contracted laboratories were required to submit three types of deliverables: a limited (Level 1) data package containing sample results and batch QC sample results; a fully documented (Level 4) data package including raw data for all analyses; and electronic data deliverables (EDDs) for storage in TVA's EarthSoft EQuIS® database.

EDDs were subjected to completeness and correctness testing during loading to TVA's EQuIS database; once loaded to the EQuIS database, the data were subjected to verification. As defined in the TVA-KIF-QAPP, data verification involved comparison of the data loaded in the EQuIS database to the results reported in the Level 1 data package. In addition, data verification included review of the batch quality control summary forms for compliance with the applicable methods and for data usability with respect to the project DQOs and the TVA-KIF-QAPP.

Following receipt of the Level 4 data package, data were subjected to validation. As defined in the TVA-KIF-QAPP, data validation included review of raw data and associated QC summary forms for compliance with the applicable methods and for data usability with respect to the appropriate guidance documents. As stated in the TVA-KIF-QAPP: "Initially, 100% of the chemical analysis data will be reported in full documentation data packages for independent data validation. Depending on the nature and frequency of issues identified during data validation, the percentage of data undergoing full data validation may be reduced to a lesser percentage (such as 20%) or data verification may be substituted. The reduction in full data validation may be matrix specific, laboratory specific, or analyte specific. If after the percentage of full data validation has decreased, a trend in frequency of reporting issues, method non-compliances, or data usability issues is identified, data validation will be conducted for specific data points or the percentage of full data validation percentage may be increased until the issues have been minimized to their initial frequency." Data validation expands upon the completeness, correctness, and usability assessment performed during verification to include evaluation of instrumental QC analyses, review of sample preparation information, and recalculation of reported results from raw data.

Data review summaries for bulk sediment, bulk overlay water, sediment porewater, and residual sediment are presented in Tables 2, 3, 4, and 5 respectively.

Table 2. Data Review Summary for Bulk Sediment

Laboratory	Number of CoCs	Number of Normal and Field Duplicates by Lab	Number of Equipment Blanks by Lab	Number of Analytical Results	Percentage Final-Verified	Percentage Validated
Frontier	2	11	0	143	0%	100%
GEL	3	20	0	360	66%	33%
RJ Lee	6	33	0	42	100%	0%
TestAmerica-Burlington	3	20	0	1,716	0%	100%
TestAmerica-Irvine	3	20	0	20	0%	100%
TestAmerica-Nashville	5	31	0	806	40%	60%
TestAmerica-North Canton	5	31	0	62	40%	60%
TestAmerica-Pittsburgh	10	51	0	3,167	0%	100%
Total Count	**29**[(a)]	**73**[(b)]	**0**	**6,316**	-	-

Analyses performed by laboratory:

Frontier – Metals speciation
GEL – Radionuclide analysis
RJ Lee – PLM
TestAmerica-Burlington – PCB compounds, chlorinated pesticide compounds, PAH, and grain size.
TestAmerica-Irvine – Hexavalent chromium
TestAmerica-Nashville – Total metals and mercury
TestAmerica-North Canton – TOC and fraction of organic carbon
TestAmerica-Pittsburgh – Acid volatile sulfide/simultaneously extracted metals and sequentially extracted metals

Notes:

(a) "Total Count" for CoCs is the number of discrete chains. Some samples originally sent to TestAmerica-Nashville were subcontracted to other TestAmerica laboratories.

(b) "Total Count" for normal, field duplicate and equipment blank samples is the number of discrete samples collected. Each sample requiring other analyses in addition to metals analysis (TestAmerica-Nashville) was split, with each split counted in this table as one sample per receiving lab ("Number of Samples by Matrix").

For definitions, see the Acronyms section.

Table 3. Data Review Summary for Bulk Overlay Water

Laboratory	Number of CoCs	Number of Normal and Field Duplicates by Lab	Number of Equipment Blanks by Lab	Number of Analytical Results	Percentage Final-Verified	Percentage Validated
TestAmerica-Nashville	25	32	0	896	100%	0%
Total Count	**25**[(a)]	**32**	**0**	**896**	-	-

Analyses performed by laboratory:

TestAmerica-Nashville – Total metals and mercury, TSS, and DOC

Notes:

(a) "Total Count" for CoCs is the number of discrete chains. Some samples originally sent to TestAmerica-Nashville were subcontracted to other TestAmerica laboratories.

For definitions, see the Acronyms section.

Table 4. Data Review Summary for Sediment Porewater

Laboratory	Number of CoCs	Number of Normal and Field Duplicates by Lab	Number of Equipment Blanks by Lab	Number of Analytical Results	Percentage Final-Verified	Percentage Validated
Frontier	8	17	1	186	0%	100%
TestAmerica-Nashville	8	19	1	646	100%	0%
Total Count	**16**[(a)]	**19**[(b)]	**2**	**832**	-	-

Analyses performed by laboratory:

Frontier – Arsenic and selenium speciation
TestAmerica-Nashville – Total and dissolved metals and mercury, alkalinity, chloride, TOC, hardness, and sulfate

Notes:

(a) "Total Count" for CoCs is the number of discrete chains. Some samples originally sent to TestAmerica-Nashville were subcontracted to other TestAmerica laboratories.

(b) "Total Count" for normal, field duplicate and equipment blank samples is the number of discrete samples collected. Each sample requiring other analyses in addition to metals analysis (TestAmerica-Nashville) was split, with each split counted in this table as one sample per receiving lab ("Number of Samples by Matrix").

For definitions, see the Acronyms section.

Table 5. Data Review Summary for Residual Sediment

Laboratory	Number of CoCs	Number of Normal and Field Duplicates by Lab	Number of Equipment Blanks by Lab	Number of Analytical Results	Percentage Final-Verified	Percentage Validated
Frontier	5	19	0	190	0%	100%
RJLee	5	19	0	19	100%	0%
TestAmerica-Nashville	5	19	0	493	100%	0%
Total Count	**15**[(a)]	**19**[(b)]	**0**	**702**	-	-

Analyses performed by laboratory:

Frontier – Arsenic and selenium speciation
RJ Lee - PLM
TestAmerica-Nashville – Total metals and mercury

Notes:

(a) "Total Count" for CoCs is the number of discrete chains. Some samples originally sent to TestAmerica-Nashville were subcontracted to other TestAmerica laboratories.

(b) "Total Count" for normal, field duplicate and equipment blank samples is the number of discrete samples collected. Each sample requiring other analyses in addition to metals analysis (TestAmerica-Nashville) was split, with each split counted in this table as one sample per receiving lab ("Number of Samples by Matrix").

For definitions, see the Acronyms section.

6. DATA QUALITY SUMMARY

Data validation was performed based on the sample results, summary QC data, and raw data provided by the laboratory. Data validation includes a review of the following QC measures (where applicable):

- Sample condition upon laboratory receipt.
- Initial calibration linearity.
- Blank analysis results greater than the method detection limit (MDL).
- Sample preparation and holding times.
- Initial calibration verification/continuing calibration verification standard recoveries.
- Inductively coupled plasma interference check standard results (metals only).
- MDLs and linear ranges.
- Internal standard recoveries.

- Percent moisture/solids.
- MS/MSD recoveries and precision.
- Post-digestion spike recoveries (metals only).
- Laboratory and field duplicate precision.
- Quantitation of positive results.
- Laboratory control sample/laboratory control sample duplicate recoveries and precision.
- Serial dilution results (metals only).
- Analytical sequence.
- Reporting limit standard recoveries (metals only).
- MDL verification standards (metals only).
- Standard reference material recoveries (metals only).
- Dual analytical column precision (organics only).
- Retention times (organics only).
- DDT/endrin breakdown (organics only).
- Surrogate recoveries (organics only).
- Internal standard areas (organics only).
- Qualitative identification (organics only).
- Gas chromatograph/mass spectrometer tuning and system performance (organics only).
- Background checks (radionuclides only).
- Chemical yields (radionuclides only).
- Centroid checks (radionuclides only).
- Efficiency checks (radionuclides only).

In general, the data met the DQOs defined for this task and the data are acceptable for use. The following is a summary of data quality based on the review performed and as compared to the data quality measures identified in the TVA-KIF-QAPP. The text of the data validation reports for the samples included in this technical memorandum will be included in EE/CA Report.

Data quality summaries for bulk sediment, bulk overlay water, sediment porewater, and residual sediment are presented in Tables 6, 7, 8, and 9 respectively.

Table 6. Summary of Bulk Sediment Data Quality

Laboratory	Analytical Results (Total Count)	Acceptable (No Qualification)		Acceptable (Estimated)		Blank Qualified		Rejected	
Frontier	143	13	*9%*	130	*91%*	0	*0%*	0	*0%*
GEL	360	318	*88%*	42	*12%*	0	*0%*	0	*0%*
RJ Lee	42	27	*64%*	15	*36%*	0	*0%*	0	*0%*
TestAmerica-Burlington	1,716	775	*45%*	922	*54%*	0	*0%*	19	*1%*
TestAmerica-Irvine	20	0	*0%*	10	*50%*	0	*0%*	10	*50%*[(a)]
TestAmerica-Nashville	806	419	*52%*	335	*42%*	0	*0%*	52	*6%*
TestAmerica-North Canton	62	40	*65%*	22	*35%*	0	*0%*	0	*0%*
TestAmerica-Pittsburgh	3,167	1,075	*34%*	1,757	*55%*	112	*4%*	223	*7%*

Notes:

[(a)] Hexavalent chromium was rejected in several samples due to matrix issues with the sediment samples. Resampling and reanalysis most likely would not have resolved the matrix issues.

For definitions, see the Acronyms section.

Table 7. Summary of Bulk Overlay Water Data Quality

Laboratory	Analytical Results (Total Count)	Acceptable (No Qualification)		Acceptable (Estimated)		Blank Qualified		Rejected	
TestAmerica-Nashville	896	698	*78%*	197	*22%*	1	*<1%*	0	*0%*

Table 8. Summary of Sediment Porewater Data Quality

Laboratory	Analytical Results (Total Count)	Acceptable (No Qualification)		Acceptable (Estimated)		Blank Qualified		Rejected	
Frontier	186	108	*58%*	76	*41%*	2	*1%*	0	*0%*
TestAmerica-Nashville	646	484	*75%*	162	*25%*	0	*0%*	0	*0%*

Table 9. Summary of Residual Sediment Data Quality

Laboratory	Analytical Results (Total Count)	Acceptable (No Qualification)		Acceptable (Estimated)		Blank Qualified		Rejected	
Frontier	190	64	*34%*	108	*57%*	18	*9%*	0	*0%*
RJLee	19	19	*100%*	0	*0%*	0	*0%*	0	*0%*
TestAmerica-Nashville	493	433	*88%*	55	*11%*	5	*1%*	0	*0%*

7. DATA SUMMARY

Summary statistics for the sediment bioassay, porewater, and overlay water analyses are provided in Appendices A through D.

Figures

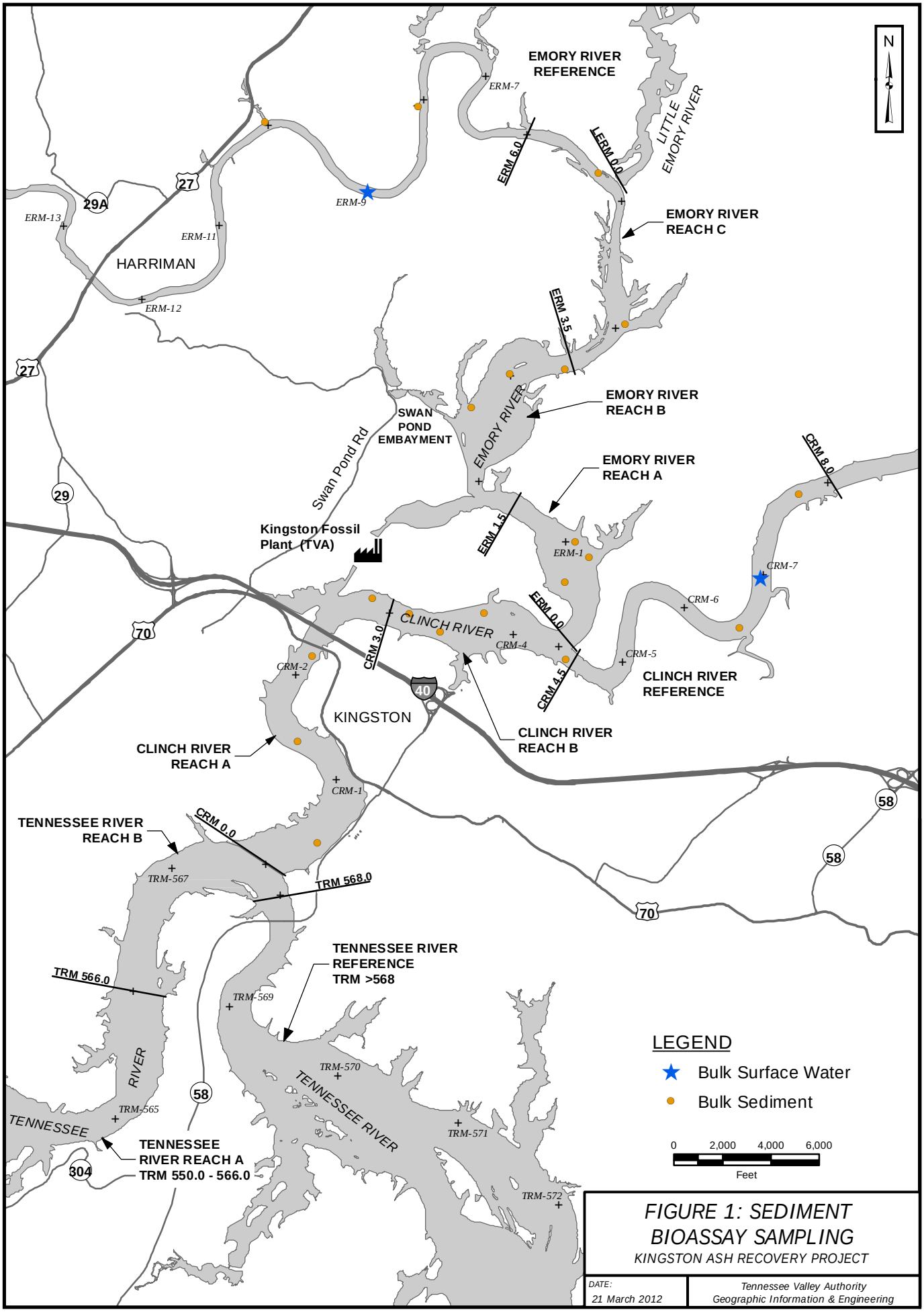

FIGURE 1: SEDIMENT BIOASSAY SAMPLING

KINGSTON ASH RECOVERY PROJECT

DATE: 21 March 2012

Tennessee Valley Authority
Geographic Information & Engineering

Filename: BiotaMaps_EPARPT021_Fig1_BulkSediment_20120315_8x11_R1

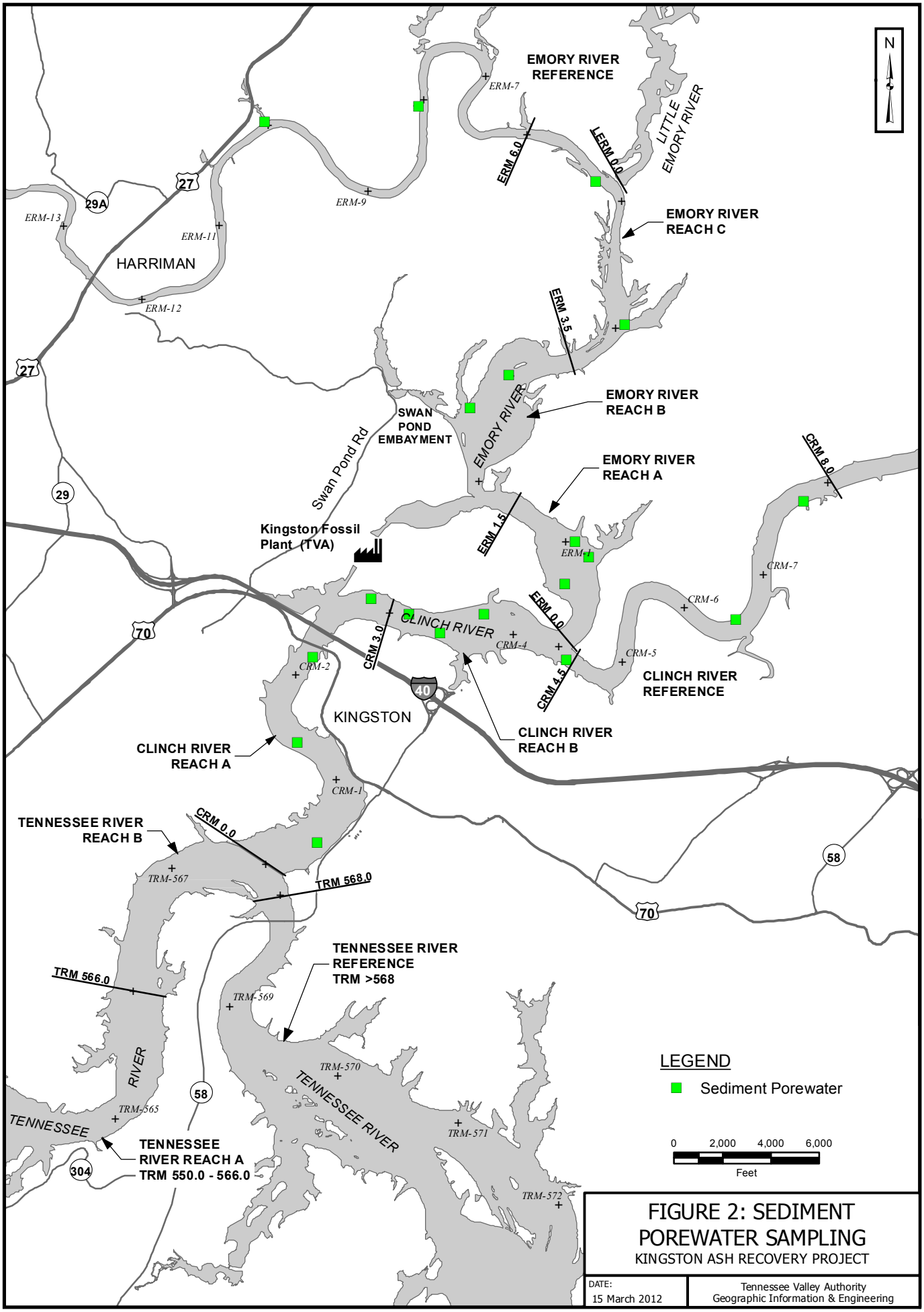

FIGURE 2: SEDIMENT POREWATER SAMPLING

KINGSTON ASH RECOVERY PROJECT

DATE: 15 March 2012

Tennessee Valley Authority
Geographic Information & Engineering

Filename: BiotaMaps_EPARPT021_Fig2_Porewater_Samples_20120315_8x11

Appendix A

Bulk Sediment and Porewater Sample Summaries

Table A- 1: Bulk Sediment and Porewater in the Emory River Reach A Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum in Bulk Sediment	mg/kg		11200	11200	16400	3 / 3	14133
Inorganic	Aluminum, Dissolved in Porewater	mg/L	0.05 / 0.05	ND	ND	ND	0 / 3	0
Inorganic	Antimony in Bulk Sediment	mg/kg	1.72 / 1.96	ND	ND	ND	0 / 3	0
Inorganic	Antimony, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	0.00034	0.00034	1 / 3	0.00034
Inorganic	Arsenic in Bulk Sediment	mg/kg		21.8	21.8	31.7	3 / 3	27.63
Inorganic	Arsenic, Dissolved in Porewater	mg/L		0.0422	0.0422	0.104	3 / 3	0.0792
Inorganic	Barium in Bulk Sediment	mg/kg		226	226	251	3 / 3	237.3
Inorganic	Barium, Dissolved in Porewater	mg/L		0.143	0.143	0.194	3 / 3	0.176
Inorganic	Beryllium in Bulk Sediment	mg/kg		1.69	1.69	2.12	3 / 3	1.933
Inorganic	Beryllium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 3	0
Inorganic	Boron in Bulk Sediment	mg/kg		18.4	18.4	20.7	3 / 3	19.37
Inorganic	Boron, Dissolved in Porewater	mg/L		0.0341	0.0341	0.0476	3 / 3	0.04037
Inorganic	Cadmium in Bulk Sediment	mg/kg	0.172 / 0.196	ND	ND	ND	0 / 3	0
Inorganic	Cadmium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 3	0
Inorganic	Calcium in Bulk Sediment	mg/kg		3410	3410	3710	3 / 3	3540
Inorganic	Calcium, Dissolved in Porewater	mg/L		37.1	37.1	47.8	2 / 2	42.45
Inorganic	Chromium in Bulk Sediment	mg/kg		20	20	24.9	3 / 3	22.87
Inorganic	Chromium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	0.00041	0.00235	2 / 3	0.00169
Inorganic	Cobalt in Bulk Sediment	mg/kg		12.6	12.6	16.7	3 / 3	15.1
Inorganic	Cobalt, Dissolved in Porewater	mg/L		0.00213	0.00213	0.00333	3 / 3	0.00315
Inorganic	Copper in Bulk Sediment	mg/kg		24.6	24.6	31	3 / 3	28.3
Inorganic	Copper, Dissolved in Porewater	mg/L		0.00053	0.00053	0.00268	3 / 3	0.00147
Inorganic	Iron in Bulk Sediment	mg/kg		19400	19400	25900	3 / 3	23500
Inorganic	Iron, Dissolved in Porewater	mg/L		0.818	0.818	2.88	3 / 3	2.513
Inorganic	Lead in Bulk Sediment	mg/kg		9.26	9.26	12.9	3 / 3	11.52
Inorganic	Lead, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	0.00034	0.00034	1 / 3	0.00034
Inorganic	Magnesium in Bulk Sediment	mg/kg		1080	1080	1490	3 / 3	1310
Inorganic	Magnesium, Dissolved in Porewater	mg/L		9.92	9.92	12.6	2 / 2	11.26
Inorganic	Manganese in Bulk Sediment	mg/kg		299	299	489	3 / 3	407
Inorganic	Manganese, Dissolved in Porewater	mg/L		3.74	3.74	5.34	3 / 3	4.777
Inorganic	Mercury in Bulk Sediment	mg/kg		0.11	0.11	0.13	3 / 3	0.12
Inorganic	Mercury, Dissolved in Porewater	mg/L	0.00015 / 0.00015	ND	ND	ND	0 / 3	0
Inorganic	Molybdenum in Bulk Sediment	mg/kg	6.89 / 7.84	ND	ND	ND	0 / 3	0
Inorganic	Molybdenum, Dissolved in Porewater	mg/L		0.00184	0.00184	0.00215	2 / 2	0.002065
Inorganic	Nickel in Bulk Sediment	mg/kg		20.7	20.7	27.2	3 / 3	24.67
Inorganic	Nickel, Dissolved in Porewater	mg/L		0.00158	0.00158	0.00271	3 / 3	0.002307

Notes:

For definitions, see the Acronyms section.

Table A- 1: Bulk Sediment and Porewater in the Emory River Reach A Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Potassium in Bulk Sediment	mg/kg		1030	1030	1570	3 / 3	1313
Inorganic	Potassium, Dissolved in Porewater	mg/L		2	2	2.89	3 / 3	2.523
Inorganic	Selenium in Bulk Sediment	mg/kg		3.1	3.1	4.27	3 / 3	3.71
Inorganic	Selenium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	0.00033	0.00045	2 / 3	0.00039
Inorganic	Silver in Bulk Sediment	mg/kg	0.861 / 0.98	ND	ND	ND	0 / 3	0
Inorganic	Silver, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 3	0
Inorganic	Sodium in Bulk Sediment	mg/kg		188	188	204	3 / 3	195
Inorganic	Sodium, Dissolved in Porewater	mg/L		6.05	6.05	6.8	3 / 3	6.453
Inorganic	Strontium in Bulk Sediment	mg/kg		127	127	145	3 / 3	135.3
Inorganic	Strontium, Dissolved in Porewater	mg/L		0.17	0.17	0.218	3 / 3	0.1883
Inorganic	Thallium in Bulk Sediment	mg/kg	1.72 / 1.96	ND	ND	ND	0 / 3	0
Inorganic	Thallium, Dissolved in Porewater	mg/L	0.0005 / 0.0005	ND	ND	ND	0 / 3	0
Inorganic	Vanadium in Bulk Sediment	mg/kg		38.6	38.6	51.9	3 / 3	45.93
Inorganic	Vanadium, Dissolved in Porewater	mg/L	0.001 / 0.001	ND	0.00117	0.00117	1 / 3	0.00117
Inorganic	Zinc in Bulk Sediment	mg/kg		54.9	54.9	75.8	3 / 3	65.47
Inorganic	Zinc, Dissolved in Porewater	mg/L	0.0083 / 0.0083	ND	0.00905	0.05	3 / 3	0.02765
Inorganic-Cation/Anion	Chloride in Porewater	mg/L		7.69	7.69	10.4	3 / 3	8.967
Inorganic-Cation/Anion	Sulfate in Porewater	mg/L		2.1	2.1	3.2	2 / 2	2.92
Physical Properties	% Ash in Bulk Sediment	%		42	42	49	3 / 3	44.67
Physical Properties	Alkalinity in Porewater	mg/L		139	139	188	3 / 3	162.3
Physical Properties	Fraction of Organic Carbon in Bulk Sediment	%		1.7	1.7	2.2	3 / 3	1.967
Physical Properties	Hardness (As CaCO3) in Porewater	mg/L		133	133	171	2 / 2	152
Physical Properties	Total Organic Carbon in Bulk Sediment	mg/kg		12000	12000	18000	3 / 3	15667
Speciation	Arsenate, Dissolved in Porewater	mg/L	0.0009 / 0.0015	ND	0.013	0.048	1 / 1	0.048
Speciation	Arsenite, Dissolved in Porewater	mg/L		0.0426	0.0426	0.0992	2 / 2	0.09265
Speciation	Inorganic Arsenic, Dissolved in Porewater	mg/L		0.0556	0.0556	0.147	2 / 2	0.1108
Speciation	Inorganic Selenium, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	ND	ND	0 / 2	0
Speciation	Organic Arsenic, Dissolved in Porewater	mg/L	0.0009 / 0.003	ND	ND	ND	0 / 1	0
Speciation	Organic Selenium, Dissolved in Porewater	mg/L		0.00052	0.00052	0.00082	2 / 2	0.0006815

Notes:

For definitions, see the Acronyms section.

Table A- 1: Bulk Sediment and Porewater in the Emory River Reach A Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Speciation	Selenate, Dissolved in Porewater	mg/L	0.00016 / 0.00016	ND	ND	ND	0 / 2	0
Speciation	Selenite, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	ND	ND	0 / 2	0
Speciation	Selenium, Dissolved (from speciation lab) in Porewater	mg/L		0.00052	0.00052	0.00082	2 / 2	0.0006815

Notes:
For definitions, see the Acronyms section.

Table A- 2: Bulk Sediment and Porewater in the Emory River Reach B Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum in Bulk Sediment	mg/kg		11700	11700	17300	3 / 3	14400
Inorganic	Aluminum, Dissolved in Porewater	mg/L	0.05 / 0.05	ND	ND	ND	0 / 2	0
Inorganic	Antimony in Bulk Sediment	mg/kg	1.25 / 1.48	ND	1.9	1.9	1 / 3	1.9
Inorganic	Antimony, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	0.00065	0.00065	1 / 2	0.00065
Inorganic	Arsenic in Bulk Sediment	mg/kg		48.9	48.9	77.7	3 / 3	63.3
Inorganic	Arsenic, Dissolved in Porewater	mg/L		0.013	0.013	0.564	2 / 2	0.2885
Inorganic	Barium in Bulk Sediment	mg/kg		212	212	401	3 / 3	289.3
Inorganic	Barium, Dissolved in Porewater	mg/L		0.169	0.169	0.265	2 / 2	0.217
Inorganic	Beryllium in Bulk Sediment	mg/kg		2.17	2.17	3.05	3 / 3	2.49
Inorganic	Beryllium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 2	0
Inorganic	Boron in Bulk Sediment	mg/kg		19	19	49	3 / 3	32.53
Inorganic	Boron, Dissolved in Porewater	mg/L		0.0158	0.0158	1.06	2 / 2	0.5379
Inorganic	Cadmium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 2	0
Inorganic	Calcium in Bulk Sediment	mg/kg		2500	2500	6140	3 / 3	4213
Inorganic	Calcium, Dissolved in Porewater	mg/L		33.3	33.3	55.9	2 / 2	44.6
Inorganic	Chromium in Bulk Sediment	mg/kg		19.9	19.9	43.9	3 / 3	33.83
Inorganic	Chromium, Dissolved in Porewater	mg/L		0.00055	0.00055	0.00333	2 / 2	0.00194
Inorganic	Cobalt, Dissolved in Porewater	mg/L		0.00232	0.00232	0.00777	2 / 2	0.005045
Inorganic	Copper, Dissolved in Porewater	mg/L		0.00133	0.00133	0.00284	2 / 2	0.002085
Inorganic	Iron in Bulk Sediment	mg/kg		15300	15300	18300	3 / 3	17067
Inorganic	Iron, Dissolved in Porewater	mg/L		1.63	1.63	9.18	2 / 2	5.405
Inorganic	Lead in Bulk Sediment	mg/kg		13.1	13.1	15.7	3 / 3	14.47
Inorganic	Lead, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 2	0
Inorganic	Magnesium in Bulk Sediment	mg/kg		919	919	1600	3 / 3	1240
Inorganic	Magnesium, Dissolved in Porewater	mg/L		8.21	8.21	13	2 / 2	10.61
Inorganic	Manganese in Bulk Sediment	mg/kg		172	172	443	3 / 3	291.7
Inorganic	Manganese, Dissolved in Porewater	mg/L		4.88	4.88	6.67	2 / 2	5.775
Inorganic	Mercury in Bulk Sediment	mg/kg		0.06	0.06	0.095	3 / 3	0.07933
Inorganic	Mercury, Dissolved in Porewater	mg/L	0.00015 / 0.00015	ND	ND	ND	0 / 2	0
Inorganic	Molybdenum in Bulk Sediment	mg/kg	4.98 / 5.93	ND	ND	ND	0 / 3	0
Inorganic	Nickel in Bulk Sediment	mg/kg		18.3	18.3	31.2	3 / 3	26.57
Inorganic	Nickel, Dissolved in Porewater	mg/L		0.00216	0.00216	0.00351	2 / 2	0.002835
Inorganic	Potassium in Bulk Sediment	mg/kg		1640	1640	2040	3 / 3	1827
Inorganic	Potassium, Dissolved in Porewater	mg/L		2.38	2.38	3.43	2 / 2	2.905
Inorganic	Selenium in Bulk Sediment	mg/kg		3.86	3.86	4.56	3 / 3	4.13

Notes:

For definitions, see the Acronyms section.

Table A- 2: Bulk Sediment and Porewater in the Emory River Reach B Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Silver in Bulk Sediment	mg/kg	0.623 / 0.741	ND	ND	ND	0 / 3	0
Inorganic	Sodium in Bulk Sediment	mg/kg		150	150	412	3 / 3	248.3
Inorganic	Sodium, Dissolved in Porewater	mg/L		3.02	3.02	4.26	2 / 2	3.64
Inorganic	Strontium in Bulk Sediment	mg/kg		149	149	277	3 / 3	201.3
Inorganic	Strontium, Dissolved in Porewater	mg/L		0.133	0.133	0.606	2 / 2	0.3695
Inorganic	Thallium in Bulk Sediment	mg/kg	1.25 / 1.3	ND	1.69	1.69	1 / 3	1.69
Inorganic	Thallium, Dissolved in Porewater	mg/L	0.0005 / 0.0005	ND	ND	ND	0 / 2	0
Inorganic	Vanadium in Bulk Sediment	mg/kg		40.2	40.2	79.3	3 / 3	59.23
Inorganic	Vanadium, Dissolved in Porewater	mg/L	0.001 / 0.001	ND	0.0016	0.0016	1 / 2	0.0016
Inorganic	Zinc in Bulk Sediment	mg/kg		41.5	41.5	48.9	3 / 3	45.3
Inorganic	Zinc, Dissolved in Porewater	mg/L		0.0322	0.0322	0.0346	2 / 2	0.0334
Inorganic-Cation/Anion	Chloride in Porewater	mg/L		5.4	5.4	5.71	2 / 2	5.555
Inorganic-Cation/Anion	Sulfate in Porewater	mg/L		2.37	2.37	3.07	2 / 2	2.72
Physical Properties	% Ash in Bulk Sediment	%		53	53	88	3 / 3	68.33
Physical Properties	Alkalinity in Porewater	mg/L		132	132	186	2 / 2	159
Physical Properties	Dissolved Organic Carbon in Porewater	mg/L		13.7	13.7	18.4	2 / 2	16.05
Physical Properties	Fraction of Organic Carbon in Bulk Sediment	%		0.5	0.5	1.3	3 / 3	0.8333
Physical Properties	Hardness (As CaCO3) in Porewater	mg/L		117	117	193	2 / 2	155
Physical Properties	Total Organic Carbon in Bulk Sediment	mg/kg		3600	3600	8700	3 / 3	5333
Speciation	Arsenate, Dissolved in Porewater	mg/L		0.00407	0.00407	0.135	2 / 2	0.06954
Speciation	Arsenic, Dissolved (from speciation lab) in Porewater	mg/L		0.0146	0.0146	0.543	2 / 2	0.2788
Speciation	Arsenite, Dissolved in Porewater	mg/L		0.00912	0.00912	0.654	2 / 2	0.3316
Speciation	Inorganic Arsenic, Dissolved in Porewater	mg/L		0.0132	0.0132	0.788	2 / 2	0.4006
Speciation	Inorganic Selenium, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	ND	ND	0 / 2	0
Speciation	Organic Arsenic, Dissolved in Porewater	mg/L	0.0015 / 0.045	ND	ND	ND	0 / 2	0
Speciation	Organic Selenium, Dissolved in Porewater	mg/L	0.00039 / 0.00039	ND	0.00086	0.00086	1 / 2	0.000861

Notes:

For definitions, see the Acronyms section.

Table A- 2: Bulk Sediment and Porewater in the Emory River Reach B Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Speciation	Selenate, Dissolved in Porewater	mg/L	0.00016 / 0.00016	ND	ND	ND	0 / 2	0
Speciation	Selenite, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	ND	ND	0 / 2	0
Speciation	Selenium, Dissolved (from speciation lab) in Porewater	mg/L	0.00039 / 0.00039	ND	0.00086	0.00086	1 / 2	0.000861

Notes:
For definitions, see the Acronyms section.

Table A- 3: Bulk Sediment and Porewater in the Emory River Reach C Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum in Bulk Sediment	mg/kg		14100	14100	16600	2 / 2	15350
Inorganic	Aluminum, Dissolved in Porewater	mg/L		0.118	0.118	0.467	2 / 2	0.2925
Inorganic	Antimony in Bulk Sediment	mg/kg	1.8 / 2.57	ND	ND	ND	0 / 2	0
Inorganic	Antimony, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 2	0
Inorganic	Arsenic in Bulk Sediment	mg/kg		9.25	9.25	19	2 / 2	14.13
Inorganic	Arsenic, Dissolved in Porewater	mg/L		0.00208	0.00208	0.0115	2 / 2	0.00679
Inorganic	Barium in Bulk Sediment	mg/kg		127	127	136	2 / 2	131.5
Inorganic	Barium, Dissolved in Porewater	mg/L		0.0421	0.0421	0.0774	2 / 2	0.05975
Inorganic	Beryllium in Bulk Sediment	mg/kg		1.28	1.28	1.3	2 / 2	1.29
Inorganic	Boron in Bulk Sediment	mg/kg	7.22 / 10.3	ND	12.4	12.4	1 / 2	12.4
Inorganic	Boron, Dissolved in Porewater	mg/L		0.0209	0.0209	0.0305	2 / 2	0.0257
Inorganic	Cadmium in Bulk Sediment	mg/kg	0.18 / 0.257	ND	ND	ND	0 / 2	0
Inorganic	Cadmium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 2	0
Inorganic	Calcium in Bulk Sediment	mg/kg		1890	1890	2020	2 / 2	1955
Inorganic	Chromium in Bulk Sediment	mg/kg		18.5	18.5	19.2	2 / 2	18.85
Inorganic	Cobalt in Bulk Sediment	mg/kg		14.7	14.7	17.4	2 / 2	16.05
Inorganic	Cobalt, Dissolved in Porewater	mg/L		0.00287	0.00287	0.00459	2 / 2	0.00373
Inorganic	Copper in Bulk Sediment	mg/kg		19.1	19.1	19.4	2 / 2	19.25
Inorganic	Copper, Dissolved in Porewater	mg/L		0.00089	0.00089	0.00193	2 / 2	0.00141
Inorganic	Iron in Bulk Sediment	mg/kg		20100	20100	23700	2 / 2	21900
Inorganic	Iron, Dissolved in Porewater	mg/L		2.58	2.58	3.94	2 / 2	3.26
Inorganic	Lead in Bulk Sediment	mg/kg		12.6	12.6	14.4	2 / 2	13.5
Inorganic	Lead, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	0.00202	0.00202	1 / 2	0.00202
Inorganic	Magnesium in Bulk Sediment	mg/kg		1130	1130	1550	2 / 2	1340
Inorganic	Magnesium, Dissolved in Porewater	mg/L		1.39	1.39	4.36	2 / 2	2.875
Inorganic	Manganese in Bulk Sediment	mg/kg		523	523	760	2 / 2	641.5
Inorganic	Manganese, Dissolved in Porewater	mg/L		0.699	0.699	3.98	2 / 2	2.34
Inorganic	Mercury in Bulk Sediment	mg/kg	0.061 / 0.061	ND	0.088	0.088	1 / 2	0.088
Inorganic	Mercury, Dissolved in Porewater	mg/L	0.00015 / 0.00015	ND	ND	ND	0 / 2	0
Inorganic	Molybdenum in Bulk Sediment	mg/kg	7.22 / 10.3	ND	ND	ND	0 / 2	0
Inorganic	Molybdenum, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	0.00101	0.00101	1 / 2	0.00101
Inorganic	Nickel in Bulk Sediment	mg/kg		21.7	21.7	26	2 / 2	23.85
Inorganic	Nickel, Dissolved in Porewater	mg/L		0.00177	0.00177	0.00277	2 / 2	0.00227
Inorganic	Potassium, Dissolved in Porewater	mg/L		1.36	1.36	1.92	2 / 2	1.64
Inorganic	Selenium in Bulk Sediment	mg/kg	1.8 / 2.57	ND	1.95	1.95	1 / 2	1.95
Inorganic	Selenium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 2	0

Notes:

For definitions, see the Acronyms section.

Table A- 3: Bulk Sediment and Porewater in the Emory River Reach C Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Silver in Bulk Sediment	mg/kg	0.902 / 1.28	ND	ND	ND	0 / 2	0
Inorganic	Silver, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 2	0
Inorganic	Sodium, Dissolved in Porewater	mg/L		1.67	1.67	3.06	2 / 2	2.365
Inorganic	Strontium, Dissolved in Porewater	mg/L		0.0236	0.0236	0.0721	2 / 2	0.04785
Inorganic	Thallium in Bulk Sediment	mg/kg	1.8 / 2.57	ND	ND	ND	0 / 2	0
Inorganic	Thallium, Dissolved in Porewater	mg/L	0.0005 / 0.0005	ND	ND	ND	0 / 2	0
Inorganic	Vanadium in Bulk Sediment	mg/kg		30.4	30.4	30.7	2 / 2	30.55
Inorganic	Vanadium, Dissolved in Porewater	mg/L	0.001 / 0.001	ND	0.00105	0.00105	1 / 2	0.00105
Inorganic	Zinc in Bulk Sediment	mg/kg		74.7	74.7	95.5	2 / 2	85.1
Inorganic	Zinc, Dissolved in Porewater	mg/L		0.00858	0.00858	0.0245	2 / 2	0.01654
Inorganic-Cation/Anion	Chloride in Porewater	mg/L		4.85	4.85	4.91	2 / 2	4.88
Inorganic-Cation/Anion	Sulfate in Porewater	mg/L		1.67	1.67	15.9	2 / 2	8.785
Physical Properties	% Ash in Bulk Sediment	%		1	1	26	2 / 2	13.5
Physical Properties	Alkalinity in Porewater	mg/L	10 / 10	ND	65.8	65.8	1 / 2	65.8
Physical Properties	Dissolved Organic Carbon in Porewater	mg/L		9.52	9.52	12	2 / 2	10.76
Physical Properties	Fraction of Organic Carbon in Bulk Sediment	%		2.1	2.1	3.2	2 / 2	2.65
Physical Properties	Hardness (As CaCO3) in Porewater	mg/L		21.8	21.8	63.8	2 / 2	42.8
Physical Properties	Total Organic Carbon in Bulk Sediment	mg/kg		15000	15000	25000	2 / 2	20000
Speciation	Arsenate, Dissolved in Porewater	mg/L		0.00541	0.00541	0.00541	1 / 1	0.00541
Speciation	Arsenic, Dissolved (from speciation lab) in Porewater	mg/L		0.0128	0.0128	0.0128	1 / 1	0.0128
Speciation	Arsenite, Dissolved in Porewater	mg/L		0.00781	0.00781	0.00781	1 / 1	0.00781
Speciation	Inorganic Arsenic, Dissolved in Porewater	mg/L		0.0132	0.0132	0.0132	1 / 1	0.0132
Speciation	Inorganic Selenium, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	ND	ND	0 / 1	0
Speciation	Organic Arsenic, Dissolved in Porewater	mg/L	0.0015 / 0.0015	ND	ND	ND	0 / 1	0
Speciation	Organic Selenium, Dissolved in Porewater	mg/L	0.00039 / 0.00039	ND	ND	ND	0 / 1	0

Notes:

For definitions, see the Acronyms section.

Table A- 3: Bulk Sediment and Porewater in the Emory River Reach C Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Speciation	Selenate, Dissolved in Porewater	mg/L	0.00016 / 0.00016	ND	ND	ND	0 / 1	0
Speciation	Selenite, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	ND	ND	0 / 1	0
Speciation	Selenium, Dissolved (from speciation lab) in Porewater	mg/L	0.00039 / 0.00039	ND	ND	ND	0 / 1	0

Notes:
For definitions, see the Acronyms section.

Table A- 4: Bulk Sediment and Porewater in the Emory River Reference Reach Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum in Bulk Sediment	mg/kg		4530	4530	4530	1 / 1	4530
Inorganic	Aluminum, Dissolved in Porewater	mg/L	0.05 / 0.05	ND	ND	ND	0 / 1	0
Inorganic	Antimony in Bulk Sediment	mg/kg	1.84 / 1.84	ND	ND	ND	0 / 1	0
Inorganic	Antimony, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 1	0
Inorganic	Arsenic in Bulk Sediment	mg/kg		2.32	2.32	2.32	1 / 1	2.32
Inorganic	Arsenic, Dissolved in Porewater	mg/L		0.00368	0.00368	0.00368	1 / 1	0.00368
Inorganic	Barium in Bulk Sediment	mg/kg		61	61	61	1 / 1	61
Inorganic	Barium, Dissolved in Porewater	mg/L		0.198	0.198	0.198	1 / 1	0.198
Inorganic	Beryllium in Bulk Sediment	mg/kg	0.735 / 0.735	ND	ND	ND	0 / 1	0
Inorganic	Beryllium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 1	0
Inorganic	Boron in Bulk Sediment	mg/kg	7.35 / 7.35	ND	ND	ND	0 / 1	0
Inorganic	Boron, Dissolved in Porewater	mg/L		0.0154	0.0154	0.0154	1 / 1	0.0154
Inorganic	Cadmium in Bulk Sediment	mg/kg	0.184 / 0.184	ND	ND	ND	0 / 1	0
Inorganic	Cadmium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 1	0
Inorganic	Calcium in Bulk Sediment	mg/kg		1560	1560	1560	1 / 1	1560
Inorganic	Calcium, Dissolved in Porewater	mg/L		52.4	52.4	52.4	1 / 1	52.4
Inorganic	Chromium in Bulk Sediment	mg/kg		7.2	7.2	7.2	1 / 1	7.2
Inorganic	Chromium, Dissolved in Porewater	mg/L		0.00244	0.00244	0.00244	1 / 1	0.00244
Inorganic	Cobalt in Bulk Sediment	mg/kg		10.1	10.1	10.1	1 / 1	10.1
Inorganic	Cobalt, Dissolved in Porewater	mg/L		0.0116	0.0116	0.0116	1 / 1	0.0116
Inorganic	Copper in Bulk Sediment	mg/kg		8.79	8.79	8.79	1 / 1	8.79
Inorganic	Copper, Dissolved in Porewater	mg/L		0.00086	0.00086	0.00086	1 / 1	0.00086
Inorganic	Iron in Bulk Sediment	mg/kg		11200	11200	11200	1 / 1	11200
Inorganic	Iron, Dissolved in Porewater	mg/L		14	14	14	1 / 1	14
Inorganic	Lead in Bulk Sediment	mg/kg		10.1	10.1	10.1	1 / 1	10.1

Notes:

For definitions, see the Acronyms section.

Table A- 4: Bulk Sediment and Porewater in the Emory River Reference Reach Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Lead, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 1	0
Inorganic	Magnesium in Bulk Sediment	mg/kg		520	520	520	1 / 1	520
Inorganic	Magnesium, Dissolved in Porewater	mg/L		8.79	8.79	8.79	1 / 1	8.79
Inorganic	Manganese in Bulk Sediment	mg/kg		360	360	360	1 / 1	360
Inorganic	Manganese, Dissolved in Porewater	mg/L		5.53	5.53	5.53	1 / 1	5.53
Inorganic	Mercury in Bulk Sediment	mg/kg	0.061 / 0.061	ND	ND	ND	0 / 1	0
Inorganic	Mercury, Dissolved in Porewater	mg/L	0.00015 / 0.00015	ND	ND	ND	0 / 1	0
Inorganic	Molybdenum in Bulk Sediment	mg/kg	7.35 / 7.35	ND	ND	ND	0 / 1	0
Inorganic	Molybdenum, Dissolved in Porewater	mg/L		0.00044	0.00044	0.00044	1 / 1	0.00044
Inorganic	Nickel in Bulk Sediment	mg/kg		13.4	13.4	13.4	1 / 1	13.4
Inorganic	Nickel, Dissolved in Porewater	mg/L		0.00565	0.00565	0.00565	1 / 1	0.00565
Inorganic	Potassium in Bulk Sediment	mg/kg		330	330	330	1 / 1	330
Inorganic	Potassium, Dissolved in Porewater	mg/L		2.78	2.78	2.78	1 / 1	2.78
Inorganic	Selenium in Bulk Sediment	mg/kg	1.84 / 1.84	ND	ND	ND	0 / 1	0
Inorganic	Selenium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 1	0
Inorganic	Silver in Bulk Sediment	mg/kg	0.919 / 0.919	ND	ND	ND	0 / 1	0
Inorganic	Silver, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 1	0
Inorganic	Sodium in Bulk Sediment	mg/kg	184 / 184	ND	ND	ND	0 / 1	0
Inorganic	Sodium, Dissolved in Porewater	mg/L		4.32	4.32	4.32	1 / 1	4.32
Inorganic	Strontium in Bulk Sediment	mg/kg	7.35 / 7.35	ND	ND	ND	0 / 1	0
Inorganic	Strontium, Dissolved in Porewater	mg/L		0.161	0.161	0.161	1 / 1	0.161
Inorganic	Thallium in Bulk Sediment	mg/kg	1.84 / 1.84	ND	ND	ND	0 / 1	0
Inorganic	Thallium, Dissolved in Porewater	mg/L	0.0005 / 0.0005	ND	ND	ND	0 / 1	0
Inorganic	Vanadium in Bulk Sediment	mg/kg		8.53	8.53	8.53	1 / 1	8.53
Inorganic	Vanadium, Dissolved in Porewater	mg/L	0.001 / 0.001	ND	ND	ND	0 / 1	0
Inorganic	Zinc in Bulk Sediment	mg/kg		56.2	56.2	56.2	1 / 1	56.2
Inorganic	Zinc, Dissolved in Porewater	mg/L		0.0135	0.0135	0.0135	1 / 1	0.0135
Inorganic-Cation/Anion	Chloride in Porewater	mg/L		5.55	5.55	5.55	1 / 1	5.55
Inorganic-Cation/Anion	Sulfate in Porewater	mg/L		1.82	1.82	1.82	1 / 1	1.82
Physical Properties	% Ash in Bulk Sediment	%	1 / 1	ND	ND	ND	0 / 1	0
Physical Properties	Alkalinity in Porewater	mg/L		163	163	163	1 / 1	163
Physical Properties	Dissolved Organic Carbon in Porewater	mg/L		8.3	8.3	8.3	1 / 1	8.3

Notes:

For definitions, see the Acronyms section.

Table A- 4: Bulk Sediment and Porewater in the Emory River Reference Reach Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Physical Properties	Fraction of Organic Carbon in Bulk Sediment	%		3.8	3.8	3.8	1 / 1	3.8
Physical Properties	Hardness (As CaCO3) in Porewater	mg/L		167	167	167	1 / 1	167
Physical Properties	Total Organic Carbon in Bulk Sediment	mg/kg		23000	23000	23000	1 / 1	23000
Speciation	Arsenate, Dissolved in Porewater	mg/L		0.00104	0.00104	0.00104	1 / 1	0.00104
Speciation	Arsenic, Dissolved (from speciation lab) in Porewater	mg/L		0.00395	0.00395	0.00395	1 / 1	0.00395
Speciation	Arsenite, Dissolved in Porewater	mg/L	0.00244 / 0.00244	ND	ND	ND	0 / 1	0
Speciation	Inorganic Arsenic, Dissolved in Porewater	mg/L		0.00349	0.00349	0.00349	1 / 1	0.00349
Speciation	Inorganic Selenium, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	ND	ND	0 / 1	0
Speciation	Organic Arsenic, Dissolved in Porewater	mg/L		0.00046	0.00046	0.00046	1 / 1	0.000461
Speciation	Organic Selenium, Dissolved in Porewater	mg/L		0.00068	0.00068	0.00068	1 / 1	0.000679
Speciation	Selenate, Dissolved in Porewater	mg/L	0.00016 / 0.00016	ND	ND	ND	0 / 1	0
Speciation	Selenite, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	ND	ND	0 / 1	0
Speciation	Selenium, Dissolved (from speciation lab) in Porewater	mg/L		0.00068	0.00068	0.00068	1 / 1	0.000679

Notes:

For definitions, see the Acronyms section.

Table A- 5: Bulk Sediment and Porewater in the Clinch River Reach A Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum in Bulk Sediment	mg/kg		15300	15300	30100	4 / 4	20925
Inorganic	Aluminum, Dissolved in Porewater	mg/L	0.05 / 0.05	ND	0.0539	0.0539	1 / 4	0.0539
Inorganic	Aluminum, Total in Porewater	mg/L		11.3	11.3	11.3	1 / 1	11.3
Inorganic	Antimony in Bulk Sediment	mg/kg	1.69 / 2.43	ND	ND	ND	0 / 4	0
Inorganic	Antimony, Dissolved in Porewater	mg/L		0.00034	0.00034	0.00057	4 / 4	0.000445
Inorganic	Antimony, Total in Porewater	mg/L		0.00077	0.00077	0.00077	1 / 1	0.00077
Inorganic	Arsenic in Bulk Sediment	mg/kg		18.7	18.7	32.5	4 / 4	23.2
Inorganic	Arsenic, Dissolved in Porewater	mg/L		0.00843	0.00843	0.0573	4 / 4	0.02448
Inorganic	Arsenic, Total in Porewater	mg/L		0.0627	0.0627	0.0627	1 / 1	0.0627
Inorganic	Barium in Bulk Sediment	mg/kg		194	194	261	4 / 4	217.5
Inorganic	Barium, Dissolved in Porewater	mg/L		0.0836	0.0836	0.152	4 / 4	0.1152
Inorganic	Barium, Total in Porewater	mg/L		0.4	0.4	0.4	1 / 1	0.4
Inorganic	Beryllium in Bulk Sediment	mg/kg		1.69	1.69	2.32	4 / 4	1.938
Inorganic	Beryllium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 4	0
Inorganic	Beryllium, Total in Porewater	mg/L		0.00178	0.00178	0.00178	1 / 1	0.00178
Inorganic	Boron in Bulk Sediment	mg/kg		18.4	18.4	26.3	4 / 4	21.75
Inorganic	Boron, Dissolved in Porewater	mg/L		0.0367	0.0367	0.0964	4 / 4	0.06325
Inorganic	Boron, Total in Porewater	mg/L		0.0865	0.0865	0.0865	1 / 1	0.0865
Inorganic	Cadmium in Bulk Sediment	mg/kg	0.169 / 0.243	ND	ND	ND	0 / 4	0
Inorganic	Cadmium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 4	0
Inorganic	Cadmium, Total in Porewater	mg/L		0.00038	0.00038	0.00038	1 / 1	0.00038
Inorganic	Calcium in Bulk Sediment	mg/kg		3120	3120	4060	4 / 4	3648
Inorganic	Calcium, Dissolved in Porewater	mg/L		38.3	38.3	63.8	4 / 4	48.88
Inorganic	Calcium, Total in Porewater	mg/L		60.8	60.8	60.8	1 / 1	60.8
Inorganic	Chromium in Bulk Sediment	mg/kg		22.7	22.7	36	4 / 4	28.28
Inorganic	Chromium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	0.00151	0.00151	1 / 4	0.00151
Inorganic	Chromium, Total in Porewater	mg/L		0.012	0.012	0.012	1 / 1	0.012
Inorganic	Cobalt in Bulk Sediment	mg/kg		12.6	12.6	21.6	4 / 4	16.98
Inorganic	Cobalt, Dissolved in Porewater	mg/L		0.00044	0.00044	0.00093	4 / 4	0.0006825
Inorganic	Cobalt, Total in Porewater	mg/L		0.014	0.014	0.014	1 / 1	0.014
Inorganic	Copper in Bulk Sediment	mg/kg		34.2	34.2	60.8	4 / 4	41.88
Inorganic	Copper, Dissolved in Porewater	mg/L		0.00195	0.00195	0.00597	4 / 4	0.004123
Inorganic	Copper, Total in Porewater	mg/L		0.0294	0.0294	0.0294	1 / 1	0.0294
Inorganic	Iron in Bulk Sediment	mg/kg		21200	21200	35100	4 / 4	26750
Inorganic	Iron, Dissolved in Porewater	mg/L	0.025 / 0.025	ND	0.0877	0.153	2 / 4	0.1204
Inorganic	Iron, Total in Porewater	mg/L		11.1	11.1	11.1	1 / 1	11.1

Notes:

For definitions, see the Acronyms section.

Table A- 5: Bulk Sediment and Porewater in the Clinch River Reach A Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Lead in Bulk Sediment	mg/kg		13.9	13.9	29.8	4 / 4	20.2
Inorganic	Lead, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	0.00185	0.00505	2 / 4	0.00345
Inorganic	Lead, Total in Porewater	mg/L		0.0213	0.0213	0.0213	1 / 1	0.0213
Inorganic	Magnesium in Bulk Sediment	mg/kg		1620	1620	3370	4 / 4	2213
Inorganic	Magnesium, Dissolved in Porewater	mg/L		11.1	11.1	16.7	4 / 4	13.45
Inorganic	Magnesium, Total in Porewater	mg/L		16.4	16.4	16.4	1 / 1	16.4
Inorganic	Manganese in Bulk Sediment	mg/kg		660	660	2200	4 / 4	1163
Inorganic	Manganese, Dissolved in Porewater	mg/L		1.44	1.44	3.8	4 / 4	2.735
Inorganic	Manganese, Total in Porewater	mg/L		9.24	9.24	9.24	1 / 1	9.24
Inorganic	Mercury in Bulk Sediment	mg/kg		0.3	0.3	0.77	4 / 4	0.4475
Inorganic	Mercury, Dissolved in Porewater	mg/L	0.00015 / 0.00015	ND	ND	ND	0 / 4	0
Inorganic	Mercury, Total in Porewater	mg/L	0.00015 / 0.00015	ND	ND	ND	0 / 1	0
Inorganic	Molybdenum in Bulk Sediment	mg/kg	6.74 / 9.73	ND	ND	ND	0 / 4	0
Inorganic	Molybdenum, Dissolved in Porewater	mg/L		0.00095	0.00095	0.00984	4 / 4	0.00566
Inorganic	Molybdenum, Total in Porewater	mg/L		0.00575	0.00575	0.00575	1 / 1	0.00575
Inorganic	Nickel in Bulk Sediment	mg/kg		20.5	20.5	32	4 / 4	26.48
Inorganic	Nickel, Dissolved in Porewater	mg/L		0.00101	0.00101	0.00181	4 / 4	0.00138
Inorganic	Nickel, Total in Porewater	mg/L		0.0211	0.0211	0.0211	1 / 1	0.0211
Inorganic	Potassium in Bulk Sediment	mg/kg		1770	1770	3760	4 / 4	2435
Inorganic	Potassium, Dissolved in Porewater	mg/L		1.98	1.98	3.71	4 / 4	2.793
Inorganic	Potassium, Total in Porewater	mg/L		4.48	4.48	4.48	1 / 1	4.48
Inorganic	Selenium in Bulk Sediment	mg/kg		2.6	2.6	4.06	4 / 4	3.298
Inorganic	Selenium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	0.00049	0.00075	3 / 4	0.0005833
Inorganic	Selenium, Total in Porewater	mg/L		0.00088	0.00088	0.00088	1 / 1	0.00088
Inorganic	Silver in Bulk Sediment	mg/kg	0.843 / 1.22	ND	ND	ND	0 / 4	0
Inorganic	Silver, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 4	0
Inorganic	Silver, Total in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 1	0
Inorganic	Sodium in Bulk Sediment	mg/kg	169 / 243	ND	ND	ND	0 / 4	0
Inorganic	Sodium, Dissolved in Porewater	mg/L		7.86	7.86	9	4 / 4	8.338
Inorganic	Sodium, Total in Porewater	mg/L		8.22	8.22	8.22	1 / 1	8.22
Inorganic	Strontium in Bulk Sediment	mg/kg		61.5	61.5	143	4 / 4	108.1
Inorganic	Strontium, Dissolved in Porewater	mg/L		0.148	0.148	0.29	4 / 4	0.2163
Inorganic	Strontium, Total in Porewater	mg/L		0.346	0.346	0.346	1 / 1	0.346
Inorganic	Thallium in Bulk Sediment	mg/kg	1.69 / 2.43	ND	ND	ND	0 / 4	0
Inorganic	Thallium, Dissolved in Porewater	mg/L	0.0005 / 0.0005	ND	ND	ND	0 / 4	0

Notes:

For definitions, see the Acronyms section.

Table A- 5: Bulk Sediment and Porewater in the Clinch River Reach A Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Thallium, Total in Porewater	mg/L		0.00081	0.00081	0.00081	1 / 1	0.00081
Inorganic	Vanadium in Bulk Sediment	mg/kg		43	43	59.1	4 / 4	50.7
Inorganic	Vanadium, Dissolved in Porewater	mg/L		0.00133	0.00133	0.00175	4 / 4	0.001533
Inorganic	Vanadium, Total in Porewater	mg/L		0.0348	0.0348	0.0348	1 / 1	0.0348
Inorganic	Zinc in Bulk Sediment	mg/kg		61.6	61.6	145	4 / 4	92.18
Inorganic	Zinc, Dissolved in Porewater	mg/L	0.0083 / 0.0083	ND	0.00986	0.0264	3 / 4	0.01552
Inorganic	Zinc, Total in Porewater	mg/L		0.0576	0.0576	0.0576	1 / 1	0.0576
Inorganic-Cation/Anion	Chloride in Porewater	mg/L		9.3	9.3	20.6	4 / 4	12.98
Inorganic-Cation/Anion	Sulfate in Porewater	mg/L		8.07	8.07	35.9	4 / 4	18.54
Organic-PAHs	Acenaphthene in Bulk Sediment	mg/kg	0.0009 / 0.001	ND	0.0013	0.0015	3 / 4	0.0014
Organic-PAHs	Acenaphthylene in Bulk Sediment	mg/kg		0.00098	0.00098	0.002	4 / 4	0.001345
Organic-PAHs	Anthracene in Bulk Sediment	mg/kg		0.0021	0.0021	0.0042	4 / 4	0.003275
Organic-PAHs	Benzo(a)anthracene in Bulk Sediment	mg/kg		0.014	0.014	0.031	4 / 4	0.021
Organic-PAHs	Benzo(a)pyrene in Bulk Sediment	mg/kg		0.015	0.015	0.035	4 / 4	0.023
Organic-PAHs	Benzo(b)fluoranthene in Bulk Sediment	mg/kg		0.023	0.023	0.052	4 / 4	0.03525
Organic-PAHs	Benzo(e)pyrene in Bulk Sediment	mg/kg		0.015	0.015	0.032	4 / 4	0.0215
Organic-PAHs	Benzo(g,h,i)perylene in Bulk Sediment	mg/kg		0.0073	0.0073	0.018	4 / 4	0.01108
Organic-PAHs	Benzo(k)fluoranthene in Bulk Sediment	mg/kg		0.017	0.017	0.037	4 / 4	0.0245
Organic-PAHs	C1-Chrysenes in Bulk Sediment	mg/kg		0.0074	0.0074	0.024	4 / 4	0.0124
Organic-PAHs	C1-Fluoranthenes/Pyrenes in Bulk Sediment	mg/kg		0.021	0.021	0.041	4 / 4	0.02975
Organic-PAHs	C1-Fluorenes in Bulk Sediment	mg/kg		0.0025	0.0025	0.0048	4 / 4	0.00335
Organic-PAHs	C1-Naphthalenes in Bulk Sediment	mg/kg		0.02	0.02	0.035	4 / 4	0.02625
Organic-PAHs	C1-Phenanthrenes/Anthracenes in Bulk Sediment	mg/kg		0.019	0.019	0.036	4 / 4	0.02625
Organic-PAHs	C2-Chrysenes in Bulk Sediment	mg/kg		0.0075	0.0075	0.017	4 / 4	0.01065
Organic-PAHs	C2-Fluoranthenes/Pyrene in Bulk Sediment	mg/kg		0.024	0.024	0.037	4 / 4	0.02975
Organic-PAHs	C2-Naphthalenes in Bulk Sediment	mg/kg		0.044	0.044	0.08	4 / 4	0.0585
Organic-PAHs	C2-Phenanthrenes/Anthracenes in Bulk Sediment	mg/kg		0.014	0.014	0.026	4 / 4	0.01825
Organic-PAHs	C3-Fluorenes in Bulk Sediment	mg/kg		0.0042	0.0042	0.008	4 / 4	0.005425

Notes:

For definitions, see the Acronyms section.

Table A- 5: Bulk Sediment and Porewater in the Clinch River Reach A Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Organic-PAHs	C3-Naphthalenes in Bulk Sediment	mg/kg		0.035	0.035	0.061	4 / 4	0.0445
Organic-PAHs	C3-Phenanthrenes/Anthracenes in Bulk Sediment	mg/kg		0.0069	0.0069	0.014	4 / 4	0.0094
Organic-PAHs	C4-Chrysenes in Bulk Sediment	mg/kg		0.0022	0.0022	0.0047	4 / 4	0.002925
Organic-PAHs	C4-Naphthalenes in Bulk Sediment	mg/kg		0.021	0.021	0.038	4 / 4	0.027
Organic-PAHs	C4-Phenanthrenes/Anthracenes in Bulk Sediment	mg/kg		0.0077	0.0077	0.015	4 / 4	0.01038
Organic-PAHs	Chrysene in Bulk Sediment	mg/kg		0.019	0.019	0.037	4 / 4	0.027
Organic-PAHs	Dibenz(a,h)anthracene in Bulk Sediment	mg/kg		0.0024	0.0024	0.0059	4 / 4	0.003775
Organic-PAHs	Fluoranthene in Bulk Sediment	mg/kg		0.034	0.034	0.06	4 / 4	0.04475
Organic-PAHs	Fluorene in Bulk Sediment	mg/kg		0.002	0.002	0.0041	4 / 4	0.002925
Organic-PAHs	Indeno(1,2,3-cd)pyrene in Bulk Sediment	mg/kg		0.0066	0.0066	0.017	4 / 4	0.01018
Organic-PAHs	Naphthalene in Bulk Sediment	mg/kg		0.0079	0.0079	0.013	4 / 4	0.0102
Organic-PAHs	Perylene in Bulk Sediment	mg/kg		0.034	0.034	0.35	4 / 4	0.118
Organic-PAHs	Phenanthrene in Bulk Sediment	mg/kg		0.017	0.017	0.03	4 / 4	0.02275
Organic-PAHs	Pyrene in Bulk Sediment	mg/kg		0.032	0.032	0.06	4 / 4	0.044
Organic-PCBs	PCB-1016 in Bulk Sediment	mg/kg	0.0023 / 0.0032	ND	ND	ND	0 / 4	0
Organic-PCBs	PCB-1221 in Bulk Sediment	mg/kg	0.0023 / 0.0032	ND	ND	ND	0 / 4	0
Organic-PCBs	PCB-1232 in Bulk Sediment	mg/kg	0.0023 / 0.0032	ND	ND	ND	0 / 4	0
Organic-PCBs	PCB-1242 in Bulk Sediment	mg/kg	0.0023 / 0.0032	ND	ND	ND	0 / 4	0
Organic-PCBs	PCB-1248 in Bulk Sediment	mg/kg	0.0023 / 0.0032	ND	ND	ND	0 / 4	0
Organic-PCBs	PCB-1254 in Bulk Sediment	mg/kg		0.0049	0.0049	0.0099	4 / 4	0.006275
Organic-PCBs	PCB-1260 in Bulk Sediment	mg/kg		0.0059	0.0059	0.014	4 / 4	0.008875
Organic-PCBs	PCB-1262 in Bulk Sediment	mg/kg	0.0023 / 0.0032	ND	ND	ND	0 / 4	0
Organic-PCBs	PCB-1268 in Bulk Sediment	mg/kg	0.0023 / 0.0032	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	4,4'-DDD in Bulk Sediment	mg/kg	0.00087 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	4,4'-DDE in Bulk Sediment	mg/kg	0.00087 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	4,4'-DDT in Bulk Sediment	mg/kg	0.00087 / 0.0011	ND	0.0017	0.0021	2 / 4	0.0019
Organic-Pesticides / Herbicides	Aldrin in Bulk Sediment	mg/kg	0.00045 / 0.00063	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	alpha-BHC in Bulk Sediment	mg/kg	0.00045 / 0.00052	ND	0.00074	0.0021	3 / 4	0.00122
Organic-Pesticides / Herbicides	alpha-Chlordane in Bulk Sediment	mg/kg	0.00045 / 0.00063	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	beta-BHC in Bulk Sediment	mg/kg		0.0013	0.0013	0.0067	4 / 4	0.003425
Organic-Pesticides / Herbicides	delta-BHC in Bulk Sediment	mg/kg	0.00045 / 0.00052	ND	0.0011	0.0027	3 / 4	0.001667

Notes:

For definitions, see the Acronyms section.

Table A- 5: Bulk Sediment and Porewater in the Clinch River Reach A Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Organic-Pesticides / Herbicides	Dieldrin in Bulk Sediment	mg/kg	0.00087 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Endosulfan I in Bulk Sediment	mg/kg	0.00045 / 0.00063	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Endosulfan II in Bulk Sediment	mg/kg	0.00087 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Endosulfan Sulfate in Bulk Sediment	mg/kg	0.00087 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Endrin aldehyde in Bulk Sediment	mg/kg	0.00087 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Endrin in Bulk Sediment	mg/kg	0.00087 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Endrin Ketone in Bulk Sediment	mg/kg	0.00087 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	gamma-BHC (Lindane) in Bulk Sediment	mg/kg	0.00045 / 0.00052	ND	0.00093	0.0015	3 / 4	0.00121
Organic-Pesticides / Herbicides	gamma-Chlordane in Bulk Sediment	mg/kg	0.00045 / 0.00063	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Heptachlor Epoxide in Bulk Sediment	mg/kg	0.00045 / 0.00063	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Heptachlor in Bulk Sediment	mg/kg		0.00056	0.00056	0.0025	4 / 4	0.001235
Organic-Pesticides / Herbicides	Methoxychlor in Bulk Sediment	mg/kg	0.0045 / 0.0063	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Toxaphene in Bulk Sediment	mg/kg	0.045 / 0.063	ND	ND	ND	0 / 4	0
Physical Properties	% Ash in Bulk Sediment	%		20	20	41	4 / 4	26.75
Physical Properties	Alkalinity in Porewater	mg/L		119	119	247	4 / 4	172
Physical Properties	Clay in Bulk Sediment	%		14.6	14.6	30.6	4 / 4	22.65
Physical Properties	Dissolved Organic Carbon in Porewater	mg/L		7.98	7.98	16.2	4 / 4	11.72
Physical Properties	Fraction of Organic Carbon in Bulk Sediment	%		1.4	1.4	2.5	4 / 4	1.95
Physical Properties	Gravel in Bulk Sediment	%	0 / 0	ND	ND	0.2	4 / 4	0.2
Physical Properties	Hardness (As CaCO3) in Porewater	mg/L		141	141	219	4 / 4	175
Physical Properties	Sand in Bulk Sediment	%		3.6	3.6	13.7	4 / 4	8.65
Physical Properties	Sand, Coarse in Bulk Sediment	%	0 / 0	ND	ND	0.4	4 / 4	0.3
Physical Properties	Sand, Fine in Bulk Sediment	%		3.3	3.3	13.1	4 / 4	8.075
Physical Properties	Sand, Medium in Bulk Sediment	%		0.3	0.3	0.7	4 / 4	0.425
Physical Properties	Silt in Bulk Sediment	%		64.6	64.6	72.9	4 / 4	68.65
Physical Properties	Total Organic Carbon in Bulk Sediment	mg/kg		11000	11000	20000	4 / 4	13750
Radionuclides	Actinium-228 in Bulk Sediment	pCi/g		1.96	1.96	2.4	4 / 4	2.13
Radionuclides	Americium-241 in Bulk Sediment	pCi/g	0.2 / 0.339	ND	ND	ND	0 / 4	0
Radionuclides	Bismuth-214 in Bulk Sediment	pCi/g		1.66	1.66	2.55	4 / 4	2.28
Radionuclides	Cesium-137 in Bulk Sediment	pCi/g		0.626	0.626	3.7	4 / 4	1.452
Radionuclides	Cobalt-60 in Bulk Sediment	pCi/g	0.072 / 0.0832	ND	ND	ND	0 / 4	0
Radionuclides	Lead-212 in Bulk Sediment	pCi/g		1.63	1.63	2.28	4 / 4	2.035

Notes:

For definitions, see the Acronyms section.

Table A- 5: Bulk Sediment and Porewater in the Clinch River Reach A Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Radionuclides	Lead-214 in Bulk Sediment	pCi/g		1.98	1.98	2.97	4 / 4	2.658
Radionuclides	Potassium-40 in Bulk Sediment	pCi/g		14.6	14.6	18.3	4 / 4	16.93
Radionuclides	Radium-226 in Bulk Sediment	pCi/g		1.66	1.66	2.55	4 / 4	2.28
Radionuclides	Radium-228 in Bulk Sediment	pCi/g		1.96	1.96	2.4	4 / 4	2.13
Radionuclides	Thallium-208 in Bulk Sediment	pCi/g		0.502	0.502	0.643	4 / 4	0.5753
Radionuclides	Thorium-228 in Bulk Sediment	pCi/g		1.76	1.76	2.43	4 / 4	2.13
Radionuclides	Thorium-230 in Bulk Sediment	pCi/g		2.12	2.12	3.29	4 / 4	2.71
Radionuclides	Thorium-232 in Bulk Sediment	pCi/g		1.77	1.77	2.35	4 / 4	1.995
Radionuclides	Thorium-234 in Bulk Sediment	pCi/g	1.86 / 2.86	ND	3.28	3.28	1 / 4	3.28
Radionuclides	Uranium-234 in Bulk Sediment	pCi/g		1.65	1.65	2.57	4 / 4	2.178
Radionuclides	Uranium-235 in Bulk Sediment	pCi/g	0.0557 / 0.101	ND	0.0557	0.192	3 / 4	0.1332
Radionuclides	Uranium-238 in Bulk Sediment	pCi/g		1.7	1.7	2.53	4 / 4	2.208
Speciation	Arsenate in Bulk Sediment	mg/kg		4.42	4.42	11.4	4 / 4	7.758
Speciation	Arsenate, Dissolved in Porewater	mg/L		0.00354	0.00354	0.0306	4 / 4	0.01247
Speciation	Arsenate, Total in Porewater	mg/L		0.0299	0.0299	0.0299	1 / 1	0.0299
Speciation	Arsenic (from speciation lab) in Bulk Sediment	mg/kg		13.2	13.2	26.4	4 / 4	18.8
Speciation	Arsenic, Dissolved (from speciation lab) in Porewater	mg/L		0.011	0.011	0.0585	4 / 4	0.0274
Speciation	Arsenic, Total (from speciation lab) in Porewater	mg/L		0.071	0.071	0.071	1 / 1	0.071
Speciation	Arsenite, Dissolved in Porewater	mg/L		0.00747	0.00747	0.0129	4 / 4	0.009758
Speciation	Arsenite, Total in Porewater	mg/L		0.0139	0.0139	0.0139	1 / 1	0.0139
Speciation	Inorganic Arsenic in Bulk Sediment	mg/kg		10.9	10.9	28.3	4 / 4	18.95
Speciation	Inorganic Arsenic, Dissolved in Porewater	mg/L		0.011	0.011	0.0412	4 / 4	0.02223
Speciation	Inorganic Arsenic, Total in Porewater	mg/L		0.0438	0.0438	0.0438	1 / 1	0.0438
Speciation	Inorganic Mercury in Bulk Sediment	mg/kg		0.38	0.38	1.66	4 / 4	0.788
Speciation	Inorganic Selenium, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	0.00036	0.00039	2 / 4	0.000372
speciation	Mercury (from speciation lab) in Bulk Sediment	mg/kg		0.382	0.382	1.66	4 / 4	0.7893
Speciation	Methyl mercury in Bulk Sediment	mg/kg		0.00107	0.00107	0.0018	4 / 4	0.00157

Notes:

For definitions, see the Acronyms section.

Table A- 5: Bulk Sediment and Porewater in the Clinch River Reach A Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Speciation	Organic Arsenic in Bulk Sediment	mg/kg	2.28 / 6.02	ND	2.32	2.32	1 / 4	2.32
Speciation	Organic Arsenic, Dissolved in Porewater	mg/L	0.0009 / 0.0009	ND	0.0014	0.0173	3 / 4	0.006887
Speciation	Organic Arsenic, Total in Porewater	mg/L		0.0272	0.0272	0.0272	1 / 1	0.0272
Speciation	Organic Selenium in Bulk Sediment	mg/kg	0.764 / 0.926	ND	1.44	2.86	3 / 4	2.177
Speciation	Organic Selenium, Dissolved in Porewater	mg/L	0.00039 / 0.00194	ND	ND	ND	0 / 4	0
Speciation	Selenate in Bulk Sediment	mg/kg	0.388 / 0.595	ND	ND	ND	0 / 4	0
Speciation	Selenate, Dissolved in Porewater	mg/L	0.00016 / 0.00016	ND	ND	ND	0 / 4	0
Speciation	Selenite in Bulk Sediment	mg/kg	0.491 / 0.752	ND	0.887	0.887	1 / 4	0.887
Speciation	Selenite, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	0.00036	0.00039	2 / 4	0.000372
Speciation	Selenium (from speciation lab) in Bulk Sediment	mg/kg	0.764 / 0.926	ND	2.23	2.86	3 / 4	2.473
Speciation	Selenium, Dissolved (from speciation lab) in Porewater	mg/L	0.00039 / 0.00194	ND	0.00055	0.00057	2 / 4	0.0005635
Speciation	Selenium, Total (from speciation lab) in Porewater	mg/L	0.00388 / 0.00388	ND	ND	ND	0 / 1	0

Notes:
For definitions, see the Acronyms section.

Table A- 6: Bulk Sediment and Porewater in the Clinch River Reach B Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum in Bulk Sediment	mg/kg		15100	15100	24900	4 / 4	21675
Inorganic	Aluminum, Dissolved in Porewater	mg/L	0.05 / 0.05	ND	ND	ND	0 / 4	0
Inorganic	Antimony in Bulk Sediment	mg/kg	1.87 / 2.26	ND	ND	ND	0 / 4	0
Inorganic	Antimony, Dissolved in Porewater	mg/L		0.00038	0.00038	0.00075	3 / 3	0.00054
Inorganic	Arsenic in Bulk Sediment	mg/kg		19.2	19.2	45.1	4 / 4	30
Inorganic	Arsenic, Dissolved in Porewater	mg/L		0.0122	0.0122	0.0589	3 / 3	0.0161
Inorganic	Barium in Bulk Sediment	mg/kg		193	193	257	4 / 4	236
Inorganic	Barium, Dissolved in Porewater	mg/L		0.101	0.101	0.234	3 / 3	0.114
Inorganic	Beryllium in Bulk Sediment	mg/kg		1.76	1.76	2.26	4 / 4	2.1
Inorganic	Beryllium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 4	0
Inorganic	Boron in Bulk Sediment	mg/kg		19.1	19.1	27.1	4 / 4	24.03
Inorganic	Cadmium in Bulk Sediment	mg/kg	0.187 / 0.226	ND	ND	ND	0 / 4	0
Inorganic	Cadmium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 4	0
Inorganic	Calcium in Bulk Sediment	mg/kg		3090	3090	3970	4 / 4	3710
Inorganic	Calcium, Dissolved in Porewater	mg/L		48.9	48.9	77	4 / 4	56.53
Inorganic	Chromium in Bulk Sediment	mg/kg		21.9	21.9	34.6	4 / 4	29.98
Inorganic	Cobalt in Bulk Sediment	mg/kg		13.3	13.3	19.4	4 / 4	16.88
Inorganic	Copper in Bulk Sediment	mg/kg		29.2	29.2	38	4 / 4	34.2
Inorganic	Copper, Dissolved in Porewater	mg/L		0.00199	0.00199	0.0079	3 / 3	0.002897
Inorganic	Iron in Bulk Sediment	mg/kg		20200	20200	31000	4 / 4	26200
Inorganic	Iron, Dissolved in Porewater	mg/L		0.103	0.103	1.46	3 / 3	0.1793
Inorganic	Lead in Bulk Sediment	mg/kg		14.9	14.9	22.5	4 / 4	19.23
Inorganic	Lead, Dissolved in Porewater	mg/L		0.0006	0.0006	0.0105	4 / 4	0.005423
Inorganic	Magnesium in Bulk Sediment	mg/kg		1540	1540	2510	4 / 4	2118
Inorganic	Magnesium, Dissolved in Porewater	mg/L		13.3	13.3	20.7	4 / 4	15.4
Inorganic	Manganese in Bulk Sediment	mg/kg		451	451	1200	4 / 4	911.5
Inorganic	Manganese, Dissolved in Porewater	mg/L		2.26	2.26	9.92	4 / 4	5.238
Inorganic	Mercury in Bulk Sediment	mg/kg		0.18	0.18	0.39	4 / 4	0.315
Inorganic	Mercury, Dissolved in Porewater	mg/L	0.00015 / 0.00015	ND	ND	ND	0 / 4	0
Inorganic	Molybdenum in Bulk Sediment	mg/kg	7.47 / 9.02	ND	ND	ND	0 / 4	0
Inorganic	Molybdenum, Dissolved in Porewater	mg/L		0.00188	0.00188	0.0152	4 / 4	0.005665
Inorganic	Nickel in Bulk Sediment	mg/kg		21	21	31.4	4 / 4	27.73
Inorganic	Nickel, Dissolved in Porewater	mg/L		0.00137	0.00137	0.0029	3 / 3	0.001433
Inorganic	Potassium in Bulk Sediment	mg/kg		1660	1660	3380	4 / 4	2683
Inorganic	Potassium, Dissolved in Porewater	mg/L		2.44	2.44	3.87	3 / 3	2.573
Inorganic	Selenium in Bulk Sediment	mg/kg		2.8	2.8	3.39	4 / 4	3.083

Notes:

For definitions, see the Acronyms section.

Table A- 6: Bulk Sediment and Porewater in the Clinch River Reach B Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Selenium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	0.00044	0.00049	2 / 4	0.00047
Inorganic	Silver in Bulk Sediment	mg/kg	0.934 / 1.13	ND	ND	ND	0 / 4	0
Inorganic	Silver, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 4	0
Inorganic	Sodium in Bulk Sediment	mg/kg	187 / 204	ND	229	278	2 / 4	262
Inorganic	Sodium, Dissolved in Porewater	mg/L		8.38	8.38	9.58	3 / 3	8.823
Inorganic	Strontium in Bulk Sediment	mg/kg		112	112	137	4 / 4	127
Inorganic	Strontium, Dissolved in Porewater	mg/L		0.194	0.194	0.346	4 / 4	0.2345
Inorganic	Thallium in Bulk Sediment	mg/kg	1.87 / 2.26	ND	ND	ND	0 / 4	0
Inorganic	Thallium, Dissolved in Porewater	mg/L	0.0005 / 0.0005	ND	ND	ND	0 / 4	0
Inorganic	Vanadium in Bulk Sediment	mg/kg		42.1	42.1	59.8	4 / 4	54.28
Inorganic	Vanadium, Dissolved in Porewater	mg/L	0.001 / 0.001	ND	0.00104	0.00233	2 / 3	0.001915
Inorganic	Zinc in Bulk Sediment	mg/kg		62.2	62.2	87.5	4 / 4	78.98
Inorganic	Zinc, Dissolved in Porewater	mg/L		0.0109	0.0109	0.0157	3 / 3	0.0124
Inorganic-Cation/Anion	Chloride in Porewater	mg/L		11.3	11.3	489	4 / 4	141.6
Inorganic-Cation/Anion	Sulfate in Porewater	mg/L		3.53	3.53	92.1	4 / 4	48.6
Organic-PAHs	Acenaphthene in Bulk Sediment	mg/kg	0.001 / 0.0012	ND	0.0011	0.0011	2 / 4	0.0011
Organic-PAHs	Acenaphthylene in Bulk Sediment	mg/kg		0.001	0.001	0.0013	4 / 4	0.0012
Organic-PAHs	Anthracene in Bulk Sediment	mg/kg		0.0022	0.0022	0.0034	4 / 4	0.0027
Organic-PAHs	Benzo(a)pyrene in Bulk Sediment	mg/kg		0.015	0.015	0.019	4 / 4	0.01725
Organic-PAHs	Benzo(b)fluoranthene in Bulk Sediment	mg/kg		0.023	0.023	0.029	4 / 4	0.02725
Organic-PAHs	Benzo(k)fluoranthene in Bulk Sediment	mg/kg		0.018	0.018	0.021	4 / 4	0.01925
Organic-PAHs	C1-Chrysenes in Bulk Sediment	mg/kg		0.0075	0.0075	0.0081	4 / 4	0.007925
Organic-PAHs	C1-Fluoranthenes/Pyrenes in Bulk Sediment	mg/kg		0.02	0.02	0.025	4 / 4	0.023
Organic-PAHs	C1-Fluorenes in Bulk Sediment	mg/kg		0.0022	0.0022	0.0031	4 / 4	0.0027
Organic-PAHs	C1-Naphthalenes in Bulk Sediment	mg/kg		0.016	0.016	0.026	4 / 4	0.02025
Organic-PAHs	C1-Phenanthrenes/Anthracenes in Bulk Sediment	mg/kg		0.017	0.017	0.023	4 / 4	0.02
Organic-PAHs	C2-Chrysenes in Bulk Sediment	mg/kg		0.0075	0.0075	0.0093	4 / 4	0.00865
Organic-PAHs	C2-Fluoranthenes/Pyrene in Bulk Sediment	mg/kg		0.023	0.023	0.044	4 / 4	0.03225

Notes:

For definitions, see the Acronyms section.

Table A- 6: Bulk Sediment and Porewater in the Clinch River Reach B Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Organic-PAHs	C2-Fluorenes in Bulk Sediment	mg/kg		0.0049	0.0049	0.0067	4 / 4	0.0058
Organic-PAHs	C2-Naphthalenes in Bulk Sediment	mg/kg		0.036	0.036	0.058	4 / 4	0.0455
Organic-PAHs	C2-Phenanthrenes/Anthracenes in Bulk Sediment	mg/kg		0.012	0.012	0.017	4 / 4	0.01425
Organic-PAHs	C3-Chrysenes in Bulk Sediment	mg/kg	0.001 / 0.0012	ND	0.0036	0.0042	2 / 4	0.0039
Organic-PAHs	C3-Fluoranthenes/Pyrene in Bulk Sediment	mg/kg		0.0085	0.0085	0.015	4 / 4	0.01125
Organic-PAHs	C3-Fluorenes in Bulk Sediment	mg/kg		0.0039	0.0039	0.0052	4 / 4	0.004675
Organic-PAHs	C3-Naphthalenes in Bulk Sediment	mg/kg		0.028	0.028	0.045	4 / 4	0.035
Organic-PAHs	C3-Phenanthrenes/Anthracenes in Bulk Sediment	mg/kg		0.0059	0.0059	0.0075	4 / 4	0.006775
Organic-PAHs	C4-Chrysenes in Bulk Sediment	mg/kg	0.001 / 0.0012	ND	0.0022	0.0025	2 / 4	0.00235
Organic-PAHs	C4-Naphthalenes in Bulk Sediment	mg/kg		0.018	0.018	0.027	4 / 4	0.02125
Organic-PAHs	C4-Phenanthrenes/Anthracenes in Bulk Sediment	mg/kg		0.0074	0.0074	0.021	4 / 4	0.01235
Organic-PAHs	Chrysene in Bulk Sediment	mg/kg		0.019	0.019	0.023	4 / 4	0.0215
Organic-PAHs	Dibenz(a,h)anthracene in Bulk Sediment	mg/kg		0.002	0.002	0.0027	4 / 4	0.0024
Organic-PAHs	Fluoranthene in Bulk Sediment	mg/kg		0.032	0.032	0.04	4 / 4	0.03675
Organic-PAHs	Fluorene in Bulk Sediment	mg/kg		0.0019	0.0019	0.0024	4 / 4	0.00225
Organic-PAHs	Indeno(1,2,3-cd)pyrene in Bulk Sediment	mg/kg		0.0061	0.0061	0.0081	4 / 4	0.007075
Organic-PAHs	Naphthalene in Bulk Sediment	mg/kg		0.0064	0.0064	0.01	4 / 4	0.008
Organic-PAHs	Perylene in Bulk Sediment	mg/kg		0.026	0.026	0.046	4 / 4	0.0355
Organic-PAHs	Phenanthrene in Bulk Sediment	mg/kg		0.016	0.016	0.019	4 / 4	0.01875
Organic-PAHs	Pyrene in Bulk Sediment	mg/kg		0.031	0.031	0.038	4 / 4	0.035
Organic-PCBs	PCB-1016 in Bulk Sediment	mg/kg	0.0026 / 0.0031	ND	ND	ND	0 / 4	0
Organic-PCBs	PCB-1221 in Bulk Sediment	mg/kg	0.0026 / 0.0031	ND	ND	ND	0 / 4	0
Organic-PCBs	PCB-1232 in Bulk Sediment	mg/kg	0.0026 / 0.0031	ND	ND	ND	0 / 4	0
Organic-PCBs	PCB-1242 in Bulk Sediment	mg/kg	0.0026 / 0.0031	ND	ND	ND	0 / 4	0
Organic-PCBs	PCB-1248 in Bulk Sediment	mg/kg	0.0026 / 0.0031	ND	ND	ND	0 / 4	0
Organic-PCBs	PCB-1254 in Bulk Sediment	mg/kg		0.0052	0.0052	0.0067	4 / 4	0.00585
Organic-PCBs	PCB-1260 in Bulk Sediment	mg/kg		0.0059	0.0059	0.012	4 / 4	0.0086
Organic-PCBs	PCB-1262 in Bulk Sediment	mg/kg	0.0026 / 0.0031	ND	ND	ND	0 / 4	0
Organic-PCBs	PCB-1268 in Bulk Sediment	mg/kg	0.0026 / 0.0031	ND	ND	ND	0 / 4	0

Notes:

For definitions, see the Acronyms section.

Table A- 6: Bulk Sediment and Porewater in the Clinch River Reach B Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Organic-Pesticides / Herbicides	4,4'-DDD in Bulk Sediment	mg/kg	0.001 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	4,4'-DDE in Bulk Sediment	mg/kg	0.001 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	4,4'-DDT in Bulk Sediment	mg/kg	0.001 / 0.0012	ND	0.0016	0.0029	2 / 4	0.00225
Organic-Pesticides / Herbicides	Aldrin in Bulk Sediment	mg/kg	0.00052 / 0.00062	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	alpha-BHC in Bulk Sediment	mg/kg	0.00052 / 0.00052	ND	0.00055	0.0014	3 / 4	0.00105
Organic-Pesticides / Herbicides	alpha-Chlordane in Bulk Sediment	mg/kg	0.00052 / 0.00062	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	delta-BHC in Bulk Sediment	mg/kg	0.00052 / 0.00052	ND	0.00078	0.0019	3 / 4	0.001327
Organic-Pesticides / Herbicides	Dieldrin in Bulk Sediment	mg/kg	0.001 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Endosulfan I in Bulk Sediment	mg/kg	0.00052 / 0.00062	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Endosulfan II in Bulk Sediment	mg/kg	0.001 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Endosulfan Sulfate in Bulk Sediment	mg/kg	0.001 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Endrin aldehyde in Bulk Sediment	mg/kg	0.001 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Endrin in Bulk Sediment	mg/kg	0.001 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Endrin Ketone in Bulk Sediment	mg/kg	0.001 / 0.0012	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	gamma-BHC (Lindane) in Bulk Sediment	mg/kg	0.00052 / 0.00062	ND	0.00095	0.0016	2 / 4	0.001275
Organic-Pesticides / Herbicides	gamma-Chlordane in Bulk Sediment	mg/kg	0.00052 / 0.00062	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Heptachlor Epoxide in Bulk Sediment	mg/kg	0.00052 / 0.00062	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Heptachlor in Bulk Sediment	mg/kg	0.00052 / 0.00062	ND	0.0007	0.0016	3 / 4	0.001037
Organic-Pesticides / Herbicides	Methoxychlor in Bulk Sediment	mg/kg	0.0052 / 0.0062	ND	ND	ND	0 / 4	0
Organic-Pesticides / Herbicides	Toxaphene in Bulk Sediment	mg/kg	0.052 / 0.062	ND	ND	ND	0 / 4	0
Physical Properties	% Ash in Bulk Sediment	%		26	26	39	4 / 4	33.25
Physical Properties	Alkalinity in Porewater	mg/L		120	120	289	4 / 4	175.5
Physical Properties	Clay in Bulk Sediment	%		14.5	14.5	30.2	4 / 4	21.1
Physical Properties	Dissolved Organic Carbon in Porewater	mg/L		8.4	8.4	17.5	3 / 3	12.53
Physical Properties	Fraction of Organic Carbon in Bulk Sediment	%		2	2	2.5	4 / 4	2.3
Physical Properties	Gravel in Bulk Sediment	%	0 / 0	ND	0.3	0.3	4 / 4	0.3
Physical Properties	Hardness (As CaCO3) in Porewater	mg/L		178	178	278	4 / 4	204.8
Physical Properties	Sand in Bulk Sediment	%		4.5	4.5	8.8	4 / 4	6.975
Physical Properties	Sand, Coarse in Bulk Sediment	%		0.1	0.1	0.6	4 / 4	0.225
Physical Properties	Sand, Fine in Bulk Sediment	%		4.3	4.3	8.6	4 / 4	6.45
Physical Properties	Sand, Medium in Bulk Sediment	%		0.1	0.1	0.7	4 / 4	0.3
Physical Properties	Silt in Bulk Sediment	%		61.8	61.8	78.9	4 / 4	71.93

Notes:

For definitions, see the Acronyms section.

Table A- 6: Bulk Sediment and Porewater in the Clinch River Reach B Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Physical Properties	Total Organic Carbon in Bulk Sediment	mg/kg		9600	9600	21000	4 / 4	15400
Radionuclides	Actinium-228 in Bulk Sediment	pCi/g		1.92	1.92	2.38	4 / 4	2.08
Radionuclides	Americium-241 in Bulk Sediment	pCi/g	0.211 / 0.533	ND	ND	ND	0 / 4	0
Radionuclides	Bismuth-214 in Bulk Sediment	pCi/g		2.25	2.25	2.91	4 / 4	2.545
Radionuclides	Cesium-137 in Bulk Sediment	pCi/g		0.399	0.399	1.3	4 / 4	0.8518
Radionuclides	Cobalt-60 in Bulk Sediment	pCi/g	0.0722 / 0.0928	ND	ND	ND	0 / 4	0
Radionuclides	Lead-212 in Bulk Sediment	pCi/g		2.26	2.26	2.39	4 / 4	2.31
Radionuclides	Lead-214 in Bulk Sediment	pCi/g		2.78	2.78	3.14	4 / 4	3.023
Radionuclides	Potassium-40 in Bulk Sediment	pCi/g		14.6	14.6	19.6	4 / 4	17.23
Radionuclides	Radium-226 in Bulk Sediment	pCi/g		2.25	2.25	2.91	4 / 4	2.545
Radionuclides	Radium-228 in Bulk Sediment	pCi/g		1.92	1.92	2.38	4 / 4	2.08
Radionuclides	Thallium-208 in Bulk Sediment	pCi/g		0.591	0.591	0.77	4 / 4	0.683
Radionuclides	Thorium-228 in Bulk Sediment	pCi/g		2.05	2.05	2.87	4 / 4	2.38
Radionuclides	Thorium-230 in Bulk Sediment	pCi/g		2.84	2.84	3.68	4 / 4	3.17
Radionuclides	Thorium-232 in Bulk Sediment	pCi/g		1.97	1.97	2.6	4 / 4	2.313
Radionuclides	Thorium-234 in Bulk Sediment	pCi/g	1.93 / 4.16	ND	3.11	4.46	3 / 4	3.99
Radionuclides	Uranium-234 in Bulk Sediment	pCi/g		2.21	2.21	2.7	4 / 4	2.44
Radionuclides	Uranium-235 in Bulk Sediment	pCi/g		0.11	0.11	0.233	4 / 4	0.1595
Radionuclides	Uranium-238 in Bulk Sediment	pCi/g		2.25	2.25	2.7	4 / 4	2.478
Speciation	Arsenate in Bulk Sediment	mg/kg	3.7 / 3.78	ND	6.8	9.04	2 / 4	8.67
Speciation	Arsenate, Dissolved in Porewater	mg/L		0.00162	0.00162	0.0119	4 / 4	0.00527
Speciation	Arsenic (from speciation lab) in Bulk Sediment	mg/kg		19.9	19.9	30.6	4 / 4	24
Speciation	Arsenic, Dissolved (from speciation lab) in Porewater	mg/L		0.0158	0.0158	0.0751	3 / 3	0.02033
Speciation	Arsenite in Bulk Sediment	mg/kg		15.3	15.3	26.2	4 / 4	19.08
Speciation	Arsenite, Dissolved in Porewater	mg/L		0.0118	0.0118	0.0579	3 / 3	0.01413
Speciation	Inorganic Arsenic in Bulk Sediment	mg/kg		19	19	35.2	4 / 4	24.38
Speciation	Inorganic Arsenic, Dissolved in Porewater	mg/L	0.0009 / 0.0134	ND	0.0177	0.0693	2 / 3	0.01905
Speciation	Inorganic Mercury in Bulk Sediment	mg/kg		0.247	0.247	0.692	4 / 4	0.501
Speciation	Inorganic Selenium in Bulk Sediment	mg/kg	0.494 / 0.788	ND	0.661	0.83	2 / 4	0.7455

Notes:

For definitions, see the Acronyms section.

Table A- 6: Bulk Sediment and Porewater in the Clinch River Reach B Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Speciation	Inorganic Selenium, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	ND	ND	0 / 4	0
speciation	Mercury (from speciation lab) in Bulk Sediment	mg/kg		0.248	0.248	0.694	4 / 4	0.5033
Speciation	Methyl mercury in Bulk Sediment	mg/kg		0.0014	0.0014	0.00379	4 / 4	0.002378
Speciation	Organic Arsenic in Bulk Sediment	mg/kg	3.7 / 6.97	ND	4.99	4.99	1 / 4	4.99
Speciation	Organic Arsenic, Dissolved in Porewater	mg/L		0.00155	0.00155	0.00581	3 / 3	0.00314
Speciation	Organic Selenium in Bulk Sediment	mg/kg		1.66	1.66	2.66	4 / 4	2.358
Speciation	Organic Selenium, Dissolved in Porewater	mg/L	0.00039 / 0.00039	ND	0.00057	0.00057	2 / 4	0.0005715
Speciation	Selenate in Bulk Sediment	mg/kg	0.391 / 0.624	ND	ND	ND	0 / 4	0
Speciation	Selenate, Dissolved in Porewater	mg/L	0.00016 / 0.00016	ND	ND	ND	0 / 4	0
Speciation	Selenite in Bulk Sediment	mg/kg	0.494 / 0.788	ND	0.661	0.83	2 / 4	0.7455
Speciation	Selenite, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	ND	ND	0 / 4	0
Speciation	Selenium (from speciation lab) in Bulk Sediment	mg/kg		1.86	1.86	3.19	4 / 4	2.73
Speciation	Selenium, Dissolved (from speciation lab) in Porewater	mg/L	0.00039 / 0.00039	ND	0.00057	0.00057	2 / 4	0.0005715

Notes:
For definitions, see the Acronyms section.

Table A- 7: Bulk Sediment and Porewater in the Clinch River Reference Reach Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum in Bulk Sediment	mg/kg		8050	8050	8050	1 / 1	8050
Inorganic	Aluminum, Dissolved in Porewater	mg/L	0.05 / 0.05	ND	ND	ND	0 / 1	0
Inorganic	Antimony in Bulk Sediment	mg/kg	1.33 / 1.33	ND	ND	ND	0 / 1	0
Inorganic	Antimony, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 1	0
Inorganic	Arsenic in Bulk Sediment	mg/kg		4.59	4.59	4.59	1 / 1	4.59
Inorganic	Arsenic, Dissolved in Porewater	mg/L		0.00687	0.00687	0.00687	1 / 1	0.00687
Inorganic	Barium in Bulk Sediment	mg/kg		53.7	53.7	53.7	1 / 1	53.7
Inorganic	Barium, Dissolved in Porewater	mg/L		0.0925	0.0925	0.0925	1 / 1	0.0925
Inorganic	Beryllium in Bulk Sediment	mg/kg	0.531 / 0.531	ND	ND	ND	0 / 1	0
Inorganic	Beryllium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 1	0
Inorganic	Boron in Bulk Sediment	mg/kg		9.06	9.06	9.06	1 / 1	9.06
Inorganic	Boron, Dissolved in Porewater	mg/L		0.0208	0.0208	0.0208	1 / 1	0.0208
Inorganic	Cadmium in Bulk Sediment	mg/kg	0.133 / 0.133	ND	ND	ND	0 / 1	0
Inorganic	Cadmium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 1	0
Inorganic	Calcium in Bulk Sediment	mg/kg		1710	1710	1710	1 / 1	1710
Inorganic	Calcium, Dissolved in Porewater	mg/L		50.4	50.4	50.4	1 / 1	50.4
Inorganic	Chromium in Bulk Sediment	mg/kg		13.2	13.2	13.2	1 / 1	13.2
Inorganic	Chromium, Dissolved in Porewater	mg/L		0.00081	0.00081	0.00081	1 / 1	0.00081
Inorganic	Cobalt in Bulk Sediment	mg/kg		7.3	7.3	7.3	1 / 1	7.3
Inorganic	Cobalt, Dissolved in Porewater	mg/L		0.00214	0.00214	0.00214	1 / 1	0.00214
Inorganic	Copper in Bulk Sediment	mg/kg		6.32	6.32	6.32	1 / 1	6.32
Inorganic	Copper, Dissolved in Porewater	mg/L		0.00077	0.00077	0.00077	1 / 1	0.00077
Inorganic	Iron in Bulk Sediment	mg/kg		12600	12600	12600	1 / 1	12600
Inorganic	Iron, Dissolved in Porewater	mg/L		2.6	2.6	2.6	1 / 1	2.6
Inorganic	Lead in Bulk Sediment	mg/kg		9.35	9.35	9.35	1 / 1	9.35
Inorganic	Lead, Dissolved in Porewater	mg/L		0.00056	0.00056	0.00056	1 / 1	0.00056
Inorganic	Magnesium in Bulk Sediment	mg/kg		1330	1330	1330	1 / 1	1330
Inorganic	Magnesium, Dissolved in Porewater	mg/L		16.8	16.8	16.8	1 / 1	16.8
Inorganic	Manganese in Bulk Sediment	mg/kg		877	877	877	1 / 1	877
Inorganic	Manganese, Dissolved in Porewater	mg/L		5.29	5.29	5.29	1 / 1	5.29
Inorganic	Mercury in Bulk Sediment	mg/kg		0.41	0.41	0.41	1 / 1	0.41
Inorganic	Mercury, Dissolved in Porewater	mg/L	0.00015 / 0.00015	ND	ND	ND	0 / 1	0
Inorganic	Molybdenum in Bulk Sediment	mg/kg	5.31 / 5.31	ND	ND	ND	0 / 1	0
Inorganic	Molybdenum, Dissolved in Porewater	mg/L		0.00084	0.00084	0.00084	1 / 1	0.00084
Inorganic	Nickel in Bulk Sediment	mg/kg		8.07	8.07	8.07	1 / 1	8.07
Inorganic	Nickel, Dissolved in Porewater	mg/L		0.00172	0.00172	0.00172	1 / 1	0.00172

Notes:
For definitions, see the Acronyms section.

Table A- 7: Bulk Sediment and Porewater in the Clinch River Reference Reach Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Potassium in Bulk Sediment	mg/kg		1460	1460	1460	1 / 1	1460
Inorganic	Potassium, Dissolved in Porewater	mg/L		2.72	2.72	2.72	1 / 1	2.72
Inorganic	Selenium in Bulk Sediment	mg/kg	1.33 / 1.33	ND	ND	ND	0 / 1	0
Inorganic	Selenium, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 1	0
Inorganic	Silver in Bulk Sediment	mg/kg	0.664 / 0.664	ND	ND	ND	0 / 1	0
Inorganic	Silver, Dissolved in Porewater	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 1	0
Inorganic	Sodium in Bulk Sediment	mg/kg	133 / 133	ND	ND	ND	0 / 1	0
Inorganic	Sodium, Dissolved in Porewater	mg/L		6.12	6.12	6.12	1 / 1	6.12
Inorganic	Strontium in Bulk Sediment	mg/kg		12.4	12.4	12.4	1 / 1	12.4
Inorganic	Strontium, Dissolved in Porewater	mg/L		0.127	0.127	0.127	1 / 1	0.127
Inorganic	Thallium in Bulk Sediment	mg/kg	1.33 / 1.33	ND	ND	ND	0 / 1	0
Inorganic	Thallium, Dissolved in Porewater	mg/L	0.0005 / 0.0005	ND	ND	ND	0 / 1	0
Inorganic	Vanadium in Bulk Sediment	mg/kg		13.2	13.2	13.2	1 / 1	13.2
Inorganic	Vanadium, Dissolved in Porewater	mg/L	0.001 / 0.001	ND	ND	ND	0 / 1	0
Inorganic	Zinc in Bulk Sediment	mg/kg		41.5	41.5	41.5	1 / 1	41.5
Inorganic	Zinc, Dissolved in Porewater	mg/L		0.0453	0.0453	0.0453	1 / 1	0.0453
Inorganic-Cation/Anion	Chloride in Porewater	mg/L		7.11	7.11	7.11	1 / 1	7.11
Inorganic-Cation/Anion	Sulfate in Porewater	mg/L		5.05	5.05	5.05	1 / 1	5.05
Organic-PAHs	Acenaphthene in Bulk Sediment	mg/kg		0.0031	0.0031	0.0031	1 / 1	0.0031
Organic-PAHs	Acenaphthylene in Bulk Sediment	mg/kg		0.0009	0.0009	0.0009	1 / 1	0.0009
Organic-PAHs	Anthracene in Bulk Sediment	mg/kg		0.0067	0.0067	0.0067	1 / 1	0.0067
Organic-PAHs	Benzo(a)anthracene in Bulk Sediment	mg/kg		0.025	0.025	0.025	1 / 1	0.025
Organic-PAHs	Benzo(a)pyrene in Bulk Sediment	mg/kg		0.028	0.028	0.028	1 / 1	0.028
Organic-PAHs	Benzo(b)fluoranthene in Bulk Sediment	mg/kg		0.031	0.031	0.031	1 / 1	0.031
Organic-PAHs	Benzo(e)pyrene in Bulk Sediment	mg/kg		0.021	0.021	0.021	1 / 1	0.021
Organic-PAHs	Benzo(g,h,i)perylene in Bulk Sediment	mg/kg		0.011	0.011	0.011	1 / 1	0.011
Organic-PAHs	Benzo(k)fluoranthene in Bulk Sediment	mg/kg		0.024	0.024	0.024	1 / 1	0.024
Organic-PAHs	C1-Chrysenes in Bulk Sediment	mg/kg		0.018	0.018	0.018	1 / 1	0.018
Organic-PAHs	C1-Fluoranthenes/Pyrenes in Bulk Sediment	mg/kg		0.033	0.033	0.033	1 / 1	0.033
Organic-PAHs	C1-Fluorenes in Bulk Sediment	mg/kg		0.0043	0.0043	0.0043	1 / 1	0.0043

Notes:

For definitions, see the Acronyms section.

Table A- 7: Bulk Sediment and Porewater in the Clinch River Reference Reach Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Organic-PAHs	C1-Naphthalenes in Bulk Sediment	mg/kg		0.048	0.048	0.048	1 / 1	0.048
Organic-PAHs	C1-Phenanthrenes/Anthracenes in Bulk Sediment	mg/kg		0.04	0.04	0.04	1 / 1	0.04
Organic-PAHs	C2-Chrysenes in Bulk Sediment	mg/kg		0.013	0.013	0.013	1 / 1	0.013
Organic-PAHs	C2-Fluoranthenes/Pyrene in Bulk Sediment	mg/kg		0.028	0.028	0.028	1 / 1	0.028
Organic-PAHs	C2-Fluorenes in Bulk Sediment	mg/kg		0.0095	0.0095	0.0095	1 / 1	0.0095
Organic-PAHs	C2-Naphthalenes in Bulk Sediment	mg/kg		0.11	0.11	0.11	1 / 1	0.11
Organic-PAHs	C2-Phenanthrenes/Anthracenes in Bulk Sediment	mg/kg		0.027	0.027	0.027	1 / 1	0.027
Organic-PAHs	C3-Chrysenes in Bulk Sediment	mg/kg		0.0071	0.0071	0.0071	1 / 1	0.0071
Organic-PAHs	C3-Fluoranthenes/Pyrene in Bulk Sediment	mg/kg		0.015	0.015	0.015	1 / 1	0.015
Organic-PAHs	C3-Fluorenes in Bulk Sediment	mg/kg		0.0066	0.0066	0.0066	1 / 1	0.0066
Organic-PAHs	C3-Naphthalenes in Bulk Sediment	mg/kg		0.075	0.075	0.075	1 / 1	0.075
Organic-PAHs	C3-Phenanthrenes/Anthracenes in Bulk Sediment	mg/kg		0.014	0.014	0.014	1 / 1	0.014
Organic-PAHs	C4-Chrysenes in Bulk Sediment	mg/kg		0.0036	0.0036	0.0036	1 / 1	0.0036
Organic-PAHs	C4-Naphthalenes in Bulk Sediment	mg/kg		0.045	0.045	0.045	1 / 1	0.045
Organic-PAHs	C4-Phenanthrenes/Anthracenes in Bulk Sediment	mg/kg		0.0076	0.0076	0.0076	1 / 1	0.0076
Organic-PAHs	Chrysene in Bulk Sediment	mg/kg		0.024	0.024	0.024	1 / 1	0.024
Organic-PAHs	Dibenz(a,h)anthracene in Bulk Sediment	mg/kg		0.0045	0.0045	0.0045	1 / 1	0.0045
Organic-PAHs	Fluoranthene in Bulk Sediment	mg/kg		0.042	0.042	0.042	1 / 1	0.042
Organic-PAHs	Fluorene in Bulk Sediment	mg/kg		0.0044	0.0044	0.0044	1 / 1	0.0044
Organic-PAHs	Indeno(1,2,3-cd)pyrene in Bulk Sediment	mg/kg		0.011	0.011	0.011	1 / 1	0.011
Organic-PAHs	Naphthalene in Bulk Sediment	mg/kg		0.018	0.018	0.018	1 / 1	0.018
Organic-PAHs	Perylene in Bulk Sediment	mg/kg		0.053	0.053	0.053	1 / 1	0.053
Organic-PAHs	Phenanthrene in Bulk Sediment	mg/kg		0.037	0.037	0.037	1 / 1	0.037
Organic-PAHs	Pyrene in Bulk Sediment	mg/kg		0.039	0.039	0.039	1 / 1	0.039
Organic-PCBs	PCB-1016 in Bulk Sediment	mg/kg	0.019 / 0.019	ND	ND	ND	0 / 1	0
Organic-PCBs	PCB-1221 in Bulk Sediment	mg/kg	0.019 / 0.019	ND	ND	ND	0 / 1	0
Organic-PCBs	PCB-1232 in Bulk Sediment	mg/kg	0.019 / 0.019	ND	ND	ND	0 / 1	0

Notes:

For definitions, see the Acronyms section.

Table A- 7: Bulk Sediment and Porewater in the Clinch River Reference Reach Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Organic-PCBs	PCB-1242 in Bulk Sediment	mg/kg	0.019 / 0.019	ND	ND	ND	0 / 1	0
Organic-PCBs	PCB-1248 in Bulk Sediment	mg/kg	0.019 / 0.019	ND	ND	ND	0 / 1	0
Organic-PCBs	PCB-1254 in Bulk Sediment	mg/kg		0.28	0.28	0.28	1 / 1	0.28
Organic-PCBs	PCB-1260 in Bulk Sediment	mg/kg	0.019 / 0.019	ND	ND	ND	0 / 1	0
Organic-PCBs	PCB-1262 in Bulk Sediment	mg/kg	0.019 / 0.019	ND	ND	ND	0 / 1	0
Organic-PCBs	PCB-1268 in Bulk Sediment	mg/kg	0.019 / 0.019	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	4,4'-DDD in Bulk Sediment	mg/kg	0.00072 / 0.00072	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	4,4'-DDE in Bulk Sediment	mg/kg	0.00072 / 0.00072	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	4,4'-DDT in Bulk Sediment	mg/kg	0.00072 / 0.00072	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	Aldrin in Bulk Sediment	mg/kg	0.00037 / 0.00037	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	alpha-BHC in Bulk Sediment	mg/kg	0.00037 / 0.00037	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	alpha-Chlordane in Bulk Sediment	mg/kg	0.00037 / 0.00037	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	beta-BHC in Bulk Sediment	mg/kg	0.00037 / 0.00037	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	delta-BHC in Bulk Sediment	mg/kg	0.00037 / 0.00037	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	Dieldrin in Bulk Sediment	mg/kg	0.00072 / 0.00072	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	Endosulfan I in Bulk Sediment	mg/kg	0.00037 / 0.00037	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	Endosulfan II in Bulk Sediment	mg/kg	0.00072 / 0.00072	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	Endosulfan Sulfate in Bulk Sediment	mg/kg	0.00072 / 0.00072	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	Endrin aldehyde in Bulk Sediment	mg/kg	0.00072 / 0.00072	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	Endrin in Bulk Sediment	mg/kg	0.00072 / 0.00072	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	Endrin Ketone in Bulk Sediment	mg/kg	0.00072 / 0.00072	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	gamma-BHC (Lindane) in Bulk Sediment	mg/kg	0.00037 / 0.00037	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	gamma-Chlordane in Bulk Sediment	mg/kg	0.00037 / 0.00037	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	Heptachlor Epoxide in Bulk Sediment	mg/kg	0.00037 / 0.00037	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	Heptachlor in Bulk Sediment	mg/kg	0.00037 / 0.00037	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	Methoxychlor in Bulk Sediment	mg/kg	0.0037 / 0.0037	ND	ND	ND	0 / 1	0
Organic-Pesticides / Herbicides	Toxaphene in Bulk Sediment	mg/kg	0.037 / 0.037	ND	ND	ND	0 / 1	0
Physical Properties	% Ash in Bulk Sediment	%	1 / 1	ND	ND	ND	0 / 1	0
Physical Properties	Alkalinity in Porewater	mg/L		186	186	186	1 / 1	186
Physical Properties	Clay in Bulk Sediment	%		5.3	5.3	5.3	1 / 1	5.3
Physical Properties	Dissolved Organic Carbon in Porewater	mg/L		10.8	10.8	10.8	1 / 1	10.8
Physical Properties	Fraction of Organic Carbon in Bulk Sediment	%		1.8	1.8	1.8	1 / 1	1.8

Notes:

For definitions, see the Acronyms section.

Table A- 7: Bulk Sediment and Porewater in the Clinch River Reference Reach Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Physical Properties	Gravel in Bulk Sediment	%		0.5	0.5	0.5	1 / 1	0.5
Physical Properties	Hardness (As CaCO3) in Porewater	mg/L		195	195	195	1 / 1	195
Physical Properties	Sand in Bulk Sediment	%		82.7	82.7	82.7	1 / 1	82.7
Physical Properties	Sand, Coarse in Bulk Sediment	%		1.7	1.7	1.7	1 / 1	1.7
Physical Properties	Sand, Fine in Bulk Sediment	%		78.1	78.1	78.1	1 / 1	78.1
Physical Properties	Sand, Medium in Bulk Sediment	%		2.9	2.9	2.9	1 / 1	2.9
Physical Properties	Silt in Bulk Sediment	%		11.5	11.5	11.5	1 / 1	11.5
Physical Properties	Total Organic Carbon in Bulk Sediment	mg/kg		5300	5300	5300	1 / 1	5300
Radionuclides	Actinium-228 in Bulk Sediment	pCi/g		0.686	0.686	0.686	1 / 1	0.686
Radionuclides	Americium-241 in Bulk Sediment	pCi/g	0.0704 / 0.0704	ND	ND	ND	0 / 1	0
Radionuclides	Bismuth-214 in Bulk Sediment	pCi/g		0.574	0.574	0.574	1 / 1	0.574
Radionuclides	Cesium-137 in Bulk Sediment	pCi/g		2.05	2.05	2.05	1 / 1	2.05
Radionuclides	Cobalt-60 in Bulk Sediment	pCi/g	0.0571 / 0.0571	ND	ND	ND	0 / 1	0
Radionuclides	Lead-212 in Bulk Sediment	pCi/g		0.615	0.615	0.615	1 / 1	0.615
Radionuclides	Lead-214 in Bulk Sediment	pCi/g		0.461	0.461	0.461	1 / 1	0.461
Radionuclides	Potassium-40 in Bulk Sediment	pCi/g		6.66	6.66	6.66	1 / 1	6.66
Radionuclides	Radium-226 in Bulk Sediment	pCi/g		0.574	0.574	0.574	1 / 1	0.574
Radionuclides	Radium-228 in Bulk Sediment	pCi/g		0.686	0.686	0.686	1 / 1	0.686
Radionuclides	Thallium-208 in Bulk Sediment	pCi/g		0.184	0.184	0.184	1 / 1	0.184
Radionuclides	Thorium-228 in Bulk Sediment	pCi/g		0.386	0.386	0.386	1 / 1	0.386
Radionuclides	Thorium-230 in Bulk Sediment	pCi/g		0.596	0.596	0.596	1 / 1	0.596
Radionuclides	Thorium-232 in Bulk Sediment	pCi/g		0.539	0.539	0.539	1 / 1	0.539
Radionuclides	Thorium-234 in Bulk Sediment	pCi/g		1.03	1.03	1.03	1 / 1	1.03
Radionuclides	Uranium-234 in Bulk Sediment	pCi/g		0.288	0.288	0.288	1 / 1	0.288
Radionuclides	Uranium-235 in Bulk Sediment	pCi/g	0.0656 / 0.0656	ND	ND	ND	0 / 1	0
Radionuclides	Uranium-238 in Bulk Sediment	pCi/g		0.522	0.522	0.522	1 / 1	0.522
Speciation	Arsenate in Bulk Sediment	mg/kg		2.11	2.11	2.11	1 / 1	2.11
Speciation	Arsenate, Dissolved in Porewater	mg/L		0.00119	0.00119	0.00119	1 / 1	0.00119
Speciation	Arsenic (from speciation lab) in Bulk Sediment	mg/kg		4.36	4.36	4.36	1 / 1	4.36
Speciation	Arsenic, Dissolved (from speciation lab) in Porewater	mg/L		0.00862	0.00862	0.00862	1 / 1	0.00862
Speciation	Arsenite in Bulk Sediment	mg/kg		1.28	1.28	1.28	1 / 1	1.28
Speciation	Arsenite, Dissolved in Porewater	mg/L		0.00584	0.00584	0.00584	1 / 1	0.00584

Notes:

For definitions, see the Acronyms section.

Table A- 7: Bulk Sediment and Porewater in the Clinch River Reference Reach Locations (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Speciation	Inorganic Arsenic in Bulk Sediment	mg/kg		3.39	3.39	3.39	1 / 1	3.39
Speciation	Inorganic Arsenic, Dissolved in Porewater	mg/L		0.00703	0.00703	0.00703	1 / 1	0.00703
Speciation	Inorganic Mercury in Bulk Sediment	mg/kg		0.555	0.555	0.555	1 / 1	0.555
Speciation	Inorganic Selenium in Bulk Sediment	mg/kg	0.457 / 0.457	ND	ND	ND	0 / 1	0
Speciation	Inorganic Selenium, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	ND	ND	0 / 1	0
speciation	Mercury (from speciation lab) in Bulk Sediment	mg/kg		0.556	0.556	0.556	1 / 1	0.556
Speciation	Methyl mercury in Bulk Sediment	mg/kg		0.00121	0.00121	0.00121	1 / 1	0.00121
Speciation	Organic Arsenic in Bulk Sediment	mg/kg		0.965	0.965	0.965	1 / 1	0.965
Speciation	Organic Arsenic, Dissolved in Porewater	mg/L		0.00159	0.00159	0.00159	1 / 1	0.00159
Speciation	Organic Selenium in Bulk Sediment	mg/kg	0.72 / 0.72	ND	ND	ND	0 / 1	0
Speciation	Organic Selenium, Dissolved in Porewater	mg/L		0.00043	0.00043	0.00043	1 / 1	0.000429
Speciation	Selenate in Bulk Sediment	mg/kg	0.362 / 0.362	ND	ND	ND	0 / 1	0
Speciation	Selenate, Dissolved in Porewater	mg/L	0.00016 / 0.00016	ND	ND	ND	0 / 1	0
Speciation	Selenite in Bulk Sediment	mg/kg	0.457 / 0.457	ND	ND	ND	0 / 1	0
Speciation	Selenite, Dissolved in Porewater	mg/L	0.00029 / 0.00029	ND	ND	ND	0 / 1	0
Speciation	Selenium (from speciation lab) in Bulk Sediment	mg/kg	0.72 / 0.72	ND	ND	ND	0 / 1	0
Speciation	Selenium, Dissolved (from speciation lab) in Porewater	mg/L		0.00043	0.00043	0.00043	1 / 1	0.000429

Notes:

For definitions, see the Acronyms section.

Appendix B
Overlay Surface Water Sample Summaries

Table B-1: Overlay Surface Water in the Emory River

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic-Total	Aluminum, Total	mg/L	0.05 / 0.0849	ND	0.058	0.26	14 / 16	0.1084
Inorganic-Total	Antimony, Total	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 16	0
Inorganic-Total	Arsenic, Total	mg/L	0.00033 / 0.00033	ND	0.00033	0.00082	12 / 16	0.0005483
Inorganic-Total	Barium, Total	mg/L		0.0297	0.0297	0.0758	16 / 16	0.04324
Inorganic-Total	Beryllium, Total	mg/L	0.00033 / 0.00033	ND	0.00039	0.00039	1 / 16	0.00039
Inorganic-Total	Boron, Total	mg/L	0.0125 / 0.0125	ND	0.013	0.0174	11 / 16	0.01565
Inorganic-Total	Cadmium, Total	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 16	0
Inorganic-Total	Calcium, Total	mg/L		7.86	7.86	32.8	16 / 16	15.18
Inorganic-Total	Chromium, Total	mg/L	0.00033 / 0.00033	ND	0.00034	0.0005	4 / 16	0.00039
Inorganic-Total	Cobalt, Total	mg/L	0.00033 / 0.00033	ND	0.00034	0.00082	8 / 16	0.000515
Inorganic-Total	Copper, Total	mg/L	0.00033 / 0.00033	ND	0.00037	0.00094	16 / 16	0.0005706
Inorganic-Total	Iron, Total	mg/L		0.091	0.091	0.442	16 / 16	0.2486
Inorganic-Total	Lead, Total	mg/L	0.00033 / 0.00033	ND	0.00041	0.00046	3 / 16	0.0004433
Inorganic-Total	Magnesium, Total	mg/L		1.6	1.6	9.09	16 / 16	4.148
Inorganic-Total	Manganese, Total	mg/L		0.0313	0.0313	1.88	16 / 16	0.401
Inorganic-Total	Mercury, Total	mg/L	0.00015 / 0.00015	ND	ND	ND	0 / 16	0
Inorganic-Total	Molybdenum, Total	mg/L	0.00033 / 0.00033	ND	0.00033	0.00067	7 / 16	0.0004643
Inorganic-Total	Nickel, Total	mg/L		0.00055	0.00055	0.00118	16 / 16	0.0008931
Inorganic-Total	Potassium, Total	mg/L		0.931	0.931	1.63	16 / 16	1.316
Inorganic-Total	Selenium, Total	mg/L	0.00033 / 0.00033	ND	0.00039	0.00059	2 / 16	0.00049
Inorganic-Total	Silver, Total	mg/L	0.00033 / 0.00033	ND	0.00036	0.00036	1 / 16	0.00036
Inorganic-Total	Sodium, Total	mg/L		2.06	2.06	5.48	16 / 16	3.139
Inorganic-Total	Strontium, Total	mg/L		0.0332	0.0332	0.0956	16 / 16	0.04849
Inorganic-Total	Thallium, Total	mg/L	0.0005 / 0.0005	ND	ND	ND	0 / 16	0
Inorganic-Total	Vanadium, Total	mg/L	0.001 / 0.001	ND	ND	ND	0 / 16	0
Inorganic-Total	Zinc, Total	mg/L	0.0083 / 0.0083	ND	ND	ND	0 / 16	0
Physical Properties	Dissolved Organic Carbon	mg/L		1.18	1.18	13.6	16 / 16	3.033
Physical Properties	Total Suspended Solids	mg/L		2.6	2.6	11.7	16 / 16	6.395

Notes:

For definitions, see the Acronyms section.

Table B-2: Overlay Surface Water in the Clinch River

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic-Total	Aluminum, Total	mg/L	0.05 / 0.05	ND	0.0527	0.335	12 / 14	0.1174
Inorganic-Total	Antimony, Total	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 14	0
Inorganic-Total	Arsenic, Total	mg/L		0.00033	0.00033	0.00049	14 / 14	0.00038
Inorganic-Total	Barium, Total	mg/L		0.0314	0.0314	0.0358	14 / 14	0.03381
Inorganic-Total	Beryllium, Total	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 14	0
Inorganic-Total	Boron, Total	mg/L	0.0125 / 0.0125	ND	0.0129	0.0415	10 / 14	0.01965
Inorganic-Total	Cadmium, Total	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 14	0
Inorganic-Total	Calcium, Total	mg/L		33.2	33.2	40	14 / 14	37.32
Inorganic-Total	Chromium, Total	mg/L	0.00033 / 0.00033	ND	0.00033	0.00033	1 / 14	0.00033
Inorganic-Total	Cobalt, Total	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 14	0
Inorganic-Total	Copper, Total	mg/L		0.00038	0.00038	0.00076	14 / 14	0.0005929
Inorganic-Total	Iron, Total	mg/L		0.0412	0.0412	0.21	14 / 14	0.1123
Inorganic-Total	Lead, Total	mg/L	0.00033 / 0.00033	ND	0.00038	0.00038	1 / 14	0.00038
Inorganic-Total	Magnesium, Total	mg/L		9.9	9.9	12.2	14 / 14	11.29
Inorganic-Total	Manganese, Total	mg/L		0.0122	0.0122	0.0352	14 / 14	0.02419
Inorganic-Total	Mercury, Total	mg/L	0.00015 / 0.00015	ND	ND	ND	0 / 14	0
Inorganic-Total	Molybdenum, Total	mg/L	0.00033 / 0.00033	ND	0.00033	0.00136	12 / 14	0.0005042
Inorganic-Total	Nickel, Total	mg/L	0.00033 / 0.00033	ND	0.00034	0.00553	13 / 14	0.0008238
Inorganic-Total	Potassium, Total	mg/L		1.49	1.49	2.77	14 / 14	1.817
Inorganic-Total	Selenium, Total	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 14	0
Inorganic-Total	Silver, Total	mg/L	0.00033 / 0.00033	ND	ND	ND	0 / 14	0
Inorganic-Total	Sodium, Total	mg/L		6.27	6.27	8.65	14 / 14	7.52
Inorganic-Total	Strontium, Total	mg/L		0.0913	0.0913	0.121	14 / 14	0.1081
Inorganic-Total	Thallium, Total	mg/L	0.0005 / 0.0005	ND	ND	ND	0 / 14	0
Inorganic-Total	Vanadium, Total	mg/L	0.001 / 0.001	ND	ND	ND	0 / 14	0
Inorganic-Total	Zinc, Total	mg/L	0.0083 / 0.0083	ND	ND	ND	0 / 14	0
Physical Properties	Dissolved Organic Carbon	mg/L		1.64	1.64	2.17	14 / 14	1.829
Physical Properties	Total Suspended Solids	mg/L		1.3	1.3	18.8	14 / 14	5.121

Notes:

For definitions, see the Acronyms section.

Appendix C

Sequentially Extracted Metals Sample Summaries

Table C- 1: Emory River Sequentially Extracted Metals

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum (Initial Total Data)	mg/kg		6030	6030	13100	9 / 9	11324
Inorganic	Aluminum (Step 1 - Water Extractable Fraction)	mg/kg	0.025 / 0.45	ND	0.68	3.3	6 / 9	1.478
Inorganic	Aluminum (Step 2 - Ion Exchange Fraction)	mg/kg	0.025 / 0.026	ND	0.035	0.29	8 / 9	0.09013
Inorganic	Aluminum (Step 3 - Carbonate Bound Fraction)	mg/kg		9.9	9.9	40.1	9 / 9	19.52
Inorganic	Aluminum (Step 4 - Hydroxide Fraction)	mg/kg		46.2	46.2	371	9 / 9	110
Inorganic	Aluminum (Rerun of Step 1 - Water Extractable Fraction)	mg/kg		0.33	0.33	6.6	9 / 9	3.319
Inorganic	Aluminum (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		0.044	0.044	0.2	9 / 9	0.1156
Inorganic	Aluminum (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		9.7	9.7	36.2	9 / 9	21.19
Inorganic	Aluminum (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		56.5	56.5	306	9 / 9	141
Inorganic	Arsenic (Initial Total Data)	mg/kg		2.8	2.8	56.1	9 / 9	28.92
Inorganic	Arsenic (Step 1 - Water Extractable Fraction)	mg/kg	0.0045 / 0.0054	ND	0.011	0.47	7 / 9	0.1073
Inorganic	Arsenic (Step 2 - Ion Exchange Fraction)	mg/kg		0.015	0.015	1.9	7 / 7	0.39
Inorganic	Arsenic (Step 3 - Carbonate Bound Fraction)	mg/kg		0.0059	0.0059	2	9 / 9	0.3834
Inorganic	Arsenic (Step 4 - Hydroxide Fraction)	mg/kg		0.11	0.11	1.6	9 / 9	0.5222
Inorganic	Arsenic (Rerun of Step 1 - Water Extractable Fraction)	mg/kg	0.0051 / 0.0051	ND	0.0061	0.41	8 / 9	0.1118
Inorganic	Arsenic (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		0.0059	0.0059	2	8 / 8	0.3822
Inorganic	Arsenic (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		0.0065	0.0065	1.7	9 / 9	0.3922
Inorganic	Arsenic (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		0.12	0.12	2.1	9 / 9	0.9311

Notes:
For definitions, see the Acronyms section.

Table C- 1: Emory River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Barium (Initial Total Data)	mg/kg		67.7	67.7	313	9 / 9	193.6
Inorganic	Barium (Step 1 - Water Extractable Fraction)	mg/kg		0.29	0.29	0.81	9 / 9	0.5722
Inorganic	Barium (Step 2 - Ion Exchange Fraction)	mg/kg		13.4	13.4	26.8	9 / 9	21.02
Inorganic	Barium (Step 3 - Carbonate Bound Fraction)	mg/kg		11.6	11.6	36.5	9 / 9	19.77
Inorganic	Barium (Step 4 - Hydroxide Fraction)	mg/kg		14	14	64.2	9 / 9	33.26
Inorganic	Barium (Rerun of Step 1 - Water Extractable Fraction)	mg/kg		0.32	0.32	0.68	9 / 9	0.5244
Inorganic	Barium (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		14.1	14.1	22.9	9 / 9	19.74
Inorganic	Barium (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		9.3	9.3	31.9	9 / 9	19.87
Inorganic	Barium (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		12.6	12.6	49.3	9 / 9	33.14
Inorganic	Cadmium (Initial Total Data)	mg/kg		0.27	0.27	0.65	9 / 9	0.4889
Inorganic	Cadmium (Step 1 - Water Extractable Fraction)	mg/kg	0.0009 / 0.0011	ND	0.0014	0.0014	1 / 9	0.0014
Inorganic	Cadmium (Step 2 - Ion Exchange Fraction)	mg/kg	0.00097 / 0.027	ND	0.028	0.042	2 / 9	0.035
Inorganic	Cadmium (Step 3 - Carbonate Bound Fraction)	mg/kg		0.055	0.055	0.11	9 / 9	0.079
Inorganic	Cadmium (Step 4 - Hydroxide Fraction)	mg/kg		0.075	0.075	0.17	9 / 9	0.1257
Inorganic	Cadmium (Rerun of Step 1 - Water Extractable Fraction)	mg/kg	0.001 / 0.0047	ND	0.053	0.053	1 / 9	0.053
Inorganic	Cadmium (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		0.013	0.013	0.78	9 / 9	0.1072
Inorganic	Cadmium (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		0.059	0.059	0.84	9 / 9	0.181
Inorganic	Cadmium (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		0.079	0.079	0.17	9 / 9	0.1096

Notes:
For definitions, see the Acronyms section.

Table C- 1: Emory River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Calcium (Initial Total Data)	mg/kg		1530	1530	4150	9 / 9	2799
Inorganic	Calcium (Step 1 - Water Extractable Fraction)	mg/kg		49.9	49.9	125	9 / 9	86.97
Inorganic	Calcium (Step 2 - Ion Exchange Fraction)	mg/kg		521	521	1250	9 / 9	729.4
Inorganic	Calcium (Step 3 - Carbonate Bound Fraction)	mg/kg		214	214	596	9 / 9	353.7
Inorganic	Calcium (Step 4 - Hydroxide Fraction)	mg/kg		164	164	1280	9 / 9	566.1
Inorganic	Calcium (Rerun of Step 1 - Water Extractable Fraction)	mg/kg		36.4	36.4	110	9 / 9	75.31
Inorganic	Calcium (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		556	556	805	9 / 9	702.7
Inorganic	Calcium (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		213	213	382	9 / 9	307.4
Inorganic	Calcium (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		203	203	975	9 / 9	560
Inorganic	Chromium (Initial Total Data)	mg/kg		9.2	9.2	21.9	9 / 9	18.43
Inorganic	Chromium (Step 3 - Carbonate Bound Fraction)	mg/kg		0.09	0.09	0.43	7 / 7	0.2214
Inorganic	Chromium (Step 4 - Hydroxide Fraction)	mg/kg		0.093	0.093	4.9	9 / 9	1.054
Inorganic	Chromium (Rerun of Step 1 - Water Extractable Fraction)	mg/kg	0.01 / 0.011	ND	0.015	0.015	2 / 9	0.015
Inorganic	Chromium (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg	0.01 / 0.011	ND	0.044	0.36	7 / 9	0.1977
Inorganic	Chromium (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		0.097	0.097	3.9	9 / 9	1.141
Inorganic	Cobalt (Initial Total Data)	mg/kg		9.9	9.9	16.1	9 / 9	12.39
Inorganic	Cobalt (Step 1 - Water Extractable Fraction)	mg/kg		0.0009	0.0009	0.015	9 / 9	0.006789
Inorganic	Cobalt (Step 2 - Ion Exchange Fraction)	mg/kg		0.0063	0.0063	0.042	9 / 9	0.01506

Notes:
For definitions, see the Acronyms section.

Table C- 1: Emory River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Cobalt (Step 3 - Carbonate Bound Fraction)	mg/kg		0.069	0.069	0.31	9 / 9	0.1491
Inorganic	Cobalt (Step 4 - Hydroxide Fraction)	mg/kg		1.5	1.5	5.3	9 / 9	2.444
Inorganic	Cobalt (Rerun of Step 1 - Water Extractable Fraction)	mg/kg		0.0018	0.0018	0.024	9 / 9	0.009222
Inorganic	Cobalt (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		0.0058	0.0058	0.033	9 / 9	0.01422
Inorganic	Cobalt (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		0.098	0.098	0.27	9 / 9	0.1674
Inorganic	Cobalt (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		1.1	1.1	4.9	9 / 9	2.667
Inorganic	Copper (Initial Total Data)	mg/kg		8.7	8.7	40.3	9 / 9	27.41
Inorganic	Copper (Step 1 - Water Extractable Fraction)	mg/kg		0.008	0.008	0.039	9 / 9	0.01662
Inorganic	Copper (Step 2 - Ion Exchange Fraction)	mg/kg		0.025	0.025	0.31	9 / 9	0.1063
Inorganic	Copper (Step 3 - Carbonate Bound Fraction)	mg/kg		0.061	0.061	1.1	9 / 9	0.3034
Inorganic	Copper (Step 4 - Hydroxide Fraction)	mg/kg		0.058	0.058	1	9 / 9	0.2579
Inorganic	Copper (Rerun of Step 1 - Water Extractable Fraction)	mg/kg	0.0044 / 0.0048	ND	0.0052	0.029	7 / 9	0.01534
Inorganic	Copper (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		0.034	0.034	0.33	9 / 9	0.1001
Inorganic	Copper (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		0.04	0.04	1.1	9 / 9	0.3154
Inorganic	Copper (Rerun of Step 4 - Hydroxide Fraction)	mg/kg	0.051 / 0.68	ND	ND	ND	0 / 9	0
Inorganic	Iron (Initial Total Data)	mg/kg		10900	10900	21000	9 / 9	16500
Inorganic	Iron (Step 1 - Water Extractable Fraction)	mg/kg		0.43	0.43	6	9 / 9	1.691
Inorganic	Iron (Step 2 - Ion Exchange Fraction)	mg/kg	0.34 / 0.98	ND	ND	ND	0 / 9	0
Inorganic	Iron (Step 3 - Carbonate Bound Fraction)	mg/kg		7.6	7.6	18.2	9 / 9	11.16

Notes:
For definitions, see the Acronyms section.

Table C- 1: Emory River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Iron (Step 4 - Hydroxide Fraction)	mg/kg		301	301	1140	9 / 9	589.4
Inorganic	Iron (Rerun of Step 1 - Water Extractable Fraction)	mg/kg	0.21 / 0.23	ND	1	11.2	7 / 9	4.743
Inorganic	Iron (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		0.24	0.24	0.34	5 / 5	0.298
Inorganic	Iron (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		6.6	6.6	19.3	9 / 9	11.88
Inorganic	Iron (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		641	641	1380	9 / 9	903.6
Inorganic	Lead (Initial Total Data)	mg/kg		11.1	11.1	19.8	9 / 9	16.79
Inorganic	Lead (Step 1 - Water Extractable Fraction)	mg/kg		0.002	0.002	0.0088	5 / 5	0.00366
Inorganic	Lead (Step 2 - Ion Exchange Fraction)	mg/kg		0.0063	0.0063	0.027	9 / 9	0.0177
Inorganic	Lead (Step 3 - Carbonate Bound Fraction)	mg/kg		0.063	0.063	0.38	9 / 9	0.2203
Inorganic	Lead (Step 4 - Hydroxide Fraction)	mg/kg		0.18	0.18	0.85	9 / 9	0.5478
Inorganic	Lead (Rerun of Step 1 - Water Extractable Fraction)	mg/kg		0.00087	0.00087	0.018	9 / 9	0.006686
Inorganic	Lead (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		0.0022	0.0022	0.022	9 / 9	0.0123
Inorganic	Lead (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		0.051	0.051	0.3	9 / 9	0.1979
Inorganic	Lead (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		0.37	0.37	1.2	9 / 9	0.7611
Inorganic	Magnesium (Initial Total Data)	mg/kg		730	730	1350	9 / 9	1141
Inorganic	Magnesium (Step 1 - Water Extractable Fraction)	mg/kg		9	9	25.1	9 / 9	16.69
Inorganic	Magnesium (Step 2 - Ion Exchange Fraction)	mg/kg		48.7	48.7	116	9 / 9	76.07
Inorganic	Magnesium (Step 3 - Carbonate Bound Fraction)	mg/kg		21.4	21.4	68.8	9 / 9	47.97

Notes:

For definitions, see the Acronyms section.

Table C- 1: Emory River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Magnesium (Step 4 - Hydroxide Fraction)	mg/kg		39.5	39.5	256	9 / 9	117.7
Inorganic	Magnesium (Rerun of Step 1 - Water Extractable Fraction)	mg/kg		7.2	7.2	21.1	9 / 9	14.77
Inorganic	Magnesium (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		48	48	127	9 / 9	82.31
Inorganic	Magnesium (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		22.3	22.3	65.6	9 / 9	48.23
Inorganic	Magnesium (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		43.2	43.2	192	9 / 9	118.6
Inorganic	Manganese (Initial Total Data)	mg/kg		125	125	717	9 / 9	378.4
Inorganic	Manganese (Step 1 - Water Extractable Fraction)	mg/kg		0.09	0.09	18.6	9 / 9	5.783
Inorganic	Manganese (Step 2 - Ion Exchange Fraction)	mg/kg		0.36	0.36	84.9	9 / 9	15.45
Inorganic	Manganese (Step 3 - Carbonate Bound Fraction)	mg/kg		22.9	22.9	110	9 / 9	59.41
Inorganic	Manganese (Step 4 - Hydroxide Fraction)	mg/kg		63.9	63.9	328	9 / 9	201.6
Inorganic	Manganese (Rerun of Step 1 - Water Extractable Fraction)	mg/kg		0.24	0.24	20.2	9 / 9	5.239
Inorganic	Manganese (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		0.89	0.89	70.3	9 / 9	16.79
Inorganic	Manganese (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		29.5	29.5	139	9 / 9	70.49
Inorganic	Manganese (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		60.6	60.6	297	9 / 9	195.9
Inorganic	Molybdenum (Initial Total Data)	mg/kg	0.015 / 1.5	ND	1.6	3.6	4 / 9	2.7
Inorganic	Molybdenum (Step 1 - Water Extractable Fraction)	mg/kg	0.0048 / 0.03	ND	0.27	0.35	2 / 8	0.31
Inorganic	Molybdenum (Step 2 - Ion Exchange Fraction)	mg/kg		0.0061	0.0061	0.18	8 / 8	0.05894

Notes:
For definitions, see the Acronyms section.

Table C- 1: Emory River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Molybdenum (Step 3 - Carbonate Bound Fraction)	mg/kg		0.008	0.008	0.047	5 / 5	0.02312
Inorganic	Molybdenum (Step 4 - Hydroxide Fraction)	mg/kg		0.0084	0.0084	0.038	3 / 3	0.01947
Inorganic	Molybdenum (Rerun of Step 1 - Water Extractable Fraction)	mg/kg	0.005 / 0.048	ND	0.28	0.44	2 / 9	0.36
Inorganic	Molybdenum (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg	0.005 / 0.044	ND	0.068	0.14	3 / 9	0.1127
Inorganic	Molybdenum (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg	0.005 / 0.043	ND	0.063	0.063	1 / 9	0.063
Inorganic	Molybdenum (Rerun of Step 4 - Hydroxide Fraction)	mg/kg	0.005 / 0.03	ND	0.21	0.33	2 / 9	0.27
Inorganic	Nickel (Initial Total Data)	mg/kg		17	17	26.2	9 / 9	22.08
Inorganic	Nickel (Step 1 - Water Extractable Fraction)	mg/kg		0.0028	0.0028	0.04	9 / 9	0.0165
Inorganic	Nickel (Step 2 - Ion Exchange Fraction)	mg/kg		0.043	0.043	0.13	9 / 9	0.08789
Inorganic	Nickel (Step 3 - Carbonate Bound Fraction)	mg/kg		0.38	0.38	0.73	9 / 9	0.5522
Inorganic	Nickel (Step 4 - Hydroxide Fraction)	mg/kg		0.83	0.83	3	9 / 9	1.892
Inorganic	Nickel (Rerun of Step 1 - Water Extractable Fraction)	mg/kg		0.0038	0.0038	0.027	9 / 9	0.01529
Inorganic	Nickel (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		0.049	0.049	0.13	9 / 9	0.08489
Inorganic	Nickel (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		0.32	0.32	0.8	9 / 9	0.5656
Inorganic	Nickel (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		1.4	1.4	2.8	9 / 9	2.167
Inorganic	Selenium (Initial Total Data)	mg/kg		0.75	0.75	4.2	9 / 9	2.761
Inorganic	Selenium (Step 1 - Water Extractable Fraction)	mg/kg		0.054	0.054	0.09	2 / 2	0.072

Notes:

For definitions, see the Acronyms section.

Table C- 1: Emory River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Selenium (Step 2 - Ion Exchange Fraction)	mg/kg		0.013	0.013	0.25	5 / 5	0.0856
Inorganic	Selenium (Step 3 - Carbonate Bound Fraction)	mg/kg		0.017	0.017	0.16	5 / 5	0.0614
Inorganic	Selenium (Step 4 - Hydroxide Fraction)	mg/kg		0.047	0.047	0.27	9 / 9	0.1344
Inorganic	Selenium (Rerun of Step 1 - Water Extractable Fraction)	mg/kg	0.013 / 0.014	ND	0.05	0.072	2 / 9	0.061
Inorganic	Selenium (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg	0.013 / 0.014	ND	0.023	0.36	6 / 9	0.112
Inorganic	Selenium (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg	0.013 / 0.014	ND	0.014	0.2	8 / 9	0.06613
Inorganic	Selenium (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		0.066	0.066	0.79	9 / 9	0.2524
Inorganic	Silver (Initial Total Data)	mg/kg		0.057	0.057	0.12	9 / 9	0.09167
Inorganic	Silver (Step 1 - Water Extractable Fraction)	mg/kg		0.0075	0.0075	0.0075	1 / 1	0.0075
Inorganic	Silver (Step 4 - Hydroxide Fraction)	mg/kg		0.0032	0.0032	0.0045	2 / 2	0.00385
Inorganic	Silver (Rerun of Step 1 - Water Extractable Fraction)	mg/kg	0.0012 / 0.0013	ND	ND	ND	0 / 9	0
Inorganic	Silver (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg	0.0012 / 0.0013	ND	ND	ND	0 / 9	0
Inorganic	Silver (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg	0.0012 / 0.0013	ND	ND	ND	0 / 9	0
Inorganic	Silver (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		0.0013	0.0013	0.0077	9 / 9	0.004044
Inorganic	Sodium (Initial Total Data)	mg/kg		21.7	21.7	264	9 / 9	137.2
Inorganic	Sodium (Step 1 - Water Extractable Fraction)	mg/kg		5.8	5.8	12.6	9 / 9	9.411
Inorganic	Sodium (Step 2 - Ion Exchange Fraction)	mg/kg		5.7	5.7	10.5	9 / 9	7.633
Inorganic	Sodium (Step 3 - Carbonate Bound Fraction)	mg/kg		4.1	4.1	7.2	9 / 9	5.011

Notes:
For definitions, see the Acronyms section.

Table C- 1: Emory River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Sodium (Step 4 - Hydroxide Fraction)	mg/kg		9.1	9.1	26.8	9 / 9	16.08
Inorganic	Sodium (Rerun of Step 1 - Water Extractable Fraction)	mg/kg		1.9	1.9	7.6	9 / 9	4.867
Inorganic	Sodium (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		1.7	1.7	4.7	9 / 9	2.922
Inorganic	Sodium (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg	0.56 / 0.62	ND	0.67	0.87	2 / 9	0.795
Inorganic	Sodium (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		1.8	1.8	17.8	9 / 9	11.23
Inorganic	Strontium (Initial Total Data)	mg/kg		8	8	265	9 / 9	134
Inorganic	Strontium (Step 1 - Water Extractable Fraction)	mg/kg		0.19	0.19	1.2	9 / 9	0.7556
Inorganic	Strontium (Step 2 - Ion Exchange Fraction)	mg/kg		2.5	2.5	14.8	9 / 9	6.789
Inorganic	Strontium (Step 3 - Carbonate Bound Fraction)	mg/kg		1.2	1.2	8.8	9 / 9	3.1
Inorganic	Strontium (Step 4 - Hydroxide Fraction)	mg/kg		0.98	0.98	34	9 / 9	14.29
Inorganic	Strontium (Rerun of Step 1 - Water Extractable Fraction)	mg/kg		0.13	0.13	1.4	9 / 9	0.6922
Inorganic	Strontium (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		2.5	2.5	12.9	9 / 9	6.678
Inorganic	Strontium (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		0.98	0.98	7.3	9 / 9	3.231
Inorganic	Strontium (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		0.83	0.83	23.3	9 / 9	14.14
Inorganic	Thallium (Initial Total Data)	mg/kg		0.12	0.12	1.3	9 / 9	0.7489
Inorganic	Thallium (Step 1 - Water Extractable Fraction)	mg/kg		0.00044	0.00044	0.0054	9 / 9	0.003071
Inorganic	Thallium (Step 2 - Ion Exchange Fraction)	mg/kg		0.0067	0.0067	0.4	9 / 9	0.142

Notes:

For definitions, see the Acronyms section.

Table C- 1: Emory River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Thallium (Step 3 - Carbonate Bound Fraction)	mg/kg		0.01	0.01	0.23	9 / 9	0.1098
Inorganic	Thallium (Step 4 - Hydroxide Fraction)	mg/kg		0.018	0.018	0.31	9 / 9	0.1626
Inorganic	Thallium (Rerun of Step 1 - Water Extractable Fraction)	mg/kg	0.00028 / 0.0003	ND	0.00064	0.0054	8 / 9	0.003143
Inorganic	Thallium (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		0.0087	0.0087	0.3	9 / 9	0.122
Inorganic	Thallium (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		0.0074	0.0074	0.18	9 / 9	0.09338
Inorganic	Thallium (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		0.014	0.014	0.24	9 / 9	0.1381
Inorganic	Vanadium (Initial Total Data)	mg/kg		12.5	12.5	60.8	9 / 9	40.43
Inorganic	Vanadium (Step 1 - Water Extractable Fraction)	mg/kg		0.012	0.012	0.37	5 / 5	0.1136
Inorganic	Vanadium (Step 2 - Ion Exchange Fraction)	mg/kg		0.071	0.071	0.23	2 / 2	0.1505
Inorganic	Vanadium (Step 3 - Carbonate Bound Fraction)	mg/kg		0.081	0.081	0.17	2 / 2	0.1255
Inorganic	Vanadium (Step 4 - Hydroxide Fraction)	mg/kg		0.11	0.11	0.81	8 / 8	0.26
Inorganic	Vanadium (Rerun of Step 1 - Water Extractable Fraction)	mg/kg	0.014 / 0.015	ND	0.015	0.3	6 / 9	0.095
Inorganic	Vanadium (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		0.056	0.056	0.23	2 / 2	0.143
Inorganic	Vanadium (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg	0.014 / 0.015	ND	0.074	0.18	2 / 9	0.127
Inorganic	Vanadium (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		0.033	0.033	11.8	9 / 9	2.421
Inorganic	Zinc (Initial Total Data)	mg/kg		33.9	33.9	81.3	9 / 9	51.32
Inorganic	Zinc (Step 1 - Water Extractable Fraction)	mg/kg	0.011 / 0.012	ND	0.023	0.092	8 / 9	0.05038
Inorganic	Zinc (Step 2 - Ion Exchange Fraction)	mg/kg		0.084	0.084	0.19	9 / 9	0.1328

Notes:
For definitions, see the Acronyms section.

Table C- 1: Emory River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Zinc (Step 3 - Carbonate Bound Fraction)	mg/kg		0.49	0.49	2.5	9 / 9	1.028
Inorganic	Zinc (Step 4 - Hydroxide Fraction)	mg/kg		6.2	6.2	23.2	9 / 9	10.83
Inorganic	Zinc (Rerun of Step 1 - Water Extractable Fraction)	mg/kg		0.022	0.022	0.11	9 / 9	0.05989
Inorganic	Zinc (Rerun of Step 2 - Ion Exchange Fraction)	mg/kg		0.076	0.076	0.22	9 / 9	0.1226
Inorganic	Zinc (Rerun of Step 3 - Carbonate Bound Fraction)	mg/kg		0.49	0.49	1.8	9 / 9	0.9544
Inorganic	Zinc (Rerun of Step 4 - Hydroxide Fraction)	mg/kg		5.3	5.3	21.6	9 / 9	11.49

Notes:

For definitions, see the Acronyms section.

Table C-2: Clinch River Sequentially Extracted Metals

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum (Initial Total Data)	mg/kg		4290	4290	19100	9 / 9	15143
Inorganic	Aluminum (Step 1 - Water Extractable Fraction)	mg/kg		3	3	43.8	9 / 9	21.33
Inorganic	Aluminum (Step 2 - Ion Exchange Fraction)	mg/kg		0.45	0.45	12.6	9 / 9	5.583
Inorganic	Aluminum (Step 3 - Carbonate Bound Fraction)	mg/kg		2	2	26.8	9 / 9	16.29
Inorganic	Aluminum (Step 4 - Hydroxide Fraction)	mg/kg		8.6	8.6	179	9 / 9	98.37
Inorganic	Arsenic (Initial Total Data)	mg/kg		4.8	4.8	42.2	9 / 9	24.82
Inorganic	Arsenic (Step 1 - Water Extractable Fraction)	mg/kg	0.0026 / 0.0026	ND	0.015	0.084	8 / 9	0.05625
Inorganic	Arsenic (Step 2 - Ion Exchange Fraction)	mg/kg		0.0035	0.0035	0.1	9 / 9	0.05839
Inorganic	Arsenic (Step 3 - Carbonate Bound Fraction)	mg/kg		0.0029	0.0029	0.13	9 / 9	0.08366
Inorganic	Arsenic (Step 4 - Hydroxide Fraction)	mg/kg		0.019	0.019	0.29	9 / 9	0.201
Inorganic	Barium (Initial Total Data)	mg/kg		48.8	48.8	272	9 / 9	219.4
Inorganic	Barium (Step 1 - Water Extractable Fraction)	mg/kg		0.16	0.16	1.2	9 / 9	0.7
Inorganic	Barium (Step 2 - Ion Exchange Fraction)	mg/kg		8.1	8.1	34.5	9 / 9	26.17
Inorganic	Barium (Step 3 - Carbonate Bound Fraction)	mg/kg		8.9	8.9	34.2	9 / 9	26.69
Inorganic	Barium (Step 4 - Hydroxide Fraction)	mg/kg		8.7	8.7	44.7	9 / 9	32.34
Inorganic	Cadmium (Initial Total Data)	mg/kg		0.17	0.17	0.62	9 / 9	0.5022
Inorganic	Cadmium (Step 1 - Water Extractable Fraction)	mg/kg	0.00052 / 0.0013	ND	0.0012	0.0022	6 / 9	0.001533
Inorganic	Cadmium (Step 2 - Ion Exchange Fraction)	mg/kg	0.00092 / 0.0028	ND	0.012	0.021	8 / 9	0.01688
Inorganic	Cadmium (Step 3 - Carbonate Bound Fraction)	mg/kg		0.026	0.026	0.21	9 / 9	0.1251

Notes:
For definitions, see the Acronyms section.

Table C-2: Clinch River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Cadmium (Step 4 - Hydroxide Fraction)	mg/kg		0.052	0.052	0.2	9 / 9	0.1436
Inorganic	Calcium (Initial Total Data)	mg/kg		1920	1920	4660	9 / 9	3960
Inorganic	Calcium (Step 1 - Water Extractable Fraction)	mg/kg		64.5	64.5	210	9 / 9	134.1
Inorganic	Calcium (Step 2 - Ion Exchange Fraction)	mg/kg		779	779	1850	9 / 9	1246
Inorganic	Calcium (Step 3 - Carbonate Bound Fraction)	mg/kg		509	509	858	9 / 9	650.6
Inorganic	Calcium (Step 4 - Hydroxide Fraction)	mg/kg		387	387	777	9 / 9	640.9
Inorganic	Chromium (Initial Total Data)	mg/kg		12.4	12.4	27	9 / 9	22.32
Inorganic	Chromium (Step 1 - Water Extractable Fraction)	mg/kg		0.021	0.021	0.049	8 / 8	0.02825
Inorganic	Chromium (Step 2 - Ion Exchange Fraction)	mg/kg		0.058	0.058	0.19	9 / 9	0.1331
Inorganic	Chromium (Step 3 - Carbonate Bound Fraction)	mg/kg		0.076	0.076	0.52	9 / 9	0.3429
Inorganic	Chromium (Step 4 - Hydroxide Fraction)	mg/kg		0.12	0.12	0.73	9 / 9	0.4444
Inorganic	Cobalt (Initial Total Data)	mg/kg		8.2	8.2	19.3	9 / 9	15.2
Inorganic	Cobalt (Step 1 - Water Extractable Fraction)	mg/kg		0.0065	0.0065	0.049	9 / 9	0.02283
Inorganic	Cobalt (Step 2 - Ion Exchange Fraction)	mg/kg		0.0048	0.0048	0.026	9 / 9	0.013
Inorganic	Cobalt (Step 3 - Carbonate Bound Fraction)	mg/kg		0.015	0.015	0.079	9 / 9	0.04889
Inorganic	Cobalt (Step 4 - Hydroxide Fraction)	mg/kg		1.6	1.6	5.1	9 / 9	2.644
Inorganic	Copper (Initial Total Data)	mg/kg		7	7	58.3	9 / 9	36.72
Inorganic	Copper (Step 1 - Water Extractable Fraction)	mg/kg		0.011	0.011	0.15	9 / 9	0.08756
Inorganic	Copper (Step 2 - Ion Exchange Fraction)	mg/kg		0.053	0.053	0.27	9 / 9	0.1648
Inorganic	Copper (Step 3 - Carbonate Bound Fraction)	mg/kg		0.055	0.055	1.4	9 / 9	0.5328

Notes:
For definitions, see the Acronyms section.

Table C-2: Clinch River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Copper (Step 4 - Hydroxide Fraction)	mg/kg		0.028	0.028	0.34	9 / 9	0.2298
Inorganic	Iron (Initial Total Data)	mg/kg		12500	12500	28600	9 / 9	21467
Inorganic	Iron (Step 1 - Water Extractable Fraction)	mg/kg		5.8	5.8	35.1	9 / 9	17.5
Inorganic	Iron (Step 2 - Ion Exchange Fraction)	mg/kg		1.5	1.5	10.5	9 / 9	5.133
Inorganic	Iron (Step 3 - Carbonate Bound Fraction)	mg/kg		1.1	1.1	23.9	9 / 9	11.91
Inorganic	Iron (Step 4 - Hydroxide Fraction)	mg/kg		89.6	89.6	941	9 / 9	369
Inorganic	Lead (Initial Total Data)	mg/kg		12	12	34.2	9 / 9	23.77
Inorganic	Lead (Step 1 - Water Extractable Fraction)	mg/kg	0.0005 / 0.027	ND	0.03	0.081	7 / 9	0.04214
Inorganic	Lead (Step 2 - Ion Exchange Fraction)	mg/kg	0.00051 / 0.034	ND	0.027	0.052	4 / 9	0.039
Inorganic	Lead (Step 3 - Carbonate Bound Fraction)	mg/kg		0.041	0.041	0.31	9 / 9	0.1857
Inorganic	Lead (Step 4 - Hydroxide Fraction)	mg/kg		0.18	0.18	1.2	9 / 9	0.5522
Inorganic	Magnesium (Initial Total Data)	mg/kg		1130	1130	2640	9 / 9	1896
Inorganic	Magnesium (Step 1 - Water Extractable Fraction)	mg/kg		14.9	14.9	52.8	9 / 9	33.94
Inorganic	Magnesium (Step 2 - Ion Exchange Fraction)	mg/kg		116	116	394	9 / 9	215
Inorganic	Magnesium (Step 3 - Carbonate Bound Fraction)	mg/kg		140	140	237	9 / 9	173.4
Inorganic	Magnesium (Step 4 - Hydroxide Fraction)	mg/kg		165	165	254	9 / 9	197.3
Inorganic	Manganese (Initial Total Data)	mg/kg		657	657	2030	9 / 9	1119
Inorganic	Manganese (Step 1 - Water Extractable Fraction)	mg/kg		0.46	0.46	1.6	9 / 9	0.8478
Inorganic	Manganese (Step 2 - Ion Exchange Fraction)	mg/kg		0.54	0.54	2	9 / 9	1.187
Inorganic	Manganese (Step 3 - Carbonate Bound Fraction)	mg/kg		49.5	49.5	131	9 / 9	89.56

Notes:
For definitions, see the Acronyms section.

Table C-2: Clinch River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Manganese (Step 4 - Hydroxide Fraction)	mg/kg		400	400	1420	9 / 9	716.1
Inorganic	Molybdenum (Initial Total Data)	mg/kg	0.018 / 1.6	ND	1.8	3.1	4 / 9	2.25
Inorganic	Molybdenum (Step 1 - Water Extractable Fraction)	mg/kg	0.0081 / 0.057	ND	ND	ND	0 / 6	0
Inorganic	Molybdenum (Step 2 - Ion Exchange Fraction)	mg/kg	0.0025 / 0.032	ND	ND	ND	0 / 9	0
Inorganic	Molybdenum (Step 3 - Carbonate Bound Fraction)	mg/kg	0.0073 / 0.012	ND	ND	ND	0 / 3	0
Inorganic	Molybdenum (Step 4 - Hydroxide Fraction)	mg/kg	0.012 / 0.012	ND	ND	ND	0 / 2	0
Inorganic	Nickel (Initial Total Data)	mg/kg		10.3	10.3	31.1	9 / 9	25.48
Inorganic	Nickel (Step 1 - Water Extractable Fraction)	mg/kg		0.0084	0.0084	0.083	9 / 9	0.04082
Inorganic	Nickel (Step 2 - Ion Exchange Fraction)	mg/kg		0.018	0.018	0.12	9 / 9	0.07556
Inorganic	Nickel (Step 3 - Carbonate Bound Fraction)	mg/kg		0.16	0.16	1	9 / 9	0.6667
Inorganic	Nickel (Step 4 - Hydroxide Fraction)	mg/kg		0.84	0.84	2.9	9 / 9	1.556
Inorganic	Selenium (Initial Total Data)	mg/kg		0.49	0.49	3.8	9 / 9	2.654
Inorganic	Selenium (Step 2 - Ion Exchange Fraction)	mg/kg		0.02	0.02	0.02	1 / 1	0.02
Inorganic	Selenium (Step 3 - Carbonate Bound Fraction)	mg/kg	0.0066 / 0.018	ND	0.019	0.026	4 / 9	0.02175
Inorganic	Selenium (Step 4 - Hydroxide Fraction)	mg/kg		0.024	0.024	0.2	9 / 9	0.1199
Inorganic	Silver (Initial Total Data)	mg/kg		0.049	0.049	0.25	9 / 9	0.1263
Inorganic	Sodium (Initial Total Data)	mg/kg		30.5	30.5	237	9 / 9	158.7
Inorganic	Sodium (Step 1 - Water Extractable Fraction)	mg/kg		4.9	4.9	17.2	9 / 9	11.91
Inorganic	Sodium (Step 2 - Ion Exchange Fraction)	mg/kg		3.8	3.8	10.9	9 / 9	7.767
Inorganic	Sodium (Step 3 - Carbonate Bound Fraction)	mg/kg		1.3	1.3	3.5	9 / 9	2.556

Notes:
For definitions, see the Acronyms section.

Table C-2: Clinch River Sequentially Extracted Metals (Continued)

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Sodium (Step 4 - Hydroxide Fraction)	mg/kg		3.1	3.1	18.3	9 / 9	14.38
Inorganic	Strontium (Initial Total Data)	mg/kg		7.6	7.6	155	9 / 9	118.3
Inorganic	Strontium (Step 1 - Water Extractable Fraction)	mg/kg		0.2	0.2	1.1	9 / 9	0.7456
Inorganic	Strontium (Step 2 - Ion Exchange Fraction)	mg/kg		2.5	2.5	8.7	9 / 9	6.6
Inorganic	Strontium (Step 3 - Carbonate Bound Fraction)	mg/kg		1.3	1.3	4.8	9 / 9	3.456
Inorganic	Strontium (Step 4 - Hydroxide Fraction)	mg/kg		0.79	0.79	21.9	9 / 9	13.99
Inorganic	Thallium (Initial Total Data)	mg/kg		0.12	0.12	1.3	9 / 9	0.7978
Inorganic	Thallium (Step 1 - Water Extractable Fraction)	mg/kg	0.00014 / 0.002	ND	0.0022	0.0034	4 / 9	0.002975
Inorganic	Thallium (Step 2 - Ion Exchange Fraction)	mg/kg		0.003	0.003	0.078	9 / 9	0.04278
Inorganic	Thallium (Step 3 - Carbonate Bound Fraction)	mg/kg		0.0082	0.0082	0.16	9 / 9	0.1002
Inorganic	Thallium (Step 4 - Hydroxide Fraction)	mg/kg		0.014	0.014	0.21	9 / 9	0.129
Inorganic	Vanadium (Initial Total Data)	mg/kg		10.2	10.2	55.1	9 / 9	42.27
Inorganic	Vanadium (Step 1 - Water Extractable Fraction)	mg/kg		0.037	0.037	0.13	8 / 8	0.07688
Inorganic	Vanadium (Step 2 - Ion Exchange Fraction)	mg/kg		0.017	0.017	0.088	9 / 9	0.05733
Inorganic	Vanadium (Step 3 - Carbonate Bound Fraction)	mg/kg		0.02	0.02	0.084	9 / 9	0.05778
Inorganic	Vanadium (Step 4 - Hydroxide Fraction)	mg/kg		0.034	0.034	0.42	9 / 9	0.2716
Inorganic	Zinc (Initial Total Data)	mg/kg		41.3	41.3	114	9 / 9	72.72
Inorganic	Zinc (Step 1 - Water Extractable Fraction)	mg/kg		0.034	0.034	0.31	9 / 9	0.1491
Inorganic	Zinc (Step 2 - Ion Exchange Fraction)	mg/kg	0.0065 / 0.23	ND	0.12	0.4	6 / 9	0.295
Inorganic	Zinc (Step 3 - Carbonate Bound Fraction)	mg/kg		1.1	1.1	5.9	9 / 9	2.444
Inorganic	Zinc (Step 4 - Hydroxide Fraction)	mg/kg		7.5	7.5	24.5	9 / 9	12.81

Notes:
For definitions, see the Acronyms section.

Appendix D

Acid Volatile Sulfide and Simultaneously Extracted Metals Sample Summaries

Table D- 1: Acid Volatile Sulfide (AVS) and Simultaneously Extracted Metals (SEM) in Emory River Reach A

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
AVS/SEM	Acid Volatile Sulfide	mg/kg	28 / 30	ND	ND	ND	0 / 3	0
AVS/SEM	Acid Volatile Sulfide (Extracted)	umol/g	0.83 / 1	ND	0.84	0.84	1 / 6	0.84
AVS/SEM	Cadmium	mg/kg	0.23 / 0.25	ND	ND	ND	0 / 3	0
AVS/SEM	Cadmium (Extracted)	umol/g	0.0018 / 0.0022	ND	0.0022	0.0022	1 / 6	0.0022
AVS/SEM	Copper	mg/kg		6.5	6.5	9.4	3 / 3	8.033
AVS/SEM	Copper (Extracted)	umol/g		0.1	0.1	0.33	6 / 6	0.1817
AVS/SEM	Lead	mg/kg		5.9	5.9	8.1	3 / 3	7.267
AVS/SEM	Lead (Extracted)	umol/g		0.026	0.026	0.053	6 / 6	0.037
AVS/SEM	Mercury	mg/kg	0.023 / 0.025	ND	ND	ND	0 / 3	0
AVS/SEM	Mercury (Extracted)	umol/g	0.0001 / 0.00013	ND	ND	ND	0 / 6	0
AVS/SEM	Nickel	mg/kg		4.6	4.6	6.3	3 / 3	5.633
AVS/SEM	Nickel (Extracted)	umol/g		0.079	0.079	0.22	6 / 6	0.1348
AVS/SEM	Zinc	mg/kg		22	22	31	3 / 3	27
AVS/SEM	Zinc (Extracted)	umol/g		0.29	0.29	0.62	6 / 6	0.4367

Notes:

For definitions, see the Acronyms section.

Table D- 2: Acid Volatile Sulfide (AVS) and Simultaneously Extracted Metals (SEM) in Emory River Reach B

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
AVS/SEM	Acid Volatile Sulfide	mg/kg	22 / 24	ND	ND	ND	0 / 2	0
AVS/SEM	Acid Volatile Sulfide (Extracted)	umol/g	0.69 / 0.98	ND	ND	ND	0 / 6	0
AVS/SEM	Cadmium	mg/kg	0.2 / 0.37	ND	ND	ND	0 / 2	0
AVS/SEM	Cadmium (Extracted)	umol/g	0.0017 / 0.0033	ND	0.0026	0.0029	2 / 6	0.00275
AVS/SEM	Copper	mg/kg		18	18	20	2 / 2	19
AVS/SEM	Copper (Extracted)	umol/g		0.11	0.11	0.31	6 / 6	0.1933
AVS/SEM	Lead	mg/kg		5.8	5.8	7.2	2 / 2	6.5
AVS/SEM	Lead (Extracted)	umol/g		0.025	0.025	0.059	6 / 6	0.0395
AVS/SEM	Mercury	mg/kg	0.018 / 0.02	ND	ND	ND	0 / 2	0
AVS/SEM	Mercury (Extracted)	umol/g	0.00009 / 0.00012	ND	ND	ND	0 / 6	0
AVS/SEM	Nickel	mg/kg		3.6	3.6	5.4	2 / 2	4.5
AVS/SEM	Nickel (Extracted)	umol/g		0.046	0.046	0.24	6 / 6	0.135
AVS/SEM	Zinc	mg/kg		16	16	110	2 / 2	63
AVS/SEM	Zinc (Extracted)	umol/g		0.16	0.16	1.6	6 / 6	0.655

Notes:

For definitions, see the Acronyms section.

Table D- 3: Acid Volatile Sulfide (AVS) and Simultaneously Extracted Metals (SEM) in Emory River Reach C

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
AVS/SEM	Acid Volatile Sulfide	mg/kg	36 / 36	ND	ND	ND	0 / 1	0
AVS/SEM	Acid Volatile Sulfide (Extracted)	umol/g	0.77 / 1.2	ND	1.4	1.4	1 / 4	1.4
AVS/SEM	Cadmium	mg/kg	0.3 / 0.3	ND	ND	ND	0 / 1	0
AVS/SEM	Cadmium (Extracted)	umol/g	0.0017 / 0.0026	ND	0.0017	0.0034	3 / 4	0.002567
AVS/SEM	Copper	mg/kg		6.3	6.3	6.3	1 / 1	6.3
AVS/SEM	Copper (Extracted)	umol/g		0.078	0.078	0.19	4 / 4	0.1268
AVS/SEM	Lead	mg/kg		12	12	12	1 / 1	12
AVS/SEM	Lead (Extracted)	umol/g		0.026	0.026	0.067	4 / 4	0.04825
AVS/SEM	Mercury	mg/kg	0.03 / 0.03	ND	ND	ND	0 / 1	0
AVS/SEM	Mercury (Extracted)	umol/g	0.0001 / 0.00015	ND	ND	ND	0 / 4	0
AVS/SEM	Nickel	mg/kg		7.5	7.5	7.5	1 / 1	7.5
AVS/SEM	Nickel (Extracted)	umol/g		0.072	0.072	0.17	4 / 4	0.123
AVS/SEM	Zinc	mg/kg		43	43	43	1 / 1	43
AVS/SEM	Zinc (Extracted)	umol/g		0.25	0.25	0.71	4 / 4	0.53

Notes:

For definitions, see the Acronyms section.

Table D- 4: Acid Volatile Sulfide (AVS) and Simultaneously Extracted Metals (SEM) in Emory River Reaches A, B, and C

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
AVS/SEM	Acid Volatile Sulfide	mg/kg	21 / 36	ND	ND	ND	0 / 3	0
AVS/SEM	Acid Volatile Sulfide (Extracted)	umol/g	0.65 / 1.1	ND	ND	ND	0 / 4	0
AVS/SEM	Cadmium	mg/kg	0.17 / 0.3	ND	ND	ND	0 / 3	0
AVS/SEM	Cadmium (Extracted)	umol/g	0.0016 / 0.0027	ND	0.0021	0.0021	1 / 4	0.0021
AVS/SEM	Copper	mg/kg		2.4	2.4	2.9	3 / 3	2.7
AVS/SEM	Copper (Extracted)	umol/g		0.038	0.038	0.075	4 / 4	0.05075
AVS/SEM	Lead	mg/kg		5.5	5.5	9.3	3 / 3	7
AVS/SEM	Lead (Extracted)	umol/g		0.027	0.027	0.045	4 / 4	0.036
AVS/SEM	Mercury	mg/kg	0.017 / 0.03	ND	ND	ND	0 / 3	0
AVS/SEM	Mercury (Extracted)	umol/g	0.00009 / 0.00015	ND	ND	ND	0 / 4	0
AVS/SEM	Nickel	mg/kg	1.4 / 1.4	ND	4	6.5	2 / 3	5.25
AVS/SEM	Nickel (Extracted)	umol/g	0.024 / 0.024	ND	0.069	0.17	3 / 4	0.1163
AVS/SEM	Zinc	mg/kg		8.9	8.9	36	3 / 3	22.63
AVS/SEM	Zinc (Extracted)	umol/g		0.14	0.14	0.56	4 / 4	0.4

Notes:

For definitions, see the Acronyms section.

Table D- 5: Acid Volatile Sulfide (AVS) and Simultaneously Extracted Metals (SEM) in the Emory River Reference Reach

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
AVS/SEM	Acid Volatile Sulfide	mg/kg	22 / 36	ND	ND	ND	0 / 6	0
AVS/SEM	Acid Volatile Sulfide (Extracted)	umol/g	0.69 / 1.2	ND	0.84	1.4	2 / 16	1.12
AVS/SEM	Cadmium	mg/kg	0.2 / 0.37	ND	ND	ND	0 / 6	0
AVS/SEM	Cadmium (Extracted)	umol/g	0.0017 / 0.0033	ND	0.0017	0.0034	6 / 16	0.002567
AVS/SEM	Copper	mg/kg		6.3	6.3	20	6 / 6	11.4
AVS/SEM	Copper (Extracted)	umol/g		0.078	0.078	0.33	16 / 16	0.1723
AVS/SEM	Lead	mg/kg		5.8	5.8	12	6 / 6	7.8
AVS/SEM	Lead (Extracted)	umol/g		0.025	0.025	0.067	16 / 16	0.04075
AVS/SEM	Mercury	mg/kg	0.018 / 0.03	ND	ND	ND	0 / 6	0
AVS/SEM	Mercury (Extracted)	umol/g	0.00009 / 0.00015	ND	ND	ND	0 / 16	0
AVS/SEM	Nickel	mg/kg		3.6	3.6	7.5	6 / 6	5.567
AVS/SEM	Nickel (Extracted)	umol/g		0.046	0.046	0.24	16 / 16	0.1319
AVS/SEM	Zinc	mg/kg		16	16	110	6 / 6	41.67
AVS/SEM	Zinc (Extracted)	umol/g		0.16	0.16	1.6	16 / 16	0.5419

Notes:

For definitions, see the Acronyms section.

Table D- 6: Acid Volatile Sulfide (AVS) and Simultaneously Extracted Metals (SEM) in Clinch River Reach A

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
AVS/SEM	Acid Volatile Sulfide (Extracted)	umol/g	0.95 / 1.1	ND	ND	ND	0 / 4	0
AVS/SEM	Cadmium (Extracted)	umol/g	0.0021 / 0.0021	ND	0.0026	0.0029	2 / 4	0.00275
AVS/SEM	Copper (Extracted)	umol/g		0.31	0.31	0.6	4 / 4	0.41
AVS/SEM	Lead (Extracted)	umol/g		0.051	0.051	0.083	4 / 4	0.06175
AVS/SEM	Mercury (Extracted)	umol/g	0.00012 / 0.00013	ND	0.00016	0.00031	2 / 4	0.000235
AVS/SEM	Nickel (Extracted)	umol/g		0.17	0.17	0.22	4 / 4	0.1925
AVS/SEM	Zinc (Extracted)	umol/g		0.53	0.53	0.93	4 / 4	0.6725

Notes:

For definitions, see the Acronyms section.

Table D- 7: Acid Volatile Sulfide (AVS) and Simultaneously Extracted Metals (SEM) in Clinch River Reach B

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
AVS/SEM	Acid Volatile Sulfide (Extracted)	umol/g	0.82 / 1	ND	ND	ND	0 / 6	0
AVS/SEM	Cadmium (Extracted)	umol/g	0.0018 / 0.0022	ND	0.0022	0.0026	3 / 6	0.0024
AVS/SEM	Copper (Extracted)	umol/g		0.14	0.14	0.36	6 / 6	0.2567
AVS/SEM	Lead (Extracted)	umol/g		0.031	0.031	0.064	6 / 6	0.0525
AVS/SEM	Mercury (Extracted)	umol/g	0.0001 / 0.00013	ND	0.00025	0.00025	1 / 6	0.00025
AVS/SEM	Nickel (Extracted)	umol/g		0.096	0.096	0.23	6 / 6	0.1593
AVS/SEM	Zinc (Extracted)	umol/g		0.31	0.31	0.62	6 / 6	0.5033

Notes:

For definitions, see the Acronyms section.

Table D- 8: Acid Volatile Sulfide (AVS) and Simultaneously Extracted Metals (SEM) in Clinch River Reaches A and B

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
AVS/SEM	Acid Volatile Sulfide (Extracted)	umol/g	0.82 / 1.1	ND	ND	ND	0 / 10	0
AVS/SEM	Cadmium (Extracted)	umol/g	0.0018 / 0.0022	ND	0.0022	0.0029	5 / 10	0.00254
AVS/SEM	Copper (Extracted)	umol/g		0.14	0.14	0.6	10 / 10	0.318
AVS/SEM	Lead (Extracted)	umol/g		0.031	0.031	0.083	10 / 10	0.0562
AVS/SEM	Mercury (Extracted)	umol/g	0.0001 / 0.00013	ND	0.00016	0.00031	3 / 10	0.00024
AVS/SEM	Nickel (Extracted)	umol/g		0.096	0.096	0.23	10 / 10	0.1726
AVS/SEM	Zinc (Extracted)	umol/g		0.31	0.31	0.93	10 / 10	0.571

Notes:

For definitions, see the Acronyms section.

Table D- 9: Acid Volatile Sulfide (AVS) and Simultaneously Extracted Metals (SEM) in the Clinch River Reference Reach

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
AVS/SEM	Acid Volatile Sulfide (Extracted)	umol/g	0.63 / 0.75	ND	ND	ND	0 / 3	0
AVS/SEM	Cadmium (Extracted)	umol/g	0.0014 / 0.0017	ND	ND	ND	0 / 3	0
AVS/SEM	Copper (Extracted)	umol/g		0.032	0.032	0.074	3 / 3	0.05167
AVS/SEM	Lead (Extracted)	umol/g		0.023	0.023	0.039	3 / 3	0.03367
AVS/SEM	Mercury (Extracted)	umol/g	0.00008 / 0.00009	ND	ND	ND	0 / 3	0
AVS/SEM	Nickel (Extracted)	umol/g		0.043	0.043	0.075	3 / 3	0.05833
AVS/SEM	Zinc (Extracted)	umol/g		0.2	0.2	0.36	3 / 3	0.2733

Notes:

For definitions, see the Acronyms section.

Appendix E
Residual Sediment Sample Summaries

Table E- 1: Residual Sediment in the Emory River Reach A Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum	mg/kg		12100	12100	17500	3 / 3	14233
Inorganic	Antimony	mg/kg	1.47 / 1.74	ND	ND	ND	0 / 3	0
Inorganic	Arsenic	mg/kg		24	24	38.9	3 / 3	31.17
Inorganic	Barium	mg/kg		209	209	249	3 / 3	230.3
Inorganic	Beryllium	mg/kg		1.81	1.81	2.06	3 / 3	1.9
Inorganic	Boron	mg/kg		10.1	10.1	13	3 / 3	11.73
Inorganic	Cadmium	mg/kg	0.147 / 0.174	ND	ND	ND	0 / 3	0
Inorganic	Calcium	mg/kg		3240	3240	3660	3 / 3	3510
Inorganic	Chromium	mg/kg		18.6	18.6	23.8	3 / 3	20.47
Inorganic	Cobalt	mg/kg		15.1	15.1	19.1	3 / 3	16.97
Inorganic	Copper	mg/kg		25.2	25.2	29.1	3 / 3	27.07
Inorganic	Iron	mg/kg		23300	23300	27900	3 / 3	25100
Inorganic	Lead	mg/kg		15.3	15.3	20.7	3 / 3	18.23
Inorganic	Magnesium	mg/kg		1220	1220	1640	3 / 3	1390
Inorganic	Manganese	mg/kg		392	392	876	3 / 3	686.3
Inorganic	Mercury	mg/kg		0.093	0.093	0.11	3 / 3	0.1067
Inorganic	Molybdenum	mg/kg	5.9 / 6.98	ND	ND	ND	0 / 3	0
Inorganic	Nickel	mg/kg		23.2	23.2	29.2	3 / 3	25.4
Inorganic	Potassium	mg/kg		977	977	1530	3 / 3	1179
Inorganic	Selenium	mg/kg		2.34	2.34	3.28	3 / 3	2.777
Inorganic	Silver	mg/kg	0.737 / 0.872	ND	ND	ND	0 / 3	0
Inorganic	Sodium	mg/kg	218 / 262	ND	ND	ND	0 / 3	0
Inorganic	Strontium	mg/kg		100	100	131	3 / 3	117.3
Inorganic	Thallium	mg/kg	1.47 / 1.74	ND	ND	ND	0 / 3	0
Inorganic	Vanadium	mg/kg		36.3	36.3	45.4	3 / 3	40.5
Inorganic	Zinc	mg/kg		51.2	51.2	73.3	3 / 3	62.93
Physical Properties	% Ash	%		49	49	58	3 / 3	54
Speciation	Arsenate	mg/kg	11 / 23.9	ND	12.6	20.9	3 / 3	16.47
Speciation	Arsenic (from speciation lab)	mg/kg		20.9	20.9	28.9	3 / 3	24.9
Speciation	Arsenite	mg/kg		5.53	5.53	16.1	3 / 3	11.44
Speciation	Inorganic Arsenic	mg/kg		25.4	25.4	32	3 / 3	28.67
Speciation	Inorganic Selenium	mg/kg	0.346 / 0.554	ND	0.824	1.1	3 / 3	1.005
Speciation	Organic Arsenic	mg/kg	11 / 23.9	ND	ND	ND	0 / 3	0
Speciation	Organic Selenium	mg/kg		1.96	1.96	3.04	3 / 3	2.51
Speciation	Selenate	mg/kg	0.274 / 0.498	ND	ND	ND	0 / 3	0
Speciation	Selenite	mg/kg	0.346 / 0.554	ND	0.824	1.1	3 / 3	1.005
Speciation	Selenium (from speciation lab)	mg/kg		3.04	3.04	3.34	3 / 3	3.157

Notes:
For definitions, see the Acronyms section.

Table E- 2: Residual Sediment in the Emory River Reach B Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum	mg/kg		8930	8930	16400	2 / 2	12665
Inorganic	Antimony	mg/kg	1.32 / 1.53	ND	2.43	2.43	1 / 2	2.43
Inorganic	Arsenic	mg/kg		6.65	6.65	82.7	2 / 2	44.68
Inorganic	Barium	mg/kg		91.4	91.4	365	2 / 2	228.2
Inorganic	Beryllium	mg/kg		0.859	0.859	2.93	2 / 2	1.895
Inorganic	Boron	mg/kg	5.27 / 6.13	ND	41.4	41.4	1 / 2	41.4
Inorganic	Cadmium	mg/kg	0.132 / 0.153	ND	ND	ND	0 / 2	0
Inorganic	Calcium	mg/kg		1360	1360	4830	2 / 2	3095
Inorganic	Chromium	mg/kg		9.72	9.72	32.5	2 / 2	21.11
Inorganic	Cobalt	mg/kg		11.2	11.2	14.5	2 / 2	12.85
Inorganic	Copper	mg/kg		9.66	9.66	45.9	2 / 2	27.78
Inorganic	Iron	mg/kg		14100	14100	22100	2 / 2	18100
Inorganic	Lead	mg/kg		11.7	11.7	22.5	2 / 2	17.1
Inorganic	Magnesium	mg/kg		844	844	1350	2 / 2	1097
Inorganic	Manganese	mg/kg		184	184	508	2 / 2	346
Inorganic	Mercury	mg/kg	0.042 / 0.05	ND	0.12	0.12	1 / 2	0.12
Inorganic	Molybdenum	mg/kg	5.27 / 6.13	ND	ND	ND	0 / 2	0
Inorganic	Nickel	mg/kg		14.6	14.6	28.2	2 / 2	21.4
Inorganic	Potassium	mg/kg		681	681	2040	2 / 2	1361
Inorganic	Selenium	mg/kg	1.32 / 1.53	ND	5.11	5.11	1 / 2	5.11
Inorganic	Silver	mg/kg	0.659 / 0.767	ND	ND	ND	0 / 2	0
Inorganic	Sodium	mg/kg	153 / 277	ND	ND	ND	0 / 2	0
Inorganic	Strontium	mg/kg		17.5	17.5	255	2 / 2	136.3
Inorganic	Thallium	mg/kg	1.32 / 1.53	ND	ND	ND	0 / 2	0
Inorganic	Vanadium	mg/kg		14.3	14.3	77	2 / 2	45.65
Inorganic	Zinc	mg/kg		41.5	41.5	50.4	2 / 2	45.95
Physical Properties	% Ash	%		7	7	76	2 / 2	41.5
Speciation	Arsenate	mg/kg		2.71	2.71	68.3	2 / 2	35.51
Speciation	Arsenic (from speciation lab)	mg/kg		5.82	5.82	75.6	2 / 2	40.71
Speciation	Arsenite	mg/kg		1.59	1.59	8.11	2 / 2	4.85
Speciation	Inorganic Arsenic	mg/kg		4.3	4.3	76.4	2 / 2	40.35
Speciation	Inorganic Selenium	mg/kg	0.29 / 0.387	ND	4.31	4.31	1 / 2	4.31
Speciation	Organic Arsenic	mg/kg	2.11 / 8.51	ND	ND	ND	0 / 2	0
Speciation	Organic Selenium	mg/kg	0.683 / 0.683	ND	1.12	1.12	1 / 2	1.12
Speciation	Selenate	mg/kg	0.229 / 0.306	ND	ND	ND	0 / 2	0
Speciation	Selenite	mg/kg	0.29 / 0.387	ND	4.31	4.31	1 / 2	4.31
Speciation	Selenium (from speciation lab)	mg/kg		1.12	1.12	4.62	2 / 2	2.87

Notes:
For definitions, see the Acronyms section.

Table E- 3: Residual Sediment in the Emory River Reach C Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum	mg/kg		5260	5260	20900	2 / 2	13080
Inorganic	Antimony	mg/kg	1.16 / 2	ND	ND	ND	0 / 2	0
Inorganic	Arsenic	mg/kg		2	2	17.8	2 / 2	9.9
Inorganic	Barium	mg/kg		41.8	41.8	178	2 / 2	109.9
Inorganic	Beryllium	mg/kg	0.465 / 0.465	ND	1.72	1.72	1 / 2	1.72
Inorganic	Boron	mg/kg	4.65 / 7.99	ND	ND	ND	0 / 2	0
Inorganic	Cadmium	mg/kg	0.116 / 0.2	ND	ND	ND	0 / 2	0
Inorganic	Calcium	mg/kg		350	350	2440	2 / 2	1395
Inorganic	Chromium	mg/kg		6.09	6.09	22.4	2 / 2	14.25
Inorganic	Cobalt	mg/kg		3.63	3.63	21.4	2 / 2	12.52
Inorganic	Copper	mg/kg		4.35	4.35	22.5	2 / 2	13.43
Inorganic	Iron	mg/kg		5460	5460	31100	2 / 2	18280
Inorganic	Lead	mg/kg		8.26	8.26	25.3	2 / 2	16.78
Inorganic	Magnesium	mg/kg		379	379	1930	2 / 2	1155
Inorganic	Manganese	mg/kg		76.9	76.9	1220	2 / 2	648.5
Inorganic	Mercury	mg/kg	0.039 / 0.039	ND	0.08	0.08	1 / 2	0.08
Inorganic	Molybdenum	mg/kg	4.65 / 7.99	ND	ND	ND	0 / 2	0
Inorganic	Nickel	mg/kg		6.93	6.93	30.2	2 / 2	18.57
Inorganic	Potassium	mg/kg		458	458	1740	2 / 2	1099
Inorganic	Selenium	mg/kg	1.16 / 1.16	ND	2.28	2.28	1 / 2	2.28
Inorganic	Silver	mg/kg	0.581 / 0.999	ND	ND	ND	0 / 2	0
Inorganic	Sodium	mg/kg	116 / 200	ND	ND	ND	0 / 2	0
Inorganic	Strontium	mg/kg	4.65 / 4.65	ND	38.5	38.5	1 / 2	38.5
Inorganic	Thallium	mg/kg	1.16 / 2	ND	ND	ND	0 / 2	0
Inorganic	Vanadium	mg/kg		7.81	7.81	37.8	2 / 2	22.81
Inorganic	Zinc	mg/kg		22.3	22.3	105	2 / 2	63.65
Physical Properties	% Ash	%	1 / 1	ND	5	5	1 / 2	5
Speciation	Arsenate	mg/kg	0.442 / 2.74	ND	1.58	1.58	1 / 2	1.58
Speciation	Arsenic (from speciation lab)	mg/kg		1.65	1.65	9.76	2 / 2	5.705
Speciation	Arsenite	mg/kg		0.195	0.195	4.48	2 / 2	2.338
Speciation	Inorganic Arsenic	mg/kg		1.78	1.78	5.48	2 / 2	3.63
Speciation	Inorganic Selenium	mg/kg	0.38 / 0.541	ND	ND	ND	0 / 2	0
Speciation	Organic Arsenic	mg/kg	0.442 / 0.442	ND	4.29	4.29	1 / 2	4.29
Speciation	Organic Selenium	mg/kg		0.651	0.651	1.83	2 / 2	1.241
Speciation	Selenate	mg/kg	0.301 / 0.428	ND	ND	ND	0 / 2	0
Speciation	Selenite	mg/kg	0.38 / 0.541	ND	ND	ND	0 / 2	0
Speciation	Selenium (from speciation lab)	mg/kg		0.651	0.651	1.83	2 / 2	1.241

Notes:
For definitions, see the Acronyms section.

Table E- 4: Residual Sediment in the Emory River Reference Reach Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum	mg/kg		12100	12100	12100	1 / 1	12100
Inorganic	Antimony	mg/kg	1.62 / 1.62	ND	ND	ND	0 / 1	0
Inorganic	Arsenic	mg/kg		4.05	4.05	4.05	1 / 1	4.05
Inorganic	Barium	mg/kg		95	95	95	1 / 1	95
Inorganic	Beryllium	mg/kg		0.973	0.973	0.973	1 / 1	0.973
Inorganic	Boron	mg/kg	6.49 / 6.49	ND	ND	ND	0 / 1	0
Inorganic	Cadmium	mg/kg	0.162 / 0.162	ND	ND	ND	0 / 1	0
Inorganic	Calcium	mg/kg		1940	1940	1940	1 / 1	1940
Inorganic	Chromium	mg/kg		12.4	12.4	12.4	1 / 1	12.4
Inorganic	Cobalt	mg/kg		13.2	13.2	13.2	1 / 1	13.2
Inorganic	Copper	mg/kg		10.4	10.4	10.4	1 / 1	10.4
Inorganic	Iron	mg/kg		15800	15800	15800	1 / 1	15800
Inorganic	Lead	mg/kg		15.1	15.1	15.1	1 / 1	15.1
Inorganic	Magnesium	mg/kg		1110	1110	1110	1 / 1	1110
Inorganic	Manganese	mg/kg		400	400	400	1 / 1	400
Inorganic	Mercury	mg/kg		0.057	0.057	0.057	1 / 1	0.057
Inorganic	Molybdenum	mg/kg	6.49 / 6.49	ND	ND	ND	0 / 1	0
Inorganic	Nickel	mg/kg		18.7	18.7	18.7	1 / 1	18.7
Inorganic	Potassium	mg/kg		1030	1030	1030	1 / 1	1030
Inorganic	Selenium	mg/kg	1.62 / 1.62	ND	ND	ND	0 / 1	0
Inorganic	Silver	mg/kg	0.811 / 0.811	ND	ND	ND	0 / 1	0
Inorganic	Sodium	mg/kg	162 / 162	ND	ND	ND	0 / 1	0
Inorganic	Strontium	mg/kg		12.1	12.1	12.1	1 / 1	12.1
Inorganic	Thallium	mg/kg	1.62 / 1.62	ND	ND	ND	0 / 1	0
Inorganic	Vanadium	mg/kg		16.5	16.5	16.5	1 / 1	16.5
Inorganic	Zinc	mg/kg		67.4	67.4	67.4	1 / 1	67.4
Physical Properties	% Ash	%	1 / 1	ND	ND	ND	0 / 1	0
Speciation	Arsenate	mg/kg		2.26	2.26	2.26	1 / 1	2.26
Speciation	Arsenic (from speciation lab)	mg/kg		2.97	2.97	2.97	1 / 1	2.97
Speciation	Arsenite	mg/kg		0.512	0.512	0.512	1 / 1	0.512
Speciation	Inorganic Arsenic	mg/kg		2.77	2.77	2.77	1 / 1	2.77
Speciation	Inorganic Selenium	mg/kg	0.453 / 0.453	ND	ND	ND	0 / 1	0
Speciation	Organic Arsenic	mg/kg	0.315 / 0.315	ND	ND	ND	0 / 1	0
Speciation	Organic Selenium	mg/kg		1.31	1.31	1.31	1 / 1	1.31
Speciation	Selenate	mg/kg	0.358 / 0.358	ND	ND	ND	0 / 1	0
Speciation	Selenite	mg/kg	0.453 / 0.453	ND	ND	ND	0 / 1	0
Speciation	Selenium (from speciation lab)	mg/kg		1.31	1.31	1.31	1 / 1	1.31

Notes:
For definitions, see the Acronyms section.

Table E- 5: Residual Sediment in the Clinch River Reach A Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum	mg/kg		23300	23300	29000	4 / 4	27025
Inorganic	Antimony	mg/kg	1.46 / 1.93	ND	1.71	1.93	2 / 4	1.82
Inorganic	Arsenic	mg/kg		15.3	15.3	33.1	4 / 4	25.65
Inorganic	Barium	mg/kg		208	208	291	4 / 4	263.3
Inorganic	Beryllium	mg/kg		1.76	1.76	2.51	4 / 4	2.263
Inorganic	Boron	mg/kg		18.4	18.4	27.5	4 / 4	24.28
Inorganic	Cadmium	mg/kg	0.146 / 0.193	ND	ND	ND	0 / 4	0
Inorganic	Calcium	mg/kg		3640	3640	4150	4 / 4	3990
Inorganic	Chromium	mg/kg		32.7	32.7	37.7	4 / 4	34.95
Inorganic	Cobalt	mg/kg		18.6	18.6	21.2	4 / 4	20.35
Inorganic	Copper	mg/kg		35.2	35.2	55.5	4 / 4	41.88
Inorganic	Iron	mg/kg		26700	26700	31700	4 / 4	30100
Inorganic	Lead	mg/kg		21.5	21.5	30.8	4 / 4	24.95
Inorganic	Magnesium	mg/kg		2190	2190	3240	4 / 4	2653
Inorganic	Manganese	mg/kg		871	871	2010	4 / 4	1323
Inorganic	Mercury	mg/kg		0.37	0.37	1.3	4 / 4	0.705
Inorganic	Molybdenum	mg/kg	5.84 / 7.71	ND	ND	ND	0 / 4	0
Inorganic	Nickel	mg/kg		31.7	31.7	35.1	4 / 4	33.53
Inorganic	Potassium	mg/kg		2960	2960	4020	4 / 4	3540
Inorganic	Selenium	mg/kg		2.56	2.56	3.5	4 / 4	3.03
Inorganic	Silver	mg/kg	0.73 / 0.964	ND	ND	ND	0 / 4	0
Inorganic	Sodium	mg/kg	146 / 173	ND	246	267	3 / 4	258.3
Inorganic	Strontium	mg/kg		54.3	54.3	166	3 / 3	120.8
Inorganic	Thallium	mg/kg	1.46 / 1.93	ND	ND	ND	0 / 4	0
Inorganic	Vanadium	mg/kg		52.8	52.8	63.8	4 / 4	60.48
Inorganic	Zinc	mg/kg		73.6	73.6	128	4 / 4	94.18
Physical Properties	% Ash	%		33	33	50	4 / 4	42.75
Speciation	Arsenate	mg/kg		7.82	7.82	21.3	4 / 4	12.05
Speciation	Arsenic (from speciation lab)	mg/kg		12.4	12.4	28.2	4 / 4	20.55
Speciation	Arsenite	mg/kg		2.74	2.74	14	4 / 4	7.655
Speciation	Inorganic Arsenic	mg/kg		11.6	11.6	24.4	4 / 4	19.7
Speciation	Inorganic Selenium	mg/kg	0.616 / 1.17	ND	ND	ND	0 / 4	0
Speciation	Organic Arsenic	mg/kg	1.71 / 3.33	ND	3.77	3.77	1 / 4	3.77
Speciation	Organic Selenium	mg/kg	0.472 / 0.783	ND	1.37	2.03	3 / 4	1.593
Speciation	Selenate	mg/kg	0.275 / 0.513	ND	ND	ND	0 / 4	0
Speciation	Selenite	mg/kg	0.616 / 1.17	ND	ND	ND	0 / 4	0
Speciation	Selenium (from speciation lab)	mg/kg		1.33	1.33	3.13	4 / 4	2.248

Notes:
For definitions, see the Acronyms section.

Table E- 6: Residual Sediment in the Clinch River Reach B Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum	mg/kg		24700	24700	32500	4 / 4	28450
Inorganic	Antimony	mg/kg	1.62 / 1.76	ND	1.69	2.05	3 / 4	1.927
Inorganic	Arsenic	mg/kg		26.2	26.2	31	4 / 4	28.6
Inorganic	Barium	mg/kg		275	275	306	4 / 4	283.5
Inorganic	Beryllium	mg/kg		2.32	2.32	2.53	4 / 4	2.485
Inorganic	Boron	mg/kg		23.5	23.5	31.5	4 / 4	27.68
Inorganic	Cadmium	mg/kg	0.162 / 0.176	ND	ND	ND	0 / 4	0
Inorganic	Calcium	mg/kg		4090	4090	4420	4 / 4	4270
Inorganic	Chromium	mg/kg		32.8	32.8	41.2	4 / 4	36.2
Inorganic	Cobalt	mg/kg		18.3	18.3	21.8	4 / 4	19.68
Inorganic	Copper	mg/kg		31.6	31.6	41.6	4 / 4	37.35
Inorganic	Iron	mg/kg		26400	26400	35300	4 / 4	29600
Inorganic	Lead	mg/kg		21.7	21.7	25	4 / 4	23.88
Inorganic	Magnesium	mg/kg		2340	2340	2910	4 / 4	2680
Inorganic	Manganese	mg/kg		932	932	1580	4 / 4	1191
Inorganic	Mercury	mg/kg		0.22	0.22	0.76	4 / 4	0.51
Inorganic	Molybdenum	mg/kg	6.5 / 7.03	ND	ND	ND	0 / 4	0
Inorganic	Nickel	mg/kg		31.9	31.9	38.1	4 / 4	33.75
Inorganic	Potassium	mg/kg		3090	3090	4900	4 / 4	4098
Inorganic	Selenium	mg/kg		2.81	2.81	3.41	4 / 4	3.155
Inorganic	Silver	mg/kg	0.812 / 0.879	ND	ND	ND	0 / 4	0
Inorganic	Sodium	mg/kg		247	247	340	4 / 4	288
Inorganic	Strontium	mg/kg		136	136	162	4 / 4	149.3
Inorganic	Thallium	mg/kg	1.62 / 1.76	ND	ND	ND	0 / 4	0
Inorganic	Vanadium	mg/kg		60.9	60.9	67.1	4 / 4	63.95
Inorganic	Zinc	mg/kg		78.6	78.6	89.5	4 / 4	84.5
Physical Properties	% Ash	%		29	29	43	4 / 4	38.25
Speciation	Arsenate	mg/kg		8.86	8.86	16.1	4 / 4	12.04
Speciation	Arsenic (from speciation lab)	mg/kg		14	14	25.8	4 / 4	19.98
Speciation	Arsenite	mg/kg		5.59	5.59	14.6	4 / 4	10.16
Speciation	Inorganic Arsenic	mg/kg		14.4	14.4	26.6	4 / 4	21.2
Speciation	Inorganic Selenium	mg/kg	0.495 / 1.03	ND	ND	ND	0 / 4	0
Speciation	Organic Arsenic	mg/kg	2.93 / 3.94	ND	ND	ND	0 / 4	0
Speciation	Organic Selenium	mg/kg		0.873	0.873	2.07	4 / 4	1.688
Speciation	Selenate	mg/kg	0.294 / 0.429	ND	ND	ND	0 / 4	0
Speciation	Selenite	mg/kg	0.495 / 1.03	ND	ND	ND	0 / 4	0
Speciation	Selenium (from speciation lab)	mg/kg		1.59	1.59	3.01	4 / 4	2.528

Notes:
For definitions, see the Acronyms section.

Table E- 7: Residual Sediment in the Clinch River Reference Reach Locations

Group	Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Inorganic	Aluminum	mg/kg		6910	6910	6910	1 / 1	6910
Inorganic	Antimony	mg/kg	1.13 / 1.13	ND	ND	ND	0 / 1	0
Inorganic	Arsenic	mg/kg		47.4	47.4	47.4	1 / 1	47.4
Inorganic	Barium	mg/kg		33.1	33.1	33.1	1 / 1	33.1
Inorganic	Beryllium	mg/kg	0.45 / 0.45	ND	ND	ND	0 / 1	0
Inorganic	Boron	mg/kg		6.37	6.37	6.37	1 / 1	6.37
Inorganic	Cadmium	mg/kg	0.113 / 0.113	ND	ND	ND	0 / 1	0
Inorganic	Calcium	mg/kg		848	848	848	1 / 1	848
Inorganic	Chromium	mg/kg		31.9	31.9	31.9	1 / 1	31.9
Inorganic	Cobalt	mg/kg		8.04	8.04	8.04	1 / 1	8.04
Inorganic	Copper	mg/kg		4.53	4.53	4.53	1 / 1	4.53
Inorganic	Iron	mg/kg		35300	35300	35300	1 / 1	35300
Inorganic	Lead	mg/kg		20.6	20.6	20.6	1 / 1	20.6
Inorganic	Magnesium	mg/kg		675	675	675	1 / 1	675
Inorganic	Manganese	mg/kg		691	691	691	1 / 1	691
Inorganic	Mercury	mg/kg		0.59	0.59	0.59	1 / 1	0.59
Inorganic	Molybdenum	mg/kg	4.5 / 4.5	ND	ND	ND	0 / 1	0
Inorganic	Nickel	mg/kg		4.57	4.57	4.57	1 / 1	4.57
Inorganic	Potassium	mg/kg		710	710	710	1 / 1	710
Inorganic	Selenium	mg/kg	1.13 / 1.13	ND	ND	ND	0 / 1	0
Inorganic	Silver	mg/kg	0.563 / 0.563	ND	ND	ND	0 / 1	0
Inorganic	Sodium	mg/kg	113 / 113	ND	ND	ND	0 / 1	0
Inorganic	Strontium	mg/kg	4.5 / 4.5	ND	ND	ND	0 / 1	0
Inorganic	Thallium	mg/kg	1.13 / 1.13	ND	ND	ND	0 / 1	0
Inorganic	Vanadium	mg/kg		40.9	40.9	40.9	1 / 1	40.9
Inorganic	Zinc	mg/kg		47.7	47.7	47.7	1 / 1	47.7
Physical Properties	% Ash	%		1	1	1	1 / 1	1
Speciation	Arsenate	mg/kg		17.4	17.4	17.4	1 / 1	17.4
Speciation	Arsenic (from speciation lab)	mg/kg		18.9	18.9	18.9	1 / 1	18.9
Speciation	Arsenite	mg/kg		7.19	7.19	7.19	1 / 1	7.19
Speciation	Inorganic Arsenic	mg/kg		24.6	24.6	24.6	1 / 1	24.6
Speciation	Inorganic Selenium	mg/kg	0.392 / 0.392	ND	ND	ND	0 / 1	0
Speciation	Organic Arsenic	mg/kg	2.59 / 2.59	ND	ND	ND	0 / 1	0
Speciation	Organic Selenium	mg/kg	0.474 / 0.474	ND	ND	ND	0 / 1	0
Speciation	Selenate	mg/kg	0.31 / 0.31	ND	ND	ND	0 / 1	0
Speciation	Selenite	mg/kg	0.392 / 0.392	ND	ND	ND	0 / 1	0
Speciation	Selenium (from speciation lab)	mg/kg	0.474 / 0.474	ND	ND	ND	0 / 1	0

Notes:
For definitions, see the Acronyms section.