REDACTED

Record of Decision

Operable Unit 4
Anniston PCB Site
Anniston, Calhoun County, Alabama

U. S. Environmental Protection Agency, Region 4
Atlanta, Georgia
December 2024

TABLE OF CONTENTS

APPENDICES

ACRONYMS AND ABBREVIATIONS

ADEM	Alabama Department of Environmental Management
AHWMMA	Alabama Hazardous Waste Management and Minimization Act
APCO	Alabama Power Company
AR	Administrative Record
ARAR	applicable or relevant and appropriate requirement
AHR	aryl hydrocarbon receptor
ASM	Adaptive Site Management
AWQC	Ambient Water Quality Criteria
BAF	bioaccumulation factor
BaPE	benzo(a)pyrene equivalents
bgs	below ground surface
BMPs	Best Management Practices
BSA	biological sampling area
CA	characterization area
CAA	Clean Air Act
CAG	Community Advisory Group
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
C.F.R.	Code of Federal Regulations
CO2e	carbon dioxide equivalents
COC	chemical of concern
COI	chemicals of interest
COPC	chemical of potential concern
CSF	cancer slope factor
CSM	conceptual site model
CTC	critical tissue concentration
CWA	Clean Water Act
DSP	dredge spoil piles alternative
EA	evaluation area
EECA	engineering evaluation and cost analysis
EPA	United States Environmental Protection Agency
EPC	exposure point concentration
ESD	Explanation of Significant Differences
FS	feasibility study
GC/ECD	Gas Chromatography/Electron Capture Detector
GC/MS	gas chromatography/mass spectrometry
gpm	gallons per minute
GW	groundwater
HDPE	high-density polyethylene
HHRA	human health risk assessment

HI	hazard index
HQ	hazard quotient
IC	institutional control
IM	interim measure
IROD	Interim Record of Decision
LOAEL	lowest observed adverse effect level
MCL	maximum contaminant level
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg	milligram(s)
mg/kg	milligrams per kilogram
mg/kg-day	milligrams per kilogram per day
mgd	million gallons per day
MMBtu	million British Thermal Units
MNR	monitored natural recovery
mph	miles per hour
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ng/kg	nanograms per kilogram
ng/m^3	nanograms per cubic meter
NOAEL	no observed adverse effect level
NPL	National Priorities List
NRS	non-residential soil alternative
NTC	Non-Time-Critical
NTCRA	Non-Time-Critical Removal Action
O&M	Operation &Maintenance
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
P/S	Pharmacia LLC and Solutia Inc.
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCD	Partial Consent Decree
PCDD/DFs	polychlorinated dibenzo-p-dioxin and dibenzofurans
PDI	predesign investigation
PEC	probable effect concentration
pg/m^3	picograms per cubic meter
PNCB	para nitrochlorobenzene
PNP	para-nitrophenol
POTW	Publicly Owned Treatment Works
ppm	parts per million
PTW	Principal Threat Waste
PRG	preliminary remedial goal
PRPs	Potentially Responsible Parties
PUF	Polyurethane Foam
PVC	polyvinyl chloride

QAPP	Quality Assurance Project Plan
RAL	remedial action level
RAO	remedial action objective
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RfC	reference concentration
RfD	reference dose
RGOs	Remedial Goal Options
RI	remedial investigation
RME	reasonable maximum exposures
ROD	Record of Decision
RS	residential soil alternative
RSL	Regional Screening Level(s)
SAA	Superfund Alternative Approach
SED	sediment and creek bank alternative
SERA	Streamlined Ecological Risk Assessment
SESD	Science and Ecosystem Support Division
Site	Anniston PCB Site
SLERA	Screening-Level Ecological Risk Assessment
SSAP	Site Sampling and Analysis Plan
SSRBC	Site-Specific Risk-Based Concentration
SSSMA	South Staging and Soil Management Area
SVOC	semi-volatile organic compounds
T&E	Threatened and Endangered
TEC	threshold effect concentration
TEQ	2,3,7,8-tetrachlorodibenzo-p-dioxin equivalent
TOC	total organic carbon
TRV	Toxicity Reference Value
TSCA	Toxic Substances Control Act
TSS	total suspended solids
UCL	upper confidence limit
UWDA	unapproved waste disposal area
VOC	volatile organic compound
VSP	Visual Sample Plan

PART 1: DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

The Anniston PCB Site (the Site) is located in and around the City of Anniston, and areas of Calhoun and Talladega Counties in Alabama. The Site is currently divided into Operable Units (OUs). This Record of Decision is for OU4, which includes Snow Creek and its floodplain downstream of Highway 78 to the confluence of Snow and Choccolocco Creeks, and Choccolocco Creek from the backwater area upstream of Snow Creek to the embayment of Logan Martin Lake on the Coosa River. The Superfund site identification number is ALD000400123.

STATEMENT OF BASIS AND PURPOSE

This decision document, or Record of Decision (ROD), presents the Selected Remedy for OU4 of the Anniston PCB Site, in Anniston, Alabama, which was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), 42 U.S.C. § 9601 et seq., and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision is based on the administrative record (AR) for the Site.

The State of Alabama, as represented by the Alabama Department of Environmental Management (ADEM), has received the reports which are included in the Administrative Record (AR) for the Site. In accordance with 40 C.F.R. § 300.430, the United States Environmental Protection Agency Region 4 (EPA) sought input from ADEM during the remedial selection process in view of obtaining state acceptance.

ASSESSMENT OF THE SITE

The response action selected in this ROD is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances from OU4 of the Anniston PCB Site into the environment.

DESCRIPTION OF THE SELECTED REMEDY

This action is the third remedial action selected for the Anniston PCB Site. The OU4 Selected Remedy includes:

- Excavate polychlorinated biphenyls (PCBs) contamination greater than 1 mg/kg in surface soil (0 to 12“) on one residential property, including offsite disposal of contaminated soil, and backfilling with clean soil;

- Adopt Resource Conservation and Recovery Act, as amended (RCRA) corrective action interim measures (IMs) previously implemented at Oxford Lake Park softball fields, the softball field’s parking lot, the tennis court complex, and the southwest portion of the park (with the infrastructure improvement of adding the Miracle Field) as final remedies (ROD Part 2, Figure 5);

- Excavate floodplain soil in 0–6 inches soil horizon (ROD Part 2, Figure 39), backfill excavated areas, and dispose of contaminated soil offsite; and

- Implement creek bank soil stabilization in contaminated areas with minor, moderate, and severe erosion (ROD Part 2, Figure 40), dredging of sediment in high- and low-energy areas (ROD Part 2, Figures 41 and 42), backfill dredged areas, dispose of excavated soil and dredged sediment offsite, monitor natural recovery of sediment, and conduct long-term monitoring.

- Institutional Controls (ICs) will be implemented, including a Soil Management Plan, to: (1) protect human health and the environment by limiting exposure to PCB impacted soil left in place and (2) protect the long-term integrity of the engineered components of the Selected Remedy. An Institutional Control Implementation and Assurance Plan (ICIAP) will be developed during remedial design which will, at a minimum, set out the specifics of the ICs and measures that will be implemented to achieve the two objectives and identify who will be responsible for implementing, enforcing and monitoring each IC.

The total estimated net present value cost (discounted at seven percent) of the Selected Remedy is $85.2 million (M), $71 M in capital costs and $14.2M in total O&M costs.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that the EPA will use treatment to address the principal threats posed at a site wherever practicable (40 C.F.R. § 300.430[a][1][iii][A]). Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. Principal threat waste (PTW) due to elevated PCB concentrations was identified in OU4 sediment and will be addressed through stabilization with portland cement which is considered an immobilization treatment. No PTW was identified in contaminated OU4 soil. All the sediment alternatives address a portion of sediment classified as PTW, or sediment with PCB concentrations greater than 500 mg/kg, which is considered highly toxic and potentially mobile. This concentration was considered PTW in previous OUs and the definition is applied to a small quantity of sediment in OU4. The estimated quantity of PTW in sediment is 228 CY, located in the backwater area (reach C2).

STATUTORY DETERMINATIONS

Remedial actions must meet the requirements set forth in Section 121 of CERCLA, 42. U.S.C. § 9621, and the NCP at 40 C.F.R. § 300.430(f)(1)(ii) to be protective of human health and the environment, comply with federal and more stringent state environmental requirements that are applicable or relevant and appropriate to the remedial action (i.e., ARARs), be cost effective, and utilize permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

This Selected Remedy is protective of human health and the environment; complies with federal and state environmental requirements that are legally applicable or relevant and appropriate to the action, and is cost-effective. A waiver is not necessary for any of the ARARs identified for the selected remedy. This remedy also satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment) through stabilization of PCB contaminated sediments with elevated concentrations of PCBs. Because this Selected Remedy will result in hazardous substances remaining onsite above levels that allow for unlimited use and unrestricted exposure, a statutory review per CERCLA section 121(c) is required within five years after initiation of the first remedial action to ensure that the remedy is, or will be, protective of human health and the environment. The first five-year review for the Anniston PCBs Site was triggered by the OU3 remedial action start, and it was signed in September 2020.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the AR file for this Site.

- Contaminants of Concern (COCs) and their respective concentrations are in Section 5, "Summary of Site Characteristics."
- Baseline risks for human health and the environment represented by the COCs are in Section 7, "Summary of Site Risks."
- Cleanup levels established for COCs and the basis for these levels are in Section 8, ''Remedial Action Objectives and Cleanup Levels."
- How source materials or highly toxic materials that are Principal Treat Waste (PTW) are addressed is in Sections 12, "Selected Remedy".
- Current and reasonably anticipated future use assumptions used in the baseline risk assessment and ROD are in Section 6, "Current and Potential Future Land and Resource Uses."
- Estimated capital, operation and maintenance (O&M), and total present value costs, discount rate, and the number of years over which the remedy cost estimates are projected are in Section 12.3. "Estimated Selected Remedy Costs."
- Key factors that led to selecting the remedy (i.e., how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decisions) are in Section 10, "Comparative Evaluation of Alternatives, and Section 13, "Statutory Determinations."

AUTHORIZING SIGNATURE

CAROLINE FREEMAN Digitally signed by CAROLINE FREEMAN Date: 2024.12.20 11:27:57 -05'00'

12/20/2024

Caroline Y. Freeman, Director
Superfund & Emergency Management Division
U.S. Environmental Protection Agency, Region 4

Date

PART 2: DECISION SUMMARY

This Decision Summary provides a description of the site-specific factors and analyses that led to the selection of a remedy for Operable Unit (OU) 4 of the Anniston PCB Site.

1. SITE NAME, LOCATION, AND BRIEF DESCRIPTION

The Anniston PCB Site (the Site) consists of residential, commercial/industrial, and public properties located in and around Anniston, Oxford, Hobson City, and areas of Calhoun and Talladega Counties in Alabama, which contain hazardous substances, including but not limited to polychlorinated biphenyls (PCBs). The primary source of contamination was a former PCB production process located at a chemical manufacturing facility (the Facility) in Anniston, Alabama. The Site includes the Facility and areas where PCBs and other contaminants (e.g. mercury) have migrated off the Facility property at levels that pose unacceptable risk to human health and the environment. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) identification number for the Site is ALD 000400123.

The Site has been divided into several OUs which were selected based on geographic location and complexity (Figure 1). OU1/OU2 is a combination of two OUs that address residential properties (OU1) and non-residential properties (OU2) located around the Facility currently owned by Solutia Inc. (Solutia), and downstream along Snow Creek to Highway 78. OU3 is Solutia's Anniston Facility and its adjacent closed landfills, the South Landfill and the West End Landfill. OU4 includes Snow Creek and its floodplain downstream of Highway 78 to the confluence of Snow and Choccolocco Creeks, and Choccolocco Creek from the backwater area upstream of Snow Creek to the embayment of Logan Martin Lake on the Coosa River.

This decision document describes the remedial alternatives evaluated to address Site contamination in OU4 and provides the rationale for the United States Environmental Protection Agency's (the EPA's) Selected Remedy. The EPA in consultation with the Alabama Department of Environmental Management (ADEM) selected the remedy to address Site contamination after reviewing and considering the comments submitted during the public comment period.

The Site is a Superfund Alternative Approach (SAA) site. An SAA site is a site that needs a remedial action, and where site contaminants are significant enough that the site is eligible for, but not listed on, the National Priorities List (NPL). SAA sites must also have cooperative financially viable and technically capable potentially responsible parties (PRPs) that are willing to perform the cleanup work under a settlement agreement with the EPA. The EPA expects to enter into a Consent Decree (CD) with the PRPs, Pharmacia LLC and Solutia Inc. (P/S), for performance of the Selected Remedy.

This Record of Decision (ROD) is only for OU4. The EPA has signed two other decision documents prior to this ROD: an Interim ROD was signed for OU3 in September 2011; and a Final ROD was signed for OU1/OU2 in November 2017. This Record of Decision includes background information about OU4, the nature and extent of contamination found, the assessment of human health and environmental risks posed by contaminants, the identification and evaluation of remedial action alternatives, and selects a remedial action.

Activities for OU4 included the investigation of approximately 37 miles of Snow and Choccolocco Creeks and 6,000 acres of floodplain (Figure 1). Of the 6,000 acres of floodplain, approximately 1,500 acres are part of a Conservation Corridor that was developed to protect and enhance water quality in Choccolocco Creek and the downstream portion of Snow Creek by limiting development and agricultural practices near the creek. OU4 also includes a limited number of properties in residential use.

2. SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.1 Manufacturing History

The primary source of contamination in OU4 is a former PCB manufacturing Facility that operated from 1929 to 1971. The Facility is still active and operates, producing phosphate ester-based non-flammable hydraulic fluids in accordance with a variety of environmental permits.

PCB mixtures (trade named Aroclors) were produced by reacting chlorine and biphenyl. Chlorine was produced at the Facility between 1952 and 1969 solely for this purpose, using a chlor alkali mercury cell process. The manufacture of PCBs generated miscellaneous production-related wastes which were disposed in onsite waste management areas including landfills located on the Facility.

2.2 Regulatory History

The Facility is currently operated in accordance with a variety of permits issued under provisions of the Clean Air Act (CAA), Clean Water Act (CWA), Resource Conservation and Recovery Act (RCRA), and their state counterparts. There have been a number of investigations and corrective measures taken over the years to reduce environmental impacts from the Facility.

Under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the EPA negotiated a Partial Consent Decree (PCD) with Pharmacia LLC and Solutia Inc., the entity's created to manage corporate liability from PCB contamination, to investigate PCB contamination and any other contamination that may have been released from the Facility. The United States lodged the draft Partial Consent Decree (PCD) with the United States District Court for the Northern District of Alabama (the Court) on March 25, 2002. The United States held a public comment period for the draft PCD from April 4, 2002 to June 3, 2002. On October 18, 2002, the United States lodged the Revised PCD with the court. After several hearings, the court entered the Revised PCD on August 4, 2003. On July 6, 2006, the United States and P/S entered into a Stipulation and Agreement Clarifying the Partial Consent Decree (Stipulation), whereby P/S agreed to, among other things, waive their right to suspend work under the PCD.

On September 29, 2011, the EPA signed an Interim Record of Decision (IROD) for OU3 (the Facility). P/S agreed to implement the requirements of the IROD in a Consent Decree (CD) that was approved by the Court on April 17, 2013. On November 8, 2017, the EPA signed a ROD for OU1/OU2 (residential and

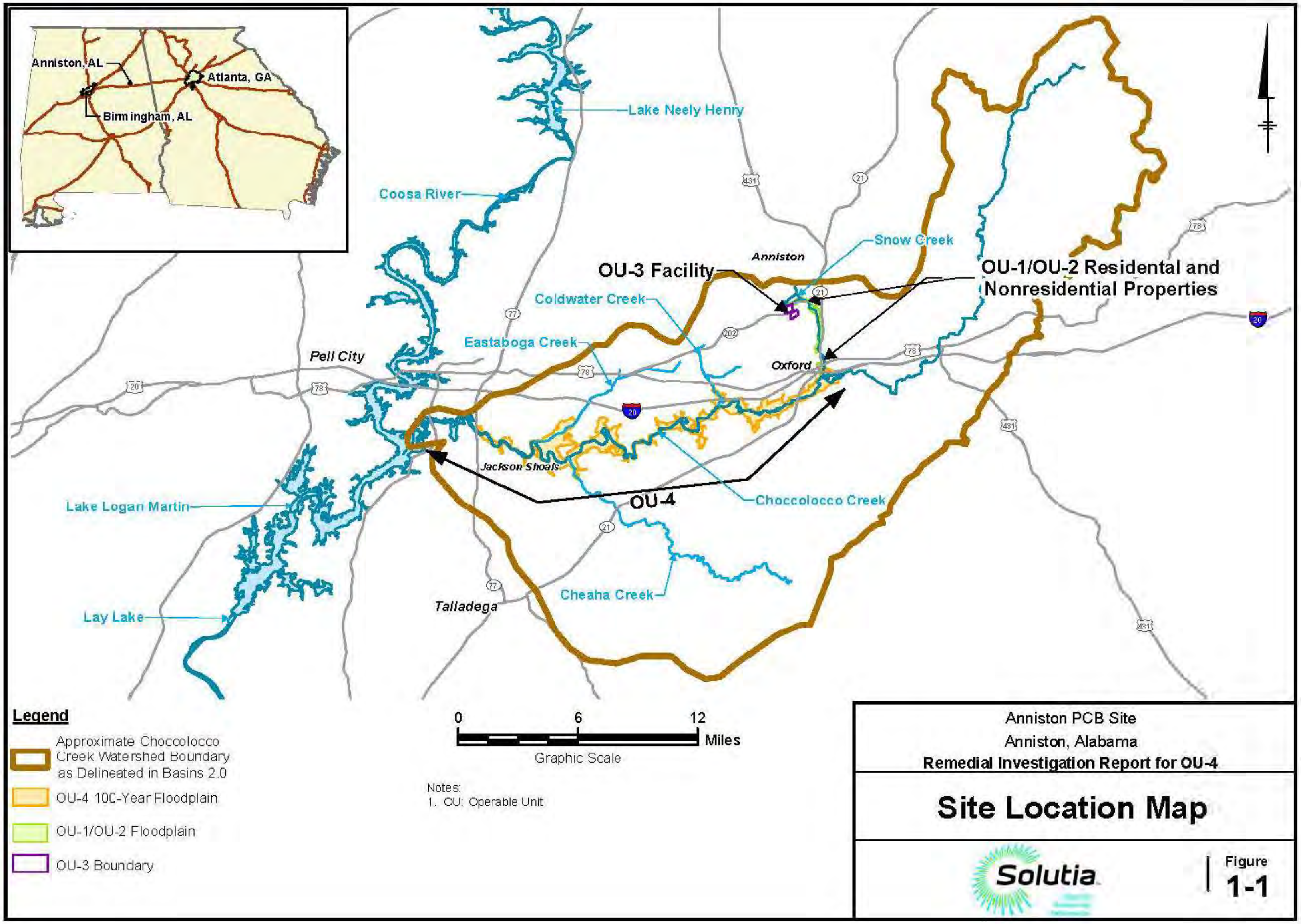

Figure 1. Site Location Map and Operable Units

nonresidential properties along Snow Creek). P/S and MRC Corporation (MRC) agreed to implement the requirements of the OU1/OU2 ROD in two CDs, one with MRC entered by the Court on December 16, 2019, and another with P/S entered by the Court on March 26, 2021.

2.3 Previous Response Actions on Residential Properties in OU4

In 2000, a time critical removal action (TCRA) was initiated by EPA to address soil contaminated with PCB concentrations greater than 10 mg/kg on residential properties. In 2004, an Action Memorandum for a non-time critical removal action (NTCRA) selected excavation and disposal of PCB contaminated surface soil (0 to 12 inches below ground surface [bgs]) at or above 1 milligram per kilogram (mg/kg) and PCB contaminated subsurface soil (greater than 12 inches bgs) at or above 10 mg/kg on residential properties. Soil with PCB concentrations less than 10 mg/kg was disposed at one of the two soil management areas located near the Facility (i.e., central site soil management area or south site soil management area). Soil with PCB concentrations greater than 10 mg/kg was disposed offsite at an EPA approved permitted facility.

Most of the residential cleanup was performed in areas around the Facility and along Snow Creek. OU4 is significantly less developed and includes more open space and far fewer residential areas than upstream areas (i.e., OU1/OU2). In total, 59 residential properties were sampled for PCBs in surface soil in OU4. A total of 20 of the 59 properties sampled contained PCB concentrations at or above 1 mg/kg and were targeted for cleanup under the NTCRA. The EPA oversaw the PRP’s excavation of soil from 19 of the residential properties. One property owner denied access, so there is one remaining residential property that has PCBs in soil above 1 mg/kg in OU4 that will be addressed by the Selected Remedy. The properties sampled and cleaned up in OU4 are on Figures 4-6a-j in the Feasibility Study.

2.4 Previous Response Actions on Non-residential Properties in OU4

Response actions have been implemented to reduce exposure to PCBs in surface soil and potential migration of PCBs from non-residential areas of OU4. The actions include RCRA Final Corrective Measures, RCRA Interim Measures (IMs), and infrastructure improvement support activities. Generally, cleanups finalized under the RCRA Final Corrective Measures will substantively satisfy the requirements of both RCRA and CERCLA programs. The protectiveness of the RCRA IMs needs to be finalized under CERCLA. PCB concentrations found in the dredge spoil IM areas of the Choccolocco Creek floodplains and PCBs remaining after implementation of infrastructure improvement support projects overseen under an additional work clause in the 2001 TCRA in the Snow Creek and Choccolocco Creek floodplains were evaluated as part of the non-residential soil investigation in OU4. The locations of response actions previously taken in OU4 are shown on Figure 2 and are described below.

2.4.1 RCRA Final Corrective Measures

Generally, cleanups finalized under the RCRA corrective action (i.e., final corrective measures) will substantively satisfy the requirements of both RCRA and CERCLA programs in terms of protection of human health and the environment. The measures are described below.

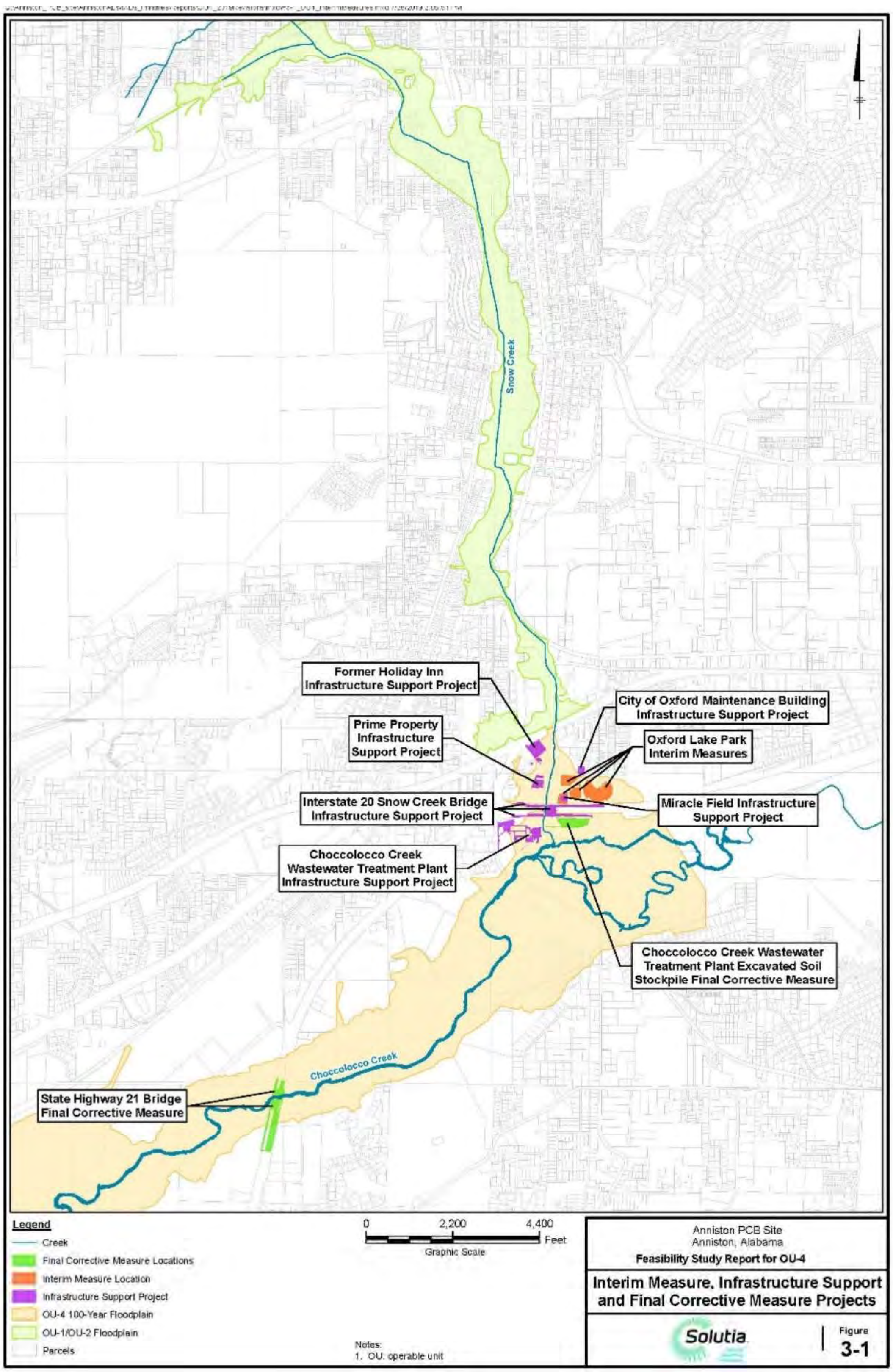

Figure 2. Location of Previous Response Actions Taken in OU4

2.4.1.1 Highway 21 Bridge

Final corrective measures were implemented to address PCB contaminated soil prior to Alabama Department of Transportation (ALDOT) construction of a bridge replacement at State Highway 21 and Choccolocco Creek, located in both Talladega and Calhoun Counties, Alabama. ADEM approved onsite containment and isolation (by capping) of soil with PCB concentrations between 1 and 50 mg/kg and excavation and offsite disposal of soil with PCB concentrations greater than or equal to 50 mg/kg. Support included sampling and analyses of soil and sediment prior to construction in the proposed excavation footprints to characterize PCB concentrations. A deed notice and associated survey plats, providing for the long-term monitoring and maintenance of the controls, were filed with Calhoun and Talladega Counties as required by the RCRA Permit. Corrective measures effectiveness reports are submitted annually to ADEM to document continued monitoring and maintenance.

2.4.1.2 Choccolocco Creek Wastewater Treatment Plant (CCWWTP) Soil Stockpile

A final corrective measure was implemented to address a soil stockpile with PCBs located at the CCWWTP in Oxford, Calhoun County, Alabama. The stockpile contained soil excavated from the floodplain of Snow Creek during the construction of detention basins at the CCWWTP. The stockpile was relocated in a final corrective measure to a 16-acre parcel located to the east of Snow Creek. The EPA's Toxic Substances Control Act (TSCA) program approved the plan to place a cap over materials with PCB concentrations greater than or equal to 50 mg/kg, under Section 6(e) of TSCA and the PCB regulations provided in 40 CFR Section 761.61(c). The approval specifically noted that the PCB concentrations ranged from non-detect to approximately 200 mg/kg but averaged less than 50 mg/kg. A deed restriction was filed outlining the site conditions, appropriate site restrictions, and an as-built survey that indicates the location of the cover system with respect to survey benchmarks. Long-term monitoring is conducted in accordance with the Comprehensive Operations and Maintenance Plan for Remedial/Corrective Action Projects. The monitoring consists of inspecting the final corrective measure (monthly and following significant storm events) with maintenance conducted as needed based on the findings of the inspections. Annual effectiveness reports are submitted to ADEM summarizing inspection and maintenance activities and documenting the effectiveness of the final corrective measure.

2.4.2 RCRA Interim Measures

Interim Measures in OU4 were performed at the Oxford Lake Park and Choccolocco Creek dredge spoil areas. Those measures are described below.

2.4.2.1 Oxford Lake Park IMs

IMs were implemented to address PCB contaminated soil at the Oxford Lake Park (OLP) located in Oxford, Alabama. The objectives of these improvements were to mitigate potential exposure to contaminated soil and to control erosion and transport of PCB contaminated soil. The IMs at OLP include the following:

- PCB contaminated surface soil was removed from three softball fields (Fields A, C, and D) and replaced with clean fill and vegetation as needed.

- Excavated soil with PCB concentrations less than 50 mg/kg were capped for use as a parking lot in the western portion of the park complex.
- The constructed tennis court complex IM covers approximately two-acres and includes eight tennis courts, an adjacent parking lot, and a small utility building in the parking lot. The IM at the tennis court complex and an adjacent parking lot included covering PCB contaminated soil beneath with a soil cover and asphalt to facilitate the intended end uses. As part of the IM, minor soil excavations were conducted to facilitate installation of posts for lighting and the tennis court nets. Sampling indicated that the excavated soil had PCB concentrations below 50 mg/kg.
- A 1.8-acre area in the southwestern portion of the park complex, south of Recreation Drive and west of the softball field parking lot, was covered with geotextile fabric, compacted fill, and vegetated topsoil. The Miracle Field was later constructed as an infrastructure improvement project over a portion of the 1.8-acre soil cover.

2.4.2.2 Choccolocco Creek Dredge Spoil Areas (DSAs)

Between 1990 and 1994, the National Resources Conservation Service (NRCS) implemented flood protection measures, including dredging sediment to improve stream flows along Choccolocco Creek near Oxford, Alabama. Dredge spoils from Choccolocco Creek were deposited in existing depressions or areas above grade and near the creek. These dredge spoils were stabilized and covered with topsoil and a vegetative cover. Nineteen dredge spoil deposition areas were identified along the banks of Choccolocco Creek between its confluence with Snow Creek and Coldwater Creek. Reconnaissance during the Remedial Investigation (RI) found 18 of the 19 dredge spoil areas had a well-established vegetative cover, and no evidence of slumping or instability issues. One area had been deliberately disturbed to create a drainage swale but was appropriately addressed with the property owner by the Land Trust, which holds a conservation easement on the property.

2.4.3 Infrastructure Improvement Project Support:

Several property owners/utilities performed infrastructure improvement projects in the floodplain that required the PRPs involvement to ensure PCB impacted soil was handled and disposed of appropriately. Data from the projects are used to inform floodplain concentrations. Those projects include:

- Lighting and drainage upgrades to the Oxford Lake Softball Complex;
- Construction of a Miracle Field over an IM cover;
- Treatment system upgrades at the Choccolocco Creek Wastewater Treatment Plant (CCWWTP);
- Foundation improvements at a parcel owned by Prime Properties, LLC;
- Widening and bridge construction of I-20;
- Parcel improvements for the former Holiday Inn property; and
- Parcel improvements for the City of Oxford to construct a maintenance garage at OLP.

3. COMMUNITY PARTICIPATION

Since 2000, the EPA and Solutia have been working to keep the community, governmental entities, the Community Advisory Group, the Technical Advisor, the United States District Court for the Northern District of Alabama, and all other interested parties informed about Site activities. Information has been disseminated through websites, fact sheets, open houses, availability meetings, and public meetings.

The Anniston PCB Site OU4 Administrative Record (AR) including the Remedial Investigation (RI) Report, Feasibility Study (FS) Report, Human Health Risk Assessment (HHRA), Baseline Ecological Risk Assessment (BERA), BERA Addendum, FS Addendum, and Proposed Plan were released to the public on May 31, 2024. These documents along with other documents were considered in selecting the OU4 remedy. A copy of the OU4 AR can be found at the website, https://www.epa.gov/superfund/anniston-pcb-site. Notices about the availability of these documents were in *The Anniston Star* three times (May 30, 2024, June 12, 2024, and July 17, 2024).

A 30-day public comment period was planned, but the EPA received a request from members of the Community Advisory Group to extend the comment period for an additional 30 days so that the community would have time to review the documents. The 60-day comment period began June 1, 2024, and ended July 30, 2024. The EPA's response to the comments are included in Part 3 of this ROD.

The EPA presented its preferred remedy for OU4 of the Anniston PCB Site during two public meetings. On Tuesday, June 18, 2024, the Proposed Plan was presented at the Oxford Civic Center, 401 McCullars Lane, Oxford, Alabama. On Tuesday, July 23, 2024, the Proposed Plan was again presented at the Oxford Civic Center. At these meetings, representatives of the EPA and Solutia answered questions about sampling results in OU4, the baseline risk assessments, and the remedial alternatives under consideration. Transcripts of the meetings are available in Appendix F. The EPA hosted public availability sessions to help the community understand the Proposed Plan. The first session was on Saturday, June 22, 2024, at the Anniston Meeting Center located at 1615 Noble Street in Anniston, Alabama. The second session was on Saturday, July 20, 2024, at the Lincoln City Center located at 140 Jones Street in Lincoln, Alabama.

The EPA mailed hundreds of fact sheets describing the Proposed Plan and preferred alternative to OU4 property owners. The pre-recorded presentation was also provided at the EPA website https://www.epa.gov/superfund/anniston-pcb-site for those people who were unable to attend the public meetings.

4. SCOPE AND ROLE OF THE OPERABLE UNIT

The Site has been divided into several OUs, which were selected based on geographic location and complexity. OU1/OU2 includes residential and non-residential properties around the Facility and downstream along Snow Creek and its floodplain to Highway 78. OU3 includes the Facility and two adjacent landfills located at 702 Clydesdale Avenue, Anniston, Alabama. OU4, the subject of this

Record of Decision, consists of Snow Creek and its floodplain downstream of Highway 78 to the confluence of Snow and Choccolocco Creeks, and Choccolocco Creek from the backwater area upstream of Snow Creek to the embayment of Logan Martin Lake on the Coosa River. The EPA may identify other OUs for the Anniston PCB Site after data from OU4 and any other studies become available and are reviewed.

The EPA has already selected the following response actions to reduce the risk to residents first, then to reduce the sources at the Facility, followed by downstream areas in OU1/OU2.

Actions taken in OU1/OU2

- CERCLA Time-Critical Removal Action (October 2001) and NTCRA (February 2004) to address residential soil PCB contamination in surface and subsurface soil. Soil contaminated with PCB concentrations greater than 1 mg/kg was identified on 632 properties. Soil removal has been performed on 584 of these properties. Twelve (12) properties remain unremediated due to access issues and 36 properties are wooded/overgrown and not prioritized for removal until clearing is needed for development.
- Record of Decision for OU1/OU2 (Snow Creek and its floodplain from the Facility downstream to Highway 78) dated November 8, 2017.

  The selected remedy consists of the following:
  - Excavation with onsite and offsite disposal of PCB contaminated soil from residential and special use properties (i.e., schools, churches, day-care centers, community centers, playgrounds, and parks);
  - Incorporation as CERCLA remedies all the interim corrective measures implemented at OU1/OU2 under ADEM's RCRA oversight, as well as the non-time critical removal action and any IMs implemented under the EPA's CERCLA oversight, prior to issuance of this ROD;
  - Excavation and offsite disposal of additional PCB contaminated soil around the IM areas to make the IMs protective over the long-term;
  - Removal and offsite disposal of soil in four (4) dredge spoil piles adjacent to Snow Creek;
  - Containment of contamination in unapproved waste disposal areas at locations west and east of the Facility, where auto fluff waste was found mixed with significant PCB and lead contamination in soil;
  - Excavation on other non-residential properties, such as commercial/industrial properties, to meet the non-residential surface soil cleanup levels for PCBs (21 mg/kg), chromium (382 mg/kg), PAHs (153 mg/kg), and polychlorinated dibenzo-pdioxin and dibenzofuran (PCDD/PCDF) and / dioxin like (DL)-PCBs toxic equivalency (TEQ) (0.73 µg/kg) and offsite disposal of contaminated soil at approved facilities;
  - Excavation of PCB PTW in soil at well T-11, installation of a low permeability cap, and groundwater extraction and treatment for PCBs in groundwater (0.5 µg/L), discharge of treated groundwater to Snow Creek, and offsite disposal of contaminated soil at approved facilities is required;

- Excavation of contaminated sediment to meet sediment cleanup levels for PCBs (3 mg/kg), barium (322 mg/kg), chromium (111 mg/kg), cobalt (59 mg/kg), lead (128 mg/kg), manganese (1,100 mg/kg), mercury (1 mg/kg), nickel (46 mg/kg), and vanadium (41 mg/kg), offsite sediment disposal; stabilization of 1,400 linear feet of bank area;
- Long-term management of residual PCB concentrations in soil more than 1 mg/kg on all properties;
- Implementation of ICs to (1) protect human health and the environment by limiting exposure to PCB impacted soil left in place and (2) protect the long-term integrity of the engineered components of the selected remedy;
- Implementation of deed notices where possible on residential and special use properties with PCB greater than 1 mg/kg in subsurface soil and potentially under structures; and
- Implementation of environmental easements/covenants on Solutia owned properties where IMs have been taken, Unapproved Waste Disposal Areas, and the groundwater at T-11 area to maintain the integrity of caps from current or future activities.

The remedial design (RD) for OU1/OU2 is still being performed by the PRPs.

Actions taken in OU 3:

- The IROD for OU3 (soil and groundwater contamination) dated September 29, 2011. The selected remedy consists of the following:
  - Installation of a new, RCRA Subtitle C-compliant cap over the Cells IE, 2E, and 3E of the South Landfill excavation;
  - Installation of a cap over impacted soils in Areas A and E to eliminate dermal contact, minimize potential soil leaching to groundwater, prevent erosion, and direct storm water away from the impacted area;
  - Installation of a cap over impacted soils in Areas C and D to eliminate dermal contact exposure, prevent erosion, and direct storm water away from the impacted area;
  - Enhanced institutional controls with a “no dig policy” restricting excavation within the Facility (particularly in Area F);
  - Installation of perimeter fencing in the northeast portion of the Facility and along the southern portion of the employee parking lot.
  - Verification with confirmation samples that the principal threat waste under cover in Area B has been removed;
  - Verification with subsurface soil and/or groundwater confirmation samples that there are no groundwater impacts in Areas B, F, and G;
  - Verification with confirmation samples that the PCB remedial goal is protective for dioxin (TEQ) where dioxin TEQ includes dioxin-like PCBs, PCDDs and PCDFs;
  - Execution and recording (by Solutia) an environmental covenant with ADEM to restrict land and groundwater use in the OU3 area and the North Side and East Side Properties (in the vicinity of monitoring wells OW-21A and OW-10);

- Monitoring of select wells for natural attenuation parameters to demonstrate continued natural attenuation of para-nitrophenol (PNP) and parathion;
- Optimization and expand the existing groundwater corrective action system to provide further containment of groundwater near OW-21A and Area A (OW-10/OW-11);
- Pre-treatment of extracted groundwater using a carbon filtration system;
- After filtration, allow the water to flow to the on-Site equalization basin for discharge to the Anniston Publicly Owned Treatment Works (POTW) for further treatment; and
- Provide operation, monitoring, and maintenance of soil ICMs, caps, groundwater corrective action system, carbon filtration system, and institutional controls to ensure continued long-term effectiveness of the remedy.

- The interim groundwater remedy is constructed, and groundwater monitoring is being performed. A final groundwater remedy for OU3 with final groundwater cleanup levels will be selected in a future decision document.

Action taken in OU4:

- The 2004 NTCRA to address residential soil PCB contamination in surface and subsurface soil was also used in OU4. PCB concentrations greater than 1 mg/kg were identified on 20 properties. Removal actions have been performed on 19 of these properties. One (1) remains unfinished due to access issues.

This ROD selects a remedial action to control sources of and reduce current and future potential risks from unacceptable exposure to PCBs in soil, sediment, surface water and fish and other biota or ecological receptors in OU4, which is downstream of OU1/OU2 and OU3. This ROD also finalizes IMs previously performed under RCRA in OU4 (see previous description) and addresses residual PCBs that remain in residential soil. This is the third CERCLA remedial action selected for the Anniston PCB Site.

5. SUMMARY OF SITE CHARACTERISTICS

5.1 Conceptual Site Model

The Conceptual Site Model (CSM) is a tool used to show the sources and fate and transport mechanisms that are important for understanding the nature and extent of contamination. The sources include historical sources that have been remediated and ongoing sources, such as other upstream OUs that have yet to be remediated, sediment areas that are not stable, and creek banks with a combination of elevated PCB concentrations and meaningful erosion. In all cases, the surface water flow transport pathway has been and will be a significant factor for the distribution of PCBs for the OU4 portion of the Site.

Historically, PCB-containing solids were conveyed from the Facility (OU3) via surface water to and down Snow and Choccolocco Creeks. During periods of the highest flows, the waters of the creeks would flow in and out of the banks, and PCB-containing solids were transported outside of the banks into the broader portions of the floodplains. Once the surface waters were outside of the creek banks, the surface water velocities would drop dramatically, and the PCB-containing solids were deposited within the floodplain. This process of downstream migration, flooding, and deposition is the primary source for the historical deposition of PCBs. As historical sources in upstream OUs are mitigated through a series of remedial actions, addressing the remaining sources in OU4 is important for protecting human health and the environment. The CSMs detailing complete exposure pathways for human health and ecological risk assessments are discussed further in Section 7.

5.2 Overview of OU4

The climate in OU4 is characterized as humid and subtropical, with hot summers, mild winters, and some precipitation during each month of the year. Rainfall is the primary form of precipitation, with an average of 54 inches per year, the majority of which occurs during winter. Droughts are infrequent, and the average annual evapotranspiration rate in the area is approximately 42 inches.

In the coming decades, Anniston, Alabama is predicted to become warmer and is likely to experience more severe floods and drought. Soil will become drier, annual rainfall will increase in most of Alabama, and more rain arrives in heavy downpours. The state is expected to experience increased damages from tropical storms.

OU4 is in Calhoun and Talladega Counties, Alabama. The geology of this area is characterized by folds and thrust faults. Thrust faults are the dominant structural features in this province. A variety of native materials, including soil ranging from clays to gravels as well as areas in contact with bedrock, comprise the bed of the Choccolocco Creek basin. The Choccolocco Creek-Logan Martin Lake watershed consists of unconsolidated Quaternary and Tertiary fluvial deposits and a weathered bedrock residuum, forming a mantle over the Paleozoic stratigraphy in much of the watershed. The fluvial deposit consists of a mix of gravel, silt, and clay and extends to a thickness of up to 100 feet. The bedrock residuum is comprised of mixed residual clay and chert boulders and fragments ranging in thickness from 30 to 100 feet, where present.

OU4 is defined by the boundaries of Choccolocco Creek and the adjacent 100-year floodplain, (a small portion of Snow Creek and its floodplain are also part of OU4). The flow of Choccolocco Creek is generally near the centerline of the 100-year floodplain. Site-specific hydraulic modeling was used to set the initial floodplain location, and subsequent refinements (expansions) of the floodplain were developed using topographic information from the National Elevation Data Set published by the U.S. Geological Survey (USGS) in 2009. The project footprint for the 100-year floodplain is larger than the 100-year floodplain developed by the Federal Emergency Management Agency (FEMA) in several locations. The decision to modify the floodplain was based on the site-specific hydraulic modeling that resulted in a more comprehensive and conservative approach to the floodplain.

Snow Creek discharges to Choccolocco Creek at a point 37 miles upstream from where Choccolocco Creek discharges to the Coosa River. The lower four to five miles of Choccolocco Creek are affected by the impoundment of Logan Martin Lake. The confluence of Snow Creek and Choccolocco Creek occurs at the midpoint of the Choccolocco watershed (which drains an area of 222 square miles at the confluence with Snow Creek, and 502 square miles at Logan Martin Lake). Average daily flow increases from 274 cubic feet per second (cfs) at the confluence with Snow Creek to 715 cfs at the confluence with Logan Martin Lake. Average surface water flows are shown on Figure 3. Other major tributaries in the Choccolocco Creek watershed include Cottagula, Shoal, Jackson, and Hillabee creeks upstream of Snow Creek, and Coldwater, Salt, Eastaboga, and Cheaha creeks downstream of Snow Creek.

Snow Creek flows through an urbanized corridor of Anniston and Oxford and is a key tributary to Choccolocco Creek that drains the upstream portions of the Site. The mean flow within Snow Creek increases from approximately five (5) cfs at the confluence with the 11th Street Ditch to 28 cfs as it discharges to Choccolocco Creek. The steep basin terrain produces sharp peak flows. The estimated 10-year and 100-year recurrence interval floods for Snow Creek at the point it discharges to Choccolocco Creek are 4,030 cfs and 6,900 cfs, respectively. Snow Creek and Choccolocco Creek are classified F&W, meaning water quality criteria for Fish and Wildlife are applicable.

A defining surface water flow feature in OU4 is the backwater area located at the confluence of Snow Creek and Choccolocco Creek (Figure 4). The backwater area receives direct surface water flow from both creeks, and, because of the area's physical configuration and hydraulic characteristics, much of the area acts as a settling basin for solids suspended in the water column. Sediment deposits in large portions of this backwater area are fine-grained and, in some locations, up to five (5) feet thick.

The major aquifers within or near OU4 are limestones and dolomites. Rainfall is the principal source of recharge to aquifers in OU4. The estimate for aquifer recharge in the area is about five (5) inches per year. Groundwater within the shallow residuum generally occurs under unconfined conditions beneath Choccolocco Creek, and potentiometric data from the Choccolocco Creek watershed indicate that Choccolocco Creek is a gaining stream, with groundwater discharging into the creek.

Several springs have been identified and located within and near OU4. Coldwater Spring is west of the City of Oxford, approximately one mile north of Interstate 20, and is the primary water source for the City of Anniston, and other municipalities and communities within Calhoun County. The City of Oxford currently relies on groundwater as its primary water source and operates five production wells. Additional public supply wells are located throughout Talladega County, near the 100-year floodplain of Choccolocco Creek. Locations of identified springs, public water supply wells, and the OU4 RI wells are depicted on Figure 4. In addition, Figure 4 shows the active groundwater investigation wells in the OU1/OU2 and OU4 portions of the Site as well as the locations of two private water supply wells that were sampled as part of the OU4 investigation.

The city of Oxford is in both Calhoun and Talladega Counties and is located at the most upstream portion of OU4 at the confluence of Snow Creek and Choccolocco Creek. The cities of Munford, Talladega, and Lincoln are within Talladega County only. Munford is located approximately eight miles downstream from the confluence of Snow Creek, and only the northern portion of the city is located within the OU4 100-year floodplain. Talladega's northern city limit is located approximately four miles south of Choccolocco Creek and 14 miles downstream from the confluence of Snow Creek. Choccolocco Creek runs through the center of the city of Lincoln, approximately 18 miles downstream from the confluence of Snow Creek.

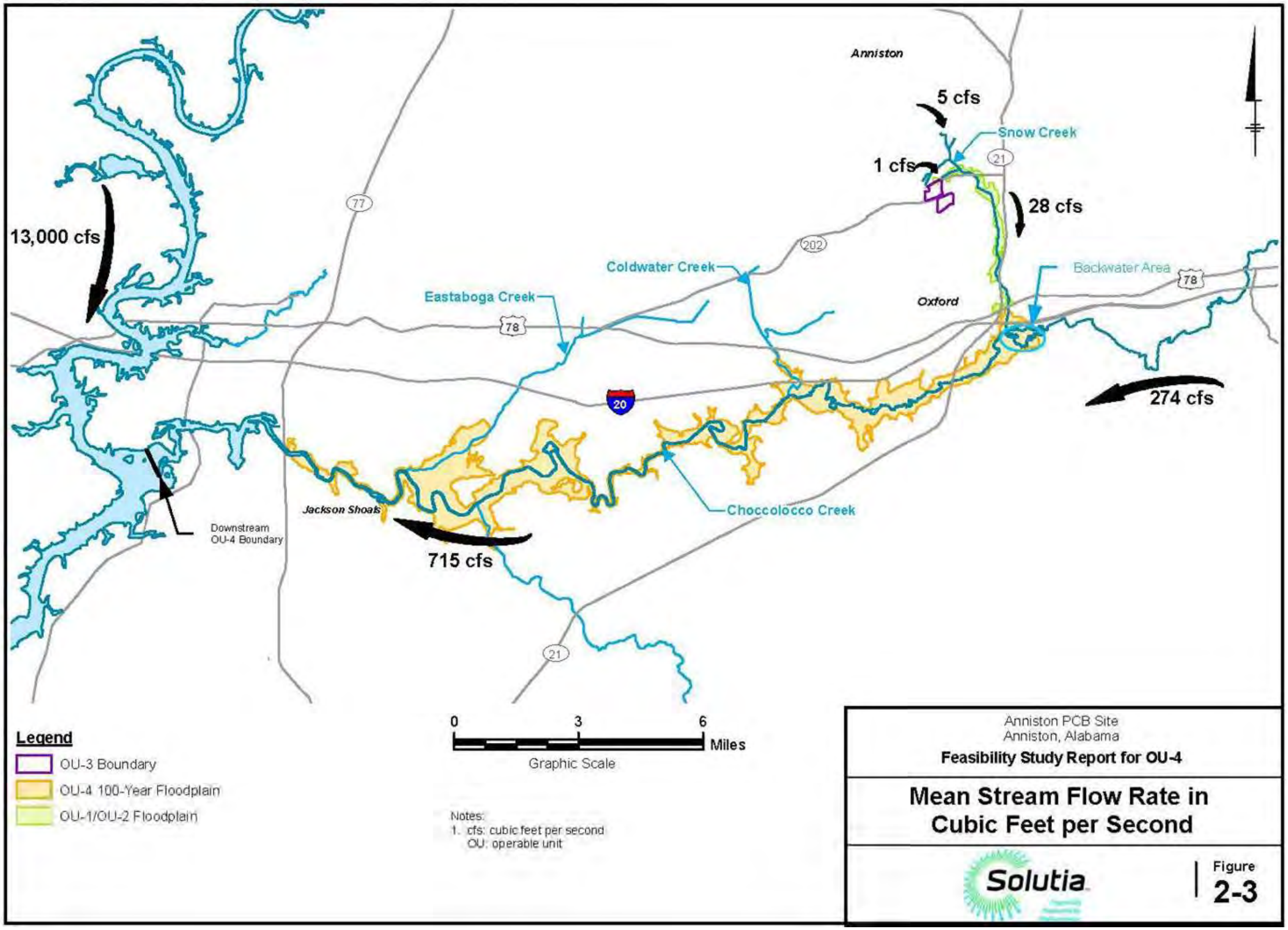

Figure 3. Mean Stream Flow Rate in Cubic Feet per Second

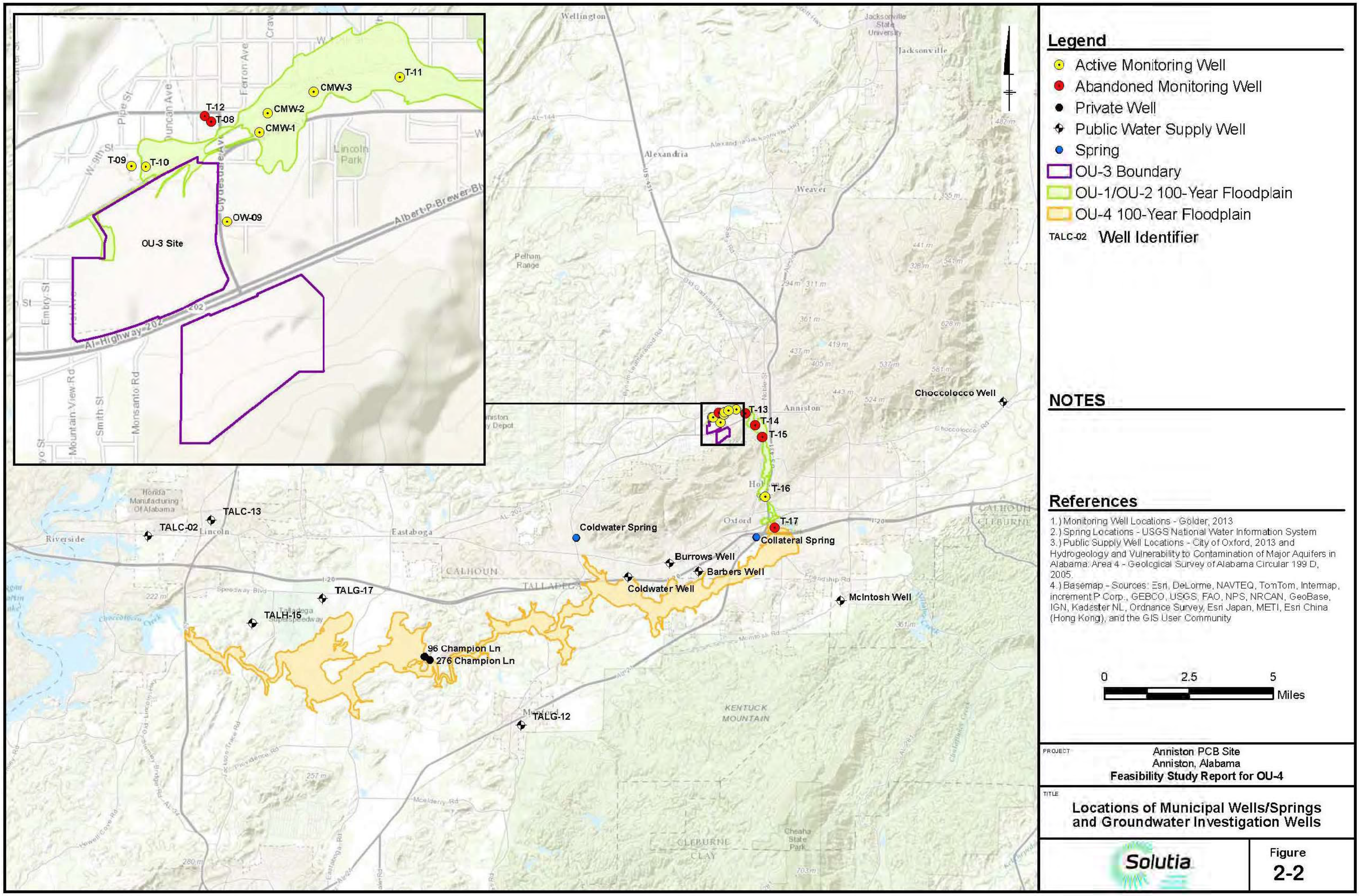

Figure 4. Location of Municipal Wells/Springs and Groundwater Investigation Wells.

Population, demography, and growth estimates for the cities of Oxford, Munford, Talladega, and Lincoln are based on the latest census information from the 2020 Census conducted by the United States Census Bureau.

- Oxford: The total population of the city of Oxford was 22,069, with 25.2% of the population under the age of 18, 74.8% of the population 18 years old or over, and 14.5% of the population over the age of 65. Oxford's population was estimated to drop less than 1% by 2022.
- Munford: The total population of the city of Munford was 1,351, with 23% of the population under the age of 18, 77% of the population 18 years old or over, and 13.4% of the population over the age of 65. Munford's population was estimated to decrease by less than 1% by 2022.
- Talladega: The total population of the city of Talladega was 15,861, with 16.9% of the population under the age of 18, 83.1% of the population 18 years old or over, and 18.2% of the population over the age of 65. The city of Talladega's population was estimated to decrease by less than 1% by 2022.
- Lincoln: The total population of the city of Lincoln was 6,845, with 22.9% of the population under the age of 18, 77.1% of the population 18 years old or over, and 13.1% of the population over the age of 65. The population of Lincoln was estimated to grow by approximately 1.5% by 2022.

In 2020, Calhoun County, Alabama (which includes the city of Oxford), had a population of 116,441, with 21.5% of the population under the age of 18, 78.5% of the population over the age of 18, and 18.1% of the population over the age of 65. In 2020, Talladega County, Alabama (including the cities of Oxford, Munford, Talladega, and Lincoln), had a population of 82,149 with 20.9% of the population under the age of 18, 79.1% of the population over the age of 18, and 18.5% of the population over the age of 65.

5.3 OU4 Investigations

Investigations of soil, sediment, groundwater, surface water, and fish and other biota were conducted in OU4. Many of the investigations focused only on PCBs. The reasoning for the sample locations and contaminants of interest in each media are described in the following sections.

5.3.1 Substances Detected in Soil

PCB concentrations in soil are summarized for previous actions on residential properties and at interim measures. Investigations of the OU4 floodplain soil for PCBs and a wider list of contaminants are summarized separately. Creek bank soil concentrations are considered separately in areas where erosion occurs because contaminant concentrations can impact sediment concentrations. Therefore, creek bank conditions and contaminant concentrations are described after sediment.

5.3.1.1 Soil on Current Residential Properties

Soil with PCB concentrations above 1 mg/kg that remain on residential properties in OU4 are considered PCB remediation waste and are addressed by this action. As described in Site background, most PCB contaminated soil on residential properties in OU4 was addressed through the NTCRA. Residual PCBs in soil greater than or equal to 1 mg/kg and less than 10 mg/kg remain in subsurface soil on five residential properties (an area of approximately 1.1 acres) and in surface soil on one property where access to cleanup was not granted (an area of 0.25 acres). In addition, 14 residential structures are located next to areas that required excavation, so long-term monitoring of the residential structures is required to ensure sampling and removal is conducted, where needed, if those structures are demolished (Table 1) in the future.

Lead contamination in soil on residential properties in the same general area as the Anniston PCB Site are part of the Anniston Lead Site and are not addressed by the action selected in this ROD.

5.3.1.2 Soil at Interim Measures

The corrective measures (CMs), interim measures (IMs), and infrastructure support projects listed in Section 2.3 and shown on Figure 2 were all performed to address PCB concentrations in soil. The CMs are final RCRA actions, and no follow up actions are needed. The soil PCB concentration data from the infrastructure support projects are part of the floodplain soils and the data is summarized in Section 5.3.1.3. Interim Measures were implemented in high activity areas of Oxford Lake Park (OLP) and to cover dredge spoil piles in the floodplain of Choccolocco Creek as discussed further below.

Oxford Lake Park (OLP)

The OLP complex is a community recreational area owned by the City of Oxford and is located east of Recreation Drive and Snow Creek and north of I-20 and the confluence of Snow Creek with Choccolocco Creek. The OLP complex is approximately 25-acres and consists of several recreational areas. Between 2000 and 2012, four IMs were implemented to address PCBs in soil at high activity areas in the OLP located in Oxford, Alabama (Figure 5):

- OLP softball complex IM;
- Softball field’s parking lot IM;
- Tennis court complex IM; and
- Southwest portion of the park IM.

The IMs at the softball field’s parking lot, tennis court complex, and southwest portion of the park (with the infrastructure improvement of adding the Miracle Field) resulted in substantial capping and covers that make the IMs effective at preventing current and future subsurface exposure to human health and the environment. The effectiveness of the IM at the softball complex was evaluated in more detail and alternatives are included in Section 9. The park area outside of the IMs was investigated with non-residential soil (exposure unit C1-EU1).

Table 1. List of OU4 Residential Properties with Residual PCBs in Subsurface or Potentially Beneath Structures if Removed.

Figure Reference[1]	Structure ID[2]	PPIN[3]	Residual Management Approach[4]	
			PCBs Remaining	Future Sampling Under Structures[6]
Figure 4-6c	401	50920[3a]	PCB residuals at depth	Yes
Figure 4-6g	407	5341[3a]	PCB residuals at depth	No
Figure 4-6g	111	6445[3a]	PCB residuals at depth	No
Figure 4-6h	117	6886[3a]	PCBs in surface soil[5]	Yes
Figure 4-6i	137	65865[3a]	PCB residuals at depth	No
Figure 4-6i	145	6777[3a]	PCB residuals at depth	No
Figure 4-6i	131	68092[3a]	Unknown	Yes
Figure 4-6b	N/A	29915[3b]	Unknown	Yes
Figure 4-6b	N/A	65958[3b]	Unknown	Yes
Figure 4-6b	N/A	65960[3b]	Unknown	Yes
Figure 4-6b	N/A	725[3b]	Unknown	Yes
Figure 4-6b	N/A	29858[3b]	Unknown	Yes
Figure 4-6b	N/A	30073[3b]	Unknown	Yes
Figure 4-6b	N/A	65955[3b]	Unknown	Yes
Figure 4-6b	N/A	29856[3b]	Unknown	Yes
Figure 4-6b	15	30075[3b]	Unknown	Yes
Figure 4-6e	85	4969[3a]	Unknown	Yes
Figure 4-6d	260	4731[3a]	Unknown	Yes

Notes:
1. Figure references from the Figure 4-6 series from the OU-4 FS where applicable.
2. Structure IDs as shown on the referenced figures where applicable.
3. PPINs are from the following:
   a. Talladega County GIS https://isv.kcsgis.com/al.talladega_revenue/
   b. Calhoun County GIS https://gis.calhouncounty.org/Parcelviewer2/
4. Residuals management to be conducted under long-term soil management.
5. Removal action for Structure ID 117/PPIN 6886 was not implemented as property access was denied by the landowner. The property will be monitored under the long-term soil management program and the removal action implemented if (and when) access is provided.
6. Future potential sampling with structure footprints should the structure be later removed.

GIS: geographic information system
ID: identification
N/A: not applicable
PCB: polychlorinated biphenyl
PPIN: property parcel identification number

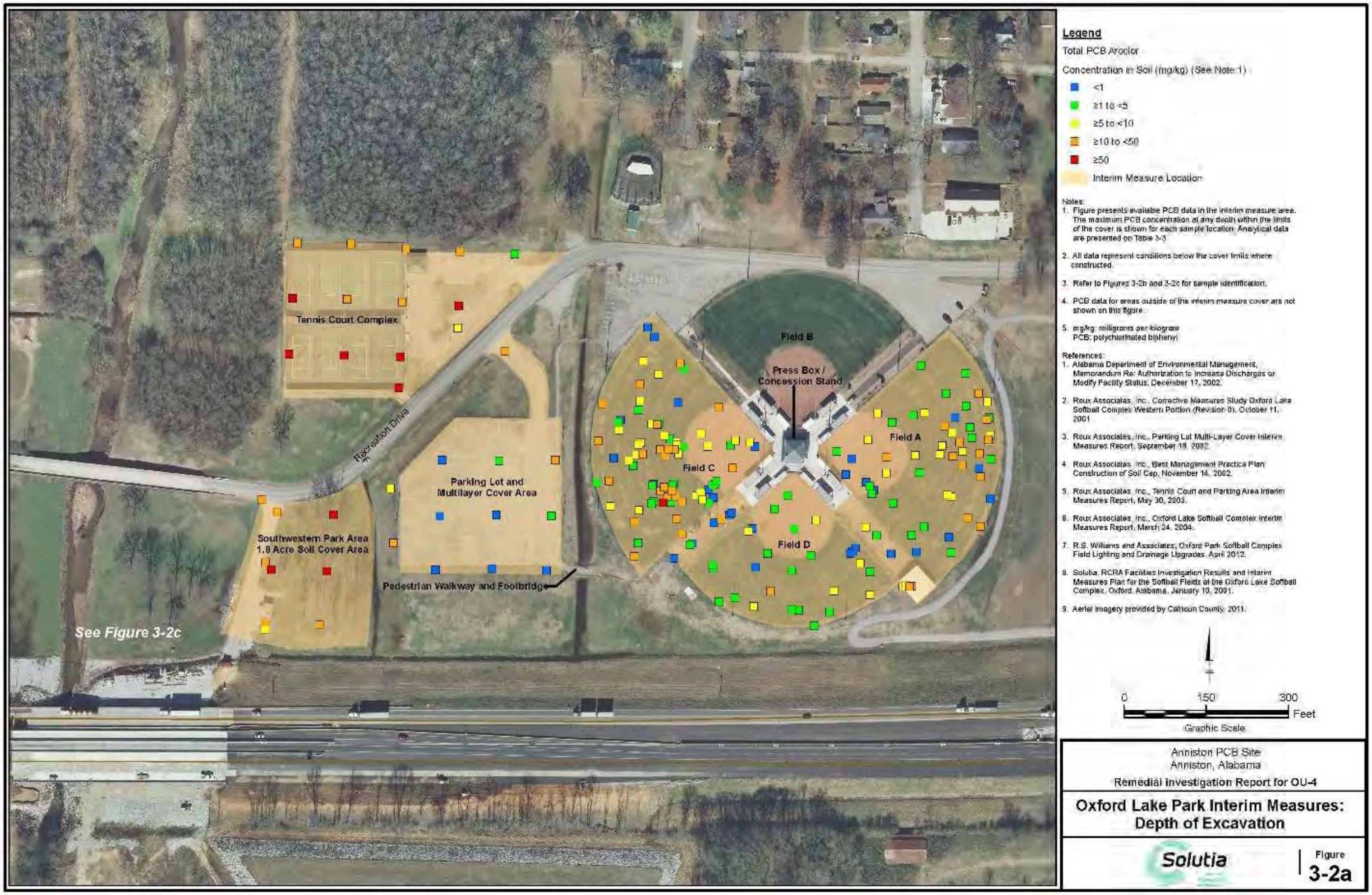

Figure 5. Oxford Lake Park Interim Measures: PCB Concentrations Shown Are Beneath Clean Soil Cavers

Oxford Lake Park Softball Complex –
IMs were conducted in the OLP Softball Complex between September 2000 and March 2001. The objectives of these measures were to mitigate potential exposure to PCB-containing soil and to control erosion and transport of PCB-containing soil to other areas of the park.

Surface soils containing PCBs were removed to a minimum depth of three inches from three softball fields (Fields A, C, and D on Figure 6). Twelve inches of soil were removed within the infield areas of these fields and from areas in the outfields where concentrations of PCBs exceeded 10 mg/kg. Soil was also excavated to a minimum depth of three inches in the grass areas between Fields A and D, and between Fields C and D.

Following excavation, a nonwoven geotextile fabric which acts as a visual layer was placed in the infield areas and covered by 12 inches of soil consisting of a silt and clay mix. In the outfield and grass areas, a nonwoven geotextile fabric was placed in areas where the excavation depth was greater than 12 inches or where PCBs were delineated at concentrations greater than 10 mg/kg. All excavations were subsequently backfilled with clean soil and covered with sod.

Soils with PCB concentrations greater than or equal to 50 mg/kg (approximately 1,000 tons) were transported off-site for disposal at a TSCA-approved facility. Excavated soils with PCB concentrations less than 50 mg/kg (estimated at 4,500 cubic yards [CYs]) were stockpiled in an area in the western portion of the park complex and subsequently capped for use as a parking lot, as described below.

Figure 6 shows the extents of the IM soil covers installed at the softball complex, sample IDs for the soil samples collected prior to the construction of the IM covers, and PCB results associated with these soil samples. There were 216 soil samples collected from 179 locations in the softball complex that characterize conditions beneath this IM. The PCB concentrations following implementation of the IM including the maximum, average, and 95% upper confidence limit (UCL) values for surface soil (0 to 12 inches) and subsurface soil (below one foot) for Fields A, C, and D include the following:

- Field A:
  - Surface soil PCB maximum concentration is 47.7 mg/kg, average concentration is 10.8 mg/kg, and the 95% UCL is 15.9 mg/kg.
  - Subsurface soil PCB maximum concentration is 30.6 mg/kg, average concentration is 4.5 mg/kg, and the 95% UCL is equal to 6.4 mg/kg.
- Field C:
  - Surface soil PCB maximum concentration is 22.5 mg/kg, average concentration is 6.3 mg/kg, and the 95% UCL is 8.9 mg/kg.
  - Subsurface soil PCB maximum concentration is 50.6 mg/kg, average concentration is 8.7 mg/kg, and the 95% UCL is 2.7 mg/kg.
- Field D:
  - Surface soil PCB maximum concentration is 11.8 mg/kg, average concentration is 4.8 mg/kg, and the 95% UCL is 6.4 mg/kg.
  - Subsurface soil PCB maximum concentration is 8.9 mg/kg, average concentration is 1.8 mg/kg, and the 95% UCL is 2.7 mg/kg.

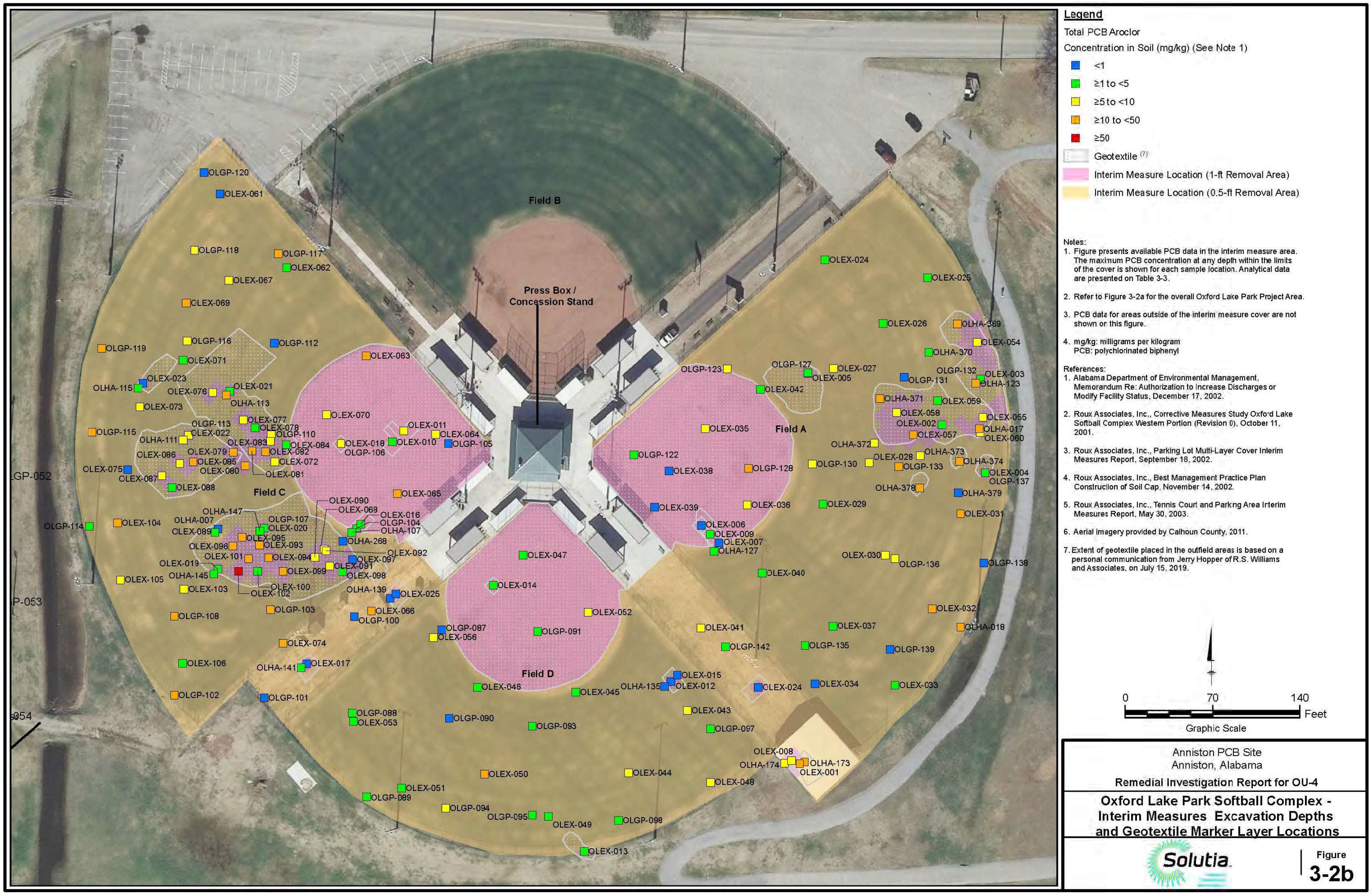

Figure 6. Oxford Lake Park Softball Complex – PCB Concentrations Shown Are Beneath Soil Covers

Softball Field's Parking Lot –
Soil with PCB concentrations less than 50 mg/kg excavated from the softball complex IM work (described above) and soil excavated to facilitate construction of a footbridge and an apron at the park entrance from Recreation Drive were consolidated beneath a multilayer cover (Figure 5). The excavated soils were placed on a geotextile visual marker and were compacted in approximately eight-inch lifts to an elevation approximately three feet above the previous ground surface and sloped to surrounding grade. There were 38 soil samples collected from 12 locations in the parking lot area that characterize conditions beneath this IM. PCBs were detected in 87% of these samples, and concentrations ranged from non-detect to 21 mg/kg and had an average PCB concentration of 2.8 mg/kg.

The cover system included nonwoven geotextile, a 12-inch crushed aggregate layer, a 14-inch layer of three-inch aggregate, a four-inch layer of crushed aggregate, and a three-inch asphalt cover. A two-foot-wide gravel-filled French drain was installed around the perimeter of the asphalt cover to facilitate drainage of the gravel aggregate layer and to minimize erosion of the soil cover. In conjunction with the IM activities, an access road was constructed connecting the parking lot to Recreation Drive.

Tennis Court Complex –
The constructed tennis court complex covers approximately two-acres and includes eight tennis courts, an adjacent parking lot, and a small utility building in the parking lot (Figure 5). The IM activities at the tennis court complex were implemented to contain PCBs in soils at concentrations ranging from non-detect to 200 mg/kg with an average PCB concentration of 21 mg/kg. Minor soil excavations were conducted to facilitate installation of posts for lighting and the tennis court nets. Sampling indicated that the excavated soils had PCB concentrations below 50 mg/kg.

Prior to construction of the multilayer covers for the tennis courts, the existing ground surface was cleared, stabilized with Portland cement, compacted, and covered with a geotextile marker layer. The geotextile was covered with a minimum of eight inches of compacted fill and a minimum of four inches of aggregate base course. The tennis courts were finished with a 1.5-inch compacted asphalt leveling layer and a minimum one-inch asphalt compacted surface course layer before being sealed and painted. A multilayer cover was also constructed in the parking lot area.

The existing ground surface in the parking lot area was cleared, stabilized with a Portland cement, compacted, and covered with a geotextile visual marker layer. The geotextile was covered with a minimum of nine inches of crushed aggregate base and three inches of asphalt. A vegetated soil isolation cover area, consisting of a nonwoven geotextile visual marker layer topped with a minimum of nine inches of soil cover, was constructed in the central portion of the parking lot. A masonry building was constructed in the northwest corner of the parking area. The surface finish surrounding the building is a combination of asphalt and concrete.

Southwest Portion of the Park –
IMs were constructed in an approximately 1.8-acre area in the southwestern portion of the park complex, south of Recreation Drive and west of the softball field parking lot (Figure 5). The 1.8-acre area was covered with geotextile fabric, nine inches of compacted fill, and three inches of vegetated

topsoil. There were 29 soil samples collected from nine locations in the southwestern park area that characterize conditions beneath this IM. PCBs were detected in 93% of these samples, and the concentrations ranged from non-detect to 160 mg/kg with an average PCB concentration of 19 mg/kg.

The Miracle Field, built to host a baseball league for physically and intellectually disabled individuals, was later constructed over the Southwest Portion of the Park IM as an infrastructure improvement project. Approximately 28 trees were cut at their base, and the root balls were excavated. The root balls were assumed to contain PCBs at concentrations greater than 50 mg/kg and were direct-loaded into roll-offs (approximately 83 tons) and disposed of at a TSCA-approved landfill. The trees were disposed of by burning at the City of Oxford's controlled burn site.

Voids created during tree removal were filled with flowable fill concrete (approximately 44 total CY). The area was compacted as needed, and a woven geotextile fabric visual barrier (approximately 36,000 square feet) was placed over the existing soil cover. Imported clean fill (a total of approximately 4,400 CY of material placed at an average thickness of approximately three feet) was placed and compacted. Seven inches of dense grade aggregate was placed, graded, and compacted to achieve the required elevation.

Additionally, 42 linear feet of 30-inch drainage pipe was installed perpendicular to the east side of the Miracle Field to facilitate storm water drainage, and dense grade aggregate was placed to a thickness of approximately seven inches in a 10-foot-wide walkway over the installed pipe. This newly installed walkway provides access from the Miracle Field to the existing parking lot located on the east side of the field.

<u>Choccolocco Creek Dredge Spoil Areas</u>

Between 1990 and 1994, the Natural Resource Conservation Service (NRCS) implemented flood protection measures, including dredging sediments to improve stream flows, along Choccolocco Creek near Oxford, Alabama. Dredge spoils from Choccolocco Creek were deposited in 19 DSAs. All of the DSAs were placed along the banks of Choccolocco Creek between its confluence with Snow Creek and Coldwater Creek. Seventeen of the DSAs were located below grade (i.e., filling of low-lying areas), and two of the DSAs were located above the existing grade. The above grade DSAs were stabilized by limiting the height and slope of the spoil areas. The DSAs were covered with topsoil and a vegetative cover (a six-inch soil cover).

The PCB concentrations in the DSAs beneath the six-inch soil cover are represented by 29 sample results, including two duplicates, that were collected from six (6) (CC-7, CC-9, CC-23, CC-24, CC-26, and CC-29, shown on Figures 7 and 8) of the 19 dredge soil piles in 1999. The PCB concentrations ranged from 0.3 to 10.8 mg/kg. Mercury concentrations in the DSAs were represented by one (1) sample from each of the six (6) DSAs and ranged from 0.65 to 3.9 mg/kg.

In September 2012, field reconnaissance activities were conducted to document the condition of each DSA along Choccolocco Creek. The reconnaissance found that each DSA had a well-established vegetative cover: no evidence of slumping, erosion, or other stability issues was observed in 18 of the

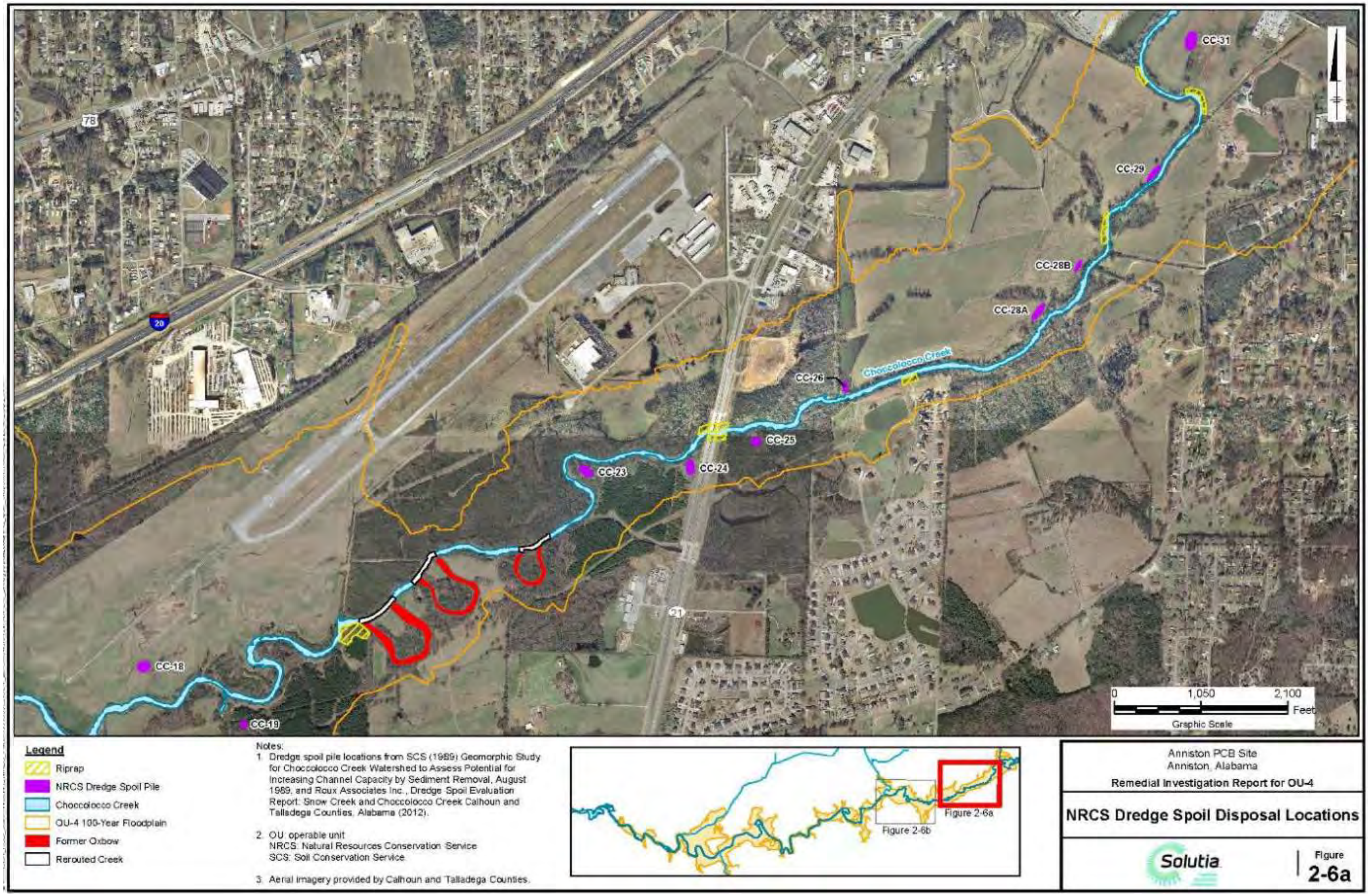

Figure 7. NRCS Dredge Spoil Disposal Locations

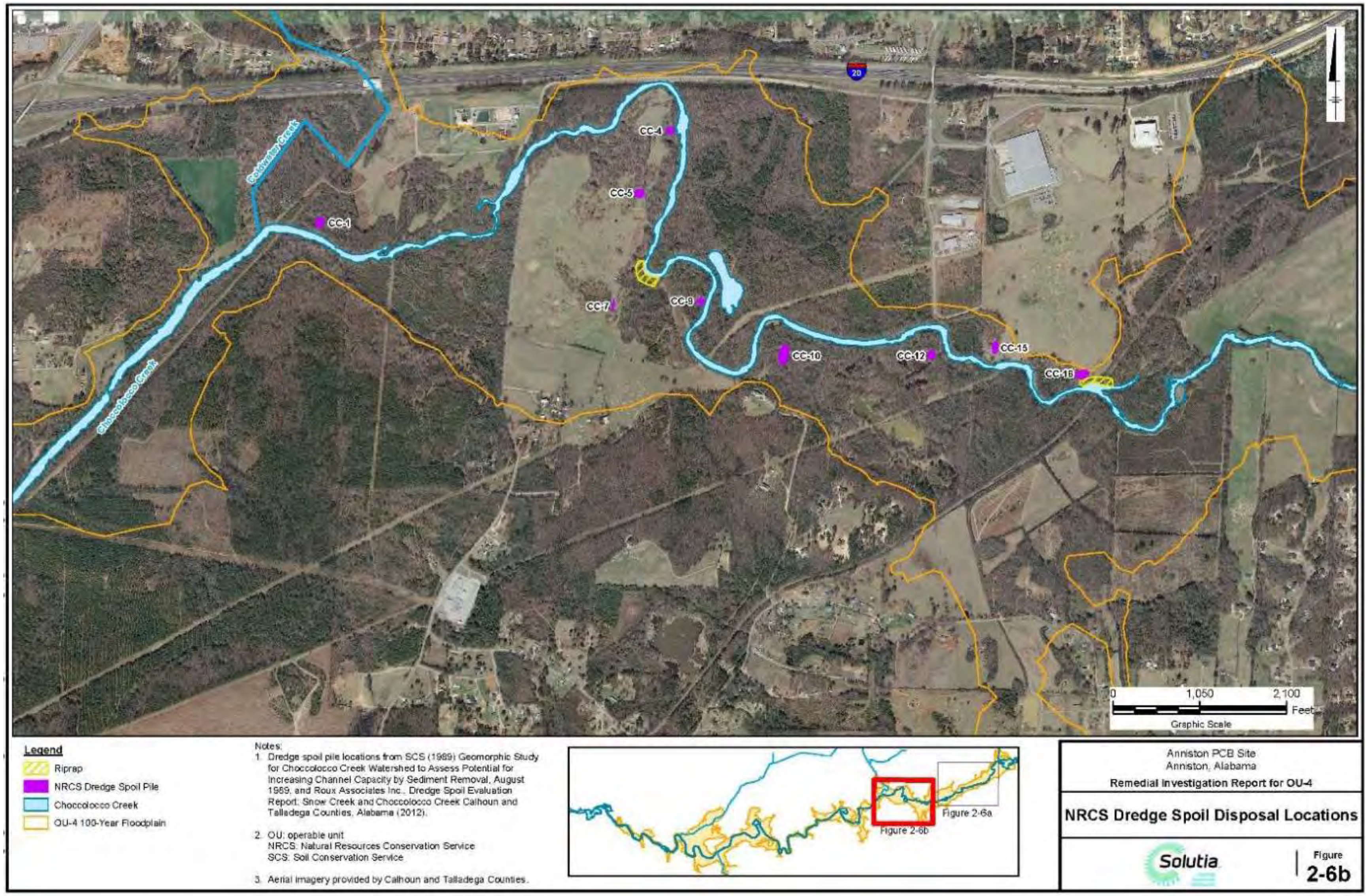

Figure 8. NRCS Dredge Spoil Disposal Locations

19 dredge spoil areas. One dredge spoil area (CC-26) was disturbed as part of repairing a culvert. The disturbed soil was regraded and stabilized with vegetation under direction of the Land Trust.

5.3.1.3 Non-Residential Floodplain Soil

All other non-residential soil was sampled through multiple sampling programs and events. The overall sample design process was driven by the need to define the nature and extent of contamination and for risk assessment purposes. The Human Health Risk Assessment (HHRA) described in Section 7.1, evaluated human exposures to surface soil (0 to 12 inches) and subsurface soil (12 to 48 inches). The Baseline Ecological Risk Assessment (BERA) described in Section 7.2, evaluated ecological exposures to surface soil (0 to 6 inches).

The analytical chemistry program originally focused on PCBs. Sampling was generally done to delineate the lateral and vertical extent of PCBs to a concentration of 1 mg/kg or less. Eventually, the analyte list was expanded to include some Site-wide data in the following categories:

- Compounds identified on the EPA's Toxic Compound List - volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs, including polycyclic aromatic hydrocarbons [PAHs]);
- Chlorinated and organophosphorus pesticides;
- Target Analyte List (TAL) list for inorganics (23 metals and cyanide);
- DL-PCB congeners (World Health Organization (WHO) list plus BZ#153);
- PCB Homolog groups; and
- PCDD/PCDF.

To assess human health risk, the floodplain was divided into 17 individual characterization areas (CA) that were configured to determine the nature and extent of contamination and support the risk assessments. The CAs were configured into 25 exposure units (EUs) for the HHRA. A geographic comparison of the CAs and EUs is provided on Figure 9.

To assess ecological risk, OU4 was divided into ten reaches (C1 through C10) based on logical break points using a combination of natural and man-made features within the OU. The floodplain reaches were further sub-divided into EUs (such as north, south, etc; see Figure 10) to account for foraging ranges of receptors and creek geography. In general, the OU4 EUs parallel those evaluated for human health. Four assessment areas were established based on three ecologically distinct areas along Choccolocco Creek, and a fourth area comprised of Snow Creek (Reach C1), each of which include multiple EUs (Figure 9). The upper assessment area (UAA) includes Reaches C2 through C4. The middle assessment area (MAA) includes Reaches C5 and C6. The lower assessment area (LAA) includes Reaches C7 thorough C10. The lower end of Choccolocco Creek (C10) has no adjoining floodplain soil areas. Surface water elevations in this lower portion of Choccolocco Creek are controlled by dams located on the upstream and downstream ends of Logan Martin Lake that serve to limit routine flooding of these areas. Additionally, riparian areas (which include a 100-foot-wide corridor of floodplain soil on both sides of the creek) were evaluated for each of the four assessment areas.

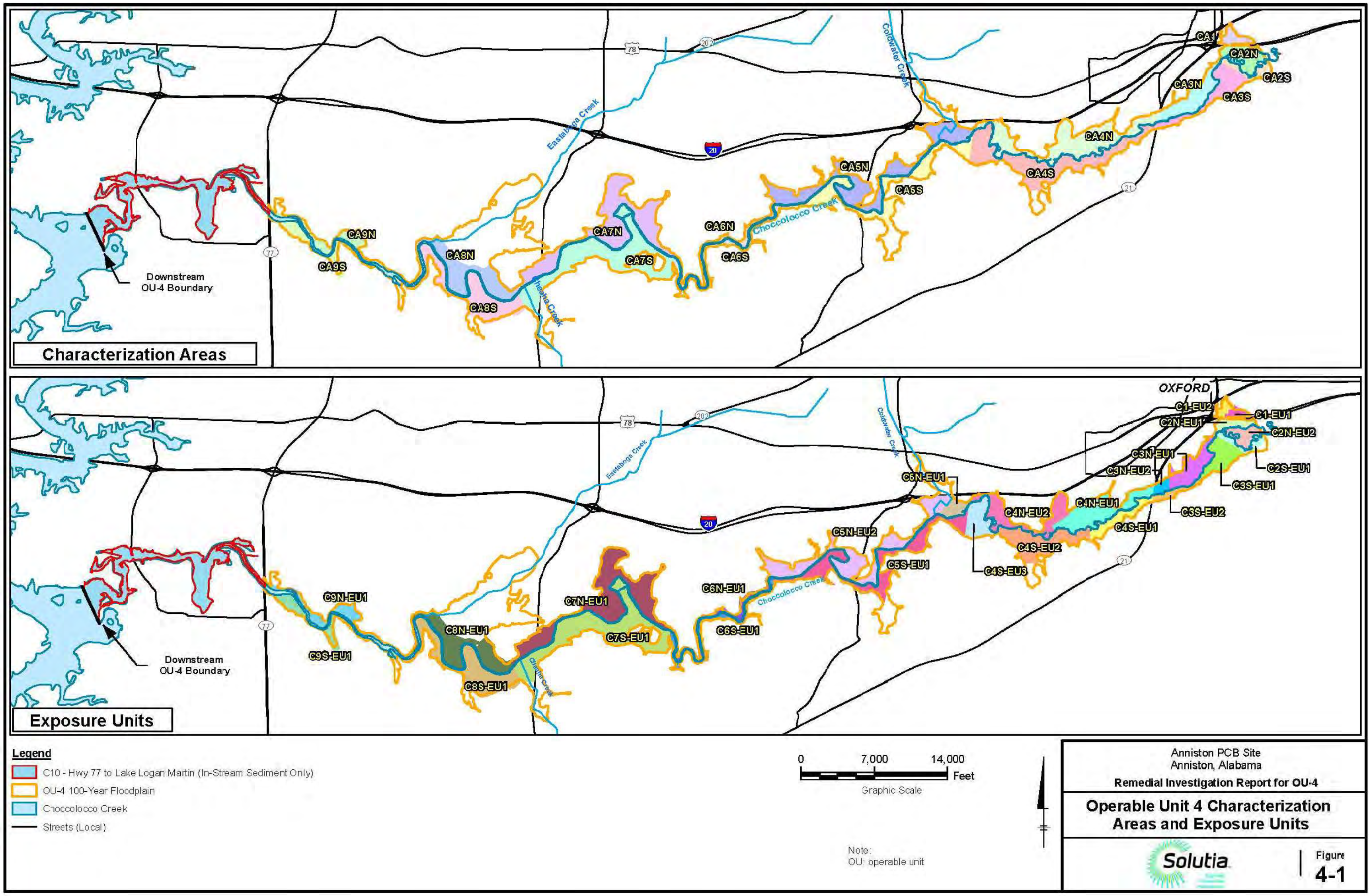

Figure 9. Operable Unit 4 Characterization Areas and Exposure Units

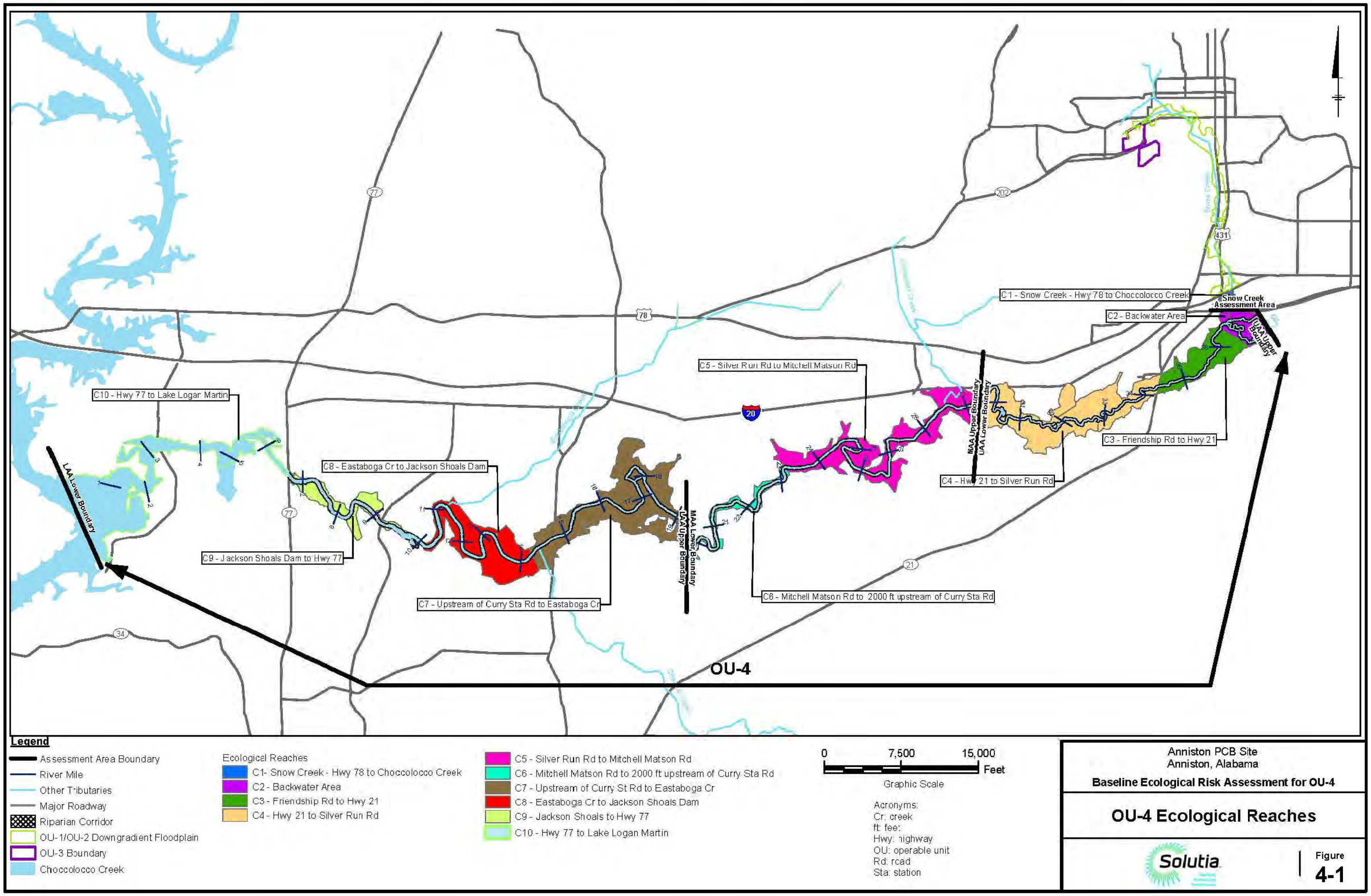

Figure 10. Operable Unit 4 Ecological Reaches and Assessment Areas

PCBs in Soil – PCB concentrations range from non-detect to 353 mg/kg in OU4 soil. The PCB concentrations consistently decrease with distance downstream from the confluence with Snow Creek (Figure 11) and decrease with distance from the creek bank (Figure 12).

The PCB concentrations detected in nonresidential surface soil, from 0 to 6 inches in depth, ranged from 0.028 mg/kg to 228 mg/kg (Table 2). In surface soil from 6 to 12 inches in depth, the PCB concentrations detected ranged from 0.038 mg/kg to 194 mg/kg. The subsurface soil sampling locations were targeted to areas within the OU that had the highest surface soil PCB concentrations. For most samples, this occurred adjacent to the creek bank. PCB concentrations detected in OU4 subsurface soil ranged from 0.045 mg/kg (sample name AP-98, depth 12-24 inches) to 353 mg/kg (sample name OLGP-065, depth 24-30 inches). Table 2 shows how PCB Aroclor concentrations varied in OU-wide non-residential soil data with depth.

Other Constituents in Nonresidential Soil - Soil samples were analyzed for a wider constituent list, which included VOCs, PAHs, other SVOCs, pesticides, TAL metals, cyanide, PCDD/PCDF TEQ and DL-PCB congener TEQ.

Dioxins (TEQ) inclusive of DL-PCBs, mercury, chromium, lead, and vanadium are discussed below. For metals, the Site data are compared with representative, naturally occurring background concentration levels from nearby Fort McClellan. Constituent concentrations less than twice the mean background concentration were generally considered to be naturally occurring or anthropogenic background.

- PCDD/PCDF TEQ and DL-PCB congener TEQ concentrations in soil (total TEQ) ranged from 57 to 4,410 picograms per gram (pg/g). The highest total TEQ concentrations were found in soil in C7S-EU1, unlike PCBs which had high concentrations in C2-EU1. PCDD/DF TEQ ranged from 0.578 to 141 picograms per gram (pg/g). DL-PCB congeners TEQ ranged from 57 to 4,410 pg/g. The data demonstrate that DL-PCB congeners are the primary contributors to the total TEQ.

  The combined distributions of TEQ and PCBs in OU4 soil, relative to the distance from Logan Martin Lake and based on the distance from the creek bank, are presented on Figures 13 and 14, respectively. The results indicate that the distribution of TEQ is different than PCB, with the highest TEQ concentrations located at the downstream end of OU4. These findings are consistent with a combination of PCDD/PCDF sources located in the OU4 watershed, including the Facility from the east and other upwind sources from the west.

- Mercury in soil ranged from 0.0048 to 33 mg/kg. The highest concentration was found in soil in C3S-EU2 at a depth of 6 to 12 inches. The highest mercury concentrations in surface soil were 22 mg/kg in exposure unit C4N-EU2. Potential mercury sources include the mercury cell process that operated at the Facility from 1952 to 1969 and a range of nearby atmospheric sources. The distributions of PCBs and mercury in soil based on distance from Logan Martin Lake are presented in Figure 15. These combined results show that mercury concentrations are generally lower than PCBs with a similar but less dramatic decrease in concentrations in a downstream direction and that concentrations do not diminish at the most downstream end of OU4. The combined distributions of PCBs and mercury based on distance from the creek bank are

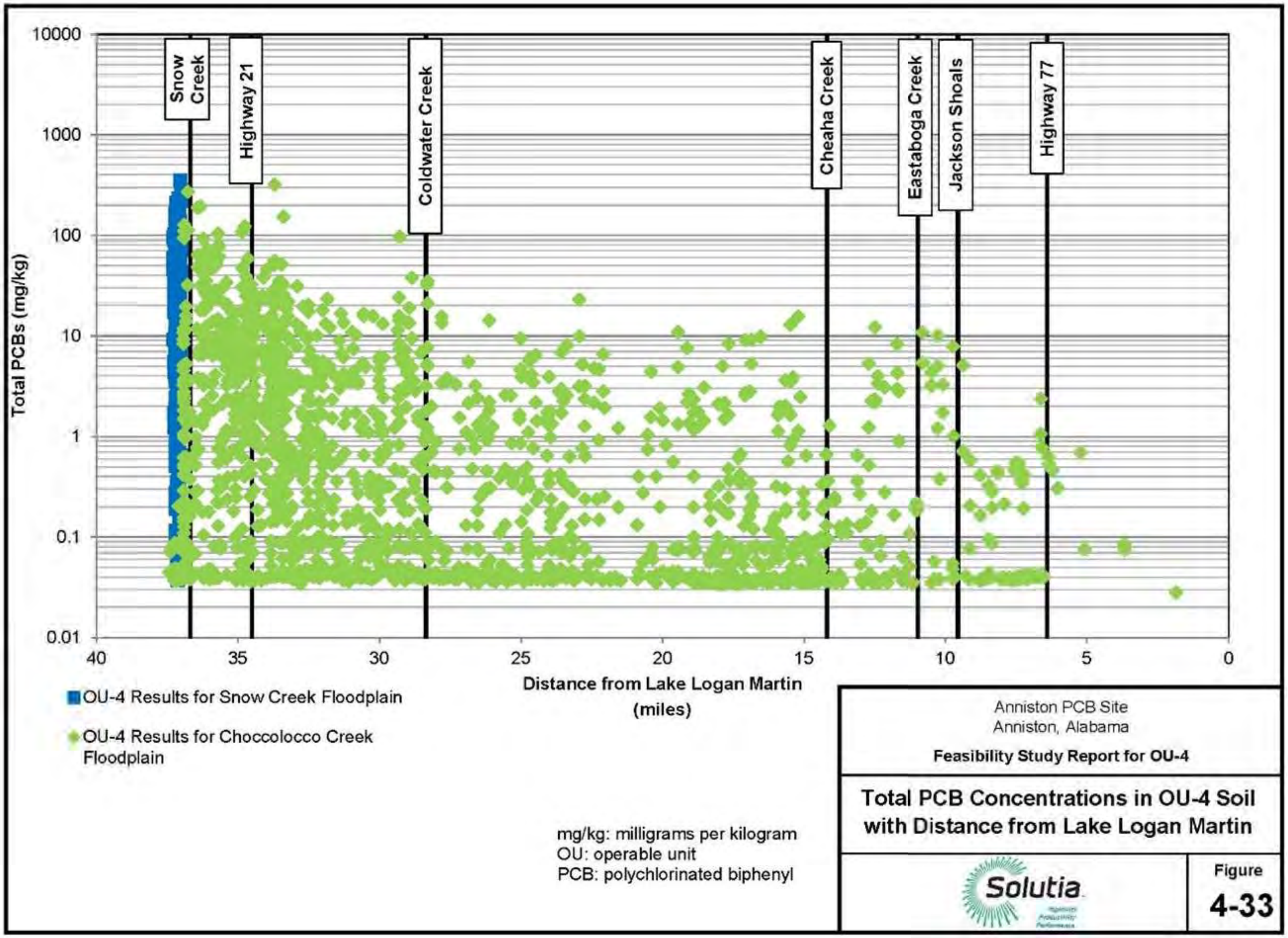

Figure 11. Total PCB Concentrations in OU4 Soil with Distance from Logan Martin Lake

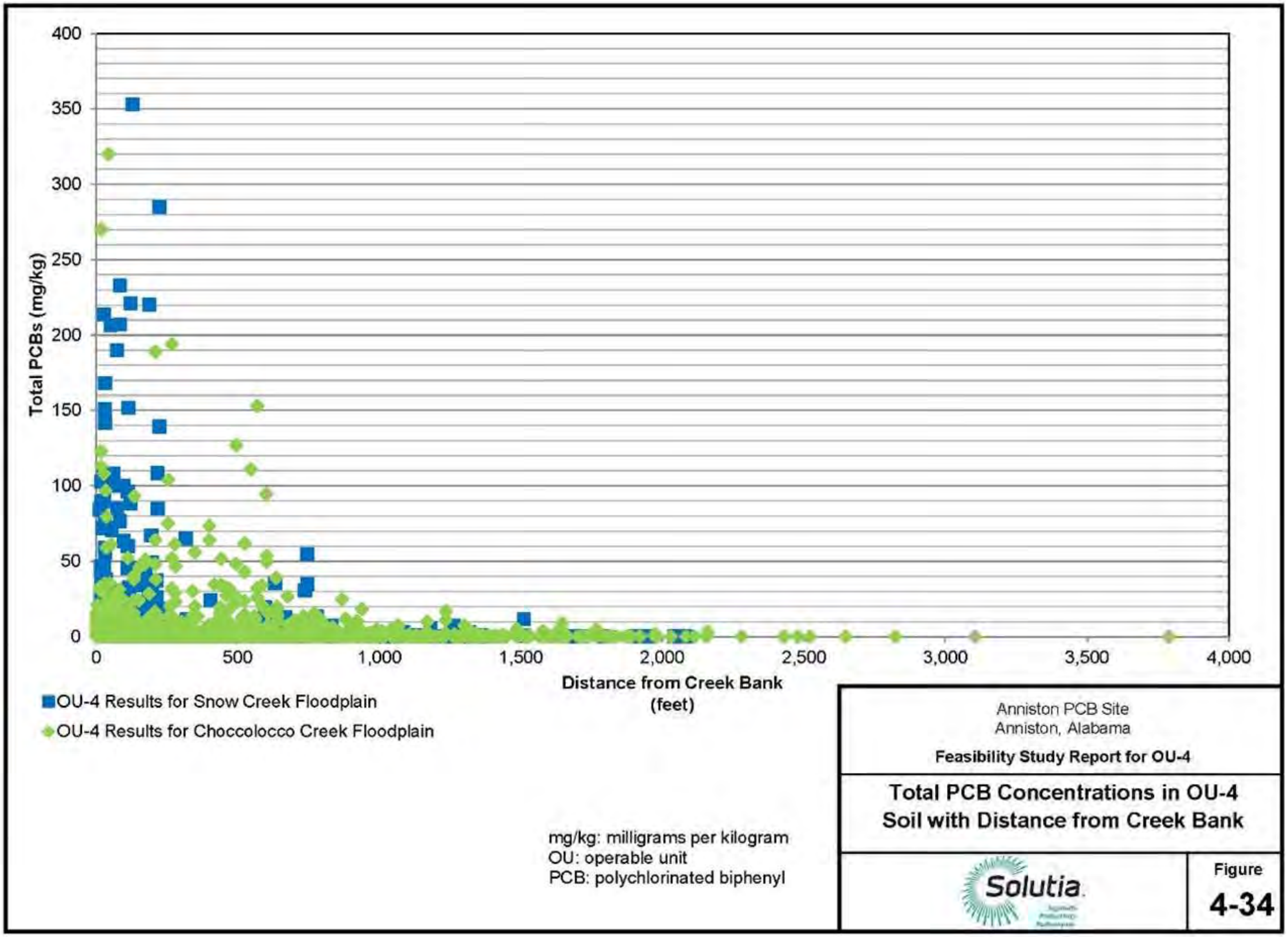

Figure 12. Total PCB Concentrations in OU4 Soil with Distance from Creek Bank

Table 2. PCB distribution in Soil.

Depth Interval							Data Use		
PCBs	# Detects	# Samples	Minimum mg/kg	Maximum mg/kg	Maximum Sample ID	EU of Maximum	BERA	HHRA	N&E
0-3 inches	15	24	0.037	3.05	OLHA-069 (0-3)	C1-EU1		Surface Soil	
0-6 inches	805	1282	0.028	228	NHA-5 (0-6)	C1-EU2			
0-1 foot	9	12	0.48	2.97	OLHA-137 (0-8)	C1-EU1			
0-2 feet	46	49	0.07	26.4	FP-4-d	C4N-EU1			
6-12 inches	516	969	0.038	194	C3S-04	C3S-EU1			
12-18 inches	57	63	0.2	285	OLGP-061 (12-18)	C1-EU1		Subsurface Soil	
1-2 feet	81	94	0.045	320	C4S-01	C4S-EU1			
2-2.5 feet	46	52	0.115	353	OLGP-065 (24-30)	C1-EU1			
2-3 feet	9	10	0.184	27.8	C4S-01	C4S-EU1			
2-4 feet	13	14	0.109	127	PC3-21H (2-4)	C2N-EU1			
3.5-4 feet	21	27	0.114	46.6	OLGP-032 (42-48)	C1-EU2			
3-4 feet	6	7	0.086	22.8	C4S-01	C4S-EU1			
4-6 feet	3	4	0.96	11.3	PC1-29 (4-6)	C2N-EU1			
6-8 feet	1	1	2.39	2.39	PC1-27 (6-8)	C2N-EU1			
Total	1628	2608							

BERA – Baseline Ecological Risk Assessment
HHRA – Human Health Risk Assessment
N&E – Nature and Extent of Contamination
EU – Exposure Unit
ID – Identification
mg/kg – milligram per kilogram

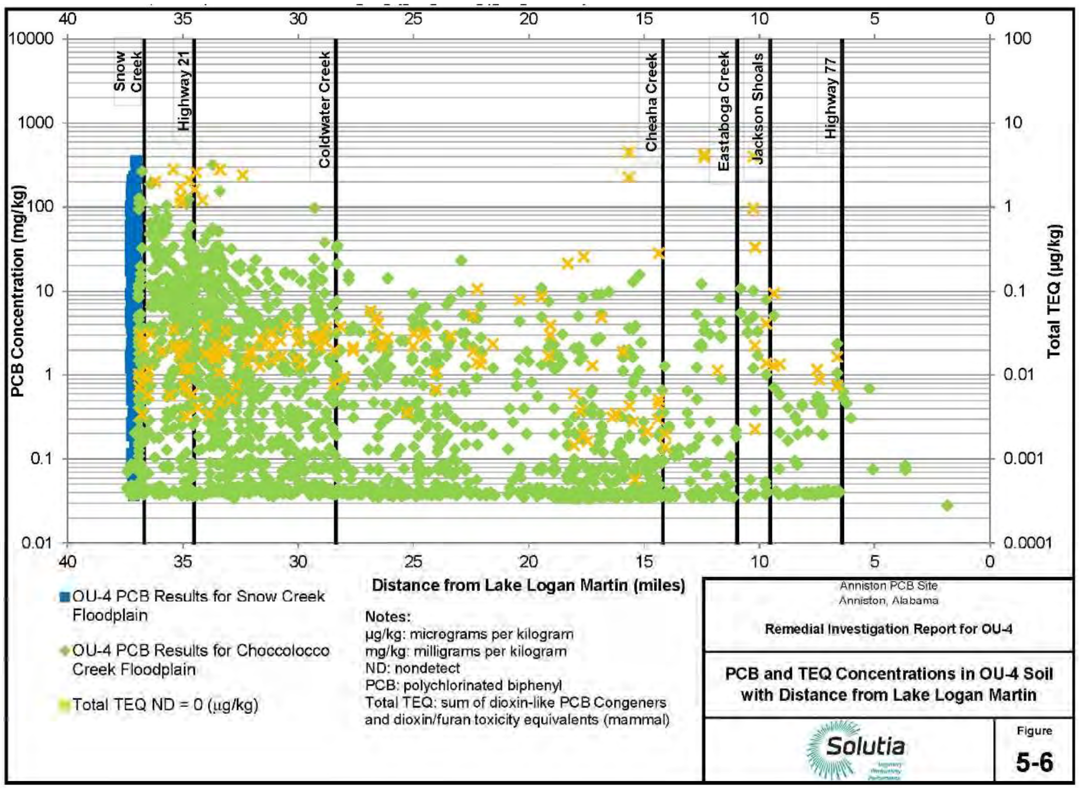

Figure 13. PCB and TEQ Concentrations in OU4 Soil with Distance from Logan Martin Lake

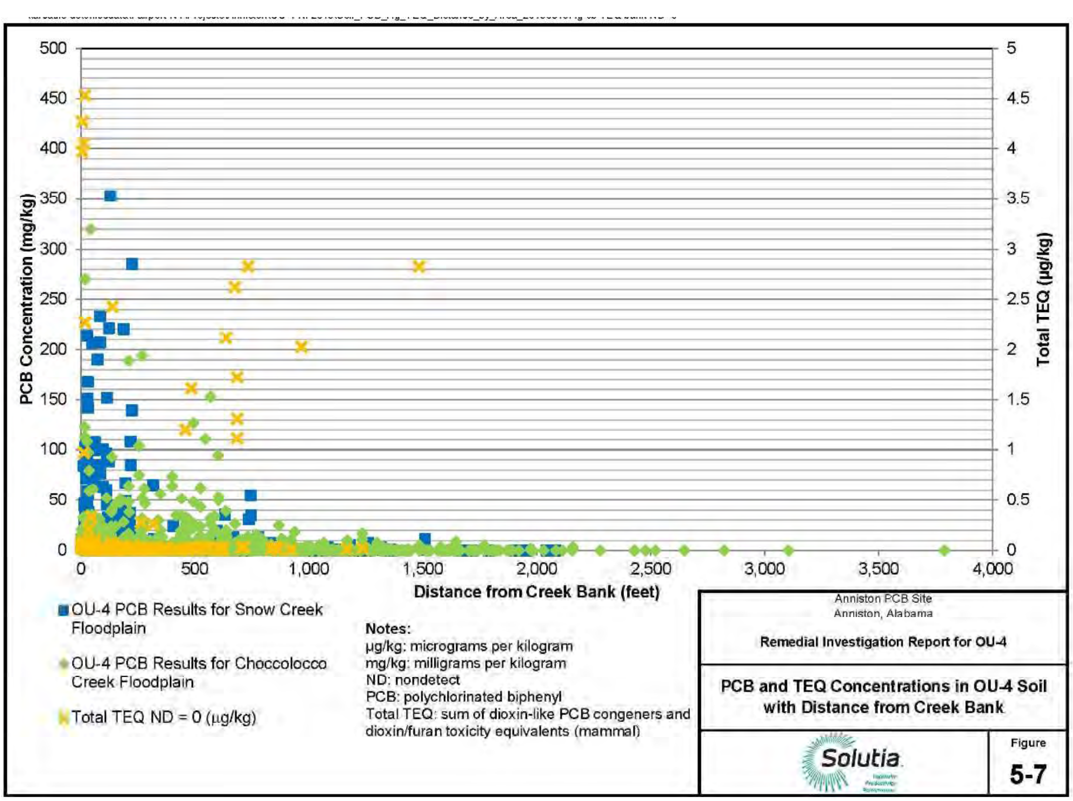

Figure 14. PCB and TEQ Concentrations in OU4 Soil with Distance from Creek Bank

presented on Figure 16. The results for both constituents show a somewhat similar trend with concentrations decreasing with distance from the creek bank.

- Chromium in soil was detected in all 158 samples where it was analyzed. The detected chromium concentrations ranged from 4.1 to 80 mg/kg. The mean OU-wide chromium concentration was 16 mg/kg. Only 12 (8%) samples had a concentration higher than twice the Fort McClellan mean of 19 mg/kg. The OU4 maximum in soil (80 mg/kg) is less than the Fort McClellan maximum of 134 mg/kg. These background data reflect a combination of naturally occurring materials and broader regionalized sources.
- Lead in soil was detected in 157 of 158 samples where it was analyzed. The detected lead concentrations ranged from 5.4 to 130 mg/kg. The average lead concentration was 28 mg/kg. One hundred fifty-six (156) (99%) samples had a concentration lower than twice the Fort McClellan mean of 59.3 mg/kg. The OU4 maximum in soil, 130 mg/kg, is close to the Fort McClellan maximum of 134 mg/kg. These background data reflect a combination of naturally occurring materials and broader regionalized sources.
- Vanadium in soil - Vanadium concentrations in soil in OU4 soil are relatively low. The maximum concentration detected was 45 mg/kg, which is less than twice the Fort McClellan mean of 31 mg/kg. The mean vanadium concentration detected in OU4 was 20 mg/kg. The vanadium present in OU4 may be naturally occurring or from a relatively low, ubiquitous, possibly atmospheric, source.

5.3.2 Substances Detected in Sediment

Like soil, OU4 sediment was characterized over a series of phased investigations. The characterization included mapping sediment deposits in Snow and Choccolocco Creeks, collecting samples for analyses to characterize the nature and extent of contamination, collecting surface sediments from the same locations as used for fish collection, collecting sediment samples for geochronological analyses to correlate PCB concentrations with the time of deposition, assessing the sediment PCB concentrations based on the grain size distribution of the sediment, and assessing sediment toxicity.

5.3.2.1 Sampling and Analysis of Sediment

The analytical chemistry program originally focused on PCBs, though the analyte list was expanded to include some data Site-wide for VOCs, SVOCs, pesticides, TAL metals, PCB congeners, homolog groups, and PCDD/PCDFs. Most of the constituents were found to be non-detect or below screening levels and were eliminated from the following phases of sampling.

PCBs in Sediment – The PCB concentrations in the OU4 portion of Snow Creek (reach C1 in Figure 10) ranged from non-detect to 41 mg/kg (Table 3). The PCB concentrations in Choccolocco Creek range from non-detect to 920 mg/kg in OU4 sediment. PCB concentrations consistently decrease with distance downstream from the confluence with Snow Creek (Figure 17).

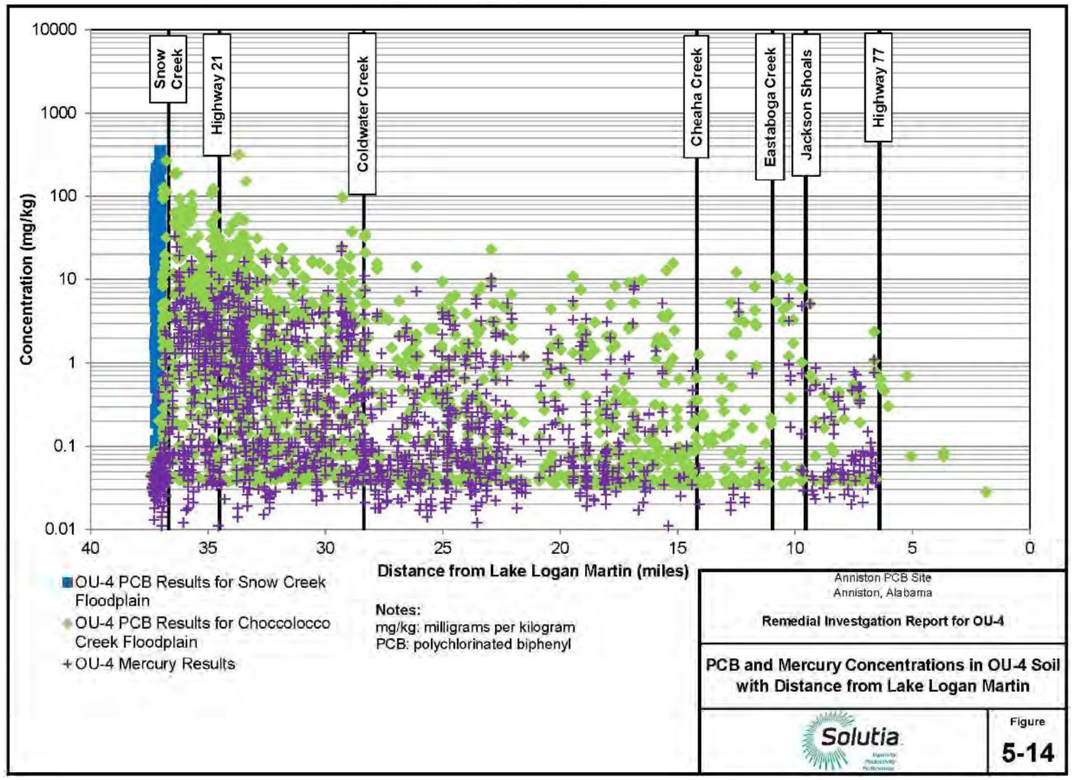

Figure 15. PCB and Mercury Concentrations in OU4 Soil with Distance from Logan Martin Lake

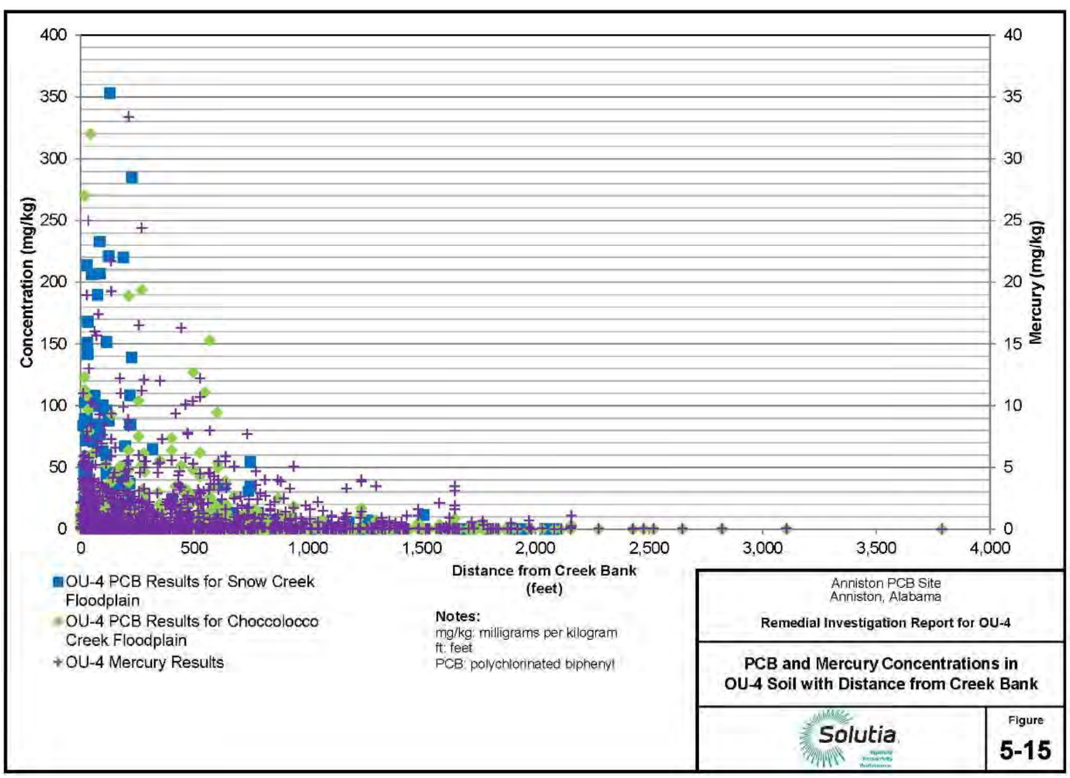

Figure 16. PCB and Mercury Concentrations in OU4 Soil with Distance from Creek Bank

Table 3. PCBs in Surface Sediments

Data Groups			Descriptive Statistics					
Assessment Area	**Reach**	**Sediment Texture**	**Core Locations (n)**	**Surface Area (ac)**	**PCB Samples (n)**	**Detected Samples (n)**	**Mean Surface PCB (mg/kg)**	**Max Surface PCB (mg/kg)**
C1	C1[a]	Snow Creek [a]	16	NA	16	15	5.26	41.00
Upper	C2	Coarse	14	2.5	15	3	0.37	3.08
		Fine	24	6.5	22	13	8.83	95.00
		Gravel	8	2.4	2	2	0.55	0.81
		No Recovery	2	0.7	0	0	0.05	NA
	C3	Coarse	14	6.0	5	5	0.75	1.96
		Fine	5	2.2	9	9	1.29	2.83
		Gravel [b]	9	5.3	0	0	**0.75**	NA
		No Recovery	4	1.7	0	0	0.05	NA
	C4	Coarse	79	28.8	16	16	1.07	8.90
		Fine	7	2.2	5	5	5.32	23.20
		Gravel	18	6.8	4	4	0.58	1.45
		No Recovery	8	3.1	0	0	0.05	NA
Middle	C5	Coarse	75	47.2	31	26	0.52	5.15
		Fine	6	3.6	14	14	1.62	3.90
		Gravel	9	5.5	2	1	0.07	0.08
		No Recovery	34	19.5	0	0	0.05	NA
	C6 [c]	Coarse	37	28.4	3	2	0.10	0.14
		Fine	1	0.7	1	1	1.20	1.20
		Gravel [b]	6	4.0	0	0	**0.10**	NA
		No Recovery	40	24.6	0	0	0.05	NA
Lower	C7	Coarse	56	35.4	17	11	0.56	3.17
		Fine	8	5.0	17	16	1.87	4.20
		Gravel	14	8.3	1	1	0.09	0.09
		No Recovery	22	12.7	0	0	0.05	NA
	C8	Coarse	30	27.1	14	13	0.57	2.64
		Fine	25	24.1	18	18	1.09	2.13
		Gravel [b]	2	1.4	0	0	**0.57**	NA
		No Recovery	35	30.4	0	0	0.05	NA
	C9	Coarse	7	7.9	7	6	0.18	0.49
		Fine	9	11.2	8	5	0.23	0.84
		Gravel	9	11.0	2	1	0.11	0.16
		No Recovery	31	37.1	0	0	0.05	NA
	C10	Coarse	13	27.6	6	6	0.37	0.64
		Fine	95	347.1	31	25	0.57	2.72
		Gravel [b]	0	0.0	0	0	**0.37**	NA
		No Recovery	13	26.6	0	0	0.05	NA

Notes:
Areas of no sediment recovery were not included in the assessment or spatial weighting
a. Snow Creek values are representative of 16 samples collected from individual deposits.
b. Gravel areas without samples in a given reach were assumed to have a gravel PCB concentration equal to mean Coarse Sediment for that reach.
c. Dataset is small; weighted maximum EPC of 0.17 mg/kg calculated for reach C6.
AA: assessment area ac: acres
EPC: exposure point concentration MCA: Monte-Carlo analysis
mg/kg: milligrams per kilogram
NA: not applicable or not calculated PCB: polychlorinated biphenyl UCL: 95% upper confidence limit

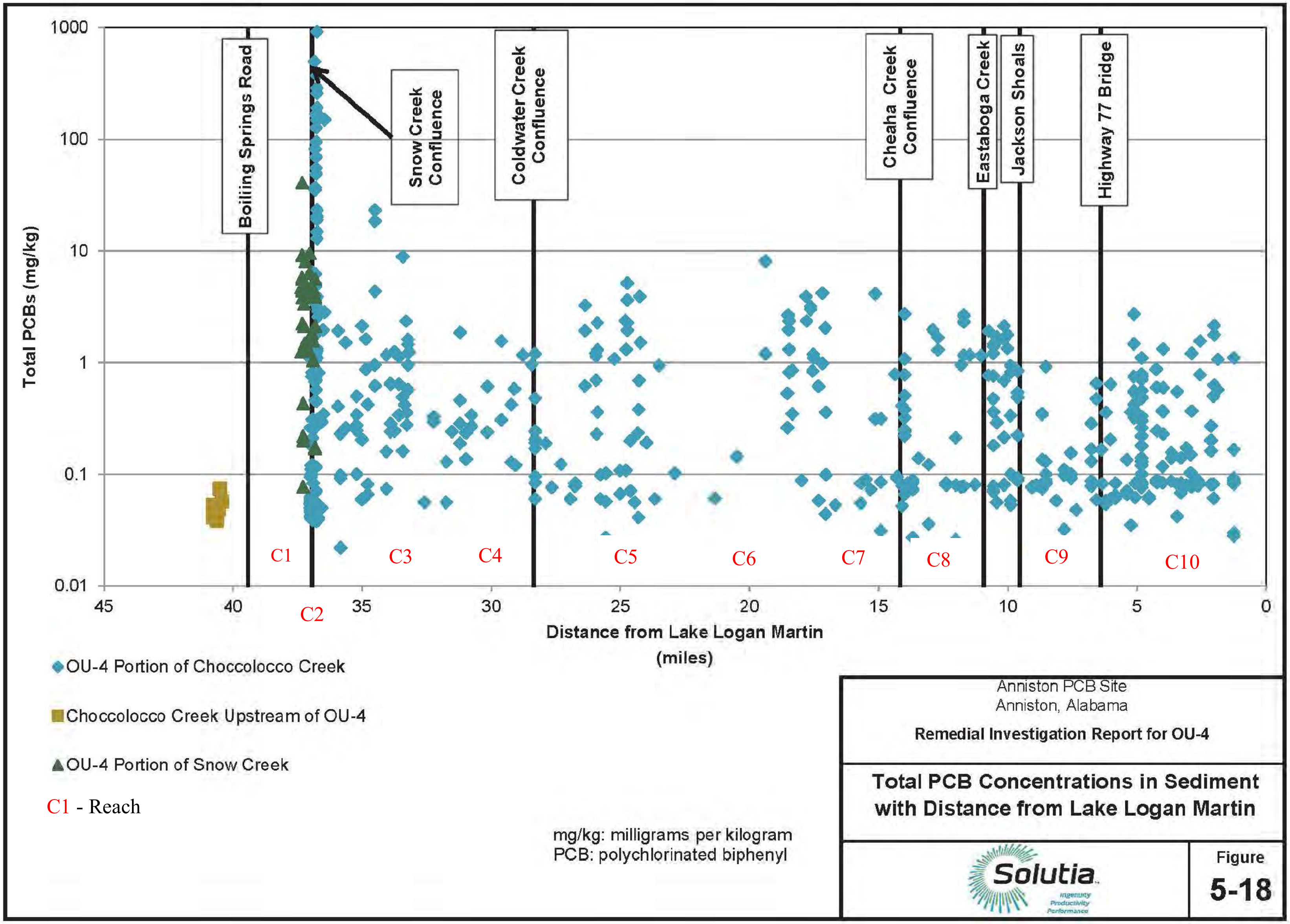

Figure 17. Total PCB Concentrations in Sediment with Distance from Logan Martin Lake

The PCB concentrations detected in surface sediment, from 0 inches up to 6 inches in depth, ranged from 0.021 mg/kg (reach C9, sample name C-147-SED-1, depth 0-2 inches) to 150 mg/kg (reach C2, sample name HHFL-08, depth 0-6 inches). The subsurface sediment, greater than six inches in depth, range from 0.027 mg/kg (reach C5, sample name C-060-SED-4, depth 2-8.5 inches) to 920 mg/kg (reach C2, sample name CU-GEO-02, depth 18-20 inches). Table 4 shows how total PCB concentrations varied in OU-wide sediment data with depth.

Other Constituents in Sediment - Sediment samples were analyzed for a wider constituent list. The results of these analyses are provided in the RI and were used in the risk assessments. Dioxins and DL-PCBs TEQ, mercury, barium, chromium, cobalt, lead, and vanadium are discussed below. For metals, the Site data are compared with representative, naturally occurring background concentration levels from nearby Fort McClellan.

- Dioxin TEQ inclusive of DL-PCBs in sediment were detected in 24 samples. The PCDD/PCDF TEQ ranged from 0.066 pg/g to 317 pg/g. The DL-PCBs TEQ ranged from 0.051 to 1,200 pg/g. The data demonstrate that PCB congeners are the primary contribution to the TEQ. The combined distributions of TEQ and PCBs in OU4 sediment, relative to the distance from Logan Martin Lake is presented on Figure 18.
- Mercury was detected in 144 of 150 samples. Concentrations ranged from 0.011 mg/kg to 96 mg/kg, with an OU-wide mean of 2.4 mg/kg. The highest concentration of mercury is located in the backwater in reach C2. The maximum concentration for mercury in surface sediment downstream is 6.3 mg/kg. This concentration is higher than the maximum concentration detected in the background data set (0.28 mg/kg), and higher than twice the mean background concentration (0.11 mg/kg). The concentrations of PCBs and mercury in sediment are presented together on Figure 19. The concentration profile for Choccolocco Creek sediment located downstream of the backwater area is flat to trending upward at the downstream end of OU4 and supports the presence of upwind sources to the west.
- Barium was detected in all 85 samples. OU-wide concentrations ranged from 14 mg/kg to 3,800 mg/kg. The highest concentration of barium is located in the upstream backwater reach C2. The maximum concentration for barium in surface sediment downstream of the backwater area is 251 mg/kg in reach C5. This concentration is lower than the maximum concentration detected in the background data set (272 mg/kg), but higher than twice the mean background concentration (99 mg/kg). These data reflect a combination of naturally occurring materials and broader regionalized sources.
- Chromium was detected in all 85 samples. OU-wide concentrations ranged from 4 mg/kg to 110 mg/kg. The highest concentration of chromium is located near the backwater in reach C3. The maximum concentration for chromium in surface sediment downstream is 54.7 mg/kg. This concentration is lower than the maximum concentration detected in the background data set (63 mg/kg), but higher than twice the mean background concentration (32 mg/kg). These background data reflect a combination of naturally occurring materials and broader regionalized sources.

Table 4. PCB Distribution in Sediment

Reach/ Program	Depth	PCBs in Surface Sediment				Depth	PCBs in Subsurface Sediment			
		Frequency Detected	Minimum Detected (mg/kg)	Maximum Detected (mg/kg)	Mean Detected (mg/kg)		Frequency Detected	Minimum Detected (mg/kg)	Maximum Detected (mg/kg)	Mean Detected (mg/kg)
C1	0-6 in	17/18	0.43	41	5.4	> 6 in	14/20	0.077	11.1	4.8
C2	0-6 in	25/48	0.116	95	9.7	> 6 in	45/104	0.05	920	83.8
C3	0-6 in	16/16	0.23	2.83	1.2	> 6 in	3/11	0.2	0.28	0.24
C4	0-6 in	36/37	0.06	23.2	1.9	> 6 in	22/24	0.074	4.34	0.8
C5	0-6 in	35/41	0.076	5.1	1	> 6 in	5/8	0.027	3.71	1.9
C6	0-6 in	4/5	0.1	8.1	2.4	> 6 in	NA			
C7	0-6 in	29/36	0.044	4.2	1.4	> 6 in	6/9	0.31	0.85	0.42
C8	0-6 in	34/38	0.026	2.64	0.9	> 6 in	11/27	0.077	2.31	0.9
C9	0-6 in	15/22	0.021	0.92	0.3	> 6 in	5/17	0.12	0.65	0.33
C10	0-6 in	29/38	0.082	2.72	0.69	> 6 in	23/55	0.035	2.15	0.42
HH Fish Locations	0-6 in Composite	10/10	0.08	150	15.5	> 6 in	NA			
Total		250/309	0.021	150	2.9		134/275	0.027	920	29

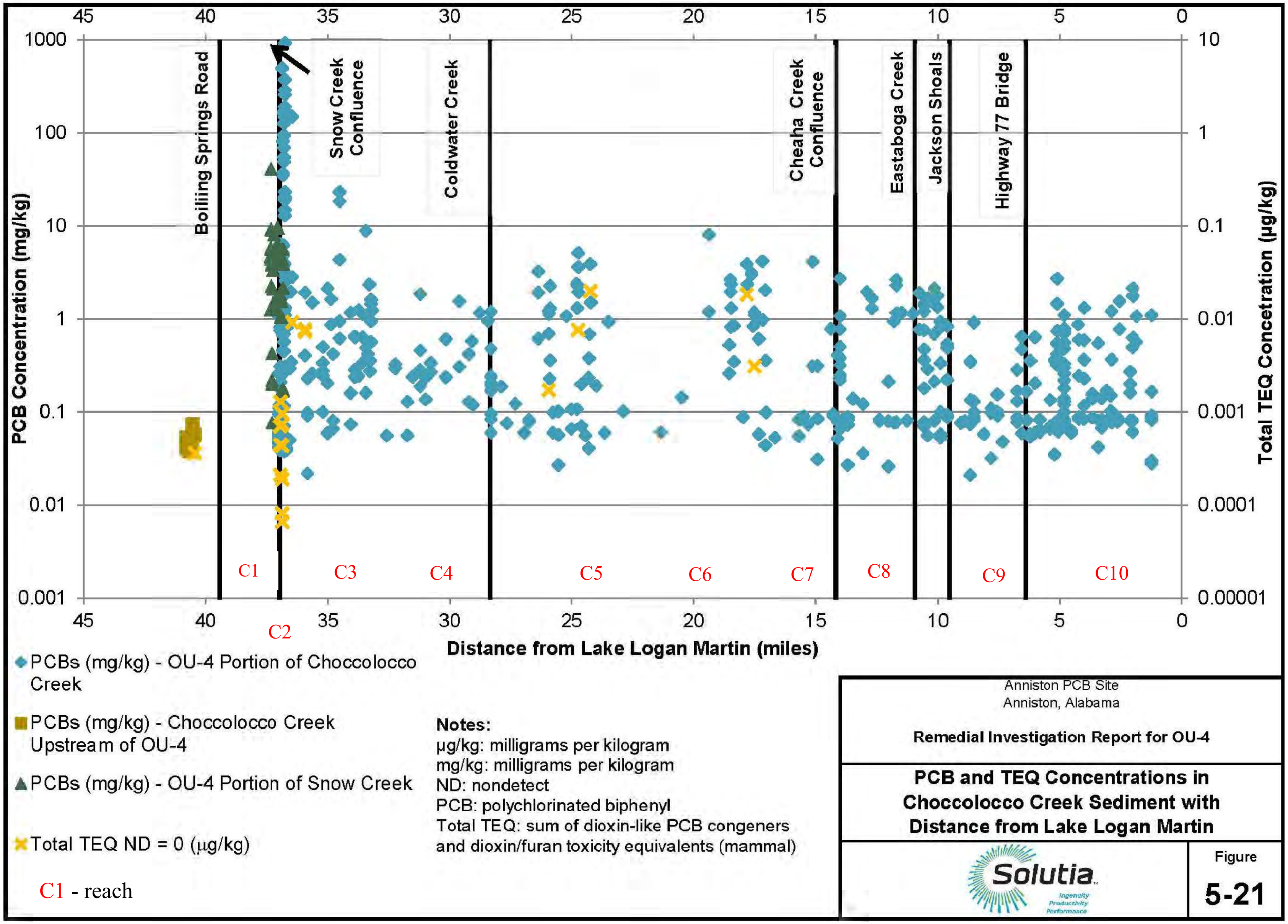

Figure 18. PCB and TEQ Concentrations in Choccolocco Creek Sediment with Distance from Logan Martin Lake

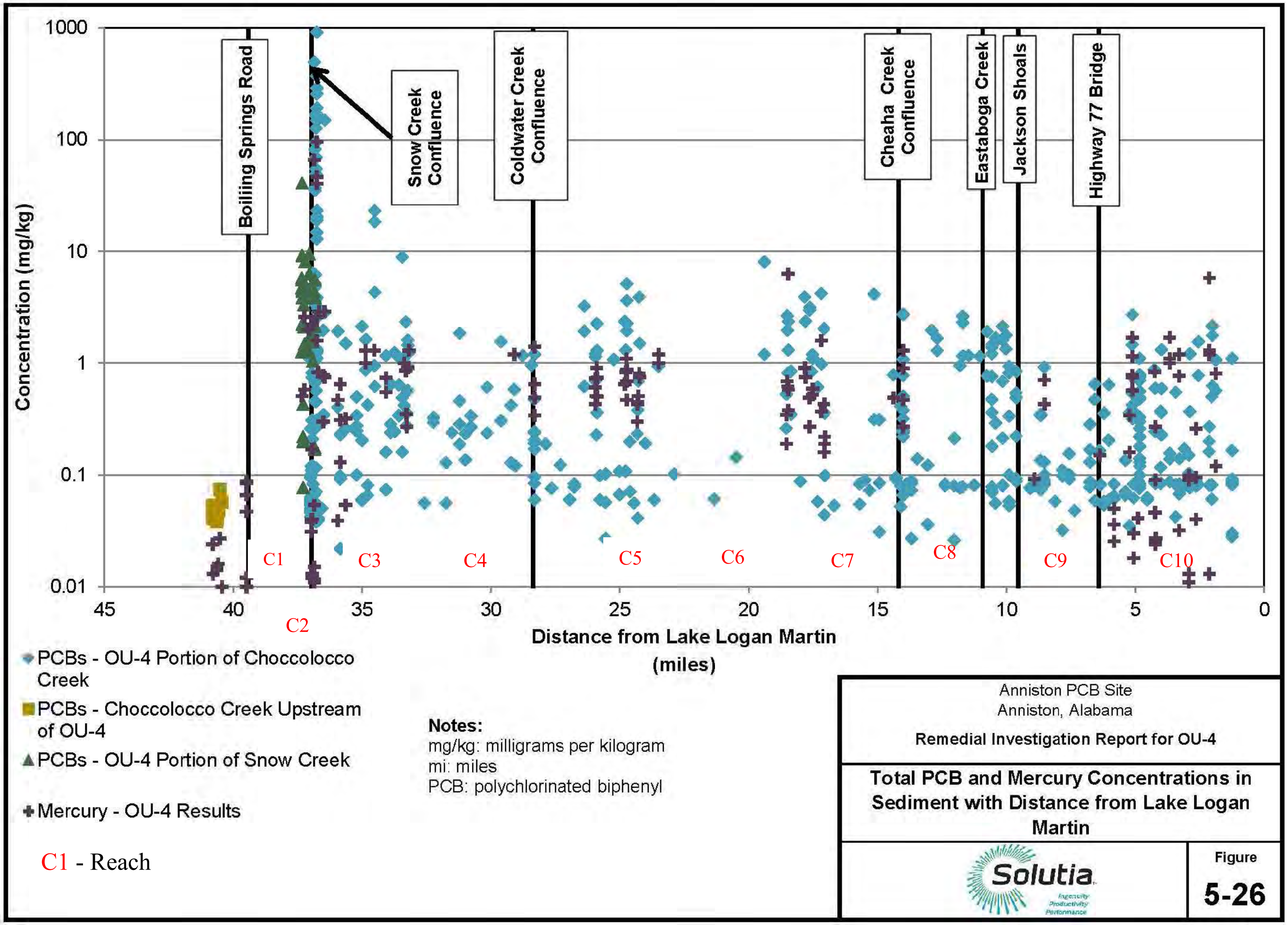

Figure 19. Total PCB and Mercury Concentrations in Sediment with Distance from Logan Martin Lake

- Cobalt was detected in all 81 samples. OU-wide concentrations ranged from 1.7 mg/kg to 96 mg/kg. The highest concentration of cobalt is located in reach C1 in subsurface sediment. The maximum concentration for cobalt in surface sediment downstream is 34 mg/kg. This concentration is higher than the maximum concentration detected in the background data set (22 mg/kg), and higher than twice the mean background concentration (11 mg/kg). These background data reflect broader regionalized sources.
- Lead was detected in 82 of 85 samples where it was analyzed. Concentrations ranged from 3 mg/kg to 250 mg/kg, with a mean of 27 mg/kg. The highest concentrations are in the upstream reaches (C1 and C2). Only one sample exceeds the background maximum concentration (110 mg/kg). The maximum concentration for lead in surface sediment downstream of the backwater area is 53 mg/kg. This concentration is lower than the maximum concentration detected in the background data set (110 mg/kg), but higher than twice the mean background concentration (38 mg/kg). These background data reflect a combination of naturally occurring materials and broader regionalized sources.
- Vanadium was detected in all 85 samples where it was analyzed. Concentrations ranged from 3 mg/kg to 63 mg/kg with a mean of 18 mg/kg. The maximum concentration for vanadium is downstream of the backwater area in C5. The maximum concentration is lower than the maximum concentration detected in the background data set (67 mg/kg), but higher than twice the mean background concentration (31 mg/kg). These data reflect a combination of naturally occurring materials and broader regionalized sources.

5.3.2.2 Geochronological Investigations

Sediment core samples for geochronological testing were collected in 1999 and in 2007 to provide data to assess sediment deposition rates and evaluate sediment stability. Results of the analyses were evaluated to characterize historical and recent sediment transport rates, sediment deposition rates, and surface sediment mixing depths.

The samples collected in 1999 were located where Choccolocco Creek flows into Logan Martin Lake (Figure 20). Core MLM-GEO-7 had the highest PCB concentrations (1.1 mg/kg) from these cores. The PCB data plotted on Figure 20 include the collection interval estimated time (years) that the sediment had been deposited. The temporal (chronological) profile aspect of this figure was developed using a combination of dating techniques. These data indicate that the highest PCB concentrations correspond with the period of the 1960s to 1970s. After this period, sediment PCB concentrations in Choccolocco Creek decline until the early 1990s when a spike in concentration is apparent. Logan Martin Lake was impounded in 1964, and 24 inches of sediment was deposited at the location sampled between 1964 and 1999 which is approximately 0.7 inches per year.

The samples collected in 2007 were located in the backwater area (reach C2), two cores were collected for analysis. A geochronological profile was generated for core CU-GEO-02 (Figure 21). Using this core, a corresponding date was assigned to each sampling interval based on fixing the 1954 horizon to the first detectable Cs-137. Based on these data, the peak PCB concentration in the core corresponds

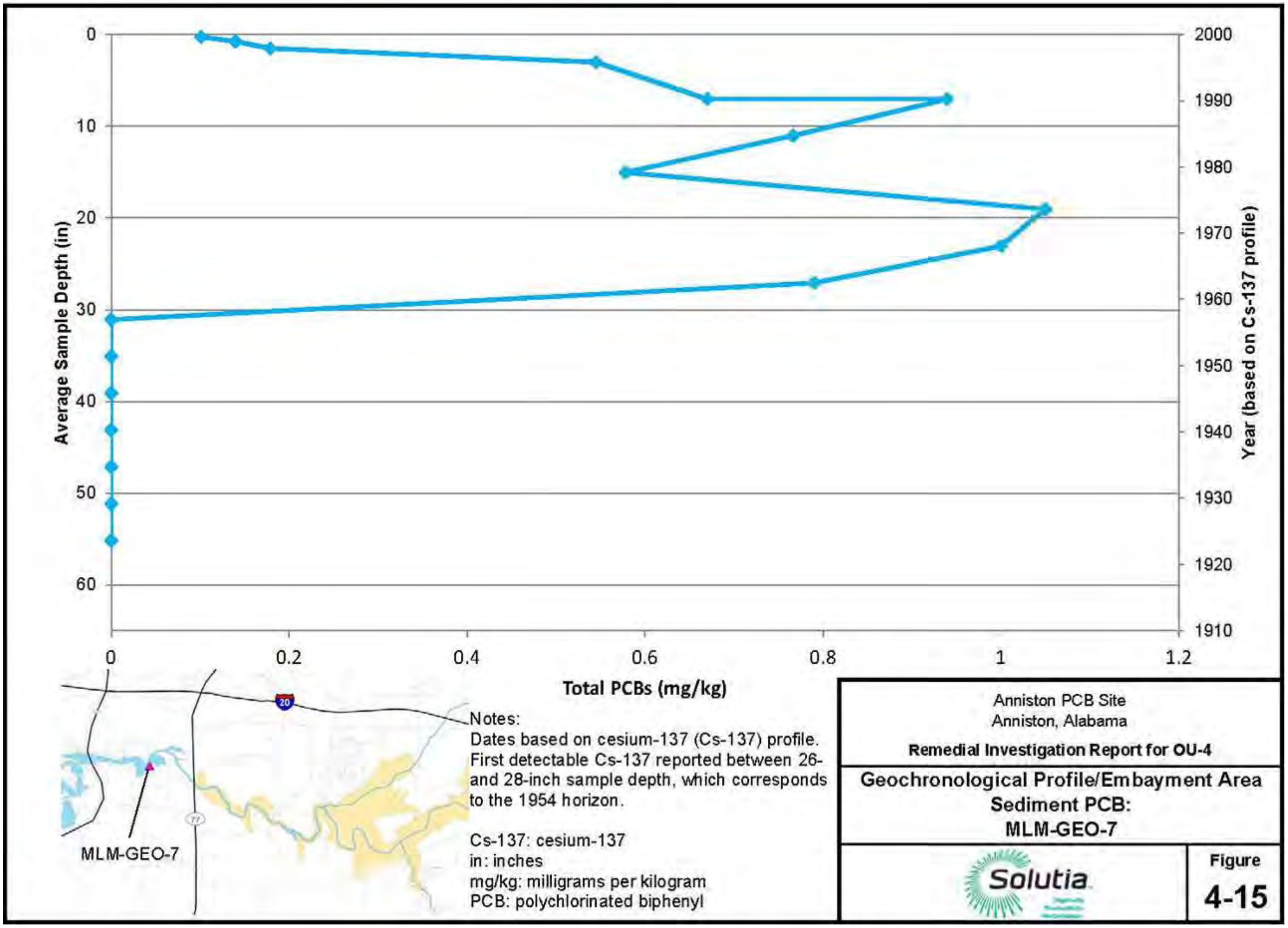

Figure 20. Geochronological Profile/Embayment Area Sediment PCB: MLM-GEO-7

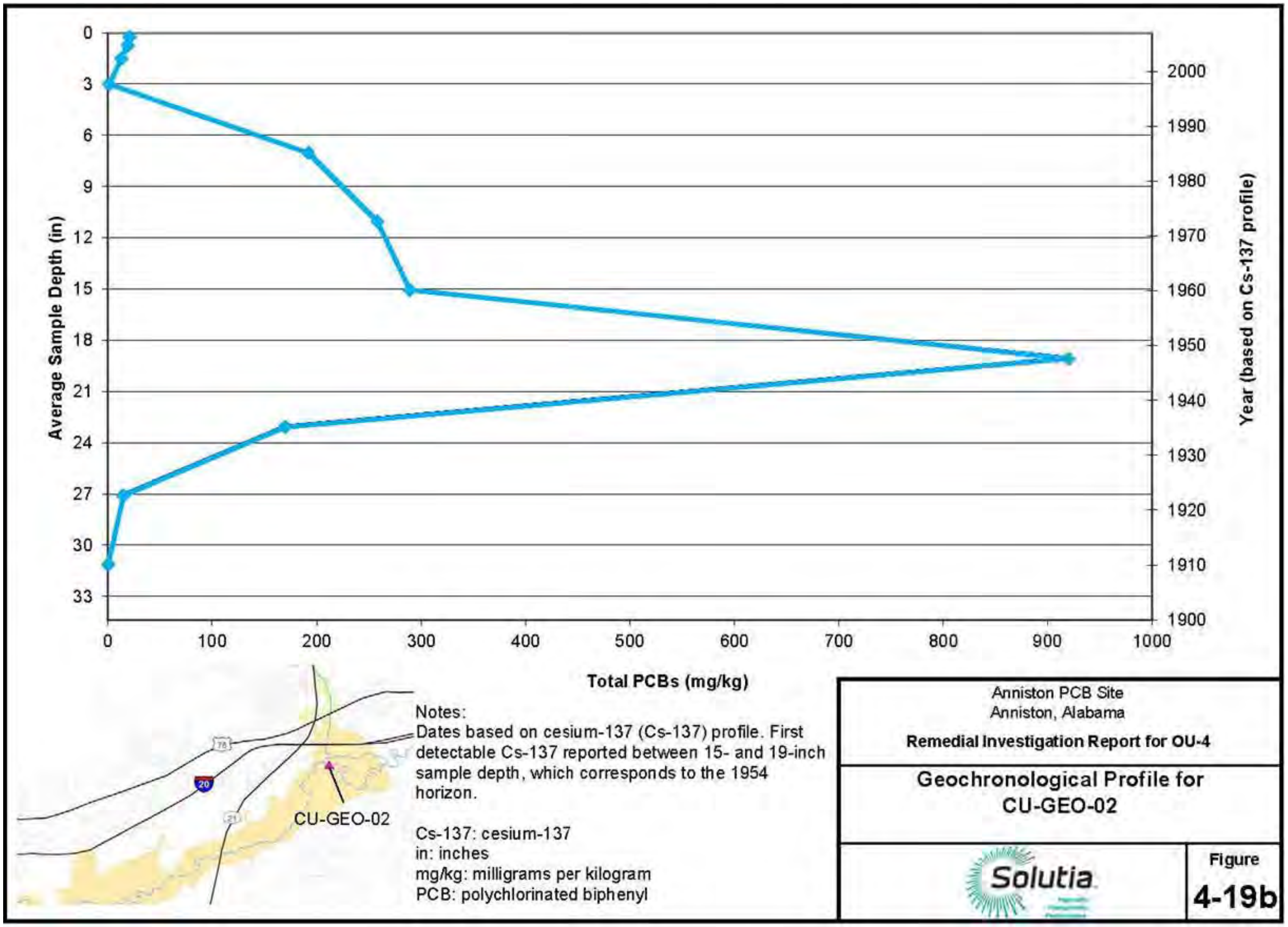

Figure 21. Geochronological Profile for CU-GEO-02

approximately to the 1948 horizon. Based on the Cs-137 data, an annual sediment deposition rate between 0.3 and 0.4 inches per year is estimated. The Pb-210 profile indicates deposition rates may be as high as 0.5 inches per year.

5.3.2.3 Sediment Stability

A weight-of-evidence approach was used to evaluate sediment stability in the different portions of Choccolocco Creek. Sediment in the Snow Creek portion of OU4 are not considered to be stable due to the high energy nature of the creek, so stability of sediment in Snow Creek was not evaluated. The weight-of-evidence approach looked at a range of considerations including the bathymetry profile of the creek. This included the slope of the creek bed in terms of feet of elevation drop per mile of creek length. Creek bed elevation data were compared to the surface water elevations to estimate water depths along the creek. Measured and modeled surface water velocities of the creek were assessed including the identification of high flow events dating back to the general time frame when PCB manufacturing began in the Anniston area. The thickness of the sediment deposits as a general indicator of depositional environments and radioisotope data to estimate sediment deposition rates were also used as lines of evidence.

Three specific areas were identified where sediment appears to be stable (Figure 22). These three areas include portions of the backwater area, the area upstream of Jackson Shoals, and the embayment area at Logan Martin Lake. The physical characteristics of the streambed in these areas, as well as water velocities and sediment thicknesses indicate that these are depositional areas of the creek.

5.3.2.4 Sediment Loading from Creek Banks

The PCB loadings for creek bank soil were calculated by combining the estimated creek bank erosion rates with the results of field surveys conducted to characterize creek bank stability conditions and PCB concentrations for creek bank soil samples. Creek banks with severe erosion are identified as unstable and were estimated to recede at 1.0 meter per year. Creek banks with minor or moderate erosion were estimated to recede at 0.1 meters per year. The creek bank conditions survey was conducted using a rating system of five categories of creek bank conditions: stable, moderately stable, minor erosion, moderate erosion, and severe erosion (Figure 23). The creek bank stability results showed that the system becomes more stable downstream of river mile 29.5 (RM 29.5) where PCB concentrations are lower.

Top of bank samples and surrogate values from samples taken within 33 feet of creek banks were used to estimate the average PCB concentrations at each bank area. The averages of these samples at each bank area are as follows:

- Snow Creek (reach C1): 49.3 mg/kg;
- Choccolocco Creek upstream of Highway 21 (reach C2 and C3): 17 mg/kg;

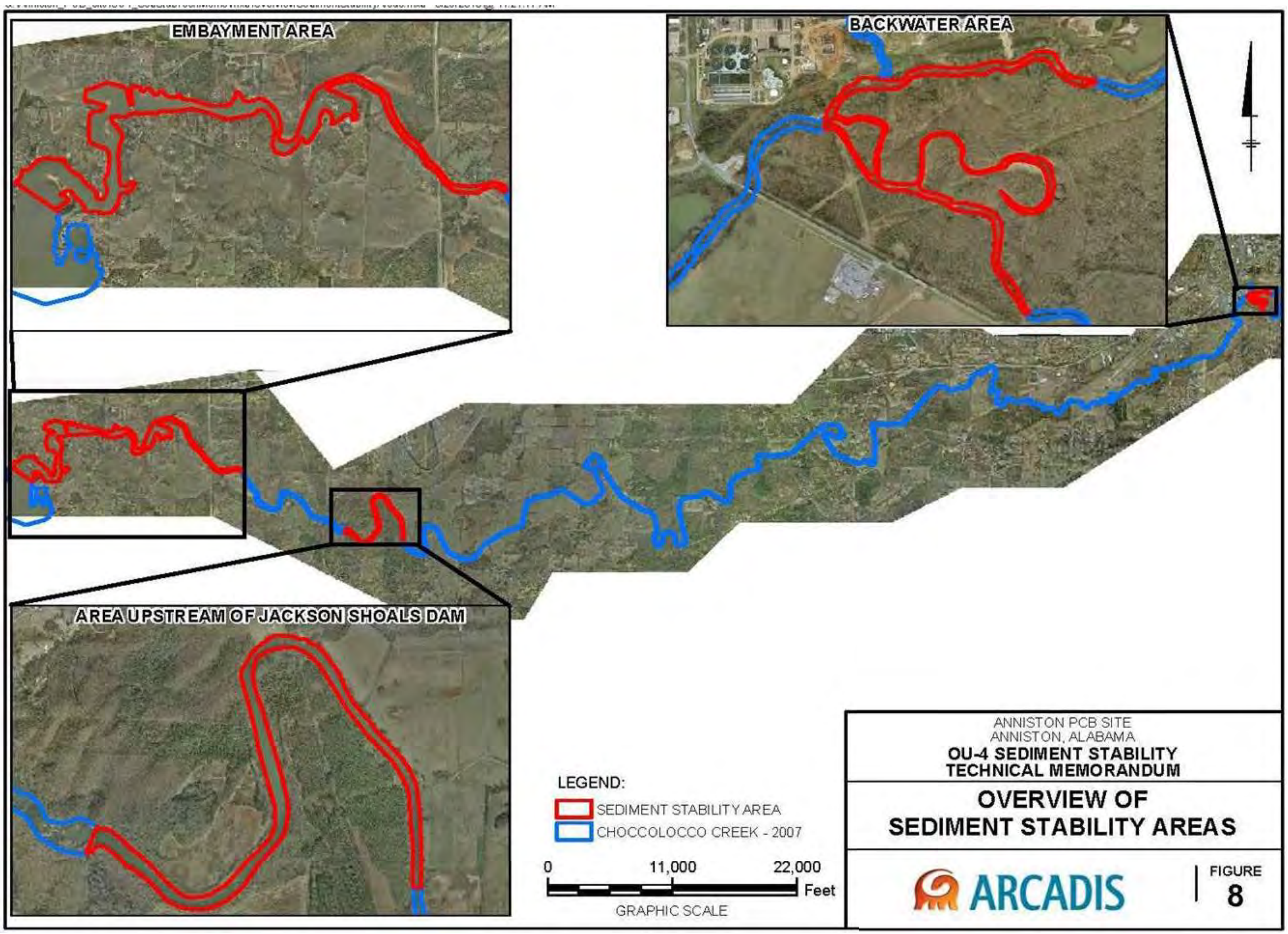

Figure 22. Overview of Sediment Stability Areas

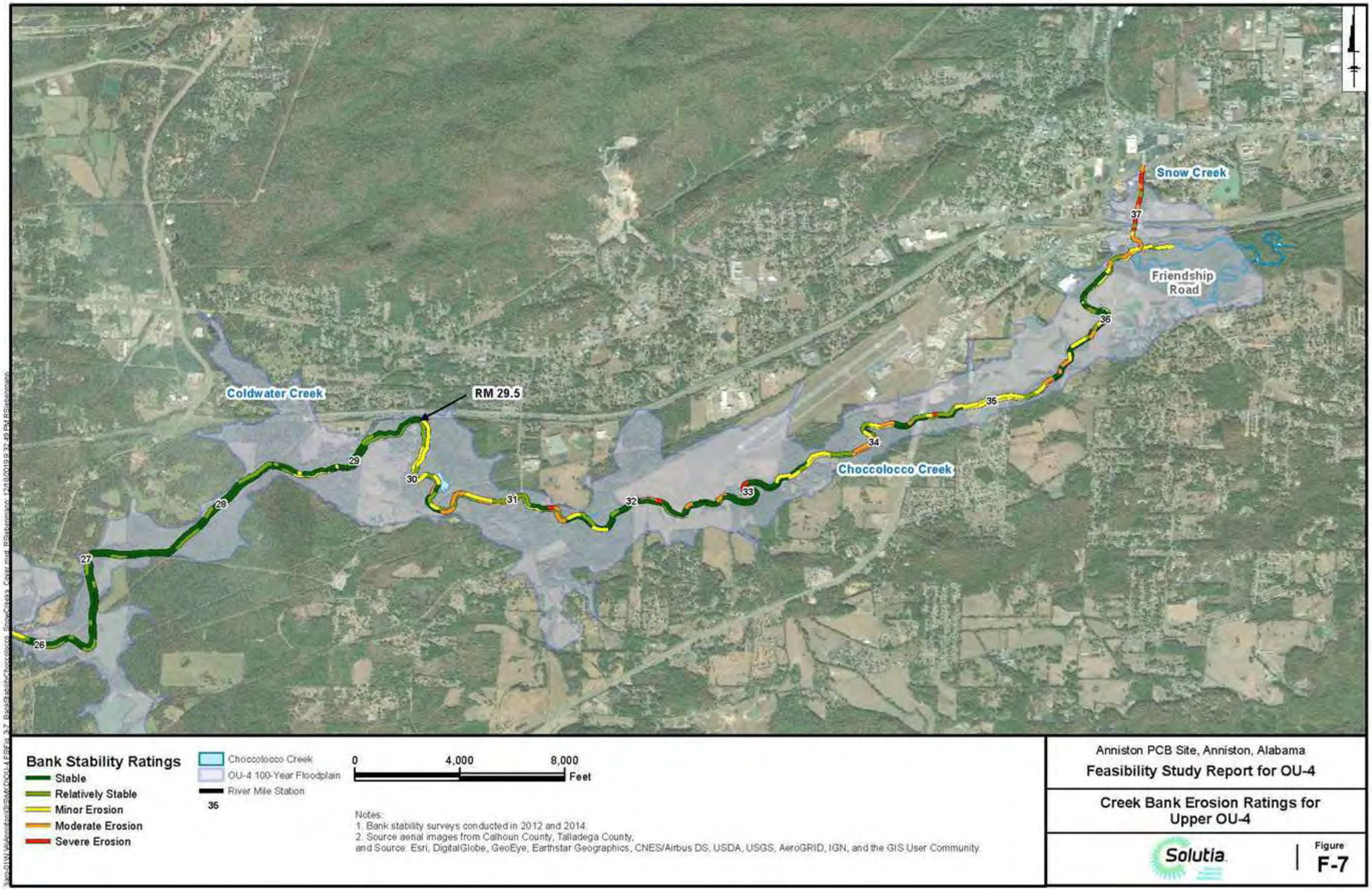

Figure 23. Creek Bank Erosion Ratings for Upper OU4

- Choccolocco Creek from Highway 21 to RM 29.5 (reach C4): 6.1 mg/kg; and
- Choccolocco Creek downstream of RM 29.5 (reach C5-C10): 3.3 mg/kg.

The 1999 field survey indicated that approximately 95% of creek banks were stable, moderately stable or had minor erosion. Most of the areas with moderate or severe erosion are located upstream of RM 29.5. A PCB loading estimate using the above surrogate values indicates that creek banks with moderate-to-severe erosion contributed 81% of the PCBs from all creek bank areas. Due to the sparse sampling, use of surrogate samples, and the lack of calibration or validation of these approaches, this loading estimate is an imprecise predictor of erosion and PCB loading potential. However, it does suggest that erosive areas in the highly contaminated upper reaches are major contributors of PCBs to the river system.

5.3.3 Substances Detected in Groundwater

Groundwater is not a medium of concern in the OU4 portion of the Site. Groundwater migrating from the Facility (OU3) with Site-related contaminants above regulatory action levels is being remediated through actions selected for OU3. Ten wells, T-8 through T-17, were installed and sampled in three sampling phases outside of OU3. All of the wells were analyzed for PCBs Aroclors and PCB homolog groups. Filtered and unfiltered results were evaluated for each sample. The well locations are on Figure 4.

With the exception of T-11, each well was constructed of two-inch diameter, flush-threaded, Schedule-40 polyvinyl chloride (PVC) casing, with a 10-foot section of 0.010-inch slotted, Schedule-40 PVC screen. T-11 was constructed using the same well material but using only a five-foot-long screen section. A 5-foot screen section was used to intersect the moist soil observed from six to ten feet bgs. The filter pack constructed around the well screens consisted of 20/30 grade silica sand with less than 2% flat particles. The sand was tremied from the bottom of the borehole to approximately two feet above the top of the screened interval. Sodium bentonite (100%) was used to construct a seal above the sand filter pack. Each bentonite seal extended a minimum of three feet above the top of the filter pack. The bentonite was allowed to hydrate approximately eight hours prior to continuing well construction activities. A grout mixture of 5% bentonite powder and 95% Portland cement was used to fill the annular space between the PVC riser section and the borehole. The grout was pumped through a tremie pipe from the top of the bentonite seal to just below the ground surface. The wells were completed by constructing a three-foot by three-foot by six-inch concrete pad around each well at the ground surface, which sloped away from the wells to provide drainage. An expandable locking well cap was placed in the top of each riser, and an aluminum protective outer casing extending approximately 2.5 feet above the ground surface was installed at each well location.

Monitoring well T-17 was installed in Oxford Lake Park. The location for T-17 was selected to represent the highest soil concentrations in OU4. Total PCB Aroclor concentrations in soil samples collected at T-17 ranged from 28 to 460 mg/kg, and homolog concentrations ranged from 21 to 360 mg/kg. Groundwater results were less than the respective detection limits for Aroclors and homologs at T-17 (Table 5).

Table 5. Groundwater Data from Well T-17 in Oxford Lake Park

Parameter	Unit	T-17 2/21/2012	T-17F0.1 2/21/2012	T-17F2 2/21/2012	600131-W 12/6/12	600131-W-X 12/6/12	600145-W 12/6/12
Oxygen, Dissolved	mg/L	5.5	5.5	5.5	0.27	0.27	0.31
pH	S.U.	8.3	8.3	8.3	6.3	6.3	6.1
Specific Conductance	mS/cm	0.48	0.48	0.48	313	313	237
Turbidity	NTU	8.3	8.3	8.3	0.76	0.76	0.28
Water Temperature	Deg C	16	16	16	18	18	15
ORP	mV	-61	-61	-61	-53	-53	-13
PCB-1016	µg/L	<0.50	<0.51	<0.53	<0.070	<0.068	<0.068
PCB-1221	µg/L	<0.50	<0.51	<0.53	<0.28	<0.27	<0.27
PCB-1232	µg/L	<0.50	<0.51	<0.53	<0.11	<0.10	<0.11
PCB-1242	µg/L	<0.50	<0.51	<0.53	<0.18	<0.17	<0.17
PCB-1248	µg/L	<0.50 J	<0.51 J	<0.53 J	<0.36	<0.34	<0.34
PCB-1254	µg/L	<0.50 J	<0.51 J	<0.53 J	<0.26	<0.25	<0.25
PCB-1260	µg/L	<0.50 J	<0.51 J	<0.53 J	<0.20	<0.19	<0.19
PCB-1268	µg/L	<0.50 J	<0.51 J	<0.53 J	<0.11	<0.10	<0.11
Total PCBs by Aroclor	µg/L	< 0.50 J	< 0.51 J	< 0.53 J	<0.36	<0.34	<0.34
Monochlorobiphenyl	µg/L	<0.10	<0.10	<0.098	<0.0053	<0.0053	<0.0058
Dichlorobiphenyl	µg/L	<0.046	<0.047	<0.044	<0.0051	<0.0051	<0.0056
Trichlorobiphenyl	µg/L	<0.046	<0.047	<0.044	<0.0061	<0.0062	<0.0067
Tetrachlorobiphenyl	µg/L	<0.046	<0.047	<0.044	<0.012	<0.012	<0.013
Pentachlorobiphenyl	µg/L	<0.046	<0.047	<0.044	<0.013	<0.013	<0.014
Hexachlorobiphenyl	µg/L	<0.046	<0.047	<0.044	<0.014	<0.014	<0.016
Heptachlorobiphenyl	µg/L	<0.046	<0.047	<0.044	<0.028	<0.028	<0.031
Octachlorobiphenyl	µg/L	<0.10	<0.10	<0.098	<0.036	<0.036	<0.039
Nonachlorobiphenyl	µg/L	<0.10	<0.10	<0.098	<0.046	<0.046	<0.051
Decachlorobiphenyl	µg/L	<0.10	<0.10	<0.098	<0.066	<0.066	<0.072
Total PCBs by Homolog	µg/L	< 0.10	< 0.10	< 0.098	<0.066	<0.066	<0.072
Mercury	µg/L	NA	NA	NA	<0.40	<0.40	<0.40

Aroclor by USEPA Method 8082A
Homolog by USEPA Method 680.
Depth intervals reported in feet below ground surface.
Sample number 600131-W-X is a duplicate sample of 600131-W.
Deg C: degrees Celsius
F: filtered
J: estimated value
µg/L: microgram(s) per liter
mg/L: milligram(s) per liter
mS/cm: milliseamen(s) per centimeter
mV: millivolts
NA: not analyzed
NTU: nephelometric units
OU: operable unit
PCB: polychlorinated biphenyl
S.U.: standard units
USEPA: United States Environmental Protection Agency

The properties sampled under the residential program were visually surveyed to identify the presence of private drinking water wells. Wells were identified on two of the properties: 96 and 276 Champion Lane in Eastaboga, Alabama (Figure 4). The samples were collected from the nearest collection point to the well and analyzed for total PCB Aroclors, total PCB homologs, and mercury. No PCBs or mercury were detected in either well. Based on these findings, groundwater is not investigated further as a medium of concern for OU4.

5.3.4 Substances Detected in Surface Water

Surface water investigations conducted focused on understanding surface water and sediment transport during base- and high-flow conditions for Snow and Choccolocco Creeks. These investigations included collecting samples for analysis from total suspended solids (TSS) in the surface water and in whole-water samples using existing and new information. Sampling locations are shown on Figure 24 and the data is summarized in the RI.

The most recent surface water data were collected for the ecological risk assessment under base-flow conditions that exist approximately 90% of the time for OU4. The periods of high surface water flow are episodic with relatively rapid increases and decreases in flow conditions in response to precipitation events. The average whole-water PCB concentration (total PCB homologs) in Choccolocco Creek was last measured in 2009 and 2010 and was reported in 37 of 43 samples at an average concentration of 0.075 µg/L (Table 6). These surface water data are higher than the chronic national ambient water quality criteria (AWQC) values for PCBs (0.014 µg/L for aquatic life and 0.000064 µg/L for human exposure from consumption of fish). ADEM surface water standards at 335-6-10-.07 Table 1 include the chronic water quality criteria of 0.014 ug/L for PCBs which are considered a chemical-specific requirements. Mercury was reported in only one of 43 samples at a concentration of 0.069 µg/L. No DL-PCBs were detected in the nine samples tested.

PCB concentrations associated with particulates are likely to continue to decrease over time as upstream remedial measures, including remediation that has been conducted for OU3 and has and will occur in OU1/OU2. The actions have and will remove and/or isolate potential sources of PCBs from surface water runoff to Snow and Choccolocco Creeks. The amount of particulate suspended in water and transported downstream during high-flow events is likely to be similar in future events. However, the concentration of PCBs associated with those particulates will decrease over time.

5.3.5 Fish Tissue Investigations

Several fish tissue collection programs were conducted in OU4 from 1994 to 2016 to characterize the nature and extent of contamination in fish, support the HHRA, and evaluate temporal fish tissue concentration trends. The fish tissue sampling programs have collected over 1,200 individual fish tissue samples from OU4. Figure 25 shows the change in fish tissue PCB concentrations over time for samples collected by ADEM at their sampling Station 35 from 1994 to 2016. Station 35 is located at the downstream end of OU4, and the PCB concentration data are presented as the minimum, maximum, and average PCB concentration based on the year of sample collection and the generalized fish type

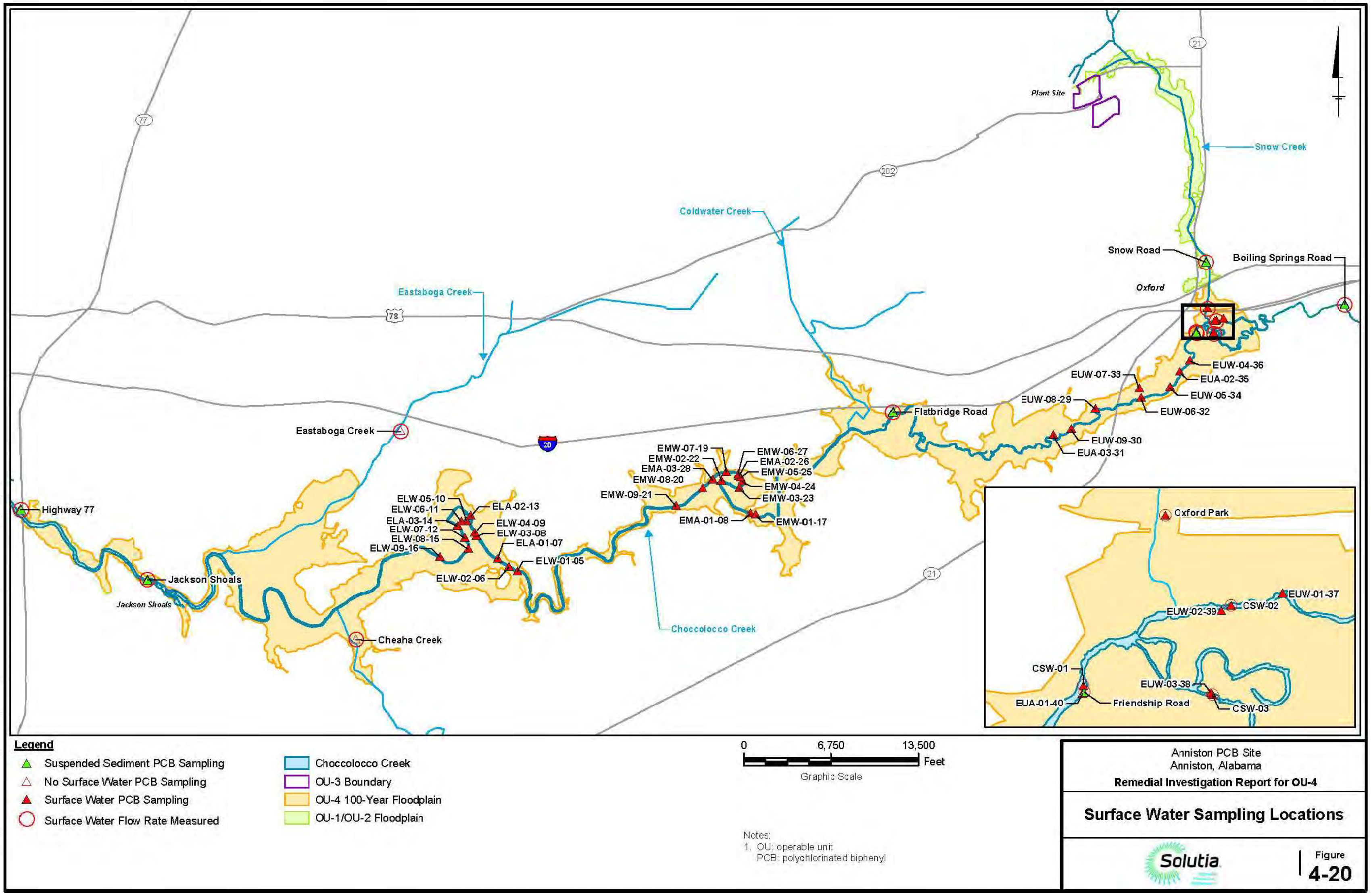

Figure 24. Surface Water Sampling Locations

Table 6. Summary Statistics for COPCs in OU4 Surface Water

Reach or AA[1]	COPC	Total Sample Size (n)	Detects	NumNDs	% FOD	Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Median	SD	CV	UCL[1,2] (mg/L)	EPC[3] (mg/L)	EPC Basis
C1	Barium	4	4	0	100%	0.0241	0.201	0.086	0.059	0.083	0.97	--	0.20	Maximum
C1	Chromium	4	4	0	100%	0.002	0.0329	0.012	0.0065	0.015	1.2	--	0.033	Maximum
C1	Cobalt	4	2	2	50%	0.005	0.0122	0.0086	0.0086	0.0051	0.59	--	0.012	Maximum
C1	Lead	4	4	0	100%	0.0042	0.0964	0.034	0.017	0.043	1.3	--	0.096	Maximum
C1	Vanadium	4	4	0	100%	0.0041	0.0339	0.015	0.011	0.014	0.94	--	0.034	Maximum
C1	Mercury	4	2	2	50%	0.00015	0.00043	0.00029	0.00029	0.00020	0.68	--	0.00043	Maximum
C1	Total Homolog PCBs	3	3	0	100%	0.000175	0.000498	0.00036	0.00040	0.00017	0.46	--	0.00050	Maximum
UAA	Barium	4	4	0	100%	0.0251	0.0319	0.030	0.031	0.0030	0.10	--	0.032	Maximum
UAA	Chromium	4	4	0	100%	0.000575	0.0017	0.0011	0.0011	0.00046	0.42	--	0.0017	Maximum
UAA	Cobalt	4	0	4	0%	NA	NA	NA	NA	NA	NA	--	--	ND
UAA	Lead	4	4	0	100%	0.00048	0.00084	0.00063	0.00060	0.00016	0.26	--	0.00084	Maximum
UAA	Vanadium	4	4	0	100%	0.000495	0.0013	0.0010	0.0012	0.00036	0.35	--	0.0013	Maximum
UAA	Mercury	15	0	15	0%	NA	NA	NA	NA	NA	NA	--	--	ND
UAA	Total Homolog PCBs	15	11	4	73%	0.000016	0.000132	0.000068	0.000064	0.000036	0.53	0.000083	0.000083	UCL
MAA	Barium	2	2	0	100%	0.0248	0.0428	0.034	0.034	0.013	0.38	--	0.043	Maximum
MAA	Chromium	2	1	1	50%	0.004	0.004	0.0040	0.0040	NA	NA	--	0.0040	Maximum
MAA	Cobalt	2	1	1	50%	0.0022	0.0022	0.0022	0.0022	NA	NA	--	0.0022	Maximum
MAA	Lead	2	2	0	100%	0.00058	0.0048	0.0027	0.0027	0.0030	1.1	--	0.0048	Maximum
MAA	Vanadium	2	2	0	100%	0.00057	0.0031	0.0018	0.0018	0.0018	0.98	--	0.0031	Maximum
MAA	Mercury	12	0	12	0%	NA	NA	NA	NA	NA	NA	--	--	ND
MAA	Total Homolog PCBs	12	12	0	100%	0.0000476	0.000172	0.000087	0.000085	0.000032	0.37	0.00011	0.00011	UCL
LAA	Barium	1	1	0	100%	0.0244	0.0244	0.024	0.024	NA	NA	--	0.024	Maximum
LAA	Chromium	1	1	0	100%	0.00067	0.00067	0.00067	0.00067	NA	NA	--	0.00067	Maximum
LAA	Cobalt	1	0	1	0%	NA	NA	NA	NA	NA	NA	--	--	ND
LAA	Lead	1	1	0	100%	0.00034	0.00034	0.00034	0.00034	NA	NA	--	0.00034	Maximum
LAA	Vanadium	1	1	0	100%	0.00039	0.00039	0.00039	0.00039	NA	NA	--	0.00039	Maximum
LAA	Mercury	13	1	12	8%	0.000069	0.000069	0.000069	0.000069	NA	NA	--	0.000069	Maximum
LAA	Total Homolog PCBs	13	13	0	100%	0.000024	0.000309	0.000073	0.000054	0.000072	1.0	0.00016	0.00016	UCL
Sitewide	Barium	11	11	0	100%	0.0241	0.201	0.050	0.030	0.054	1.1	0.12	0.12	UCL
Sitewide	Chromium	11	10	1	91%	0.000575	0.0329	0.0057	0.0019	0.010	1.8	0.018	0.018	UCL
Sitewide	Cobalt	11	3	8	27%	0.0022	0.0122	0.0065	0.0050	0.0052	0.80	--	0.012	Maximum
Sitewide	Lead	11	11	0	100%	0.00034	0.0964	0.013	0.00084	0.029	2.2	0.067	0.067	UCL
Sitewide	Vanadium	11	11	0	100%	0.00039	0.0339	0.0061	0.0013	0.010	1.7	0.017	0.017	UCL
Sitewide	Mercury	44	3	41	7%	0.000069	0.00043	0.00022	0.00015	0.00019	0.88	--	0.00043	Maximum
Sitewide	Total Homolog PCBs	43	39	4	91%	0.000016	0.000498	0.00010	0.000069	0.00010	1.0	0.00016	0.00016	UCL

Notes:

[1] Datasets with "NA" for UCL did not have enough samples for ProUCL to calculate a UCL.

[2] ProUCL 5.1 (USEPA 2016) was used to calculate summary statistics and UCL values.

[3] EPC based on the UCL when available, otherwise based on the maximum detected concentration.

Datasets with "NA" for UCL did not have enough samples for ProUCL to calculate a UCL.

ProUCL 4.1 (USEPA 2011) was used to calculate summary statistics and UCL values.

EPC based on the UCL when available, otherwise based on the maximum detected concentration.

COPC: constituent of potential concern

Table 6. Summary Statistics for COPCs in OU4 Surface Water (continued)

CV: coefficient of variation
EPC: exposure point concentration
LAA: lower assessment area
MAA: middle assessment area
MAD: median absolute deviation
MAD/0.675: Robust estimate of variability (standard deviation)
Maximum: Maximum value
Mean: Sample average value
Median: Median value
mg/L: milligram per liter
Minimum: Minimum value
n: sample size
NA: not available
ND: nondetect
Num Obs: Number of Observations
NumNDs: Number of Nondetects
SD: Classical sample standard deviation
UAA: upper assessment area
UCL: 95% upper confidence limit
USEPA: United States Environmental Protection Agency
% FOD: Frequency of Detection

Reference:

USEPA. 2016. ProUCL 5.1.A Statistical Software for Environmental Applications for Data Sets with and without non detect observations. National Exposure Research Lab, EPA, Las Vegas Nevada, May 2016. http://www.epa.gov/osp/hstl/tsc/softwaredocs.htm

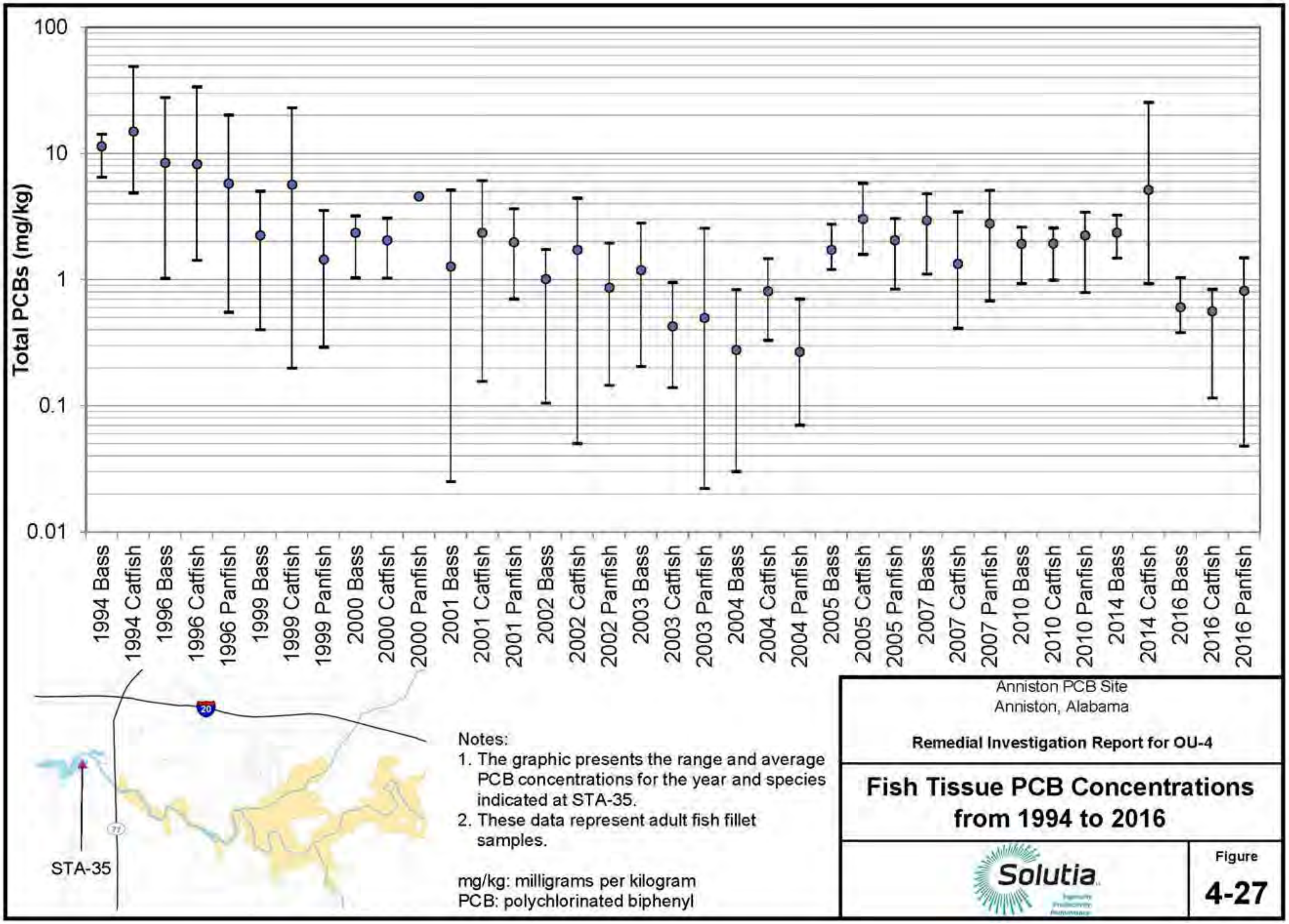

Figure 25. Fish Tissue PCB Concentrations from 1994 to 2016.

(catfish, panfish, and bass). These data demonstrate a factor of 10 decline in PCB concentrations since 1994 and are consistent with the early source control actions taken in OU1/OU2 and OU3. Average fish tissue PCB concentrations in catfish, panfish, and bass have declined to below 1 mg/kg at Station 35 (reach C10) in 2016.

The 361 fish tissue samples collected in 2008 were used to calculate the exposure point concentrations (EPCs) used in the HHRA. The data are also useful for evaluating changes in fish tissue concentrations over time. Fish were collected from nine locations including eight Choccolocco Creek locations and one location at the downstream end of Snow Creek (Figure 26).

The sampling program collected target species from three separate trophic levels: predator (largemouth bass or spotted bass); bottom feeder (channel cattish or blue. catfish); and forage fish (sunfish or crappie). All fish tissue samples were analyzed for total PCBs (tPCBs, represented as the sum of Aroclors), percent lipid, and mercury. Ten percent of the fish tissue samples were analyzed for a wider list including PCB homologs, PCB congeners, non-mercury metals, and PCDD/PCDFs.

The average PCB and mercury results for fish tissue are shown in Figures 27 and 28, respectively. The sample collection locations labelled HHFL01 through HHFL09 are provided in an insert at the bottom of the figures. It should be noted that the Alabama Department of Public Health has published “do not eat any” fish advisories for PCBs and mercury in Choccolocco Creek for many years. In 2023, these advisories were retained due to continued high PCB and mercury concentrations in fish tissue. Fish consumption advisories for mercury are also present upstream of the confluence of Snow Creek and Choccolocco Creek to Boiling Springs Road. (see Appendix A, Tables A-1, A-2, and A-3).

5.3.6 Ecological Species Investigations

Ecological investigations were conducted for OU4 and included habitat assessments and ecological surveys of vegetation, benthic macro-invertebrates, fish, reptiles, amphibians, birds, and mammals. In addition to the habitat and survey data collected, terrestrial and aquatic biotic tissue samples were collected for chemical analysis to evaluate exposure based on dietary food chains.

5.3.6.1 Habitat Surveys

OU4 is the most geographically expansive of the OUs delineated at the Anniston PCB Site. It encompasses large areas of potentially suitable habitat for ecological receptors and includes a variety of distinct habitats. It also includes a number of areas that have been substantially affected by agriculture, grazing, urbanization, and other human activities. Several ecological investigations were conducted in OU4 between 1996 and 2010, including habitat assessments and ecological surveys of vegetation, benthic macroinvertebrates, fish, reptiles, amphibians, birds, and mammals. These data were collected to meet a variety of specific objectives and to support ecological risk assessment activities for OU4.

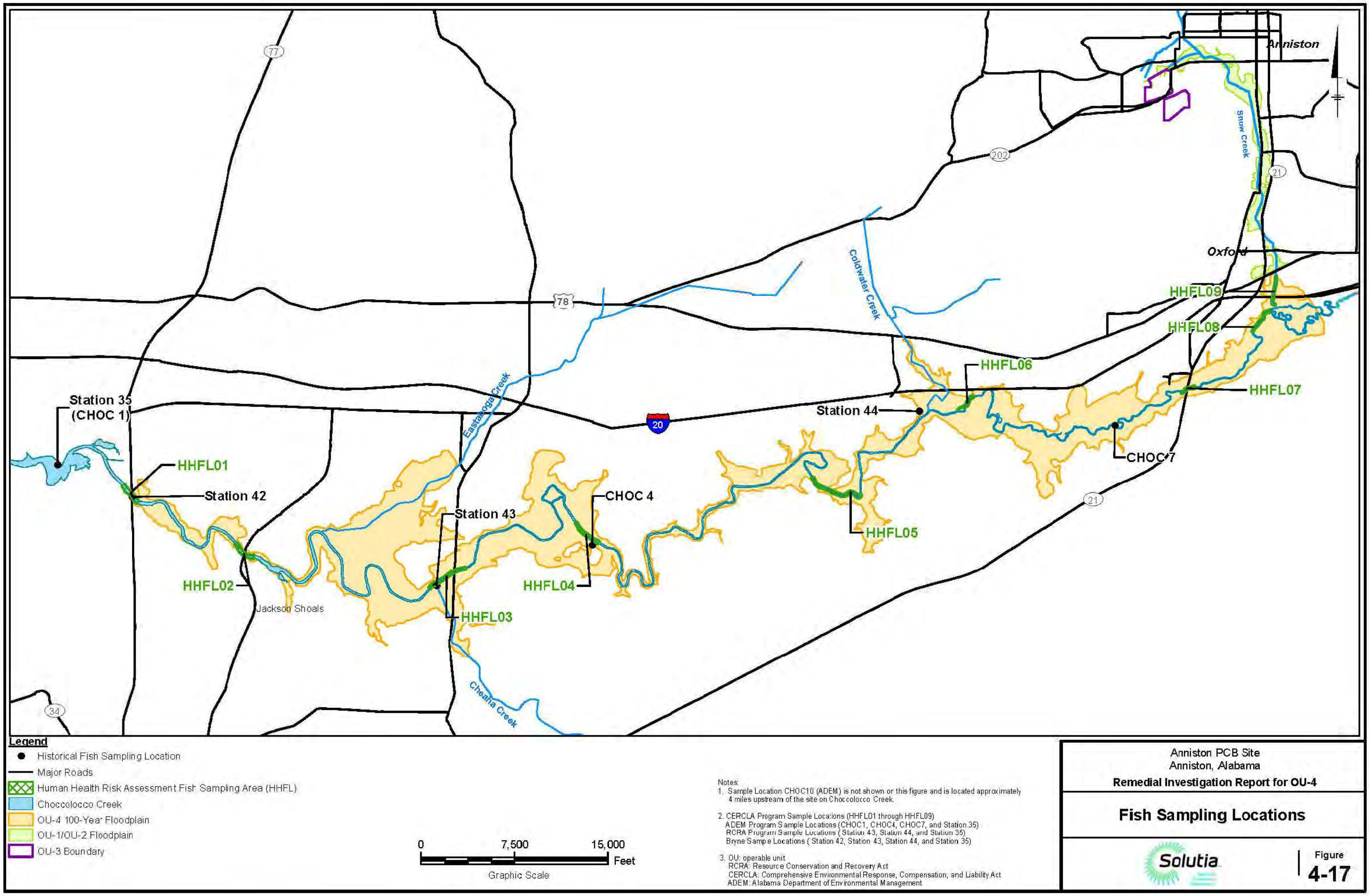

Figure 26. Fish Sampling Locations.

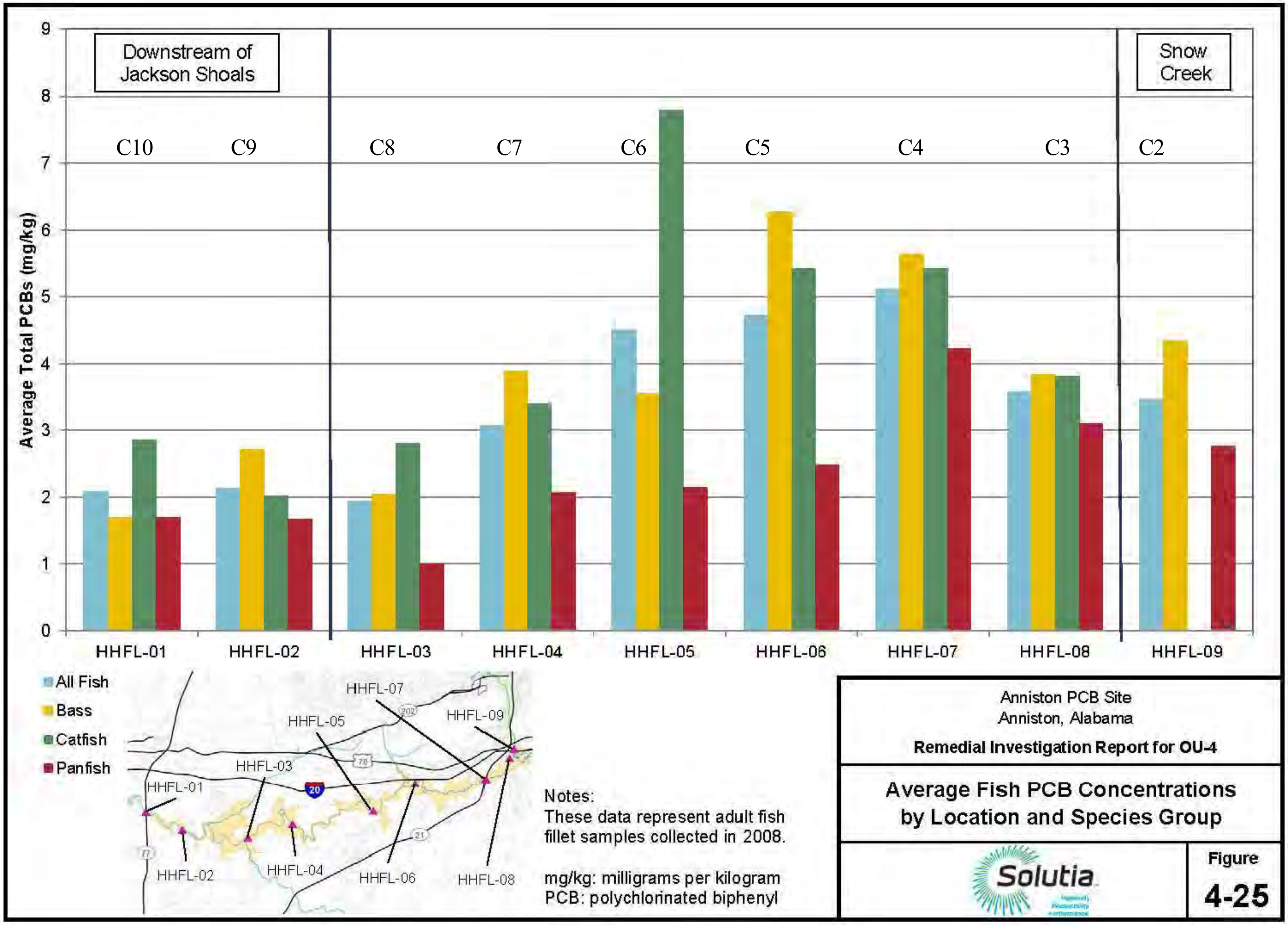

Figure 27. Average Fish PCB Concentrations by Location and Species Group.

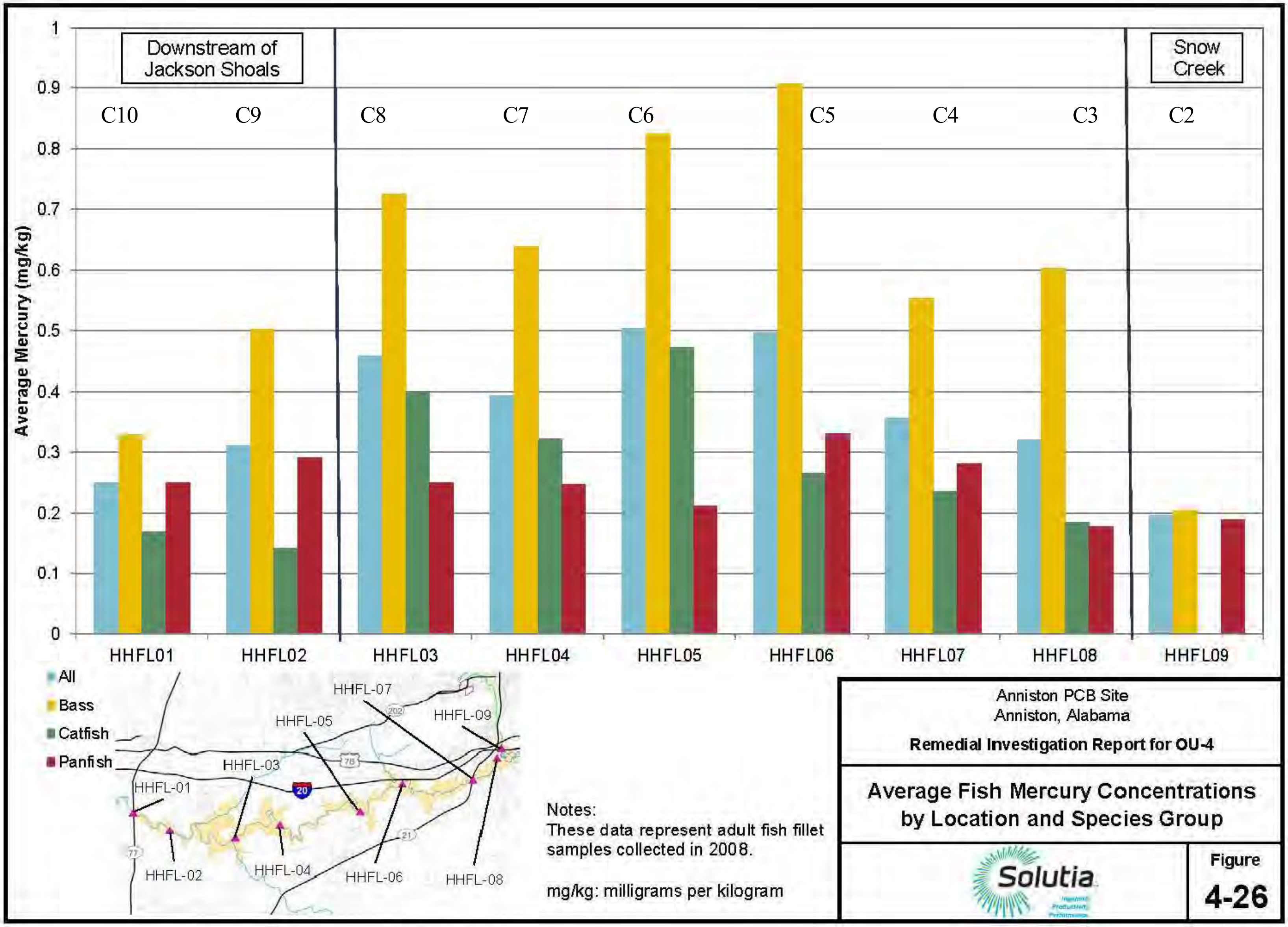

Figure 28. Average Fish Mercury Concentrations by Location and Species Group.

The habitat within OU4 was divided into aquatic and terrestrial habitats. Aquatic habitats encompass the creek and its banks. Terrestrial habitats encompass the adjoining 100-year floodplain outside of the creek banks. The initial portion of the floodplain immediately adjacent to the creek bank includes the riparian corridor. The riparian corridor, while variable in width, is densely forested and forms an important buffer zone between terrestrial/human-maintained areas and the creek. In most areas, the corridor contains a substantial number of large, older, well-established trees dominated primarily by box elder and sycamore. These trees provide an important canopy for the creek and its bank habitats and are an important factor in maintaining shoreline stability and creek habitat viability.

The riparian areas are used by a disproportionate number of wildlife and plant species. The diversity of structure and cover provides nesting habitat, hiding and thermal cover, and food (insects, seeds, and vegetation) for a variety of bird and mammal species. The adjacent water provides a source of water and food for aerial insectivores. In addition, riparian habitat also helps regulate light and temperature and is a source of large woody debris, which can provide important instream habitat and stream stability. Moreover, contiguous riparian zones create important corridors for wildlife that link a variety of ecosystems together and help maintain critical biodiversity.

5.3.6.2 Biological Sampling

The biological sampling program was structured around three identified assessment areas (upper, middle, and lower) and three reference areas. Three major nonaquatic habitat types were identified within OU4: forested floodplain, maintained fields, and successional fields. Five major aquatic habitat types in OU4 were identified: riffles, runs, emergent aquatic vegetation, tributary confluences (backwaters), and depositional environments (islands, banks/bars).

Tissue samples from various organisms within the food web (Figure 29) were collected and analyzed for PCBs and mercury. PCBs were measured as Aroclors or homologs when small sample sizes precluded Aroclor methods. In addition, 10% of the tissue samples collected were analyzed for 10 metals (arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, manganese, nickel, and vanadium), PCB homologs (when Aroclors methods were the primary method), mono- and -ortho-substituted congeners, and PCDD/PCDFs.

The results of the tissue analysis for PCBs concentrations are presented for terrestrial tissue, aquatic tissue, and whole-body fish in Figures 30, 31, and 32, respectively. PCBs generally appear to be elevated in biota tissue samples collected within OU4 compared to reference locations. Several of the biota samples, including crayfish, emergent insects, frogs, and worms, demonstrated a concentration gradient in tissue like that seen in soil and sediment with higher PCB concentration in tissues from the Upper Assessment Area (UAA) than in the Middle Assessment Area (MAA) and Lower Assessment Area (LAA). Mercury tends to demonstrate similar concentrations between the assessment areas.

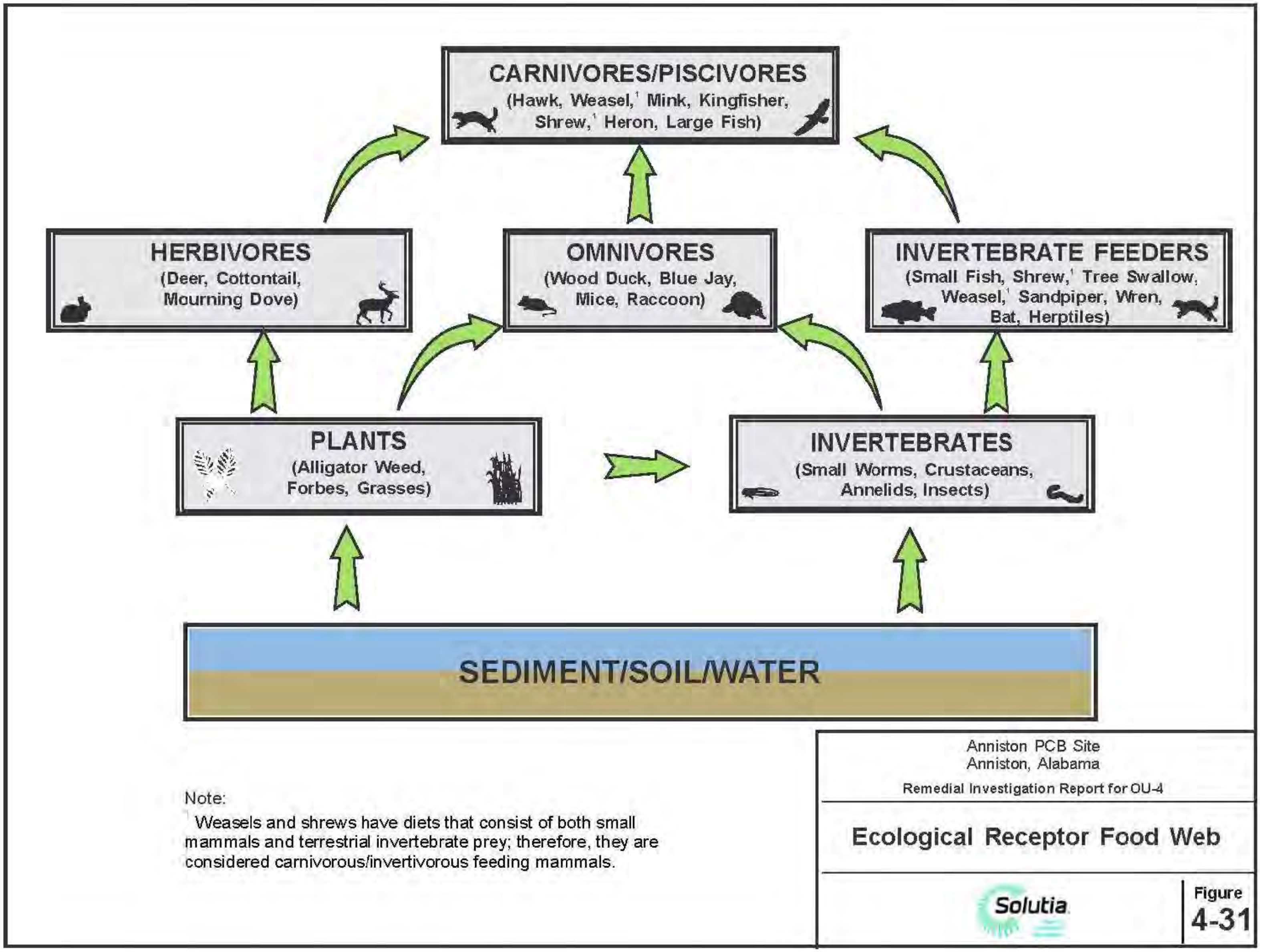

Figure 29. Ecological Receptor Food Web.

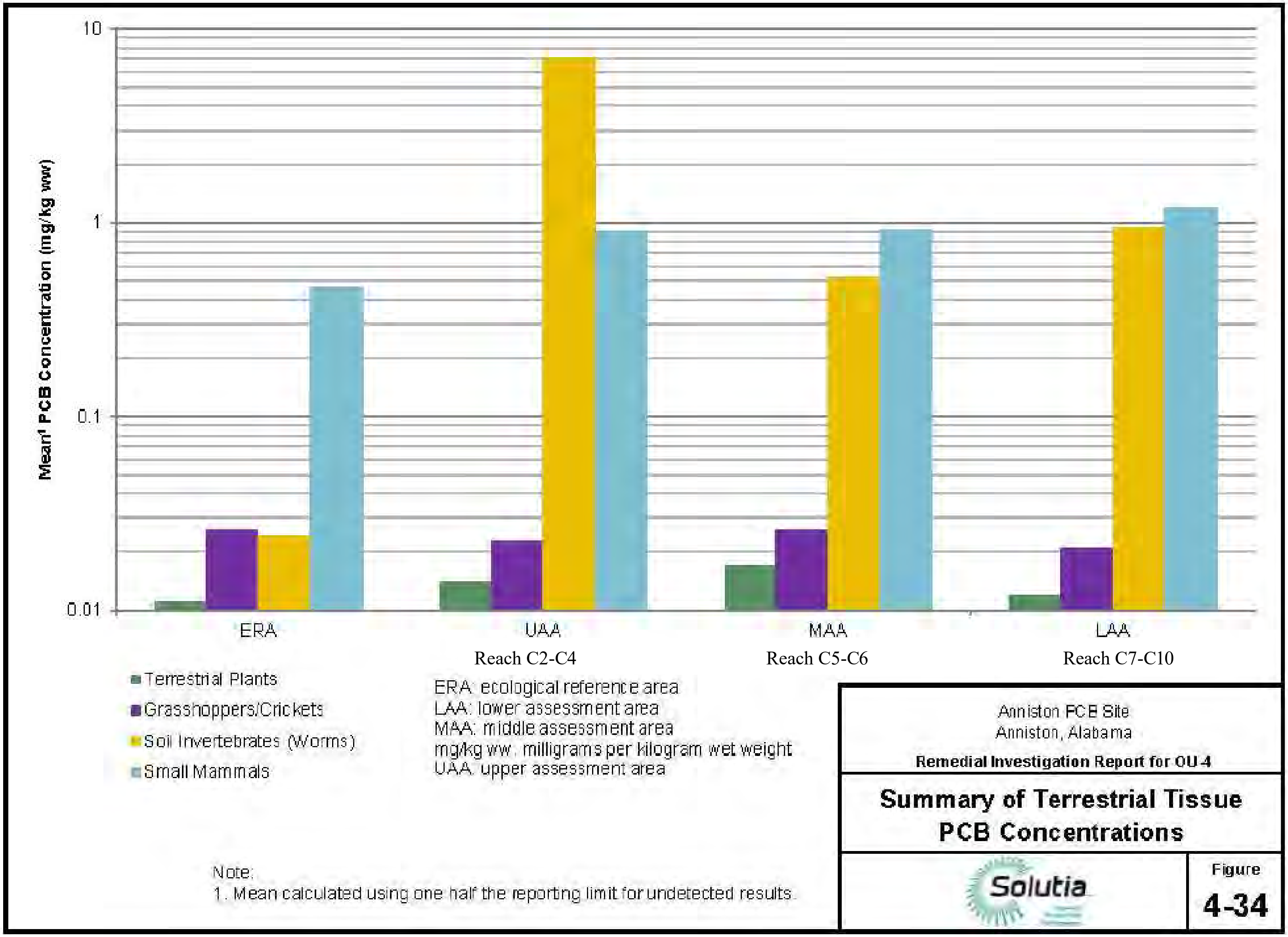

Figure 30. Summary of Terrestrial Tissue PCB Concentrations.

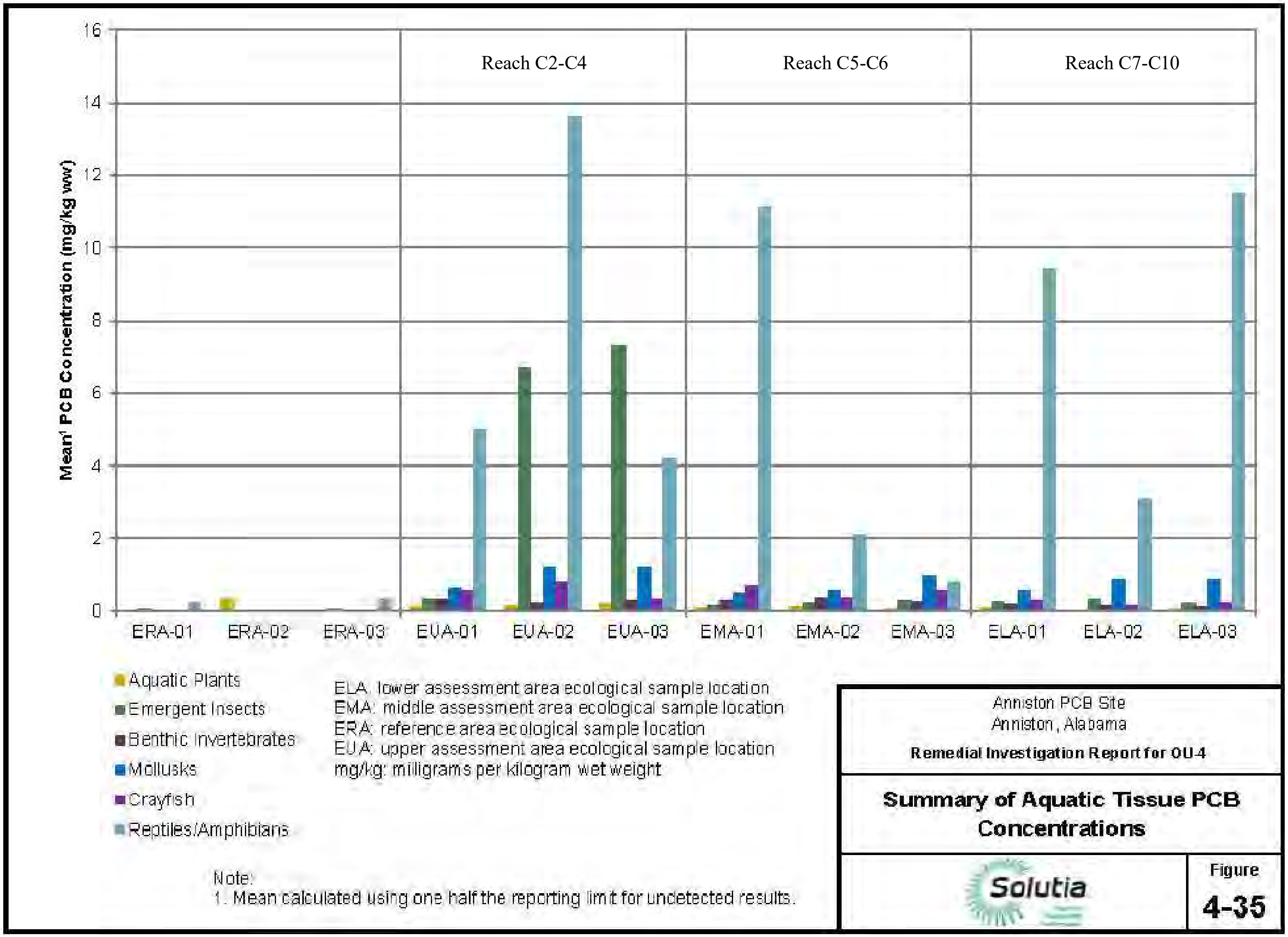

Figure 31. Summary of Aquatic Tissue PCB Concentrations.

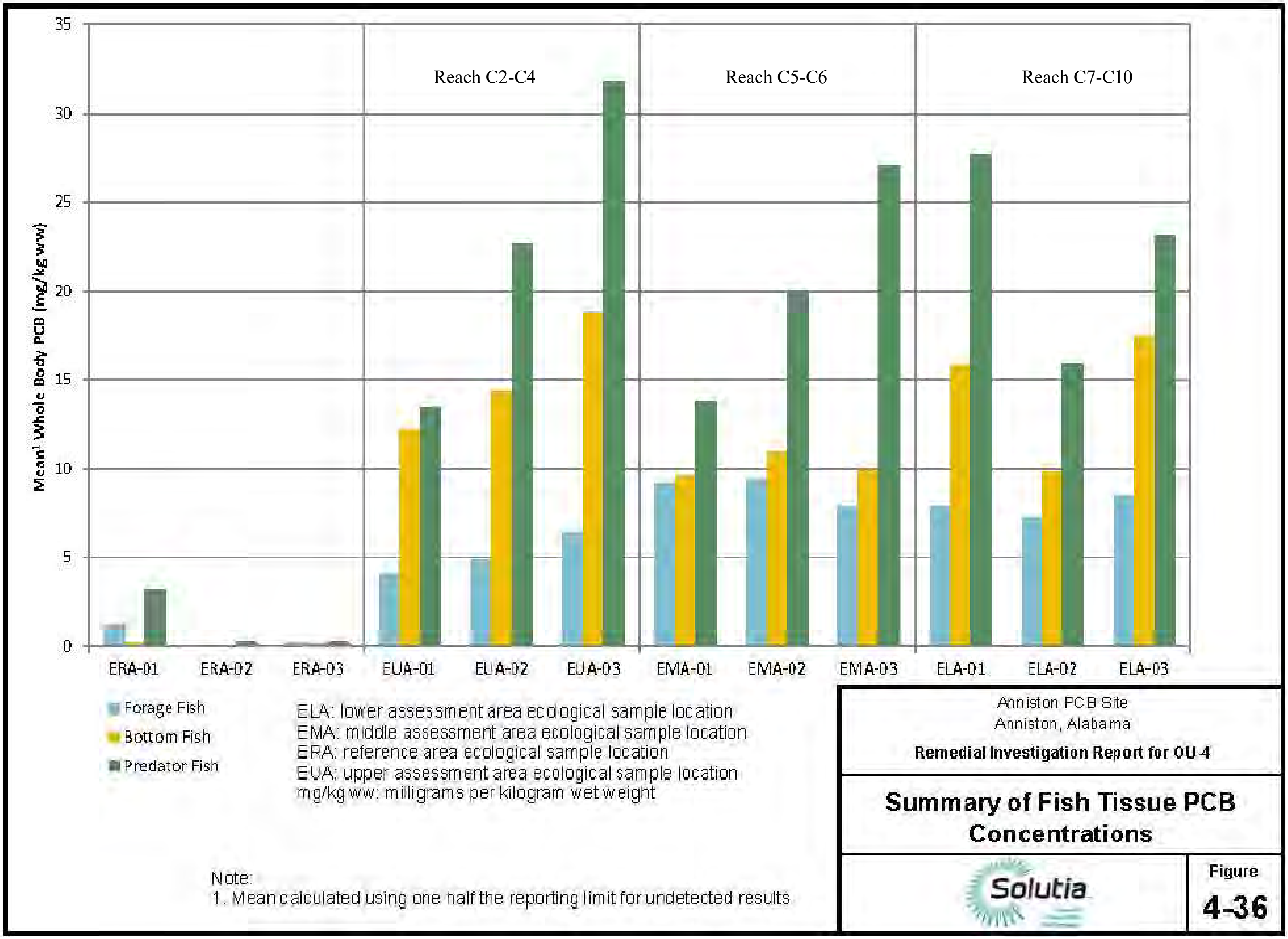

Figure 32. Summary of Fish Tissue PCB Concentrations

Other metals (arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, manganese, nickel, and vanadium) were generally similar between OU4 and the reference areas with few exceptions based on the limited number of samples collected for these analytes. PCDD/PCDF concentrations seemed to be elevated in the LAA and MAA compared to the UAA samples, and OU4 samples were generally elevated relative to reference areas. The wider list of constituents analyzed in biological samples are documented in the baseline ecological risk assessment.

5.3.6.3 Sediment Toxicity and Bioaccumulation Testing

Sediment Toxicity and Bioaccumulation Testing were performed by the USGS and the U.S. Army Corps of Engineers (USACE), respectively between 2010 and 2011. A total of 32 sediment samples were collected for toxicity and bioaccumulation testing. This included 26 sediment samples from six different locations in OU4 and six reference area sediment samples from Choccolocco Creek. The sample locations were identified to collectively span a wide range of combinations of total PCB and organic carbon concentrations, instead of randomly sampling the OU4 sediment.

Because high-concentration samples were needed, much of the sediment collection effort was conducted in the backwater area. The sediment was analyzed for a range of geochemical parameters and for concentrations of organic carbon, PCBs, 23 major and trace metals, 46 parent and alkylated PAHs, 21 pesticides, and 17 PCDD/PCDF congeners. In general, the highest concentrations of PCBs were associated with the highest concentrations of PAHs, dioxins, and pesticides.

During the toxicity tests, porewaters were analyzed for water quality parameters, PCBs, and 61 major and trace elements. Concentrations of metals or PCBs in porewater during the sediment toxicity exposures or during sediment bioaccumulation exposures were also measured using peeper samples (for metals) or solid phase microextraction (SPME) samplers (for PCBs). Twelve survival, growth, and reproduction endpoints were measured in tests with C. dilutus, and 11 survival, growth, and reproduction endpoints were measured in tests with H. azteca.

Background toxicity was evaluated by considering the lowest control normalized response observed among the six reference samples. The lowest response, defined as the “bottom” of the reference envelope, established a threshold above which sediments were considered toxic. Effects concentrations corresponding to this threshold, 10% impairment above the threshold, and 20% impairment above the threshold were calculated from the PCB response regressions for each survival, growth, and reproduction endpoint.

The most sensitive endpoints for H. azteca related to reproduction (the lowest EC0*, EC10*, and EC20* values [i.e., 0%, 10%, and 20% impairment beyond the bottom of the reference envelope]) were 1.38 (the EC0*), 2.58 (the EC10*), and 4.43 (the EC20*) mg total PCB Aroclor per kg dry weight of sediment for 42-day young/female normalized to 42-day survival.

The most sensitive endpoints for C. dilutus were related to emergence (the lowest EC0*, EC10*, and EC20* values were 2.04 [the EC0*], 6.80 [the EC10*], and 14.3 [the EC20*] mg per total PCB Aroclor per kg dry weight of sediment, for percent emergence of the pupae from their cocoons). Although other chemicals not related to the Anniston PCB Site are also present in OU4 sediments, they did not appear to be at concentrations that would have impacted benthic species considerably in the toxicity tests, compared to the impacts of the PCBs.

The bioaccumulation of PCBs in 14 sediment samples (12 test sediment and two reference sediment) were investigated by using the Lumbriculus variegatus 28-day bioaccumulation test in basic accordance with USEPA and ASTM International (ASTM) standard methods. Sediment PCB concentrations were measured as Aroclors, homologs, and congeners. Tissue PCB concentrations were measured as homologs and congeners. Accumulation of total PCBs in tissues was calculated as a sum of PCB homolog groups. Oligochaetes exposed to control sediments accumulated low concentrations of PCBs ranging from 0.022 to 0.38 mg/kg wet weight. The median concentration of total PCBs in oligochaetes exposed to test sediments was 35.3 mg/kg wet weight and ranged from 1.9 to 140 mg/kg wet weight.

The bioavailability of PCBs in 14 sediment samples were additionally investigated using SPME passive samplers. Tissue residues predicted using SPME-derived porewater data provide information regarding the bioavailability of PCBs in these sediments. For metals, a small dialysis chamber called a “peeper” was used to measure dissolved metal concentrations in porewater. Concentrations of metals in peeper samples were relatively low in all samples.

6. CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

The OU4 area includes numerous properties owned by private and public entities that are used for residential and nonresidential (recreational, agricultural, and commercial/industrial) purposes (Figure 33). The floodplain area is approximately 6,000 acres. The percentage of each land use in the floodplain is as follows:

- Agriculture - 40 %
- Forest - 38 %
- Scrub - 10 %
- Commercial/Industrial - 7 %
- Residential - 3 %
- Park - 1 %
- Waste-water treatment plant - 1 %

According to local Agricultural Extension and Farm Service Agents, there are no dairy cattle and only limited row crop production in Calhoun County in the floodplain other than crops such as corn and soybeans that can be used as silage for cattle. Further downstream in Talladega County, row crops are more common (wheat, cotton, corn and soybeans) and acreage in row crops exceeds acreage used to raise beef cattle. As with Calhoun County, there are no current dairy farms with grazing cows in the floodplain in Talladega County. Agricultural Extension and Farm Service agents for both counties indicated that locally raised beef consumption is not typical and that the common practice is to sell livestock to local and/or regional buyers. Small backyard gardens and chicken raising operations are

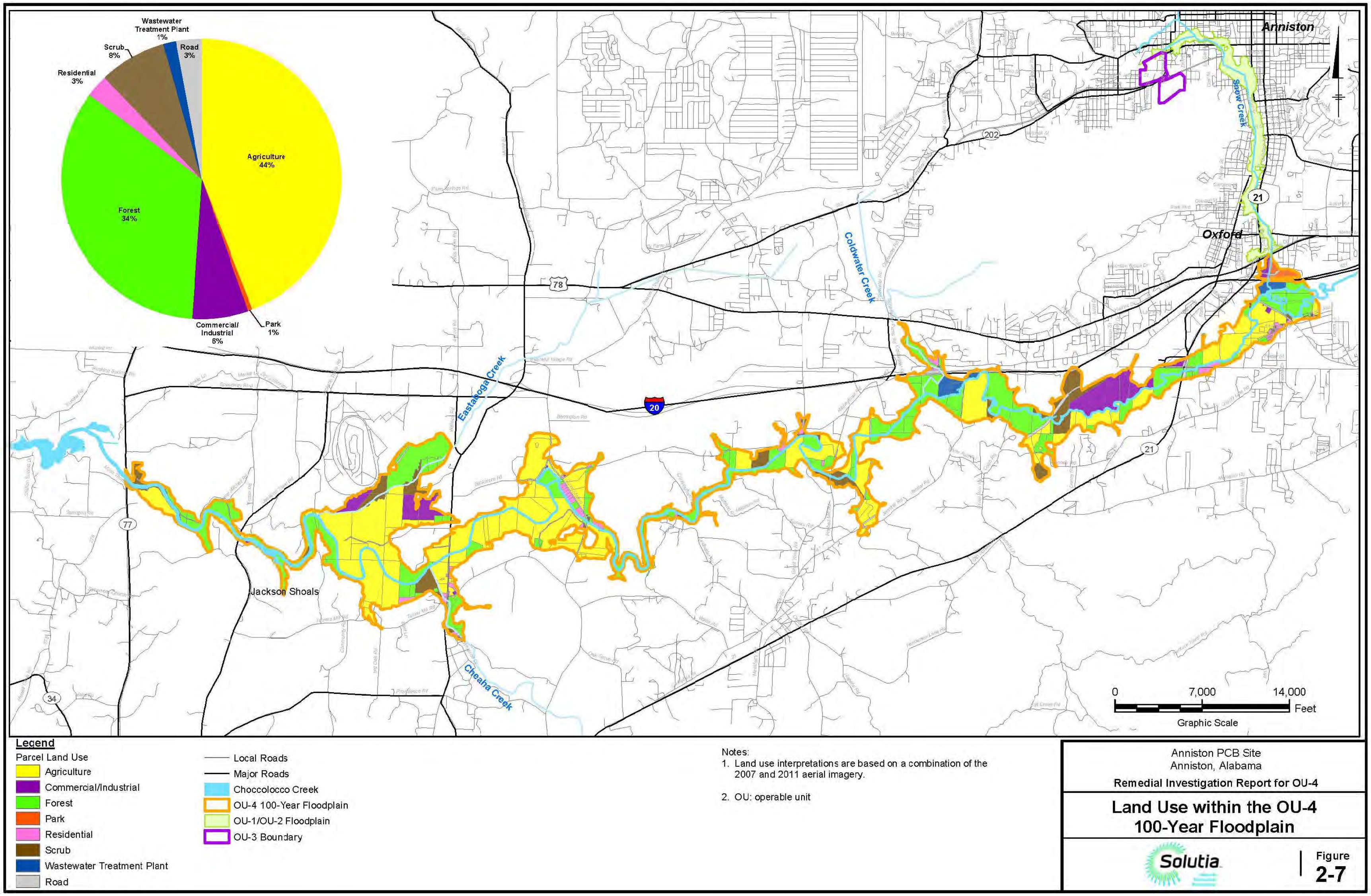

Figure 33. Land Use within the OU4 100-Year Floodplain.

present at many locations in both counties and were remediated for these purposes if found on residential properties in OU4.

Fishing is possible anywhere along the Choccolocco Creek, but it is likely that the majority of the fishing occurs at and around bridge crossings where access is easy. Local landowners are also known to fish along the Creek in areas with private access. In addition, given the nature, size, and accessibility of the Creek, it is likely that fishing is more common at locations further downstream than at locations closer to the confluence with Snow Creek. Snow Creek and Choccolocco Creek surface water classification is Fish and Wildlife.

There has been a fish consumption advisory on the Creek since 1994, recommending no consumption due to PCBs. For the purposes of the evaluation of fish consumption presented in this HHRA, it was assumed that the Creek did not have a fish advisory in place, and that consumption of locally caught fish was not influenced by this advisory. This approach is consistent with EPA policy.

Recreational use and exposure to floodplain soil is possible throughout the floodplain area. The forested areas provide attractive habitat for various recreational activities including hiking, fishing, canoeing, wading, etc. It is also likely that local adolescents frequent specific areas along the Creek. Hunting is common at many areas as demonstrated by the deer hunting blinds interspersed throughout the floodplain.

There are a number of residential areas within and adjacent to the floodplain. The commercial/ industrial areas within the floodplain area consist of the airport property and two waste-water treatment plants. Natural gas pipelines, a railroad, and aboveground utility lines transect the floodplain at various locations.

The Alabama Land Trust (ALT) is in the process of developing a Conservation Corridor for Choccolocco Creek (Figure 34). The Conservation Corridor is a conservation easement that limits the development and use of the floodplain within certain distances from the Creek bank. There are three distinct zones within the corridor:

- Zone 1 is the area closest to the creek bank and usually extends 50 to 100 feet from the bank. The intent of Zone 1 is to leave the riparian buffer zone as natural as possible. Planting native hardwood trees is allowed with the intent of converting the acreage into a functioning hardwood forest ecosystem.
- Zone 2 is the area outside of Zone 1 and can extend up to 500 feet from the creek bank. The uses permitted in Zone 2 are more flexible than in Zone 1 but are still constrained. For example, commercial timber harvesting is permitted provided it is conducted in accordance with forestry management guidelines and the specific terms of the easement.
- Zone 3 includes the areas outside of Zone 2. In Zone 3, buildings, structures, utility lines, driveways, roads, and excavation are prohibited unless specifically accepted in the easement.

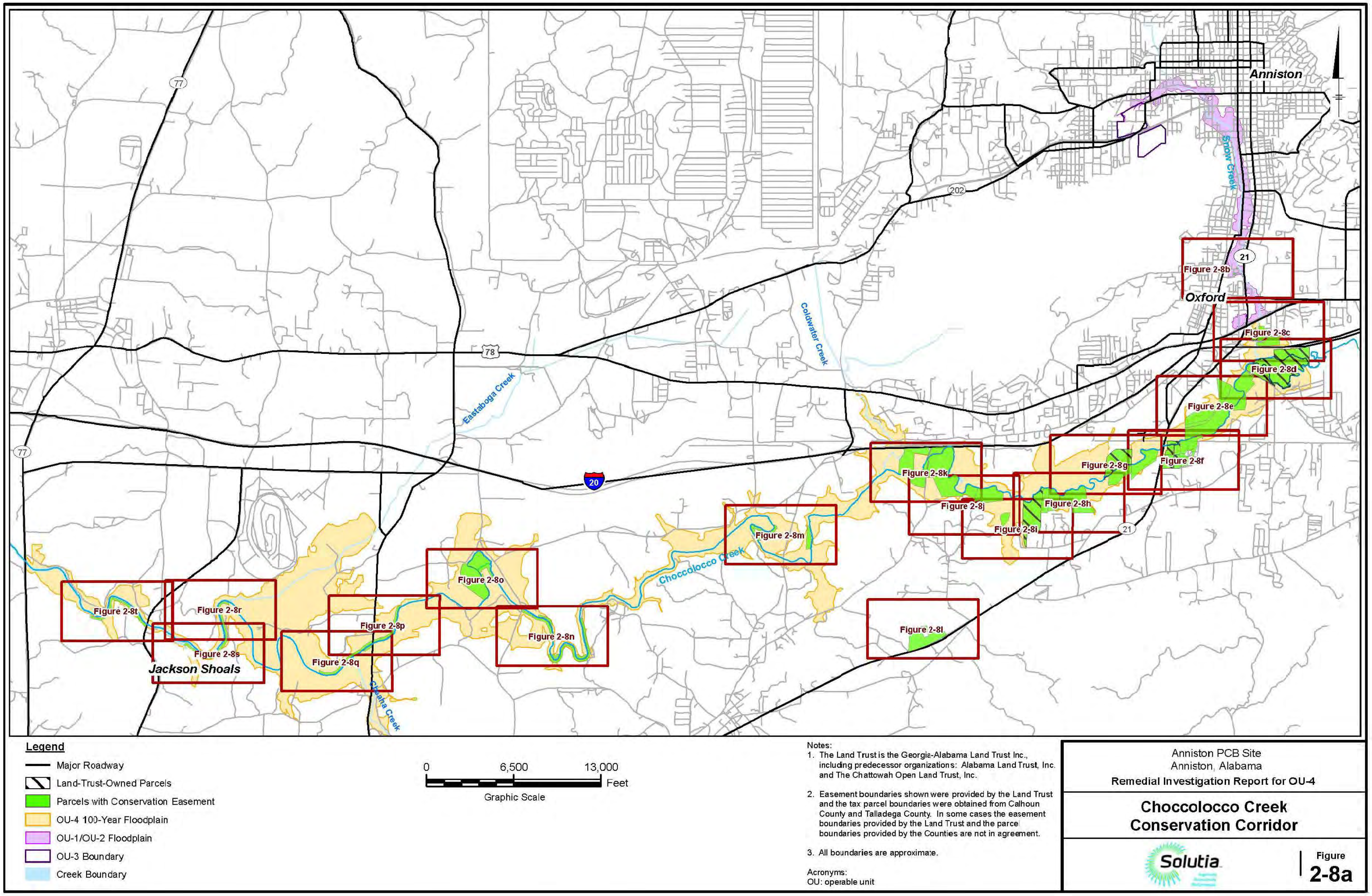

Figure 34. Choccolocco Creek Conservation Corridor

Some of the figures and deeds include a riparian buffer zone, defined as within 50 feet of the Snow Creek bank and within 200 feet from the Choccolocco Creek bank. The riparian buffer zone is similar to Zone 1, where no agricultural uses, including timber harvesting, are permitted. For some of the properties, an agricultural easement is also in place. The agricultural easement areas are located outside of Zones 1 and 2, and, in keeping with the conservation values and historical uses of the property (not commercial farming), agricultural activities are permitted provided they do not cause soil erosion or other harm. Domestic and farm animals must be confined so they cannot access Zones 1 or 2.

In areas where the Conservation Corridor does not specifically limit certain uses, it was assumed that future land use will be the same as current land use with no restrictions in place. Future residential development in floodplain areas will be identified during design to ensure residential exposures do not exceed applicable risk benchmarks. The PRPs will monitor this potential change going forward after the design utilizing the 811 service.

All groundwater is considered by the State of Alabama to be a potential drinking water source. Though groundwater in OU4 is not impacted by Site contaminants, construction of new water supply lines through floodplains could impact OU4 areas with PCBs impacted soil. Choccolocco creek surface water is not currently or planned for use as a drinking water source. Snow Creek and Choccolocco Creek surface water classification under ADEM water quality regulations at Chapter 335-6-11 is Fish and Wildlife. The lower portion of Choccolocco Creek is used for recreation (e.g., canoes/kayaks, swimming and fishing).

7. SUMMARY OF SITE RISKS

The assessment of risk prepared for this portion of the Site identifies and quantifies the risks the contamination in OU4 pose to human health and the environment if no action is taken. It provides the basis for taking CERCLA action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. The OU4 risk assessment consists of a Human Health Risk Assessment (HHRA) and a Baseline Ecological Risk Assessment (BERA). The HHRA and BERA were developed with data gathered in previous RCRA investigations and during the RI, and include analyses of samples of soil, sediment, groundwater, surface water, fish, and other biota in OU4. More information and details of the risk assessments and their findings can be found in the RI and in the HHRA and BERA reports.

7.1 Human Health Risk Assessment

A HHRA was conducted to assess the cancer risks and non-cancer health hazards associated with exposure to Contaminants of Concern (COCs) present at the Site. Exposure to COCs present in soil and sediment, as well as COCs consumed in fish and agricultural products raised within the OU were considered. Consistent with EPA guidance, risks were evaluated without taking into consideration the current fish consumption advisory. Both a reasonable maximum exposure (RME) and a central tendency exposure (CTE) were evaluated to estimate cancer risks and non-cancer hazards. Remedial decisions are based on the RME, consistent with the NCP.

7.1.1 Conceptual Site Model

The CSM for human health risk in OU4 is illustrated on Figure 35. The CSM identified that people could be exposed to contaminants in the floodplain through a variety of activities that are consistent with both current and potential future uses of the Site. These include people who work in the floodplain, use the floodplain for high-contact and low-contact recreation, farm in the floodplain, and live in the floodplain. People may consume fish from Choccolocco Creek despite the no consumption fish advisories. People may consume agricultural products raised within the floodplain.

The potential exposure associated with consuming wild game (e.g., deer and turkey) taken from the floodplain was considered for inclusion in the HHRA. However, EPA determined that the exposure from consuming game is expected to be negligible given the home ranges of the game, the limited contact time with the affected media in OU4, and the subsequent lack of contaminant uptake and transfer into the tissues of targeted game species. In addition, the assumptions related to human consumption of beef and chicken raised in the floodplain that were quantified in the HHRA exceed any reasonable estimate of the potential consumption of wild game from the same areas. Therefore, consumption of game was not quantitatively evaluated in the HHRA.

The CSM identified three complete human health exposure pathways:

- Ingesting fish caught in Choccolocco Creek in the absence of a fish consumption advisory;
- Directly contacting floodplain soils (ingestion, dermal contact and absorption, and inhalation of particulates); and
- Ingesting agricultural products (vegetables, meat, eggs, and dairy products) grown within the floodplain.

7.1.2 Contaminants of Potential Concern

7.1.2.1 Fish Tissue

Fish sampling results were grouped into location groupings to evaluate consumption risk:

- Group A – Locations HHFL01 (reach C9 and C10) and HHFL02 (reach C9)
- Group B – Locations HHFL03 (reach C8 and C7) and HHFL04 (reach C7 and C6)
- Group C – Locations HHFL05 through HHFL09 (reach C5 through C2)

Although fish data have been collected from Choccolocco Creek dating back to approximately 1993, the HHRA used only fish data collected in November and December of 2008 (the most recent data at the time of the HHRA) to be representative of human consumption (i.e., were collected as fillets with skin off). There were 361 fish samples collected from Choccolocco Creek (i.e., 122 bass, 112 catfish, and 127 sunfish). All fish samples were analyzed for total PCBs based on the sum of detected Aroclors, select metals (i.e., arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, manganese, nickel, and vanadium), and mercury. Approximately 10% of the sample locations were analyzed for dioxin-like

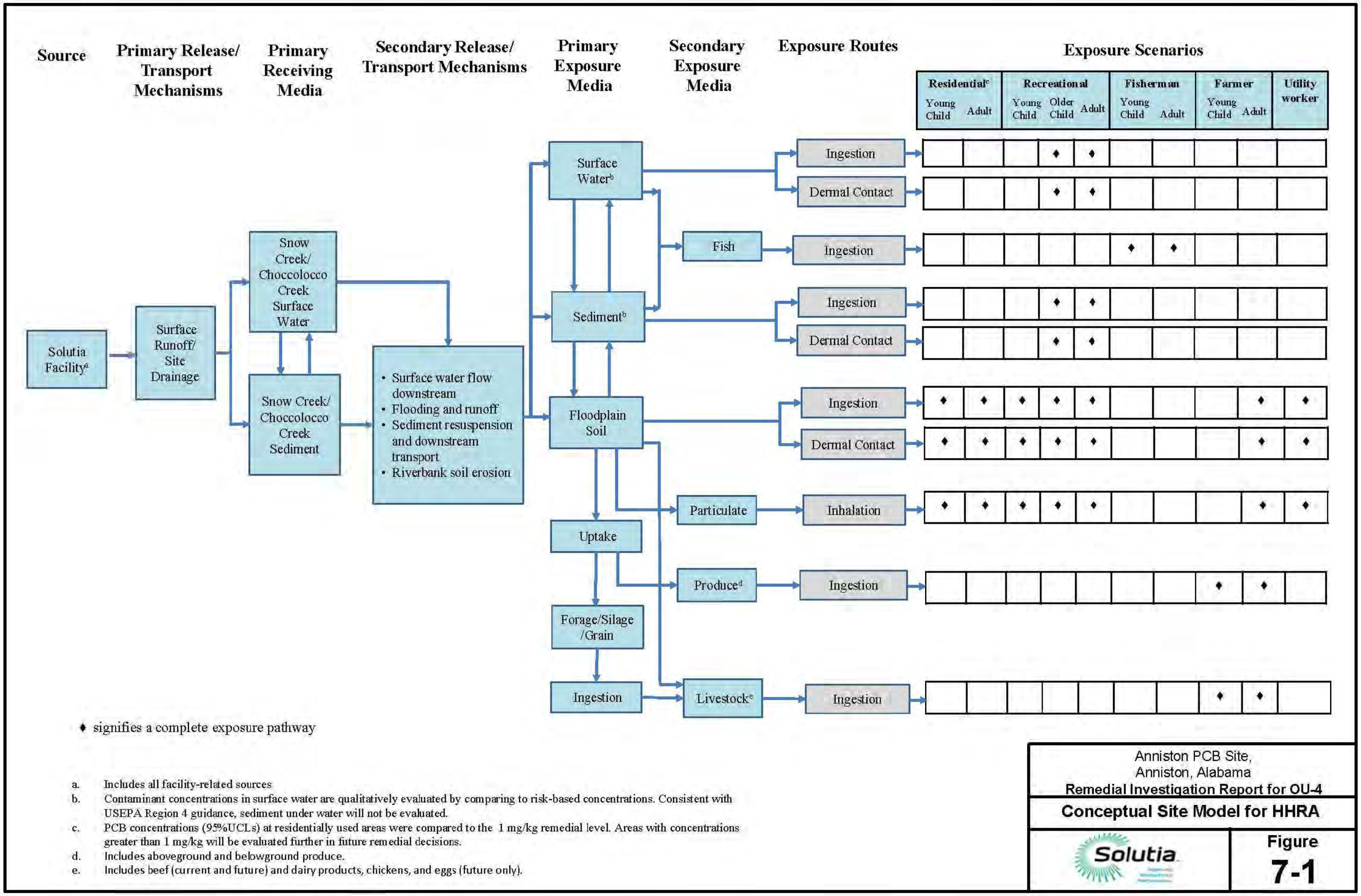

Figure 35. Conceptual Site Model for HHRA

PCB (DL PCB) congeners (36 samples) and PCDD/DF congeners (35 samples). The data is tabulated in Appendix A, Tables A-1, A-2, and A-3.

Appendix A, Table A-4 presents summary statistics (i.e., frequency of detection, range of detected concentrations, location of maximum detected concentration, and average concentration) of contaminants that were detected in fish tissue along with the screening toxicity value. The fish tissue EPA Regional Screening Levels (RSLs) were based on a default fish ingestion rate of 54 grams/day (g/day, equates to consuming approximately 13 ounces of fish tissue per week). This is likely an over-estimate of the level of fish consumption assumed to occur in Choccolocco Creek (as preferred for screening purposes). The contaminants that exceeded the fish RSLs are: tPCBs (represented by the sum of Aroclors), PCB-DL congener TEQ, PCDD/PCDF TEQ, arsenic, chromium, lead, and mercury. Arsenic, chromium, and lead were eliminated based on a comparison to background sediment concentrations (Appendix A, Table A-5). The final COPCs in fish were identified as PCBs, DL PCB TEQs, PCDD/DF TEQs, and mercury as shown in Table 7.

7.1.2.2 Floodplain Soil

The exposure units in Figure 9, as well as the eight agricultural exposure units in Figure 36, were used to evaluate human risk from dermal contact and incidental ingestion of soil. For surface soil, the samples collected between the 0 to 0.5 ft bgs and 0.5 to 1 ft bgs depth intervals at a location were averaged. For the subsurface, the samples collected from multiple intervals between 0 to 4 ft bgs were averaged. The resultant average concentrations for each sampling location were used in the evaluation of the potential floodplain soil exposure and risks (Appendix B, Table B-1 surface soil and Table B-2 subsurface soil).

The maximum detected concentrations in floodplain soil were compared to the EPA Regional Screening Levels (RSLs) for residential soil (Appendix B, Table B-3). The cancer based RSLs were set at a target cancer risk of one-in-a-million, 1E-06. The noncancer based RSLs were set at a target hazard quotient of 0.1, which is one-tenth of the RSL value presented on the RSL Table. The residential soil RSLs were

Table 7. Contaminants of Potential Concern

COPCs	HHRA Media		BERA Media	
	Soil	Fish	Soil	Sediment
PCBs	x	x	x	x
WHO Congener TEQ (ND = 0)		x	x	x
WHO Dioxin TEQ (ND = 0)		x	x	x
Mercury	x	x	x	x
Barium				x
Chromium			x	x
Cobalt				x
Lead			x	x
Vanadium			x	x

ND= non detect

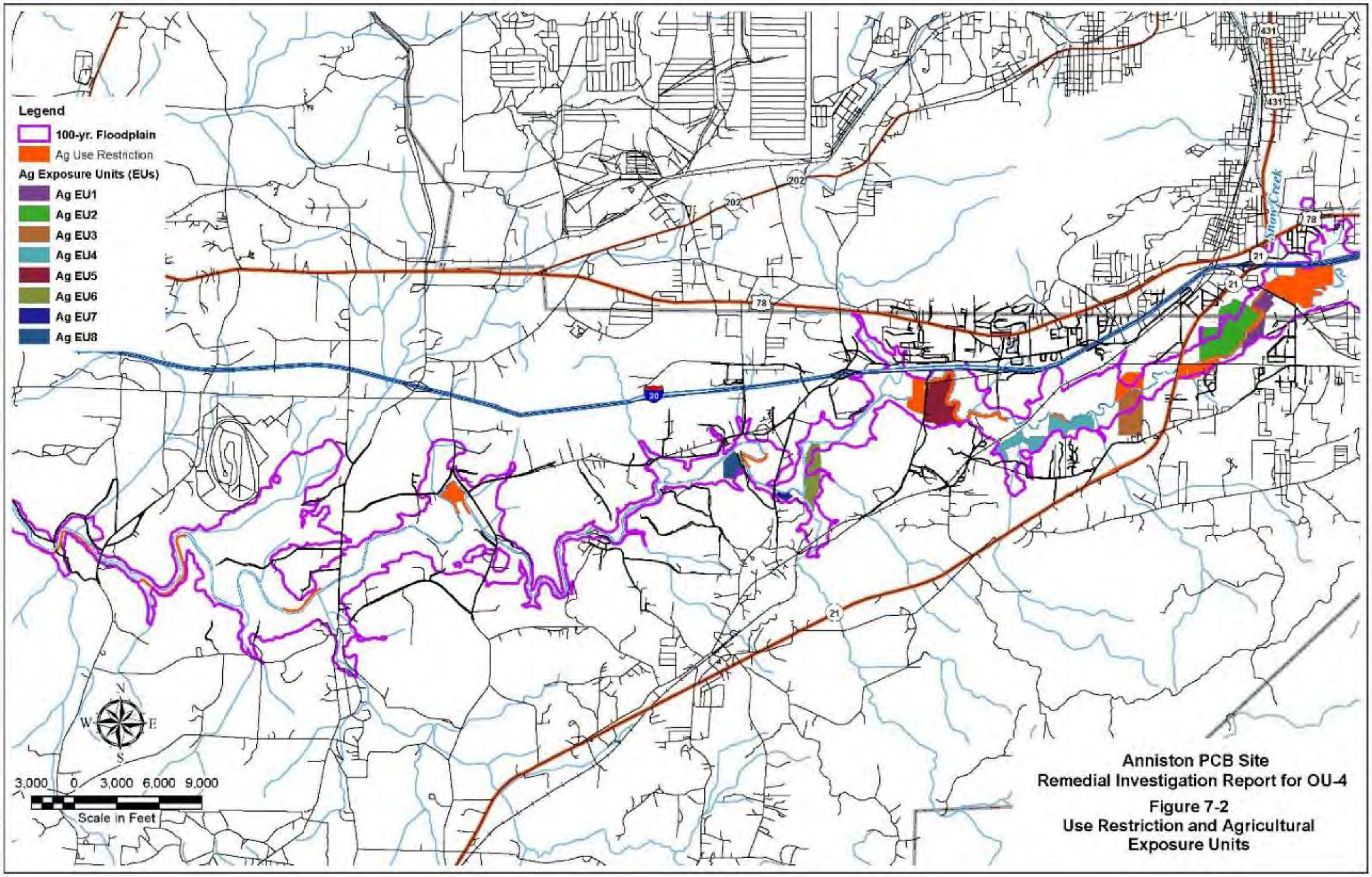

Figure 36. Use Restrictions and Agricultural Exposure Units

used for the soil evaluation. The residential soil RSLs are based on assumptions indicative of exposure associated with residential backyards. They over-estimate the recreational level of exposure that dominates the current use of the floodplain.

If the medium-specific maximum detected concentration was less than the RSL, the analyte was eliminated from further consideration in the HHRA. If the maximum concentration exceeded the RSL, the contaminant was identified as a COPC (Appendix B, Table B-4). Exceedances of the RSLs by metals were further evaluated by comparing site concentrations with background levels from Fort McClellan and from locations upstream of the hydraulic influence of the Solutia Facility in Anniston (Appendix B, Table B-5). The final COPCs in soil were identified as PCBs and mercury (Table 7).

7.1.3 Exposure Assessment

The exposure assessment involves calculating EPCs and identifying the exposure models and parameters with which to calculate exposure doses.

7.1.3.1 Fish Tissue

The EPCs for the COPCs in fish tissue were calculated by species group for location Groups A, B, and C, respectively (Appendix A, Table A-6). The recreational fisherman scenario consists of an adult or child who may be exposed to COPCs through the ingestion of fish from the Choccolocco Creek. Dose estimates for recreational anglers were calculated for one receptor – an individual who consumes fish as a child (age 1 to 6 years) and an "adult" (age 7 to 30 years). Exposure doses were calculated separately using age-adjusted factors. The evaluation of subsistence anglers was considered for this assessment, but was not included because no evidence has been found of subsistence angling practices in OU4. The same EPC values were used for the RME and CTE scenarios.

Fish ingestion exposure parameters are provided in Appendix A, Table A-7. The RME used an adult fish consumption rate based on the 1993 ADEM report titled Estimation of Daily Per Capita Freshwater Fish Consumption of Alabama Anglers. The mean consumption rate of 30 g/day, calculated by the serving size method for all respondents was used in this evaluation. This consumption rate equates to eating one eight-ounce meal per week. Based on ratios of child to adult ingestion rates, 15 g/day was used as a reasonable estimate of the consumption rate for the child of a recreational angler. An age-adjusted ingestion rate of 16.3 grams per year/kilograms body weight per day (g-yr/kg-day) was calculated. As appropriate for Superfund HHRAs, these consumption rates assume that there are no current fish consumption advisories for the OU4 area.

The CTE used an adult fish consumption rate based on the 2009 year-long creel/angler survey conducted for Choccolocco Creek. The rate of 2.8 g/day was the average of only three respondents. This CTE rate equates to eating between four and five meals (eight ounce) per year. One-half of the adult consumption rate was used to determine the child ingestion rate, i.e., (1.4 g/day). An age-adjusted ingestion rate of 1.5 g-yr/kg-day was calculated. It should be noted that this CTE ingestion rate may be biased low considering it was based on a study that was conducted in the presence of the long-standing fish consumption prohibition.

Fraction ingested (FI) refers to the fraction of the recreationally caught fish consumed by anglers from Choccolocco Creek in the absence of any consumption prohibition. An FI of 1.0 was used for the recreational angler scenario below Jackson Shoals (river miles 0-10; fish locations 1-2, Group A). where the fish are more prevalent, and the creek is boatable. Upstream of Jackson Shoals (river miles 10-37; fish locations 3-9; Groups B and C) boating is limited by the size of the creek, depth of the water at some places, obstructions, and locations to put in; and other than bridge crossings, public wade-in access in the portion above Jackson Shoals is limited by the amount of private property bordering the Creek. The FI for fish above Jackson Shoals was estimated at 0.5 or 50% of the rate downstream of Jackson Shoals. These FI values were used for both the RME and CTE scenarios.

7.1.3.2 Floodplain Soil

EPCs represent concentrations to which receptors may be exposed. PCB and mercury data for surface soil were sufficient to develop EPCs for most EUs. EPCs for constituents other than PCBs were calculated on an OU-wide basis due to the size of the database. EPCs are an input factor to calculations of chemical exposure and, for the reasonable maximum exposure, are typically estimated as the upper one-sided 95% UCL of the mean. This process is used to help reduce the chance that the actual average concentration is underestimated by the available data. Appendix B, Table B-6 presents the calculated EPCs for surface soil for each EU. Table B-7 presents EPCs calculated for surface soil on a site-wide basis. Table B-8 include the calculated EPCs for subsurface soil.

The exposure parameters are presented for all soil-related exposure scenarios in Appendix B, Table B-9. It was assumed that each of the receptor populations was exposed to surface soil (via incidental ingestion, dermal contact, and/or inhalation), based on an exposure within the individual EUs. The intrusive worker was assumed to contact subsurface soil (ingestion/dermal contact/inhalation) based on an OU-wide exposure.

7.1.4 Toxicity Assessment

The toxicity assessment examines information concerning the potential human health effects of exposure to COPCs. Cancer slope factors (CSFs) are the dose-response values used to evaluate potential carcinogens. Noncancer effects, such as organ damage or reproductive effects, are evaluated by reference doses (RfDs). The hierarchy used to select toxicity values was to first use values from the EPA Integrated Risk Information System (IRIS) and to next use values presented on the EPA Regional Screening Levels Table. Toxicity values presented on the Regional Screening Levels Table are from a variety of sources including EPA (Provisional Peer-Reviewed Toxicity Values), California Environmental Protection Agency, and the Agency for Toxic Substance and Disease Registry (ATSDR).

The CSF is the toxicity value used to quantitatively calculate the carcinogenic risk of cancer causing COPCs via oral and dermal routes of exposure. Oral and dermal CSFs and the absorption efficiencies used in their determination are presented in Table 8. The absorption efficiencies were obtained from EPA's Risk Assessment Guidance for Superfund (RAGS), Part E.

Table 8. Cancer Toxicity Data – Oral/Dermal

Contaminant of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (1)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Dates (2)
Total PCBs (3)	2.00E+00	$(mg/kg\text{-}day)^{-1}$	1.0	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	4/2/2012
Total PCBs (4)	1.00E+00	$(mg/kg\text{-}day)^{-1}$	1.0	1.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	4/2/2012
PCB Dioxin-like Congener TEQ	1.30E+05	$(mg/kg\text{-}day)^{-1}$	1.0	1.30E+05	$(mg/kg\text{-}day)^{-1}$	B2	CalEPA	4/2/2012
Mercury	NA	---	---	NA	---	D	IRIS	4/2/2012
2,3,7,8-TCDD TEQ	1.30E+05	$(mg/kg\text{-}day)^{-1}$	1.0	1.30E+05	$(mg/kg\text{-}day)^{-1}$	B2	CalEPA	4/2/2012
Benzo(a)anthracene	7.30E-01	$(mg/kg\text{-}day)^{-1}$	1.0	7.30E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	4/2/2012
Benzo(a)pyrene	7.30E+00	$(mg/kg\text{-}day)^{-1}$	1.0	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	4/2/2012
Benzo(b)fluoranthene	7.30E-01	$(mg/kg\text{-}day)^{-1}$	1.0	7.30E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	4/2/2012
Benzo(k)fluoranthene	7.30E-02	$(mg/kg\text{-}day)^{-1}$	1.0	7.30E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	4/2/2012
Chrysene	7.30E-03	$(mg/kg\text{-}day)^{-1}$	1.0	7.30E-03	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	4/2/2012
Indeno(1,2,3-cd)pyrene	7.30E-01	$(mg/kg\text{-}day)^{-1}$	1.0	7.30E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	4/2/2012
Aluminum	NA	---	---	NA	---	No information	---	---
Arsenic	1.50E+00	$(mg/kg\text{-}day)^{-1}$	1.0	1.50E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	4/2/2012
Chromium, Total (5)	5.00E-01	$(mg/kg\text{-}day)^{-1}$	0.025	2.00E+01	$(mg/kg\text{-}day)^{-1}$	Likely to be carcinogenic	NJDEP	4/2/2012
Cobalt	NA	---	---	NA	---	No information	---	---
Iron	NA	---	---	NA	---	No information	---	---
Lead	NA	---	---	NA	---	B2	IRIS	4/2/2012
Manganese	NA	---	---	NA	---	D	IRIS	4/2/2012

(1) Source: RAGS Part E Guidance (EPA, 2004)
(2) Represents date source was searched.
(3) The IRIS upper bound slope factor for high risk and persistence used for RME scenario.
(4) The IRIS central-estimate slope factor used for CTE scenario.
(5) Chromium VI toxicity criteria used.

Definitions: CalEPA=California Environmental Protection Agency
B2 = Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans.
D = Not classifiable as a human carcinogen.
IRIS = Integrated Risk Information System
NA = Not available.
NJDEP = New Jersey Department of Environmental Protection

The potential for noncancer health effects resulting from oral or dermal exposure to COPCs is assessed by comparing an exposure estimate (intake or dose) to an RfD. Oral and dermal RfDs and the absorption efficiencies used in their determination are presented in Table 9. The absorption efficiencies were obtained from EPA's RAGS Part E Guidance. Table 9 also includes the primary target organs affected by each listed COPC, where information is available. This information may be used in the risk characterization to segregate risks by target organ effects when the total hazard index (HI) is greater than one.

7.1.5 Risk Characterization

The risk characterization integrates the information developed in the exposure assessment and the toxicity assessment. Cancer risks were calculated for those COPCs with evidence of carcinogenicity and for which cancer toxicity values were available. Noncancer health effects were evaluated for COPCs (i.e., including carcinogens) for which noncancer toxicity values were available.

For carcinogens, CSFs are the dose-response values used to evaluate potential carcinogens. Carcinogenic risk estimates are expressed in terms of probability. For example, exposure to a particular site-related carcinogenic chemical may present a 1 in 1,000,000 increased chance of causing cancer over an estimated lifetime of 70 years. This can also be expressed as one-in-a-million or 1×10^{-6} excess lifetime cancer risk. CERCLA's acceptable risk range for carcinogens is 1×10^{-6} (1 in 1,000,000) to 1×10^{-4} (1 in 10,000) over a 70-year lifetime. In general, site-related risks higher than the upper end of this range (i.e., greater than 1 in 10,000) this range warrant action under CERCLA.

For non-carcinogens, exposures are first estimated and then compared to a RfD. RfDs are developed by EPA scientists to estimate the amount of a chemical a person (including the most sensitive person) could be exposed to over a lifetime without an appreciable risk of developing adverse health effects. The exposure dose is divided by the RfD to calculate the ratio known as a hazard quotient (HQ) to determine whether non-cancer adverse health effects would likely occur or not. The hazard index (HI) is the sum of the HQs from multiple contaminants. An HI greater than one suggests that adverse effects may be possible and would require consideration of cleanup alternatives.

7.1.5.1 Fish Consumption Risk

Risks were evaluated using a RME for fish ingestion which exceeded the CERCLA's acceptable cancer risk range ($1x10^{-6}$ to $1x10^{-4}$). The cancer risks from total PCBs were greater than $1x10^{-4}$ for all locations and fish groupings are detailed in Appendix A and summarized in Table 10a. The cancer risks from DL-PCB congener TEQ and PCDD/PCDF TEQ were less than the risks from total PCBs (Table 10b). Total PCBs resulted in HQs greater than one (1) for every location. The HQs from mercury, DL-PCB congener TEQ, and PCDD/PCDF TEQ were greater than one (1) at several locations but were far less than the total PCBs HQs. When compared to the Central Tendency Evaluations detailed in Appendix A and summarized in Tables 11a and 11b where PCBs are the only contaminant that generates unacceptable risk, it is clear that PCBs are the risk driver for fish consumption.

Table 9. Non-Cancer Toxicity Data – Oral/Dermal

Contaminant of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (1) Value	Absorbed RfD for Dermal (1) Units	Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD: Target Organ(s) Source(s)	RfD: Target Organ(s) Dates (2)
Total PCBs (3)	Chronic	2.0E-05	(mg/kg-day)	1.0	2.0E-05	(mg/kg-day)	Eyes, Immune system	300	IRIS	4/2/2012
PCB Dioxin-like Congener TEQ	Chronic	7.0E-10	(mg/kg-day)	1.0	7.0E-10	(mg/kg-day)	Developmental	30	IRIS	3/27/2012
Mercury (4)	Chronic	3.0E-04	(mg/kg-day)	1.0	3.0E-04	(mg/kg-day)	Immune system	1,000	IRIS	4/2/2012
Methylmercury (5)	Chronic	1.0E-04	(mg/kg-day)	1.0	1.0E-04	(mg/kg-day)	Nervous system	10	IRIS	4/2/2012
Total PCBs (3)	Subchronic	6.0E-05	(mg/kg-day)	1.0	6.0E-05	(mg/kg-day)	Eyes, Immune system	100	IRIS (7)	6/13/2012
PCB Dioxin-like Congener TEQ	Subchronic	7.0E-10	(mg/kg-day)	1.0	7.0E-10	(mg/kg-day)	Developmental	30	IRIS (8)	6/13/2012
Mercury (4)	Subchronic	3.0E-03	(mg/kg-day)	1.0	3.0E-03	(mg/kg-day)	Immune system	100	IRIS (9)	6/13/2012
2,3,7,8-TCDD TEQ	Chronic	7.0E-10	(mg/kg-day)	1.0	7.0E-10	(mg/kg-day)	Developmental	30	IRIS	3/27/2012
Benzo(a)anthracene	---	NA	---	---	NA	---	---	---	---	---
Benzo(a)pyrene	---	NA	---	---	NA	---	---	---	---	---
Benzo(b)fluoranthene	---	NA	---	---	NA	---	---	---	---	---
Benzo(k)fluoranthene	---	NA	---	---	NA	---	---	---	---	---
Chrysene	---	NA	---	---	NA	---	---	---	---	---
Indeno(1,2,3-cd)pyrene	---	NA	---	---	NA	---	---	---	---	---
Aluminum	Chronic	1.0E+00	(mg/kg-day)	1.0	1.0E+00	(mg/kg-day)	Nervous system	100	PPRTV	4/2/2012
Arsenic	Chronic	3.0E-04	(mg/kg-day)	1.0	3.0E-04	(mg/kg-day)	Skin	3	IRIS	4/2/2012
Chromium, Total (6)	Chronic	3.0E-03	(mg/kg-day)	0.025	7.5E-05	(mg/kg-day)	None observed	900	IRIS	4/2/2012
Cobalt	Chronic	3.0E-04	(mg/kg-day)	1.0	3.0E-04	(mg/kg-day)	Thyroid	3,000	PPRTV	4/2/2012
Iron	Chronic	7.0E-01	(mg/kg-day)	1.0	7.0E-01	(mg/kg-day)	Gastrointestinal	1.5	PPRTV	4/2/2012
Manganese	Chronic	2.4E-02	(mg/kg-day)	0.04	9.6E-04	(mg/kg-day)	Nervous system	3	IRIS	4/2/2012
2,3,7,8-TCDD TEQ	Subchronic	7.0E-10	(mg/kg-day)	1.0	7.0E-10	(mg/kg-day)	Developmental	30	IRIS (8)	6/13/2012
Benzo(a)anthracene	---	NA	(mg/kg-day)	---	NA	(mg/kg-day)	---	---	---	---
Benzo(a)pyrene	---	NA	(mg/kg-day)	---	NA	(mg/kg-day)	---	---	---	---
Benzo(b)fluoranthene	---	NA	(mg/kg-day)	---	NA	(mg/kg-day)	---	---	---	---
Benzo(k)fluoranthene	---	NA	(mg/kg-day)	---	NA	(mg/kg-day)	---	---	---	---
Chrysene	---	NA	(mg/kg-day)	---	NA	(mg/kg-day)	---	---	---	---
Indeno(1,2,3-cd)pyrene	---	NA	(mg/kg-day)	---	NA	(mg/kg-day)	---	---	---	---
Aluminum	Subchronic	1.0E+00	(mg/kg-day)	1.0	1.0E+00	(mg/kg-day)	Nervous system	100	PPRTV (8)	6/13/2012
Arsenic	Subchronic	3.0E-04	(mg/kg-day)	1.0	3.0E-04	(mg/kg-day)	Skin	3	Chronic value	6/13/2012
Chromium, Total (6)	Subchronic	9.0E-03	(mg/kg-day)	0.025	2.3E-04	(mg/kg-day)	None observed	300	IRIS (7)	6/13/2012
Cobalt	Subchronic	3.0E-03	(mg/kg-day)	1.0	3.0E-03	(mg/kg-day)	Thyroid	300	PPTRV (9)	6/13/2012
Iron	Subchronic	7.0E-01	(mg/kg-day)	1.0	7.0E-01	(mg/kg-day)	Gastrointestinal	1.5	PPRTV	6/13/2012
Manganese	Subchronic	2.4E-02	(mg/kg-day)	0.04	9.6E-04	(mg/kg-day)	Nervous system	3	Chronic value	6/13/2012

(1) Source: RAGS Part E Guidance (EPA, 2004)

Definitions: IRIS = Integrated Risk Information System

Table 9. Non-Cancer Toxicity Data – Oral/Dermal (continued)

Contaminant of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (1)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD: Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Dates (2)

(2) Represents date source was searched.

(3) Aroclor 1254 toxicity criteria used.

(4) Mercuric chloride toxicity criteria used. Applicable to soil-mediated exposures.

(5) Methylmercury toxicity values applicable to fish-mediated exposure only. Subchronic RfDs not presented because an age-adjusted approach (resulting in chronic exposure) was used for this pathway.

(6) Chromium VI toxicity criteria used.

(7) Chronic RfD times subchronic to chronic modifying factor of 3.

(8) Chronic RfD times subchronic to chronic modifying factor of 1.

(9) Chronic RfD times subchronic to chronic modifying factor of 10.

NA = Not available

PPRTV = Provisional peer-reviewed toxicity value

Table 10a. Summary of Cancer Risks and Hazard Indices from Primary Contaminants of Potential Concern – RME Scenario

Location Grouping	Species	Cancer Risk	Hazard Index		PCB Dioxin-like Congener TEQ	
		Total PCBs	Total PCBs	Mercury	Cancer Risk	Hazard Quotient
A Reaches C9 & C10	All Fish	**1E-03**	**62**	**2**	**5E-04**	**12**
	Bass	**1E-03**	**71**	**3**	**6E-04**	**15**
	Catfish	**1E-03**	**77**	1	**2E-04**	**4**
	Panfish	**9E-04**	**55**	**2**	**4E-04**	**9**
B Reaches C6 toC8	All Fish	**6E-04**	**38**	1	1E-04	**3**
	Bass	**1E-03**	**62**	**2**	1E-04	**4**
	Catfish	**9E-04**	**52**	1	7E-05	**2**
	Panfish	**4E-04**	**24**	1	6E-05	**2**
C Reaches C5 to C2	All Fish	**1E-03**	**71**	1	1E-04	**3**
	Bass	**1E-03**	**68**	**2**	1E-04	**3**
	Catfish	**1E-03**	**87**	1	1E-04	**3**
	Panfish	**7E-04**	**43**	1	1E-04	**4**

Bold = cancer risk greater than 1E-04 or hazard index greater than 1.

Table 10b. Summary of Cancer Risks and Hazard Indices – RME Scenario - TEQs

Location Grouping	Species	Cancer Risk			Contribution of PCB Dioxin-like Congener to Total TEQ Risk	Hazard Quotient			Contribution of PCB Dioxin-like Congener to Total TEQ HQ
		PCB Dioxin-like Congener TEQ	2,3,7,8-TCDD TEQ	Total		PCB Dioxin-like Congener TEQ	2,3,7,8-TCDD TEQ	Total	
A Reaches C9 & C10	All Fish	**5E-04**	1E-04	**6E-04**	76%	**12**	**4**	**16**	76%
	Bass	**6E-04**	1E-04	**7E-04**	84%	**15**	**3**	**18**	84%
	Catfish	**2E-04**	3E-05	**2E-04**	86%	**4**	0.7	**5**	86%
	Panfish	**4E-04**	1E-04	**5E-04**	71%	**9**	**4**	**13**	71%
B Reaches C6 toC8	All Fish	1E-04	3E-05	1E-04	81%	**3**	0.6	**3**	81%
	Bass	1E-04	4E-05	**2E-04**	81%	**4**	0.9	**5**	81%
	Catfish	7E-05	1E-05	9E-05	85%	**2**	0.3	**2**	85%
	Panfish	6E-05	2E-05	8E-05	73%	**2**	0.6	**2**	73%
C Reaches C5 to C2	All Fish	1E-04	1E-05	1E-04	91%	**3**	0.3	**3**	91%
	Bass	1E-04	1E-05	1E-04	91%	**3**	0.3	**3**	91%
	Catfish	1E-04	2E-05	1E-04	89%	**3**	0.4	**4**	89%
	Panfish	1E-04	9E-06	1E-04	94%	**4**	0.2	**4**	94%

Bold = cancer risk greater than 1E-04 or hazard quotient/index greater than 1.0.

Table 11a. Summary of Cancer Risks and Hazard Indices from Primary Contaminants of Potential Concern – CTE Scenario

Location Grouping	Species	Cancer Risk	Hazard Index		PCB Dioxin-like Congener TEQ	
		Total PCBs	Total PCBs	Mercury	Cancer Risk	Hazard Quotient
A Reaches C9 & C10	All Fish	5E-05	**6**	0.2	4E-05	1
	Bass	6E-05	**7**	0.2	6E-05	1
	Catfish	6E-05	**7**	0.09	2E-05	0.4
	Panfish	4E-05	**5**	0.2	3E-05	0.9
B Reaches C6 toC8	All Fish	6E-05	**7**	0.2	2E-05	0.5
	Bass	1E-04	**12**	0.4	3E-05	0.7
	Catfish	8E-05	**10**	0.2	1E-05	0.4
	Panfish	4E-05	**5**	0.1	1E-05	0.3
C Reaches C5 to C2	All Fish	1E-04	**13**	0.2	2E-05	0.6
	Bass	1E-04	**14**	0.3	2E-05	0.6
	Catfish	1E-04	**17**	0.2	2E-05	0.6
	Panfish	7E-05	**8**	0.1	3E-05	0.7

Bold = cancer risk greater than 1E-04 or hazard index greater than 1.0.

Table 11b. Summary of Cancer Risks and Hazard Indices – CTE Scenario - TEQs

Location Grouping	Species	Cancer Risk			Contribution of PCB Dioxin-like Congener to Total TEQ Risk	Hazard Quotient			Contribution of PCB Dioxin-like Congener to Total TEQ HQ
		PCB Dioxin-like Congener TEQ	2,3,7,8-TCDD TEQ	Total		PCB Dioxin-like Congener TEQ	2,3,7,8-TCDD TEQ	Total	
A Reaches C9 & C10	All Fish	4E-05	1E-05	6E-05	76%	1	0.4	2	76%
	Bass	6E-05	1E-05	7E-05	84%	1	0.3	2	84%
	Catfish	2E-05	3E-06	2E-05	86%	0.4	0.07	0.5	86%
	Panfish	3E-05	1E-05	5E-05	71%	0.9	0.4	1	71%
B Reaches C6 toC8	All Fish	2E-05	5E-06	2E-05	81%	0.5	0.1	0.6	81%
	Bass	3E-05	7E-06	3E-05	81%	0.7	0.2	0.9	81%
	Catfish	1E-05	2E-06	2E-05	85%	0.4	0.06	0.4	85%
	Panfish	1E-05	4E-06	2E-05	73%	0.3	0.1	0.4	73%
C Reaches C5 to C2	All Fish	2E-05	2E-06	2E-05	91%	0.6	0.06	0.6	91%
	Bass	2E-05	2E-06	2E-05	91%	0.6	0.05	0.6	91%
	Catfish	2E-05	3E-06	3E-05	89%	0.6	0.07	0.7	89%
	Panfish	3E-05	2E-06	3E-05	94%	0.7	0.04	0.7	94%

Bold = cancer risk greater than 1E-04 or hazard quotient/index greater than 1.0.

7.1.5.2 Soil Direct Contact Risk

The farmer cancer risks based on both total PCBs and DL-PCB congeners TEQ in soil were either within or less than the CERCLA's acceptable cancer risk range ($1x10^{-6}$ to $1x10^{-4}$) at all applicable exposure units as detailed in Appendix B and summarized in Table 12. The soil recreational user and utility worker cancer risks for both total PCBs and DL-PCB congener TEQ were less than the acceptable cancer risk range ($1x10^{-6}$ to $1x10^{-4}$) at all exposure units as detailed in Appendix B and summarized Table 13. The noncancer soil recreational exposure HIs were less than one for total PCBs, DL-PCB congener TEQ, and mercury. The utility worker and farmer HIs were also less than one at all direct contact exposure units.

The residential risk assessment was prepared for the NTCRA agreement and was verified to be valid (i.e., health protective) in the OU4 HHRA. For the limited number of properties evaluated at that time of the NTCRA streamlined risk assessment, the calculated cancer risks were within the CERCLA's protective risk range of $1x10^{-6}$ to $1x10^{-4}$. However, the non-cancer HI was greater than one at all properties.

The RCRA IMs were intended to eliminate potential exposure to PCB contamination in non-residential soil. To determine if there were risks that still needed to be accounted for, the EPCs for Field A, C, and D were calculated in the OU4 Feasibility Study for surface soil (0 to 12 inches) as 15.9 mg/kg, 8.9 mg/kg and 6.4 mg/kg, respectively. These EPCs are lower than the EPCs for high activity recreational use on Appendix B, Table B-7, and therefore, they do not exceed the CERCLA's risk range and do not warrant further action under CERCLA.

7.1.5.3 Agricultural Product Modelled Risk

The results of a conservative, modeling-based evaluation of agricultural products currently raised in floodplain areas, and other products from potential future agricultural practices, indicate that minimal, if any, risks from tPCBs are likely to arise from consuming locally raised chicken, eggs, or vegetables.

Although there are no dairy operations in the floodplain areas at the current time, if local farmers were to raise dairy cattle for personal consumption at some point in the future, the potential exists for health impacts at the highest tPCB concentration areas combined with the most conservative ingestion assumptions. More typical dairy operations, with less grazing and more silage feeding, would be unlikely to raise any health concerns.

Beef cattle are currently raised in the floodplain, there is a potential for unacceptable health risks to the farmer who raises and consumes a significant portion of beef from home grown sources over a long period of time. It should be stressed that beef and dairy exposure and risks are the result of a significant number of assumptions applied to conservative models. It is very likely that these risk estimates are overestimated to a larger degree than the other exposure pathways. No further assessment of domestic animal consumption was conducted.

Table 12. Summary of Cancer Risks and Hazard Indices from Primary Contaminants of Potential Concern Agricultural Exposure Units - RME Scenario

Exposure Unit	Exposure Scenario	Receptor	Cancer Risk (Total PCBs)	Hazard Index (Total PCBs and Mercury)	Cancer Risk (PCB Dioxin-like Congener TEQ)	Hazard Index (PCB Dioxin-like Congener TEQ)
Ag-EU1	Farmer	Adult	3E-06	0.1	3E-07	0.007
Ag-EU2	Farmer	Adult	1E-06	0.06	2E-07	0.004
Ag-EU3	Farmer	Adult	2E-06	0.08	2E-07	0.005
Ag-EU4	Farmer	Adult	1E-07	0.005	1E-08	0.0003
Ag-EU5	Farmer	Adult	3E-07	0.01	4E-08	0.0008
Ag-EU6	Farmer	Adult	3E-09	0.0002	8E-11	0.000002
Ag-EU7	Farmer	Adult	5E-08	0.002	6E-09	0.0001
Ag-EU8	Farmer	Adult	3E-08	0.002	3E-09	0.00006

Table 13. Summary of Cancer Risks and Noncancer Hazard Indices from Primary COPCs

Exposure Unit	Exposure Scenario	Receptor	Cancer Risk (Total PCBs)	Hazard Index (Total PCBs and Mercury)	Cancer Risk (PCB Dioxin-like Congener TEQ)	Hazard Index (PCB Dioxin-like Congener TEQ)
C1-EU1	High contact recreational	Young child	4E-06	0.4	5E-07	0.06
		Adolescent	3E-06	0.5	4E-07	0.03
		Adult	2E-06	0.1	2E-07	0.006
C1-EU2	Low contact recreational	Adolescent	7E-06	1	9E-07	0.07
		Adult	4E-06	0.2	5E-07	0.01
	Worker	Adult	1E-07	0.2	2E-08	0.01
C2N-EU1	Low contact recreational	Adolescent	2E-06	0.4	3E-07	0.02
		Adult	1E-06	0.08	2E-07	0.005
	Worker	Adult	6E-08	0.1	8E-09	0.006
C3N-EU1	Low contact recreational	Adolescent	3E-06	0.6	4E-07	0.03
		Adult	2E-06	0.1	2E-07	0.006
C3N-EU2	Low contact recreational	Adolescent	5E-06	0.6	4E-07	0.03
		Adult	3E-06	0.1	2E-07	0.006
C3S-EU1	High contact recreational	Young child	7E-06	1	9E-07	0.1
		Adolescent	6E-06	1	7E-07	0.06
		Adult	3E-06	0.2	4E-07	0.01
C3S-EU2	High contact recreational	Young child	8E-06	1	3E-06	0.3
		Adolescent	7E-06	1	2E-06	0.2
		Adult	4E-06	0.2	1E-06	0.03
C4N-EU1	Low contact recreational	Adolescent	1E-06	0.2	2E-07	0.01
		Adult	7E-07	0.04	1E-07	0.003
	Worker	Adult	1E-08	0.02	2E-09	0.001
C4N-EU2	Low contact recreational	Adolescent	1E-06	0.2	2E-07	0.01
		Adult	7E-07	0.04	1E-07	0.003
C4S-EU1	Low contact recreational	Adolescent	2E-06	0.4	4E-07	0.03
		Adult	1E-06	0.09	2E-07	0.006
C4S-EU2	Low contact recreational	Adolescent	4E-07	0.06	5E-08	0.004
		Adult	2E-07	0.01	3E-08	0.0007
C4S-EU3	Low contact recreational	Adolescent	8E-07	0.1	1E-07	0.008
		Adult	5E-07	0.03	6E-08	0.002
C5N-EU1	Low contact recreational	Adolescent	9E-07	0.2	1E-07	0.009
		Adult	5E-07	0.03	7E-08	0.002
	Worker	Adult	2E-08	0.04	3E-09	0.002
C5S-EU1	Low contact recreational	Adolescent	2E-07	0.03	2E-08	0.002
		Adult	1E-07	0.007	1E-08	0.0004
C6N-EU1	Low contact recreational	Adolescent	3E-07	0.05	4E-08	0.003
		Adult	2E-07	0.01	2E-08	0.0006
C6S-EU1	Low contact recreational	Adolescent	4E-07	0.07	5E-08	0.004
		Adult	3E-07	0.02	3E-08	0.0008
C7S-EU1	Low contact recreational	Adolescent	2E-07	0.03	2E-08	0.002
		Adult	1E-07	0.007	1E-08	0.0004
C8N-EU1	Low contact recreational	Adolescent	4E-07	0.08	7E-08	0.005
		Adult	3E-07	0.02	4E-08	0.001

7.1.6 Human Health Risk Summary

In summary, human health risk is primarily due to PCB concentrations in fish tissue for Snow Creek and the entire length of Choccolocco Creek. Mercury and DL-PCBs are also contaminants of concern (COCs) in fish tissue in the LAA of Choccolocco Creek where fish consumption rates are higher (Tables 10a and 10b). There is no unacceptable direct contact risk from PCBs or mercury in surface soil (Tables 12 and 13).

7.2 Baseline Ecological Risk Assessment

The 2016 BERA followed the eight-step process outlined in the EPA's Ecological Risk Assessment Guidance for Superfund. A 2018 BERA Addendum was prepared by the EPA to focus on the specific technical issues where agreement was not reached during the BERA comment and review process. The conclusions below are based on the BERA Addendum.

OU4 encompasses a variety of distinct habitats suitable for ecological receptors, including aquatic habitat within Choccolocco and lower Snow Creek, riparian corridor corresponding to the forested canopy along the creek edges, and terrestrial floodplain habitat consisting predominantly of maintained fields and successional fields, as well as some forested floodplain areas. These habitats were characterized during several independent site assessments conducted since 1997, and support a variety of aquatic, semi-aquatic, and terrestrial organisms.

The CSM for ecological risk in OU4 is illustrated on Figure 37. Complete and significant exposure pathways evaluated in the BERA include:

- Soils/sediment and ecological communities of plants and invertebrates;
- Surface water and aquatic life (aquatic plants, aquatic invertebrates, fish, and amphibians); and
- Ingestion of prey associated with soil/ sediment or soil/sediment/surface water by direct ingestion and herbivorous, insectivorous, invertivorous, piscivorous, omnivorous, and carnivorous birds and mammals.

7.2.1 Identification of Chemicals of Potential Concern

The primary media of interest for OU4 are soil and sediment. Although other media (surface water and/or biota) may be impacted by COPCs, they are not evaluated for COPC selection because concentrations of COPCs in these media are generally a function of their concentrations in soil and sediment (primary exposure media). Samples were analyzed for total PCBs primarily as the sum of Aroclors. Mercury and the remaining COPCs were analyzed in a subset of the samples. Sediment data from up to 0 to 6 inches bgs, soil data collected primarily from 0 to 1 feet bgs, and whole water samples collected over five separate sampling events were evaluated.

The SLERA compared maximum detected concentrations of chemicals in soil, sediment, surface water, and fish tissue available at that time to conservative ecological screening values (ESVs) developed for specific media. If an ESV was not available for a constituent, that constituent was not eliminated as a

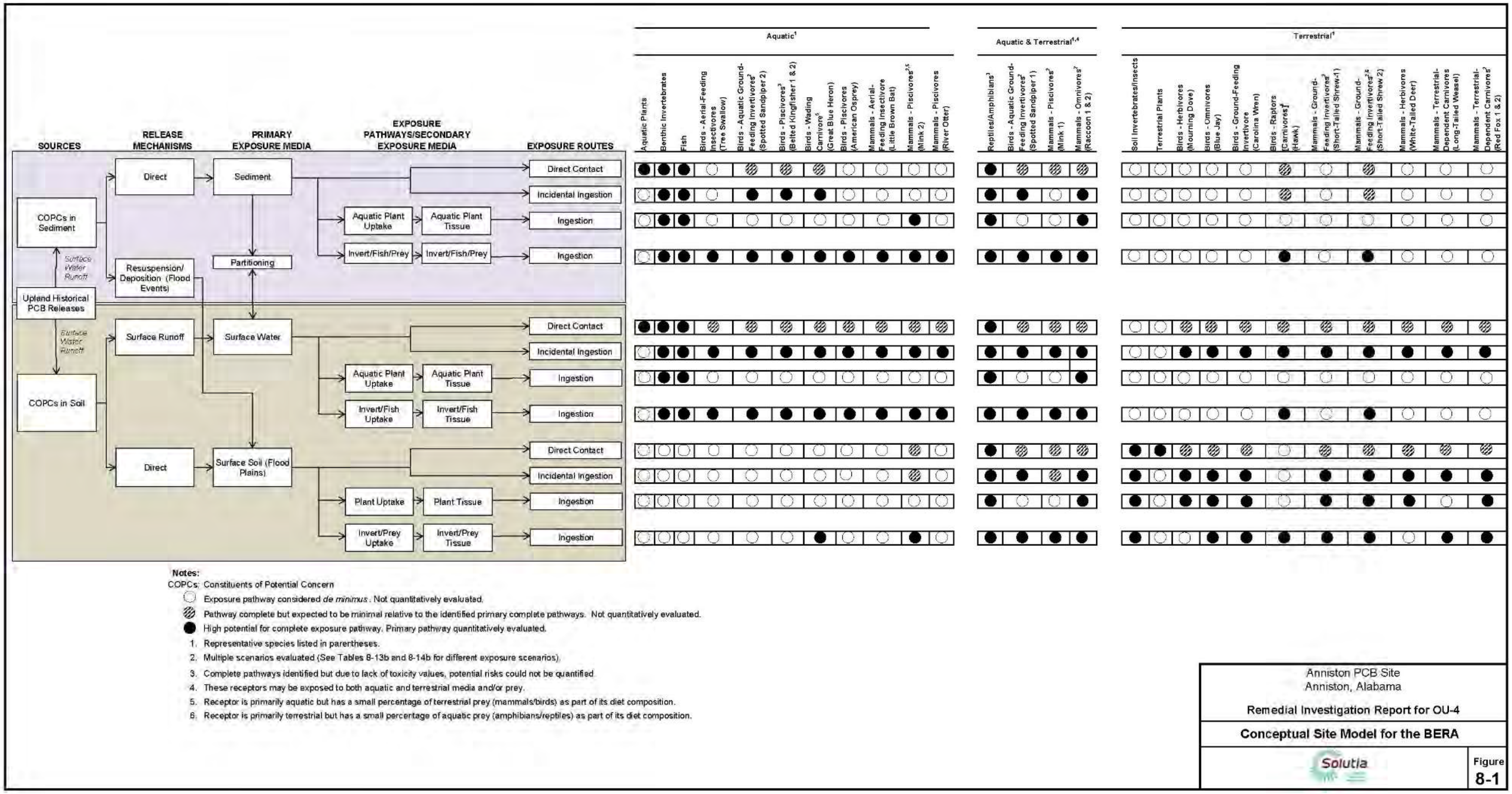

Figure 37. Conceptual Site Model for the BERA

COPC. For soil, ESVs were available for mercury and PCBs and the maximum detected concentrations exceeded respective soil ESVs. For sediment, the maximum detected concentrations of arsenic, chromium, lead, mercury, nickel, and PCBs exceeded respective sediment ESVs. The maximum detected concentration of cadmium in sediment did not exceed the sediment ESV, and sediment ESVs were not available for barium, beryllium, cobalt, manganese, and vanadium. For surface water, PCB concentration data were available, and the maximum detected concentration exceeded the surface water ESV. For fish tissue, mercury and PCB concentration data were available and the maximum detected concentrations exceeded respective tissue ESVs. To summarize, only cadmium in sediment was eliminated from further consideration by ESVs.

The COPCs were refined after additional data was collected during the remedial investigation. PCBs are the primary COPC. Seven other constituents in soil and sediment that may be present at elevated concentrations were also selected as COPCs and include barium (sediment only), cobalt (sediment only), chromium, lead, mercury, vanadium, and PCDDs/PCDFs/DL-PCBs (Table 7).

7.2.2 Exposure Assessment

Seven assessment endpoints (AEs) were established to represent valuable ecological resources that need to be protected from risk potentially created by COPCs. They include survival, growth, and reproduction of the following: aquatic/terrestrial plant communities; benthic invertebrate communities; terrestrial invertebrate communities; fish communities; birds; mammals; and amphibians and reptiles.

Multiple measurement endpoints (MEs) were evaluated for each AE (Appendix C, Table C-13). MEs include:

- A range of hazard quotients (HQs) (based on dietary and tissue-based exposure models);
- Site-specific sediment toxicity testing evaluated by comparing site sediment sample COPC concentrations to site-specific toxicity thresholds and/or literature-derived toxicity benchmarks;
- Quantitative evaluation of site-specific biological community data within OU-4 and compared to reference conditions;
- Comparisons between OU-4 and reference conditions and/or and spatial trend analysis for abiotic and biotic media; and
- Qualitative observations of ecological communities.

Eight mammals and nine birds were selected as representative receptors for OU4. In addition, lower trophic level receptors including aquatic plants, aquatic invertebrates, benthic sediment invertebrates, fish, terrestrial plants, and terrestrial invertebrates were evaluated in this OU4 BERA. These lower trophic level receptors were evaluated as general categories because toxicity values used in evaluation of risk for these groups are based on data for multiple species and are based on abiotic media or tissue concentrations that do not incorporate species-specific attributes. For reptiles and amphibians, representative species were not identified because a lack of available toxicity data prevents species-specific evaluation of this group.

Threatened and Endangered (T&E) species that have been observed within Choccolocco Creek and may be found in OU4 include the blue shiner (*Cyprinella caerulea*), painted rocksnail (*Leptoxis taeniata*), Cylindrical lioplax (*Lioplax cyclostomaformis*), and Tulotoma snail (*Tulotoma magnifica*). In addition, the United States Fish and Wildlife Service (USFWS) lists two mammals (Indiana bat [*Myotis sodalist*] and grey bat [*Myotis grisescens*]), one bird (red-cockaded woodpecker [*Picoides borealis*]), four flowering plants, eight clams, and one fish (pygmy sculpin [*Cottus paulus*]) as potentially occurring within Calhoun County, Alabama. In addition, one sensitive snail species (*Wicker Ancylid limpet*), formerly thought to be extinct, has been observed in lower Choccolocco Creek. Therefore, a range of risk estimates are provided in the OU4 BERA to allow evaluation of the potential for adverse effects at both the individual and population levels.

Lower trophic levels (plants, invertebrates, fish, and aquatic life) were evaluated based on direct contact with environmental media, whereas upper trophic levels (birds and mammals) were evaluated using standard dietary food web models with measured tissue EPCs or modeled tissue EPCs calculated from abiotic media EPCs and bioaccumulation factors (BAFs). In addition, invertebrates, fish, small mammals, and birds were evaluated based on whole body (or egg for birds) tissue residues.

For PCBs and mercury, abiotic media EPCs were based on the 95% UCL on the mean concentration for floodplain and riparian soil EUs and a spatially weighted 95th percentile concentration calculated using probabilistic methods for sediment in each EU. For non-mercury metals, EPCs were based on the 95% UCL in each EU, or the maximum detected concentration when sample size was insufficient to calculate a reliable 95% UCL. Surface water EPCs for PCBs and metal COPCs are based on the assessment area-wide and OU4-wide 95% UCL concentrations. Measured tissue EPCs are based on assessment area-wide 95% UCL concentrations.

Dietary exposure to a range of feeding guilds was evaluated from concentrations of COPCs measured in soils, sediments and biota. Dietary compositions for each of the wildlife representative receptors, and wildlife exposure parameters are presented in the BERA.

Site-specific BAFs were developed using biotic tissue data collected from OU4 and abiotic media data collected within the same biological sampling area (BSA). For PCBs and mercury, regression relationships were used when significant; however, in most cases (and in all cases for other COPCs), median BAFs were used to estimate prey tissue concentrations. Biotic tissue data were collected for fourteen types of species (Appendix C, Table C-14) to support the development of BAFs including:

Aquatic Organisms:

- Aquatic plants,
- Emergent insects,
- Benthic invertebrates,
- Crayfish,
- Mollusks,
- Frogs,
- Snakes,

- Predator fish,
- Forage fish, and
- Bottom fish

Terrestrial Organisms:

- Plants
- Insects
- Earthworms
- Small mammals.

7.2.3 Ecological Effects Assessment

The effects assessment included the development of toxicity values. The selected toxicity values were based on endpoints that could result in population-level impacts such as survival, reproduction, development, and growth. Media-based toxicity benchmarks from federal, state, and literature-based sources were used to assess lower trophic levels. Site-specific toxicity tests were used to develop benthic community toxicity thresholds for PCBs. Twenty-six toxicity tests were conducted using sediments from within OU4, and six reference sediments from upstream locations were tested using two standard bioassay tests. A range of effects thresholds based on reproduction, survival, and growth in the tests were derived. Dietary toxicity reference values (TRVs) for wildlife from published sources or developed from the literature were used to assess risk to birds and mammals. For PCBs, high-sensitivity and mid-sensitivity TRVs were developed to reflect differences in PCB sensitivity based on aryl hydrocarbon receptor (AHR)- receptor types in birds. In addition to a mammal TRV based on small mammals, two minks specific TRVs were also evaluated based on this species elevated sensitivity to PCBs relative to other mammals. Tissue-based TRVs, referred to as critical tissue concentrations (CTCs), were developed for PCBs, mercury, and some metals for invertebrates, fish, birds, and mammals.

7.2.4 Ecological Risk Characterization

The results of the BERA are summarized on Table 14 and include a range of aquatic and terrestrial receptors. The aquatic receptor predicted risk will be addressed though sediment remedies, the terrestrial/riparian receptors predicted risk will be reduced through soil remedies, and the mixed aquatic and terrestrial diet receptors will be addressed through sediment and soil remedies. The risks for C1 through C10 are categorized as being acceptable, generally acceptable, indeterminate, unacceptable, or highly unacceptable. Acceptable risk is interpreted as a no observed adverse effect level (NOAEL)-based HQ < 1.0. Indeterminate risk is interpreted as a NOAEL-based HQ > 1.0 and a low observed adverse effect level (LOAEL)-based HQ < 1.0. Unacceptable risk is interpreted as a LOAEL-based HQ > 1.0. Finally, calculated HQs > 10.0 will be identified as highly unacceptable. Where only one or two sediment samples exceeded the NOAEL-based HQ < 1.0, the WOE evaluation was modified to state that sediment concentrations within that Reach were generally acceptable.

Table 14. Predicted Risk for Ecological Receptors Exposed to PCBs in OU4.

Assessment Endpoint			UAA			MAA		LAA			
		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
Aquatic Receptor Predicted Risk											
Aquatic Plants/ Aquatic Life		U	A	A	A	A	A	A	A	A	A
Benthic Invertebrates		U	U	GA	GA	GA	A	U	GA	A	GA
Fish/Aquatic Life		U	U	U	U	U	U	U	U	U	U
Piscivorous Birds	Belted kingfisher	U	U	U	U	U	U	U	U	U	U
Insectivorous Birds	Sandpiper	HU	HU	U	U	U	U	U	U	U	U
Aerial Insectivorous Birds	Swallow	U	U	U	U	A	A	A	A	A	A
Piscivorous Mammals	Otter/mink	HU	HU	HU	HU	HU	HU	HU	HU	HU	HU
Aerial Insectivorous Mammals	Bat	U	U	U	U	A	A	A	A	A	A
Terrestrial/Riparian Receptor Predicted Risk											
Terrestrial Plants		U[1]	A	A	A	A	A	A	A	A	A
Terrestrial Invertebrates		U[1]	I	I	I	A	A	A	A	A	I
Herbivorous Birds	Dove	U[1]	A	I	A	A	A	A	A	A	A
Insectivorous Birds	Wren	U	U	U	U	I	I	I	I	I	--
Omnivorous Birds	Blue jay	U	I	I	I	A	A	A	A	A	--
Carnivorous Birds	Hawk	HU	U	U	U	I	A	A	I	A	--
Herbivorous Mammals	Deer	A	A	A	A	A	A	A	A	A	--
Insectivorous/ Invertivorous Mammals	Shrew	U	U	U	U	I	I	I	I	I	--
Carnivorous Mammals	Weasel	U[1]	A	U[2]	I	A	A	A	A	A	--
Mixed Aquatic and Terrestrial Diet Receptor Predicted Risk											
Omnivorous Birds	Wren	HU	U	U	U	I	I	I	I	I	--
Omnivorous Mammals	Raccoon	I	I	I	I	I	I	I	I	I	I
Omnivorous Mammals	Mink	HU	HU	HU	HU	HU	HU	HU	HU	HU	HU

Notes:

[1]Unacceptable for C1 West only; C1 East risk is indeterminate.

[2]Unacceptable for C3 South only; C3 North risk is indeterminate.

-- Terrestrial and riparian habitat not evaluated in Reach C10

BERA: baseline ecological risk assessment
LAA: lower assessment area
LOE: line of evidence
MAA: middle assessment area
UAA: upper assessment area

Risk categories:

A	Acceptable risk (NOAEL-based HQ < 1.0)
GA	Generally acceptable risk (based on weight of evidence)
I	Indeterminate risk (NOAEL-based HQ > 1.0 and LOAEL-based HQ < 1.0)
U	Unacceptable risk (LOAEL-based HQ > 1.0)
HU	High unacceptable risk (Calculated HQs > 10.0)

The table also groups EUs by overall assessment areas, including UAA (reach C2 through C4), MAA (reach C5 and C6), and LAA (reach C7 through C10). The results for the C1 were not grouped with the UAA results because of the physical break that I-20 forms between C1 and C2.

The overall conclusions from the BERA and BERA Addendum are similar. PCBs are the primary contaminants that contribute to the unacceptable risk. Predicted risk for aquatic receptors is highest for piscivorous birds and mammals and are primarily due to PCB concentrations in fish tissue. Predicted high risk for aquatic invertivorous/ insectivorous birds is primarily due to modeled PCB concentrations in aquatic worms. Predicted risk is unacceptable for fish throughout OU4. Risk to benthic invertebrates is highest and unacceptable in reaches C1 and C2, which includes Snow Creek and the backwater area, respectively. Predicted risk is unacceptable for aerial insectivores (swallows and bats) in reaches C1 through C4 and acceptable in reaches C5 through C10. Predicted risk to terrestrial receptors is unacceptable for some receptors in reaches C1 through C4 and generally indeterminate or acceptable in reaches C5 through C10, with highest risks to carnivorous birds.

Risks were also evaluated for seven additional secondary COPCs (i.e., mercury, PCDD/PCDF and DL-PCB congener TEQ, barium, chromium, cobalt, lead, and vanadium), and are reported in the BERA Addendum. Although unacceptable risks were identified in some areas of OU4 for some of these COPCs, overall risks in OU4 are primarily due to PCBs. The “unacceptable risk” was derived by using the highest concentrations in each area. However, the areas showing unacceptable risks for COPCs had EPCs that were lower than what would have been the cleanup levels for the COPCs.

7.2.5 Threatened and Endangered Species

The potential for adverse effects to populations of T&E species that may occur in OU4 was qualitatively evaluated based on the risk conclusions for each assessment endpoint that corresponds with the relevant T&E species. No unacceptable risk to local populations of T&E plants is estimated. Unacceptable risks to threatened or endangered benthic invertebrates may be present. No unacceptable risks to T&E invertebrates in OU4 is predicted. Unacceptable risks to the forage fish community (which would include T&E blue shiner and pygmy sculpin) may be present. No T&E birds have been observed within OU4. Insectivorous aerial mammals, which may include Indiana bats, grey bats, and the northern long-eared bat, indicates potential unacceptable risks.

7.2.6 Ecological Risk Summary

In summary, ecological risk is primarily due to PCB concentrations in soil and sediment. Risks were also evaluated for seven additional secondary contaminants of potential concern (COPCs) (i.e., mercury, dioxin toxic equivalents [TEQs], barium, chromium, cobalt, lead, and vanadium). Although unacceptable risks were identified in some areas of OU-4 for some of these COPCs, overall risks in OU4 are dominated by PCBs. The risk from non-mercury metals are generally anthropogenic background. The areas where mercury and dioxin TEQ are highest are co-located with areas of high PCB concentration.

7.3 Risk Assessment Conclusions

The results of the HHRA, BERA, and nature and extent of contamination results together lead to the following conclusions for OU4 moving forward:

- The primary contaminants of concern for soil based on the BERA are PCBs and mercury, as all no observed adverse effect level (NOAEL)-based HQs calculated using modeled tissue TEQ concentrations are less than or equal to one for PCDD/PCDF and DL-PCB TEQ in soil;
- Addressing PCBs in soil will address Site-related Mercury as exposure point concentrations of concern are co-located;
- The contaminants of concern for sediment based on the HHRA and BERA/BERA Addendum are PCBs, mercury, PCDD/PCDF and DL-PCB TEQ.
- Addressing PCBs in sediment will address Site related Mercury and PCDD/PCDF and DL-PCBs. The exposure point concentrations of concern are co-located in the backwater area.

Based on the HHRA and BERA/BERA Addendum, action under CERCLA is warranted and actions are necessary to protect human health or the environment from actual or threatened releases of hazard substances into the environment.

8. REMEDIAL ACTION OBJECTIVES AND CLEANUP LEVELS

8.1 Remedial Action Objectives

The Remedial Action Objectives (RAOs) provide the overall goals that a remedy needs to achieve to protect human health and the environment based on the risk assessments and consideration of available ARARs. RAOs are established to support the evaluation of remedial alternatives for areas with the potential for unacceptable risk as identified in the human health and ecological risk assessments. The RAOs for OU4 established in the FS and revised in the FS Addendum include the following:

RAO 1: Reduce PCB concentrations in residential soil to levels that are protective to residents, including young children and adolescents, and other users from direct contact with or incidental ingestion exposure. This RAO is expected to be achieved when cleanup is performed at the one remaining property or when existing structures are removed. Access will be required for the work to be conducted.

RAO 2: Ensure the long-term effectiveness of the previously implemented RCRA interim measures in Oxford Lake Park. This RAO is expected to be achieved when actions are finalized in this decision document.

RAO 3: Reduce PCB concentrations in soil (0-6 inches) to levels that are protective to terrestrial ecological receptors. This RAO is expected to be achieved when PCB remedial goal concentrations in soil (Table 15) are met.

RAO 4: Reduce PCB concentrations in sediment to levels that reduce PCB concentrations to acceptable levels in fish tissue. This RAO is expected to be achieved when PCB remedial goal concentrations in sediment (Table 15) are met.

RAO 5: Reduce PCB concentrations in fish tissue to levels that are protective to human fish consumers, including pregnant women, young children, and adolescents. This RAO is expected to be achieved when PCB remedial goal concentrations in fish tissue are met.

RAO 6: Reduce PCB concentrations in sediment to levels that are protective t**o benthic macroinvertebrate communities.** This RAO is expected when dredging and/or capping of sediment is completed.

RAO 7: Reduce PCB concentrations in sediment to levels that are protective to fish communities and aquatic feeding birds and mammals. This RAO is expected to be achieved PCB remedial goal concentrations in sediment are met.

RAO 8: Reduce PCB concentrations to levels that are protective of ecological receptors that consume whole fish. This RAO is expected to be achieved when PCB remedial goal concentrations in whole body fish are met.

RAO 9: Reduce transport of PCBs in OU4 soil and sediment to downstream areas. This RAO is expected to be achieved when PCB remedial goal concentrations in sediment and on creek banks are met.

RAO 10: Restore surface water to achieve AWQC for PCBs for the protection of aquatic life and human consumers of fish. This RAO will be achieved when ADEM water quality criteria that are identified as chemical-specific ARARs are met.

8.2 Preliminary Remedial Goals and Cleanup Levels

Pursuant to the NCP at 40 C.F.R. § 300.430(e)(2)(i), preliminary remedial goals (PRGs) are identified in the FS based upon ARARs if available and risk-based concentrations if ARARs are not available. PRGs specify the contaminant concentrations that need to be met by the remedial alternatives to achieve the RAOs. PRGs are finalized in the ROD and become the “cleanup levels”. Site-specific Cleanup Levels are summarized in Table 15.

8.2.1 Soil Cleanup Levels

Residential

The PCB cleanup levels for residential soil were established in the NTCRA and are required to satisfy RAO 1. The removal action level for PCBs in residential soil was established at 1 mg/kg in surface soil

Table 15. Summary of Cleanup Levels OU4 Media

MEDIA	CONTAMINANT	CLEANUP LEVEL	BASIS	RAO
Soil - residential surface subsurface	 PCBs PCBs	 1 mg/kg 10 mg/kg	 NTCRA SRA PCB Guidance	1
Soil - non-residential Surface (0-6 in)	PCBs	95% UCL SWAC 6 mg/kg over each 5-acre decision unit in reaches C1 thru C4	BERA	3
Soil – creek banks	PCBs	NTE 2.6 mg/kg	BERA	9
Sediment - all	PCBs	NTE/RAL 2.6 mg/kg 95% UCL SWAC 0.1 mg/kg in each reach[1]	BERA HHRA/BERA	6 4, 7, 9
Surface Water	PCBs (aquatic life) PCBs (human health)	0.014 µg/L 0.000064 ug/L	ARAR ARAR	10 10
Fish	PCB (fillet tissue) upstream Jackson Shoals PCB (fillet tissue) downstream Jackson Shoals PCB (whole body)	0.08 mg/kg ww 0.04 mg/kg ww 1.3 mg/kg dw	HHRA HHRA BERA	5 5 8

[1] The sediment remedy has two cleanup levels applied at different spatial scales: 1) an NTE cleanup level of 2.6 mg/kg total PCBs where individual sediment samples are not to exceed 2.6 ppm total PCBs (this NTE cleanup level is also being used as a RAL to delineate areas for active remediation); and 2) a SWAC cleanup level of 0.1 mg/kg total PCBs where the 95% UCL of the measured SWAC will not exceed the 0.1 mg/kg total PCB cleanup level in each of the ten creek reaches (C1 through C10) (see Figure 11 and FS figures 5-7a-k). Although Mean SWAC was used over the risk assessment exposure areas in the FS, a 95% UCL of the SWAC over the relevant creek reach will be required.

NTE – not to exceed.
SWAC – surface weighted average concentration
HHRA – human health risk assessment
ARAR – applicable, relevant and appropriate requirements
UCL – upper confidence limit
SRA – streamlined risk assessment
BERA – baseline ecological risk assessment
RAL – remedial action level

and 10 mg/kg in subsurface soil. These concentrations have been achieved for most residential properties at the Site. However, any soil with PCB concentrations greater than 1 mg/kg that remain on the property are considered PCB remediation waste if removed. The PRPs still have TSCA obligations related to future soil disturbance activities that could create an unacceptable risk by bringing subsurface soil with PCB concentrations greater than 1 mg/kg to the surface. The alternatives considered for residential exposure need to address the one property that has not been cleaned up and the residual PCB concentrations greater than 1 mg/kg in subsurface soil and potentially beneath structures on residential properties.

Non- Residential

The IMs in OU4 are recreational areas that require monitoring and maintenance of soil and other caps by the PRPs to remain protective and satisfy RAO 2. There is no cleanup level designated for the IMs because the actions were completed under RCRA.

The cleanup level for non-residential soil was established to protect ecological receptors that are exposed to, ingest, and bioaccumulate PCBs in soil (0-6 inches bgs). The cleanup level was selected from the range of lowest observed adverse effect level (LOAEL)-based remedial goal options (RGOs) for terrestrial and semi-terrestrial receptors evaluated in the OU4 BERA and BERA Addendum. The selected cleanup level is protective of at least one exposure scenario for all receptor groups evaluated, including avian and mammalian herbivores, omnivores, invertivores, and carnivores.

As stated in the BERA the mink is the only semi-terrestrial species identified as having an unacceptable risk. Although the mink is identified as semi-terrestrial, the mink diet was documented in the BERA as being 99% aquatic. The risk from an aquatic diet will be addressed by the sediment cleanup. Because the risk to the mink will be addressed through the sediment remedy, the floodplain soil remedy will only address terrestrial receptor risks. Terrestrial receptor risks are only present in reaches C1-C4. Attainment of the non-residential soil cleanup levels will be measured through the 95% UCL of the surface weighted average concentrations (SWAC) in five-acre decision units (the upper bound foraging range for small mammals and small birds) in floodplain reaches C1, C2, C3 and C4, where unacceptable risk to terrestrial receptors is found. Therefore, achieving the cleanup level for non-residential soil through the SWAC in reaches C1, C2, C3 and C4 meets RAO 3.

Creek Banks

The cleanup level for creek bank soil was established to keep PCB concentrations in soil on creek banks from re-contaminating the sediment and contributing to downstream migrations of PCBs in sediment to Logan Martin Lake. The cleanup level for creek bank soil contributes to the achievement of RAO 9.

8.2.2 Sediment Cleanup Levels

The not-to exceed/ remedial action level (NTE /RAL) cleanup level of 2.6 mg/kg total PCBs for sediment satisfies RAO 6. The results of the OU4 sediment toxicity test were considered as the basis for a NTE PCB cleanup level in sediment. Specifically, the PCB cleanup level value proposed is the PCB concentration that would cause an additional 10% effect beyond the lowest response measured in the reference sediment (EC10). This cleanup level is also applied as a remedial action level (RAL) and sample locations that exceed the RAL will be actively remediated.

For comparison, the EPA used existing site data to evaluate additional sediment bed RALs to provide context on the effectiveness and protectiveness of the single evaluated sediment bed RAL versus other RALs. A relationship between RALs and SWACs was developed for Choccolocco Creek reaches between the backwater/Friendship Road area (which is proposed to be remediated in its entirety) and the Choccolocco Creek embayment area (Logan Martin Lake backwater). The analysis shows that a RAL of 2.6 mg/kg results in post-removal SWACs ranging from 0.11 to 0.51 mg/kg in these reaches. The combined footprint is 12.58 acres, which corresponds to the FS estimate of 12 acres of remediation below the backwater area in Choccolocco Creek. To achieve the final sediment cleanup levels protective of fish tissue consumption (0.2 mg/kg SWAC above Jackson Shoals; 0.1 below Jackson Shoals) in the analyzed river sections, with no monitored natural recovery (MNR) component, RALs would range from 0.8 to 2.6 ppm and include a combined 46 acres of remediation below the backwater area in Choccolocco Creek. The selected RAL does not achieve the remedial action objective at the completion of construction. However, overtime MNR in addition to the active remediation is expected to achieve protective levels in sediment and fish tissue.

To be protective of aquatic and semi-aquatic ecological receptors (mink and otter), a sediment cleanup level of 0.1 mg/kg should be met for each of the 10 creek reaches. This sediment cleanup level is protective of human health and ecological exposure pathways, as discussed in RAOs 4 and 7. This cleanup level also contributes to the achievement of RAO 9 to reduce transport of PCB contaminated sediment to downstream areas. Compliance will be achieved when the 95% UCL of the measured sediment SWAC is less than or equal to the 0.1 mg/kg total PCB SWAC in each creek reach.

8.2.3 Surface Water Cleanup Levels

The cleanup levels for contaminants in surface water are established by chemical specific ARARs and satisfy RAO 10. Nationally recommended water quality criteria adopted by ADEM in the surface water standards approved by the EPA for aquatic life and for human consumption of fish are considered chemical-specific ARARs. The AWQC for total PCBs in surface water are 0.014 µg/L (for aquatic life) and 0.000064 µg/L (for human consumption of fish).

8.2.4 Biota Cleanup Levels

Meeting the PCB cleanup levels for fish tissue upstream and downstream of Jackson Shoals will satisfy RAO 5. The human health PCB cleanup levels for fish tissue are based on the RME value. Meeting the cleanup level for whole body fish will satisfy RAO 8. The cleanup levels for piscivorous wildlife and fish were developed based on a range of measured PCB concentrations in fish. The one difference in approach is PCB concentrations in fish for ecological purposes are assessed on a whole-body basis in contrast to fish tissue PCB concentrations that are used to quantify human health exposure conditions. A PCB concentration of 1.3 mg/kg dry weight in whole-body fish is proposed as the target cleanup level range for fish and receptors that consume fish (from LOAEL-Based Remedial Goal Options for the otter evaluated in the BERA).

9. DESCRIPTION OF ALTERNATIVES

General response actions and remedial technologies for reducing unacceptable risks to contamination in soil, sediment, surface water, and biota at OU4 were developed and screened. The potential technologies were first screened based on effectiveness, implementability, and cost. The technologies that were not feasible or had limitations that might prevent achievement of RAOs were eliminated in the screening process, with the remaining technologies considered to be better suited for further consideration in developing remedial alternatives.

Treatment alternatives for PCB contamination in soil and sediment have previously relied on incineration or thermal desorption of PCBs as the most effective treatment. The Anniston community is particularly sensitive to the use of thermal technologies due to activities at the Anniston Chemical Agent Disposal Facility (ANCDF) at the Anniston Army Depot. Thermal desorption of PCB contaminated soil was included in RODs for OU1/OU2 and OU3 but were not selected because of concerns that onsite thermal desorption could create addition air pollution; excavation and offsite disposal provides a faster remedy to the local community than thermal desorption; and all alternatives are protective in the long-term while thermal desorption is more expensive.

No treatment was included for OU4 soil alternatives because the reasons for not considering and selecting thermal treatment in previous OUs are still appropriate. Instead, alternatives were developed and evaluated that remove additional PCB contamination in subsurface soil to achieve unlimited use/unlimited exposure designation or removing PCB concentrations greater than 50 mg/kg in subsurface soil to reduce concerns about improper handling of TSCA hazardous waste in the future. Onsite and offsite treatment of sediment was evaluated for sediment considered PTW in the backwater area.

9.1 Common Elements of all Alternatives

Areas where PCBs remain in soil at concentrations greater than 1 mg/kg are subject to ICs, including a Site Soil Management Plan, to ensure no unreasonable risk of exposure to human health or the environment occurs. Implementation of the Soil Management Plan includes annual dashboard checks (drive by observation) to identify any soil disturbance activities, and letters notifying landowners where PCBs remain on the property, as well as providing residents with contact information for coordinating planned or future soil disturbances. ICs include investment in the Alabama 811, one-call system used by local utilities where soil disturbances are planned, and support for land trust conservation corridors in impacted portions of the Site, including OU4. In some cases, deed restrictions may be requested to further protect human health and the environment where owners are willing to participate.

The retained technologies are used to develop four categories of remedial alternatives for the media of concern:

- Residential soil;
- Interim measures at Oxford Lake Park;
- Non-residential soil; and

- Sediment and creek banks.

9.2 Remedial Alternatives for Residential Soil

Three remedial alternatives were developed for soil on residential properties. Each alternative includes the removal actions already completed in OU4 under the NTCRA Agreement and finalizing them through this remedial action. The alternatives are consistent with the range of remedial alternatives for residential soil evaluated by the EPA for the OU1/OU2 portion of the Site. The properties sampled and cleaned up in OU4 are on Figures 4-6a-j in the FS.

Residential cleanup alternatives are needed to manage residual PCBs that may remain on residential use areas of OU4 properties. Residual PCBs in soil greater than or equal to 1 mg/kg and less than 10 mg/kg remain in subsurface soil on five residential properties (an area of approximately 1.1 acres) and in surface soil on one property where access to cleanup under the NTCRA was not granted (an area of 0.25 acres). In addition, 14 residential structures are located next to areas that required excavation under the NTCRA, so long-term monitoring is required to make sure sampling and soil removal is conducted where necessary if structures are demolished in the future (Table 1).

The Key ARARs for the Residential Soil alternatives include (See full tables in Appendix D):

- RCRA regulations at 40 Code of Federal Regulations (C.F.R.) Part 262.11(a)-(d) for the management and disposal of remediation wastes.
- TSCA regulations at 40 C.F.R. Part 761 for the management, storage and disposal of PCB remediation wastes.
- TSCA regulations at 40 C.F.R. § 761.61(c) for risk-based disposal of PCB remediation waste.

The Residential Soil (RS) remedial alternatives developed are summarized below:

RS-1: No Further Action

RS-2: Excavation and On- or Offsite Disposal for Surface Soil with PCB Concentrations ≥ 1.0 mg/kg and Subsurface Soil PCB Concentrations ≥ 10.0 mg/kg

RS-3: Excavation and On- or Offsite Disposal for Surface Soil and Subsurface Soil with PCB concentrations ≥ 1 mg/kg

ALTERNATIVE RS-1: No Further Action

Estimated Capital Cost: $0
Estimated Annual Operation & Maintenance (O&M) Cost: $0
Estimated Present Worth Cost: $0

Alternative RS-1 is the no further action alternative, which would involve no further action beyond the residential removals that have already been completed under the TCRA and the NTCRA. RS-1 would leave contaminated surface soil with PCBs above 1 mg/kg in in the one residential area (0.25 acres) where access for removal has not been granted. Under this alternative no further action would be taken at this property and in residential areas where PCBs remain at concentrations above 1 mg/kg and below 10 mg/kg at depths below 1 foot. The RS-1 alternative would also not include implementation of a Soil Management Plan to monitor property uses and changes in the future throughout OU4.

ALTERNATIVE RS-2: Excavation and On- or Offsite Disposal for Surface Soil with PCB Concentrations ≥ 1 mg/kg and Subsurface Soil PCB Concentrations ≥ 10 mg/kg

Estimated Capital Cost: $105,600
Estimated Annual O&M Cost: $0
Estimated Present Worth Cost: $400,000

RS-2 includes the removal actions conducted to date under the TCRA and the NTCRA Agreements and long-term management of PCB residuals through implementation of a Soil Management Plan. PCB residuals remain at depth for residential use areas at five properties and potential PCB-containing soil may be present beneath pavement or structures on 14 properties (Table 1). These PCB residuals would be managed in perpetuity through implementation of a Soil Management Plan. The remaining residential removal action that has yet to be implemented due to the lack of property access would be conducted when access is provided by the landowner.

To implement RS-2, 540 tons of refined materials, including sandy backfill materials, topsoil, and a high-density polyethylene (HDPE) liner (from decontamination area), would need to be used. Implementing RS-2 would generate approximately 600 tons of soil with PCB concentrations less than 50 mg/kg for offsite disposal.

The following components are part of alternative RS-2:

- Follow an approved Soil Management Plan which requires:
  - Periodic attempts (at least annually) to gain access to properties identified with PCBs in surface and/or subsurface soil and performance of cleanup identified below;
  - Periodic notification that residual PCBs > 1 mg/kg are or may be present in subsurface soil or beneath structures; and
  - PCB sampling and cleanup, if needed, of soil below demolished structures (i.e., buildings, sheds, or paved areas that limits exposure) on properties where previous cleanups have occurred or in areas where present in subsurface.
- Residential cleanup includes all activities conducted under the NTCRA, which applies to the one residential property and any properties identified in the future where existing structures are removed:
  - Excavate surface soil with PCB concentrations greater than or equal to 1 mg/kg and subsurface soil with PCB concentrations greater than or equal to 10 mg/kg.
  - Clean interior surfaces of homes with dust concentrations above 1 mg/kg.
  - Excavate or install barriers in accessible crawl spaces with PCB concentrations in surface soil above 1 mg/kg.

- Dispose of soil with PCB concentrations less than 10 mg/kg onsite at the South Site Soil Management Area (SSSMA) located near the Facility, provided the material passes leachability testing, or at an offsite disposal facility.
- Dispose of soil with PCB concentrations greater than or equal to 10 mg/kg PCBs at an approved offsite disposal facility.
- Backfill excavated areas with clean soil and topsoil to approximately the same grades that existed prior to excavation.
- Re-vegetate the property as close to original conditions as possible.

- ICs include investment in the Alabama 811, one-call system used by local utilities where soil disturbances are planned.

The estimated time frame to complete construction and achieve RAO 1 for this remedial alternative and achieve RAO 1 would be several months after the property owner grants access, recognizing the time frame necessary to mobilize construction equipment for this relatively small project. The in-field construction time at the property would be one to two weeks; the remainder of the time is associated with planning, coordinating, and final reporting.

ALTERNATIVE RS-3: Excavation and On- or Offsite Disposal for Surface Soil and Subsurface Soil with PCB Concentrations ≥ 1.0 mg/kg

Estimated Capital Cost: $ 1,044,500
Estimated Annual O&M Cost: $ 0
Estimated Present Worth Cost: $ 1,390,000

Alternative RD-3 is complete residential removals for all surface and subsurface soil in accessible areas on residential properties up to four feet bgs with PCB concentrations greater than or equal to 1 mg/kg. Soil located beneath developed portions of the residential use areas (e.g., walkways, driveways, sheds) would not be removed and would be addressed through implementation of a Soil Management Plan. These remedial actions would address PCBs remaining in subsurface soil with concentrations between 1 mg/kg and 10 mg/kg for the five residential use areas where surface removals have already been conducted and the one (1) residential use area with surface soil PCB concentrations greater than or equal to 1 mg/kg where access has been denied. This process would also include removing the clean surface soil that was placed on the five residential use areas several years ago as part of the surface soil removals before the subsurface soil is excavated. In total, removal would be required for 1.35 acres of residential use area, and 7,400 cubic yards of material that would be disposed of at an approved soil management area, provided the material passes leachability testing, or offsite in an approved disposal facility. The alternative would also include removal of soil from the property where access to conduct the surface soil removal has yet to be granted.

RS-3 would require using 12,700 tons of refined materials for implementation of the remediation activities, including sandy backfill materials, topsoil, and HDPE liner (from decontamination area). Implementing RS-3 would generate 11,100 tons of soil with PCB concentrations of less than 50 mg/kg for offsite disposal. Restoration water use during implementation of the remedial activities would be limited to hydroseeding activities and would total 4,000 gallons. Other water use, including public, surface, ground, storm, and reclaimed water would be negligible.

The following components are part of alternative RS-3:

- Follow an approved Soil Management Plan which requires:
  - periodic attempts to gain access to properties identified with PCBs in surface and/or subsurface soil and performance of cleanup identified below;
  - periodic notification that residual PCBs > 1 mg/kg are or may be present beneath structures; and
  - PCB sampling and cleanup, if needed, of soil below demolished structures (i.e., buildings, sheds, or paved areas that limits exposure) on properties where previous cleanups have occurred or in areas where present in subsurface.
- Residential cleanup includes:
  - Excavate surface soil with PCB concentrations greater than or equal to 1 mg/kg and subsurface soil with PCB concentrations greater than or equal to 1 mg/kg up to 4 ft bgs.
  - Clean interior surfaces of homes with dust concentrations above 1 mg/kg.
  - Excavate or install barriers in accessible crawl spaces with PCB concentrations in surface soil above 1.0 mg/kg.
  - Dispose of soil with PCB concentrations less than 10 mg/kg at the SSSMA located near the Facility, provided the material passes leachability testing, or at an offsite disposal facility.
  - Dispose of soil with PCB concentrations greater than 10 mg/kg PCBs at an approved offsite disposal facility.
  - Backfill excavated areas with clean soil and topsoil to approximately the same grades that existed prior to excavation.
  - Re-vegetate the property as close to original conditions as possible.
- ICs include investment in the Alabama 811, one-call system used by local utilities where soil disturbances are planned.

The estimated time frame to complete construction and achieve RAO 1 is several months to a year after obtaining property access from the landowners.

9.3 Remedial Alternatives for Interim Measure Soil

Remedial alternatives developed for the Oxford Lake Park IMs considered several factors, including (i) the protective nature of how the IMs were implemented, including removal of soil and cover systems; (ii) that, where applicable, monitoring and maintenance activities have been conducted since the IMs were constructed; and (iii) that the IMs are constructed on property owned by the City of Oxford and are deed restricted from future development adverse to their current recreational purposes. The IMs at the softball field’s parking lot, tennis court complex, and southwest portion of the park (with the infrastructure improvement of adding the Miracle Field) resulted in substantial capping and covers that make the IMs effective preventing current and future subsurface exposure to human health and the environment, if maintained. The softball fields have soil covers that vary in depth and were considered for additional action to prevent future exposure and risk.

The IMs, as constructed and maintained, are considered by the EPA as protective of human health and the environment. These IMs were not conducted as CERCLA response actions; therefore, compliance with ARARs was not required. However, certain regulations including those in RCRA and TSCA were followed in conducting those corrective measures. Three of the remedial alternatives (IM-3, IM-4, and IM-5) were identified in the FS to improve soil covers on the softball fields. Those alternatives were not brought forward into the Proposed Plan because the IM covers are protective and further action under CERCLA is not warranted. Long-term maintenance of these covers is needed to ensure long-term protectiveness.

The Key ARARs for the maintaining IM soil alternatives include (See full tables in Appendix D):

- RCRA regulations at 40 C.F.R. Part 262.11(a)-(d) for the management and disposal of remediation wastes.
- TSCA regulations at 40 C.F.R. Part 761 for the management, storage and disposal of PCB remediation wastes.
- TSCA regulations at 40 C.F.R. § 761.61(c) for risk-based disposal of PCB remediation wastes.

The IM remedial alternatives developed are summarized below:

IM-1: No Further Action

IM-2: Long-term Monitoring, Maintenance and Soil Management

ALTERNATIVE IM-1 No Further Action

Estimated Capital Cost: $0
Estimated Annual O&M Cost: $0
Estimated Present Worth Cost: $0

The No Further Action alternative is intended to serve as a baseline for comparison with the other alternatives. This alternative would leave the previously implemented IMs in place without finalizing them as CERCLA actions and would not include long-term maintenance.

ALTERNATIVE IM-2 Long-term Monitoring, Maintenance and Soil Management

Estimated Capital Cost: $0
Estimated Annual O&M Cost: $400,000
Estimated Present Worth Cost: $400,000

IM-2 will finalize the previously implemented RCRA IMs at the Oxford Lake Park softball fields, the softball fields' parking lot, tennis court complex, and southwest portion of the park (with the infrastructure improvement of adding the Miracle Field). IM-2 will continue the monitoring and maintenance of the

IMs. If cap or cover repairs are needed or if subsurface intrusive activities are needed, maintenance activities may include removing contaminated soil, disposing offsite, and bringing in clean backfill. Repaving the parking lot and tennis court areas may also be required as part of long- term maintenance. Inspections would document the effectiveness of maintenance activities conducted by the City of Oxford's routine maintenance.

The City of Oxford has restricted the deed of the park and agreed to notify the PRPs of any intrusive or land-disturbance work that may occur in this area so that soil management support can be provided, if appropriate.

The following components are part of Alternative IM-2:

- Adopt RCRA IMs at Oxford Lake Park softball fields, the softball field's parking lot, the tennis court complex, and the southwest portion of the park (with the infrastructure improvement of adding the Miracle Field) as final CERCLA remedies;
- ICs include investment in the Alabama 811 one-call system used by local utilities where soil disturbances are planned, maintaining the existing deed restriction for recreational use at Oxford Lake Park, and implementing the Soil Management Plan described in Common Elements of all Alternatives on ROD Part 2, Page 97.

Development and approval of the Soil Management Plan and O&M plan can be done during remedial design and will achieve RAO 2 when the plans are approved.

9.4 Remedial Alternatives for Non-residential Soil

The non-residential soil remedial alternatives developed include removing floodplain soil and disposing of it offsite. Although placing cover materials directly over the floodplain soil was initially considered as a potential remedial approach, an initial evaluation of this approach revealed that target areas were in the FEMA floodway; therefore, placing cover soil without first excavating the existing soil would not be permitted. Based on these factors, remedial alternatives requiring placement of cover soil within the floodway were not developed.

Five remedial alternatives were developed in the Feasibility Study to protect ecological receptors from PCBs in floodplain soil. The soil most relevant to ecological risk is from 0 to 6 inches below ground surface. Pre-remediation mean SWAC PCB concentrations in non-residential soil for ecological exposure conditions (0 to 6 inches) is shown in Figure 38. Three of the remedial alternatives (NRS-3, NRS-4, and NRS-5) were identified in the FS to address subsurface PCB concentrations. Those alternatives were not brought forward into the Proposed Plan because subsurface PCB concentrations did not pose unacceptable risk and action under CERCLA is not warranted.

Key ARARs for Non-Residential Soil Alternatives include (See full tables in Appendix D):

- RCRA regulations at 40 C.F.R. Part 262.11(a)-(d) for the management and disposal of remediation wastes.

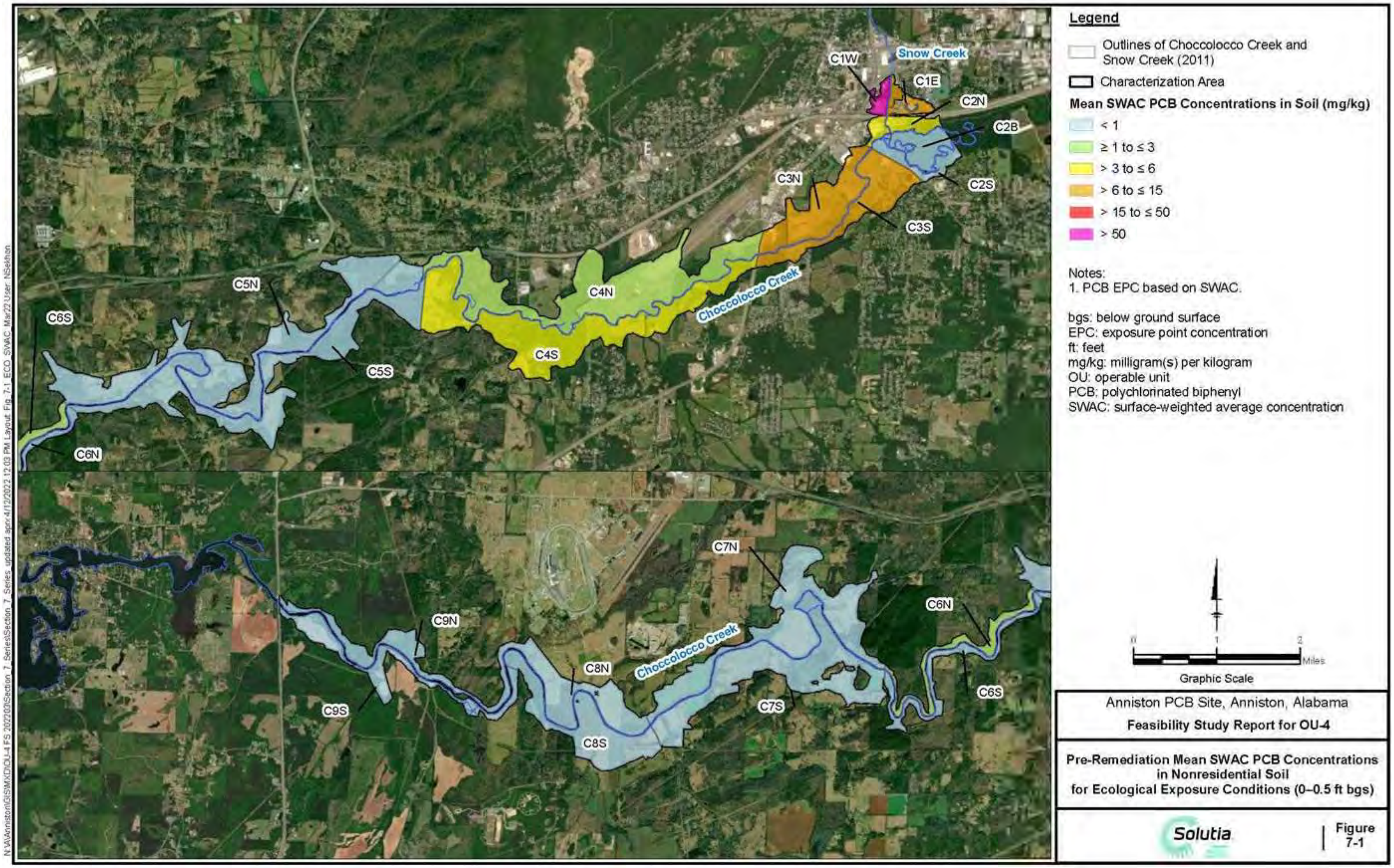

Figure 38. Pre-Remediation Mean SWAC PCB Concentrations in Non-residential Soil for Ecological Exposure Conditions

- TSCA regulations at 40 C.F.R. Part 761 for the management, storage and disposal of PCB remediation wastes.
- TSCA regulations at 40 C.F.R. § 761.61(c) for risk-based disposal of PCB remediation wastes.

The Non-Residential Soil (NRS) remedial alternatives developed are summarized below:

NRS-1 – No Further Action

NRS-2 – Excavation of Soil in 0–6-inches Soil Horizon, Offsite Disposal, ICs, and Implementation of Soil Management Plan

ALTERNATIVE NRS-1 No Further Action

Estimated Capital Cost: $0
Estimated Annual O&M Cost: $0
Estimated Present Worth Cost: $0

For NRS-1, no further action would be taken to protect human health and the environment. Previous action to cover dredge spoil piles and for infrastructure support projects provide some management, but no future soil management activities would be performed.

ALTERNATIVE NRS-2 Excavation of Soil in 0–6-inch Soil Horizon, Offsite Disposal, ICs, and Implementation of Soil Management Plan

Estimated Capital Cost: $29,500,000
Estimated Annual O&M Cost: $1,400,000
Estimated Present Worth Cost: $30,900,000

NRS-2 would remove soil using traditional excavation equipment from the 0–6-inch horizon based on achieving a PCB cleanup level of 6 mg/kg SWAC for ecological receptors (Figure 39). The excavated soil would be taken offsite for disposal at an approved facility (landfill). The excavated areas would be backfilled with clean soil to the original grade. Vegetation would be planted to stabilize the newly placed surface soil layer.

NRS-2 requires using 63,554 tons of refined materials, including sand, topsoil, and HDPE liner (for decontamination area). This alternative would generate 60,340 tons of soil with PCB concentrations greater than or equal to 50 mg/kg for offsite disposal at a TSCA-regulated disposal facility and 25,860 tons of soil for disposal in an offsite Subtitle D facility.

NRS-2 includes long-term soil management, as has been implemented for the non-residential portion of the Site over the past 20 years. Figures 7-2b through 7-2t in the Feasibility Study (FS) show where PCB concentrations in soil may remain greater than 1 mg/kg and be subject to the implementation of a Soil Management Plan.

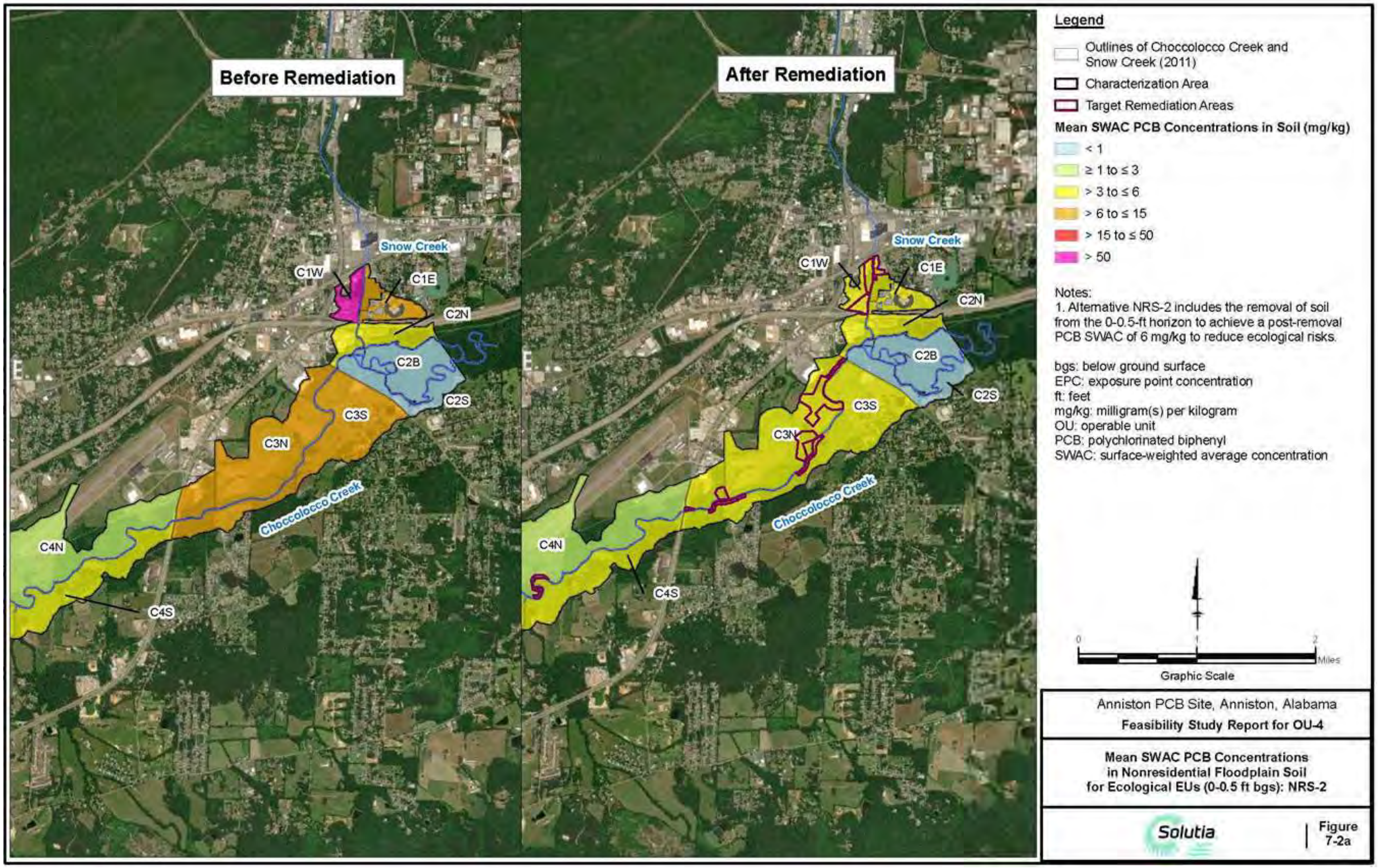

Figure 39. Mean SWAC PCB Concentrations in Non-residential Floodplain Soil for Ecological EUs, (0-6 in bgs) NRS-2

The following components are part of Alternative NRS-2:

- Excavate soil in 0–6-inch soil horizon to achieve PCB SWAC of 6 mg/kg;
- Dispose of excavated soil at an approved offsite disposal facility;
- Backfill excavated areas with clean soil and topsoil;
- Re-vegetate and restore the property as close to original conditions as possible; and
- ICs include investment in the Alabama 811 one-call system used by local utilities where soil disturbances are planned, support for land trust conservation corridors in impacted portions of the Site, and implementing the Soil Management Plan described in Common Elements of all Alternatives on ROD Part 2, Page 97.

The estimated duration to implement NRS-2 and meet RAO 3 is approximately two years.

9.5 Remedial Alternatives for Creek Banks and Sediment

Creek bank soil and sediment alternatives are required to protect both human and ecological receptors. Reducing the erosion of contaminated creek bank soil will reduce a source of contamination to the sediment in Snow Creek and Choccolocco Creek, as well as downstream areas. Reducing contaminated sediment concentrations will reduce contaminant concentrations in fish, other biota, and surface water, and will also reduce the transport of contaminants to downstream areas. Seven alternatives, one no action alternative and six active alternatives, that address creek bank soil and sediment were considered.

Note: The estimated areas of creek bank stabilization, volumes of dredged material, surface areas for in-place treatment or capping are assumptions for purposes of developing cost estimates for the remedial alternatives. These assumptions were developed based on the existing data and will be refined and finalized during the RD, after design level data is obtained.

9.5.1 Common Elements of the Creek Bank and Sediment Alternatives

Common elements of the six active alternatives are discussed below. Additionally, all the active creek bank and sediment alternatives include an allowance for a significant preliminary design investigation (PDI) sampling program. All the active remedial alternatives also need to meet similar ARARs. Where the alternatives differ, additional descriptions are provided for each alternative.

9.5.1.1 Creek Bank Soil Approach

The characterization of creek bank soil erosion and PCB loading to sediment from bank erosion were described previously in ROD Part 2 Section 5.3.2.4. Each of the six active alternatives include measures to address the creek bank areas that are contributing PCBs to OU4 sediment. There are two approaches for creek bank source control. One approach targets contaminated creek banks that exhibit moderate and severe erosion. The second approach targets contaminated creek banks that exhibit minor, moderate, and severe erosion. If erosive creek banks exceed the PCB RAL of 2.6 mg/kg, those creek banks will be included in the delineation of the area to be actively remediated.

The creek bank areas would be addressed through several actions, depending on the physical characteristics of the area and findings from the RD process. The creek bank stabilization measures will likely include stabilization with shoreline hardening techniques such as riprap or geotextile; bioengineering, including root wads and plantings; reshaping/grading of creek banks that may include removing soil to increase the cross-section flow area; or combinations of these approaches. If soil that exceeds the bank RALs is left in place, the design will ensure that contaminants are isolated from erosion and release (for example, with geotextile behind stabilization measures). The conceptual approach for creek bank stabilization assumes that soil in the creek bank areas will require excavation and disposal at an approved offsite facility. This soil may be excavated to support reshaping creek banks, placing riprap, or other related support activities. The specific type of creek bank stabilization activity for the various locations targeted for creek bank stabilization will be determined during the RD with the intent of removing the potential for bank sediment and bank soil that exceed the PCB RAL to be exposed and/or erode into the creek. The design process will include geomorphological and hydraulic evaluations, relevant predesign investigations, sampling, evaluations and modelling and input received through outreach with local landowners.

The conceptual approach to address creek banks along the OU4 portion of Snow Creek that are mostly characterized as having severe erosion is shown below in Figure 40a. The conceptual approach to address creek banks along Choccolocco Creek with severe erosion is shown in Figure 40b. (Note: The portion of the creek bank from the top of the bank to the creek water level is creek bank soil and the portion of the creek bank below the water level is considered sediment. The PCB cleanup level is the same for sediment and creek bank soil.)

Most of the creek bank areas targeted for potential source control actions are characterized as having moderate or minor erosion and would be addressed using a range of available natural approaches. Pilot design studies could also be included in the RD process to iteratively evaluate the performance of different natural techniques and adaptively advance the design to provide an effective remedy over the long term. The stabilization methods will also consider any habitat requirements if there are ecological areas that would not be re-established post restoration.

9.5.1.2 Sediment approach

The characterization of sediment contamination, sediment stability, and potential sedimentation rates (from geochronological data analysis) were described in this ROD Part 2 in Sections 5.3.2.1 through 5.3.2.3. Considering that data, each of the active sediment alternatives include activities that actively address the same sediment footprint (currently estimated at 25 acres) where all sediment that exceeds the PCB RAL concentration of 2.6 mg/kg is addressed. The differences in the alternatives are based on what remedial technologies would be used to actively address the sediment footprint (e.g., dredging, capping, in-place treatment). The range of alternatives developed for this sediment footprint provides an opportunity to evaluate different remedial approaches in the backwater area located at the confluence of Snow Creek and Choccolocco Creek.

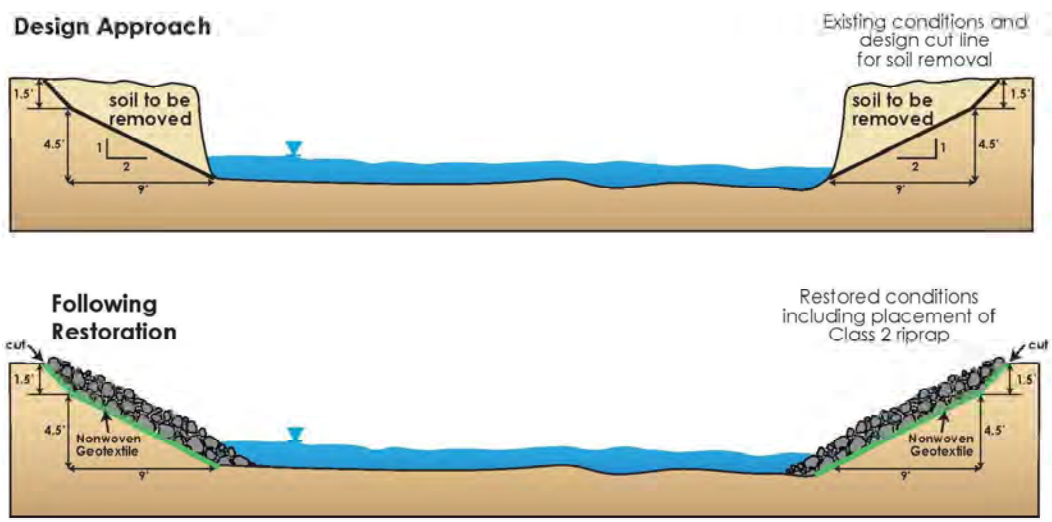

Figure 40a. Conceptual Creek Bank Approach for OU4 Portion of Snow Creek

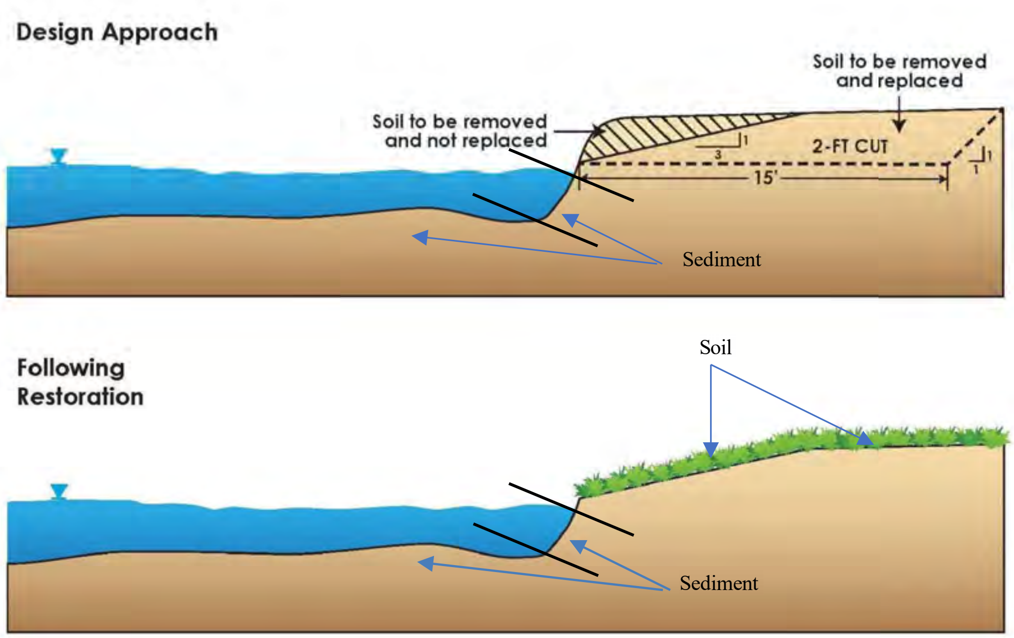

Figure 40b. Conceptual Approach for Choccolocco Creek Banks

The creek channels, especially in the backwater area, have been identified based on flow rates as low energy or high energy to identify which remedial technology (e.g., dredging, capping, in-place treatment) might be most effective in different areas. The high-energy portion of the remedial footprint for sediment in OU4 includes Snow Creek, the upper or northern branch of Choccolocco Creek that flows east-to-west through the backwater area (Figure 41), and the portions of Choccolocco Creek sediment located downstream of the backwater area shown on Figure 42 (Based on current data but modified by information gathered during RD). The low-energy portion of the remedial footprint for the 4.1 acres of sediment in the backwater area allows for approaches that include dredging, capping, and in-place treatment.

9.5.1.3 Dredging

Each remedial alternative involves some sediment removal (dredging) from the sediment footprint. The sediment remediation footprint for the upper portion of OU4, including Snow Creek and Choccolocco Creek, includes the backwater area (Figure 41). Additional sediment remediation is targeted for multiple locations along Choccolocco Creek based on achieving the NTE/RAL criterion of 2.6 mg/kg (Figure 42). For each alternative, sediment would be dredged from Snow Creek, the high-energy portion of the backwater area, and multiple locations along Choccolocco Creek (Figures 41 and 42).

The alternatives differ in the way they address the low-energy areas in the backwater area. Four active alternatives would require dredging all sediment in the low-energy portions of the backwater area. One active remedial alternative would remove a 1-foot layer of existing sediment from the low-energy portions of the backwater area and then place a 1-foot-thick sand cap layer to maintain the current bathymetry after the cap is placed.

Dredging would likely be conducted from the shore using long-reach excavators, and the materials would be placed in off-road transport vehicles. For a limited number of cases, earthen pedestals may need to be constructed along the creek banks such that the long-reach excavator can access the sediment targeted for removal. The potential need for this approach will be evaluated during the RD phase of the project following the ROD and will incorporate the results of predesign investigations and available property access along the creeks.

9.5.1.4 Backfill

Consistent with other environmental dredging projects, a layer of clean backfill materials would be placed in the dredge areas once removal has been completed. For OU4, the approach would be to replace the layer of sediment removed with clean sand up to a maximum layer thickness of one foot. This backfill would replace the biological strata removed during dredging and assist in mitigating the potential for PCB residuals. Even with careful execution and the placement of backfill following dredging, the actions of dredging and changes to creek channel alignment associated with dredging (and creek bank work) will result in changes to channel morphology. The potential impacts of these changes will be assessed during the RD. The restoration and habitat requirements based on ARARs and TBCs will be specified in RD.

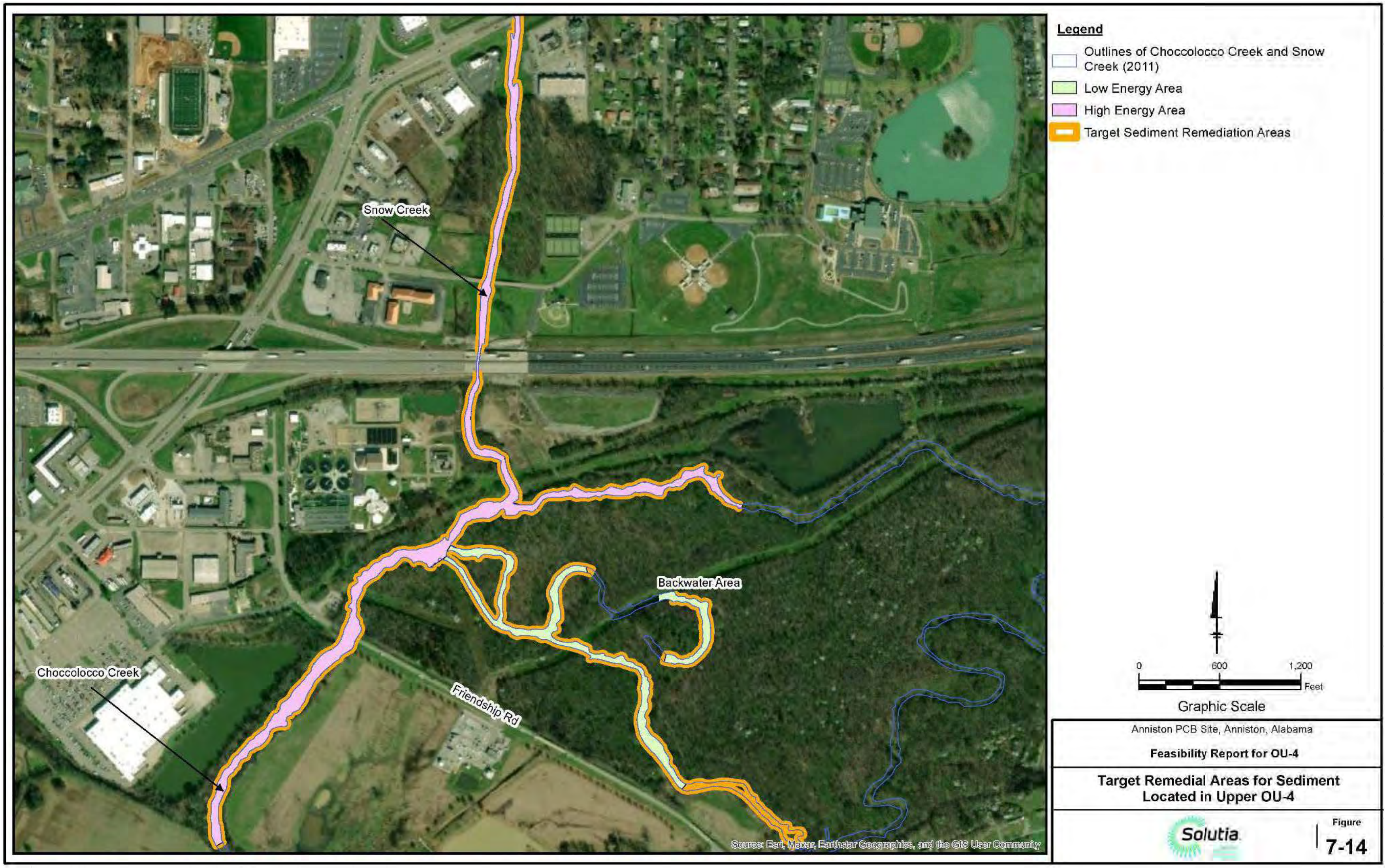

Figure 41. Remedial Areas for Sediment Located in Upper OU4

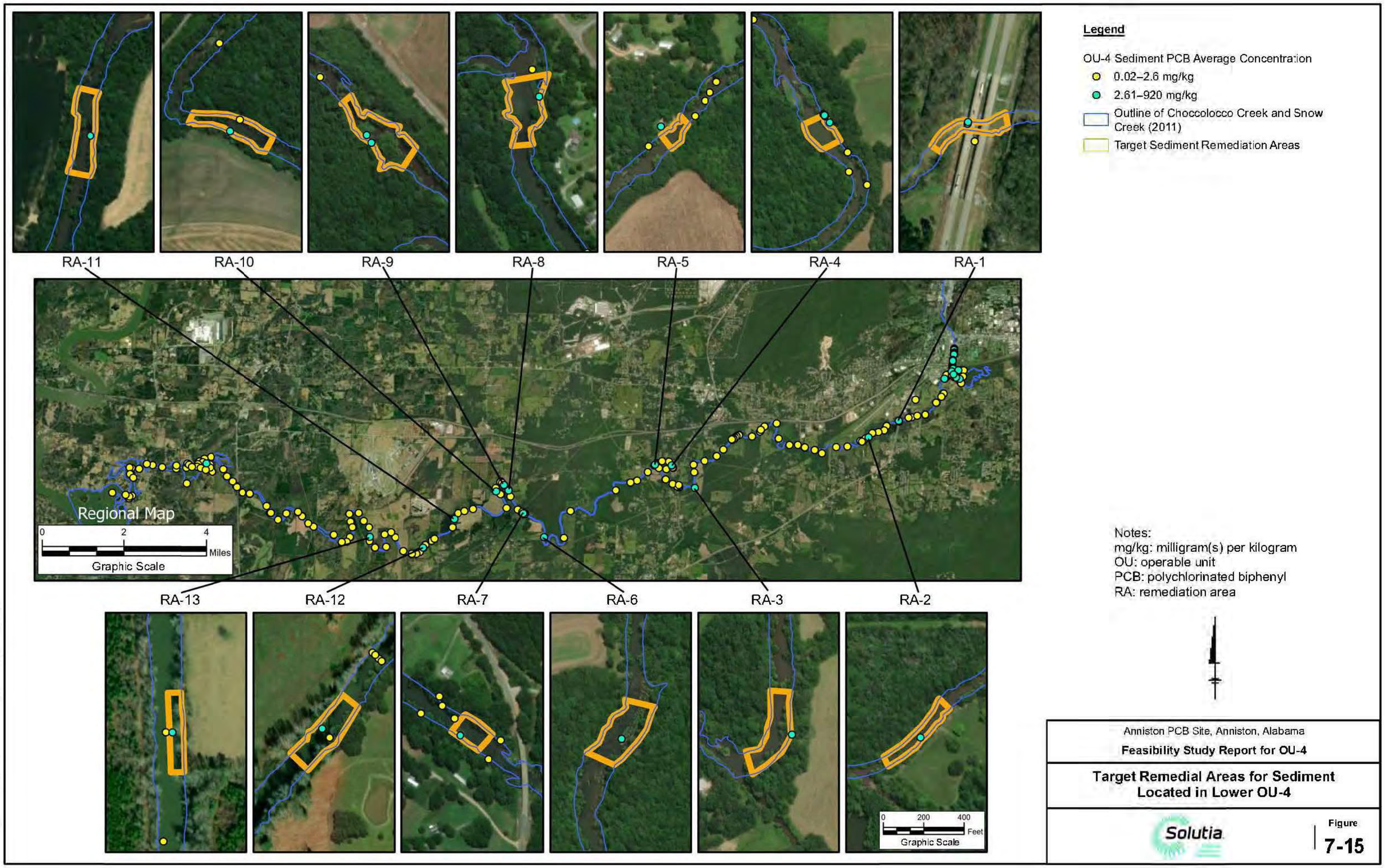

Figure 42. Remedial Areas for Sediment Located in Lower OU4

9.5.1.5 Offsite Disposal

A combination of soil and sediment would be generated for offsite disposal for the remedial alternatives that address creek bank areas and in-creek sediment. The estimated quantity of soil associated with creek bank stabilization efforts requiring offsite disposal at a TSCA-regulated facility (i.e., PCB concentrations greater than or equal to 50 mg/kg) is approximately 10,000 tons, and the estimated quantity of soil requiring offsite disposal at a Subtitle D facility (i.e., PCB concentrations less than 50 mg/kg) is approximately 1,800 tons.

For the sediment portions of these remedial alternatives, the materials would be removed from the creeks by dredging and would be transported to a staging area, dewatered, and subsequently transported to an offsite, licensed landfill or to a permitted treatment facility in the case of the one alternative. The off-road vehicles used for sediment transport would likely transport the sediment to a local consolidation area for dewatering prior to being shipped offsite. If the sediment is dry enough to pass a paint filter test upon excavation, it could be direct-loaded into over-the-road trucks and transported to the offsite disposal facility.

9.5.1.6 Principal Threat Waste

All the sediment alternatives address a portion of sediment classified as PTW, or sediment with PCB concentrations greater than 500 mg/kg, which is considered highly toxic and potentially mobile. This concentration was considered PTW in previous OUs and the definition is applied to a small known quantity of sediment in OU4. The estimated quantity of PTW in sediment is 228 CY, located in the backwater area (reach C2). Although located in an area of relatively lower energy, the high concentrations are located at the beginning of the OU near higher population areas. The success of the remedy in the backwater area will determine the success of the remedy in the whole OU. Some alternatives include onsite stabilization (SED-4 and SED-6) of PTW with the addition of cement. Offsite incineration of the PTW is evaluated in SED-7 due to community sensitivity to onsite incineration/ thermal desorption technologies.

9.5.1.7 Monitored Natural Recovery

MNR for sediment relies on natural processes to reduce COC exposure concentrations over time. For PCBs in sediment, the primary MNR mechanism is introducing and mixing relatively cleaner sediment brought into the aquatic system through flow from upstream. Other processes for sediment, such as biodegradation, volatilization, dispersion, adsorption, and dissolution, play a lesser role in MNR of PCBs.

There are multiple lines of evidence to support that natural recovery has occurred in OU4 sediment. Sediment cores taken in stable locations such as the backwater area (reach C-2, Figure 21) and the Logan Martin Lake embayment area (reach C-10, Figure 20) demonstrate that higher PCB concentrations have been buried beneath newer, less contaminated sediment over time. The lower sediment concentrations in surface sediment over time help to explain the order of magnitude decrease in fish tissue concentrations found at downstream end of OU4 from 1994 through 2016 (reach 10, Figure 25). Sedimentation rates estimated in the upstream and downstream reaches of OU4 are sufficient to support continued MNR in those areas once source control measures in creek bank soil and in-creek sediment have been implemented. The sedimentation rate in C10 can be estimated at 0.7 in/year rates based on the depth of sediment accumulation since Logan Martin Lake was impounded in 1964. This amount is supported by geochronological data from reach C-10 (Figure 20). The sedimentation rates estimated in the backwater area can be estimated at 0.25 to 0.5 in/year based on geochronological data from reach C-2 (e.g., Figure 21).

It is very challenging to estimate the rate and degree of natural recovery that will occur over time throughout a creek that is as long, ever-changing, and with as many sediment PCB sources as well as sources of uncontaminated sediments such as several tributaries to Choccolocco Creek. The lines of evidence described above suggest that natural recovery may be reasonably anticipated in some areas following the remediation of creek bed and bank PCBs, but that process, its rates, and the areas over which it will occur are uncertain. MNR sampling will be designed to evaluate whether natural recovery is occuring and contaminated media (including fish, sediments, and surface water) are trending towards and expected to attain the cleanup levels and RAOs in an acceptable time frame. The timeframe for sediment cleanup levels and RAO attainment is 20 years below Jackson Shoals and 30 years at and above Jackson Shoals. If the monitoring indicates that sediment concentrations are not trending toward or are not likely to achieve the cleanup levels within these time frames, in the ten exposure areas, the data will be used to identify other high PCB concentration areas that are limiting cleanup level attainment. Any findings would be used to inform future decisions regarding additional active remediation needed to achieve cleanup levels and meet RAOs and would be used to develop and evaluate such actions in a future decision document, if need.

9.5.1.8 Long-term Monitoring

A long-term monitoring plan (LTMP) has been developed at the conceptual level to describe proposed long- term monitoring to assess the effectiveness of the OU4 remedy. This conceptual LTMP would be refined as part of the RD for OU 4. This refinement process would include developing detailed field sampling plans (FSPs) and quality assurance projects plans (QAPPs). While the sampling program is designed to assess remedy effectiveness, baseline (pre-remedy) monitoring would be conducted during the RD to document current conditions. The conceptual LTMP is summarized in Table 16 and described in greater detail below.

Sediment Sampling to Support MNR

Surface sediment samples would be collected for the top six inches of sediment at all locations necessary to estimate a SWAC in the ten reaches of Choccolocco Creek. The samples would be collected using grab sampling techniques (e.g., Ekman grab sampler or Lexan core), and the analytical results for these samples would track changes in sediment concentrations over time following construction in OU4. Sediment sampling would occur with the objective of establishing a post- construction SWAC in each of the ten reaches. Sediment sampling would begin the year following remediation and the sampling design would ensure comparability with PDI SWAC estimates and establish a statistically robust SWAC and 95th UCL estimate of the ten reaches, for example using unbiased sampling in a grid. All samples would be analyzed for PCB Aroclors, PCB homologs, and total organic carbon. Surface sediment sampling locations would be surveyed using conventional ground survey methods or global positioning system (GPS) technology.

Creek Banks

Creek Banks will be monitored after significant flow events or at a minimum annually to ensure that areas that have been stabilized remain protective and to identify any new areas of concern. Climate impacts should be considered in the design of creek bank stabilization and monitoring plans.

Sediment Traps

In addition to grab samples, sediment traps would be deployed to document changes in PCB concentrations in sediment transported in the water column. These data would be important to document the effectiveness of upstream source control actions and MNR in decreasing the downstream transport of contaminated sediment. The potential fish sampling locations identified in Figure 26 would include sediment traps designed to collect localized, time-integrated data on the deposition of sediment for a range of flow conditions in the system. Data from sediment traps provide additional information on suspended sediment conditions, particulate-phase constituent concentrations, and deposition rates during each sampling period. At each of the deployment locations, a set of three sediment traps would be deployed for a period of six months to a year. Once the sediment traps are deployed, they would collect sediment that settles out of the water column over the deployment duration. After the deployment period and prior to retrieval, the equipment would be observed to ensure it remains in place and in the proper orientation and to note the conditions of the equipment and any concerns or issues. Accumulated sediment from the traps would be measured, photographed, and collected. Samples would be submitted for laboratory analysis for the following parameters (in order of priority): PCB Aroclors, PCB homologs, DL-PCB congeners, mercury, and total organic carbon. Sediment trap locations would be surveyed using GPS technology.

Surface Water Sampling

The surface water program would characterize total and dissolved contaminant concentrations in surface water as a function of time, including concentration declines following remediation. Surface water would be sampled at the same sediment sampling locations using grab sampling and passive sampling techniques. Grab sampling would be used to measure total and dissolved concentrations of PCB Aroclors, PCB homologs, and DL-PCBs congeners, and mercury in surface water. The samples would be collected during non-storm conditions (not within seven days of a precipitation event that results in 0.1 inches of precipitation at the Anniston Airport). In situ passive samplers, specifically commercially available polyethylene (PE) passive samplers, would be used to measure PCB concentrations (PCB Aroclors, PCB homologs, and DL-PCB congeners). The PE samplers would measure PCBs that are truly dissolved in surface water in contrast to PCBs that may be associated with suspended particles or colloids. The in situ passive samplers would be deployed at each location for four to eight weeks in the general proximity of where fish samples are collected. The grab samples would be collected at these same locations when the PE sampling devices are being deployed or retrieved. Total (unfiltered) surface water sample results would be compared to AWQC as part of assessing remedy performance.

Additionally, the surface water results collected using passive samplers in combination with the fish tracking results and tissue/whole body concentrations measured for fish would be critical to assessing long-term remedy performance. The truly dissolved PCB results from the passive samplers would also be compared against the AWQC values.

Grab samples of surface water would be collected using bottle immersion, Kemmerer sampler (or equivalent), or a peristaltic pump depending on the water depth at a given location. Filtered samples would be collected using a 0.1-micron filter to evaluate the dissolved fractions of PCBs and mercury. Surface-water filtering would be completed in the field.

PE passive samplers would be deployed at the same sampling locations. The configuration of these passive samples would depend on whether the sampling location is classified as low energy or high energy. For low-energy settings, the PE passive sampler would be secured to a line held in place by an anchor and marked with a buoy. For high-energy settings, the PE passive sampler would be secured to a piece of steel rebar driven into the rocky substrate. The PE samplers would be preloaded with stable isotope-labeled performance reference compounds, including 13C PCB-28, 13C PCB-47, 13C PCB-70, 13C PCB-80, 13C PCB-111, 13C PCB-141, and 13C PCB-182. Once deployed, the sampling devices would be left in place for four to eight weeks. After the deployment, the passive samplers would be retrieved and shipped for analysis.

Porewater Sampling

Porewater would be sampled using the same passive sampling techniques proposed for surface water sampling and would be sampled at all fish sampling locations. PE passive samplers would be used to measure PCB concentrations truly dissolved in porewater (PCB Aroclors, PCB homologs, and DL- PCB congeners). PE passive samplers would be deployed at each location in the general proximity of where the other media samples are collected. As with surface water, the configuration of the porewater PE samplers would depend on whether the location is classified as low energy or high energy. For low-energy settings, the PE passive sampler would be inserted into the sediment, secured to a line held in place by an anchor, and marked with a buoy.

For high-energy settings, the PE passive sampler would include two deployment methods: 1) securing the sample media to a brick placed at the sediment-water interface, and 2) direct insertion of the sample media into the rocky substrate. The brick would be worked into the rocky substrate such that its surface is at a similar elevation to the surrounding rocky substrate. This placement would protect the sampling device from potential damage due to bedload transport during high-flow conditions and provide an opportunity to assess exposure conditions from light, flocky materials that periodically form on these surfaces between high-flow events. A second PE sampling device would be inserted into the rocky substrate to obtain measurements of porewater conditions.

The PE samplers would be preloaded with the same stable isotope-labeled performance reference compounds as the surface water samplers. As with the surface water samplers, once deployed, the porewater PE sampling devices would be left in place for four to eight weeks. After the deployment, the passive samplers would be retrieved and shipped to the laboratory for analysis.

Additionally, for low-energy settings, separate sediment grab samples would be collected for ex situ porewater evaluations using methods described in Appendix B of the FS. Similar sediment grab samples would not be collected for ex situ porewater evaluations at high-energy setting locations because of the difficulties associated with maintaining the in-situ structure of a rocky substrate sample following its collection and shipment to the laboratory. The grab samples would be shipped to the laboratory for processing and analysis. Collected sediment mass would be homogenized and divided into equal volumes (approximately 500 milliliters) for assessment of PCB Aroclors, PCB homologs, and DL-PCB congeners. A PE sampler preloaded with stable isotope-labeled performance reference compounds would be placed into each jar, and the jars would be tumbled for a minimum of 28 days and approximately the same duration as the devices that were deployed in the field. After tumbling is complete, the PE samplers would be removed from the sediment for extraction and analysis.

Results from the passive porewater sampling would also be used in assessing PCB concentrations in fish and for comparison with the AWQC values.

Fish Sampling

The fish monitoring program is proposed to characterize constituent concentrations in fish tissue as a function of time, including concentration declines following construction. The skin-off fillet fish tissue samples would be analyzed for PCB Aroclors and homologs, mercury, and percent lipids. The whole-body fish samples would be analyzed for these same constituents plus DL-PCB congeners.

As described, surface water, porewater, and sediment would also be sampled at the fish tissue sampling stations to assist in characterizing exposure conditions. The general approach for the collection of fish samples builds on the work conducted for OU4 under the CERCLA and Resource Conservation and Recovery Act (RCRA) programs and work conducted by ADEM and would be based on the technical approach provided in Using Fish Tissue Data to Monitor Remedy Effectiveness (USEPA 2008). The conceptual proposed long-term monitoring for OU4 includes different trophic levels and feeding guilds, species targeted by local anglers, collection slot size based on ADEM procedures, and comparability with historical data:

- 10 individual fillet samples and 10 whole-body samples of predator fish (i.e., spotted bass [Micropterus punctulatus] or largemouth bass [Micropterus salmoides])
- 10 individual fillet samples and 10 whole-body samples of bottom feeder fish (i.e., channel catfish [Ictalurus punctatus] or blue catfish [Ictalurus furcatus])
- 10 individual fillet samples and 10 whole-body samples of forage fish (i.e., sunfish [Centrarchidae] or crappie [Pomoxis])

The proposed sample locations, species, numbers of samples, and sampling approaches (grab versus composites) would be finalized as part of developing the FSP and QAPP in collaboration with the EPA.

The conceptual LTMP is summarized in Table 16. Proposed fish and associated sediment, surface water, and pore water sampling locations are shown on Figure 26 (the same locations where samples HHFL-1 through HHFL-9 were collected in the RI).

9.5.1.9 Institutional Controls

For creek banks and sediment alternatives in OU4, ICs will include maintaining fish consumption advisory signage for as long as they are needed and educating the community about the importance of adhering to the advisories. ICs will also include conservation corridors to control adjacent land use and restrict access, if needed, to banks, which will help maintain the creek bank and sediment alternatives. Monitoring, including inspections, will be needed to ensure that restrictions are functioning as intended. Additional institutional control mechanisms may be developed during RD.

The approach for soil management support (described below) would be gated through the 811-utility clearance system as an IC. Use of the 811 system to register intrusive soil disturbance work prior to implementation is required by law in Alabama.

Potential intrusive work for creek bank and in-creek areas located downstream of Jackson Shoals would also be subject to an additional IC from the Alabama Power Company (APCO). This additional IC includes a formal permitting process that requires APCO review and approval prior to project implementation. As part of reviewing the permit applications, APCO, as a matter of practice, shares the permit applications with the EPA and the PRPs for the purpose of identifying any contamination concerns.

The approach for managing soil in the creek banks and sediment in OU4 in the future would be consistent with the rest of the Soil Management Plan for the Site that focuses on construction-related projects that could disturb PCB residuals. This would also apply to in-creek sediment. These projects could include new construction or the repair of existing infrastructure. Projects with intrusive activities could include bridges, pipelines, utilities, shoreline retaining walls/structures, or docks.

9.5.1.10 Preliminary Design Investigation/Remedial Design

A PDI will be conducted to resolve uncertainties associated with the age of the data, close any gaps in the types and quantity of data needed for RD, and serve as a comprehensive pre-remediation (baseline) sampling event. A few of the uncertainties than must be addressed include the following:

- Since the bank stability analysis that categorized the erosive areas was conducted in 2012 and 2014, it will be updated.

Table 16. Conceptual Long-term Monitoring Plan

RAO	Media	Number of Locations[1]	Samples/ Location	Total Number of Samples	Analyses	Schedule
4, 7	Sediment	9 Fish Sampling Locations	1 grab	5	PCBs Aroclors, PCB homologs, DL-congeners, mercury, total organic carbon	Years 1, 3, and 5 following remedy completion the,n years 8,13,18, etc.
	Sediment	10 reaches	TBD - minumum 10	Sum of sediment samples in the ten reaches	PCBs	Years 1, 3, 8, 13, and18, then every 5 years until goal for reach achieved or additional action taken
9	Creek Bank Soil	entire impacted length	entire impacted length	entire impacted length	Inspections	After TBD-year flow events (minimum annually)
	Sediment	9 Fish Sampling Locations	3 sediment traps	15	PCBs Aroclors, PCB homologs, DL-congeners, mercury, total organic carbon	Years 1, 3, and 5 following remedy completion then years 8,13,18, etc.
10	Surface Water	9 Fish Sampling Locations	1 grab whole water	5	PCBs Aroclors, PCB homologs, DL-congeners, mercury	Years 1, 3, and 5 following remedy completion then years 8,13,18, etc. Years 1, 3, and 5 following remedy completion then years 8,13,18, etc.
	Surface Water	9 Fish Sampling Locations	1-grab filtered (0.1 micron)	5	PCBs Aroclors, PCB homologs, DL-congeners, mercury	Years 1, 3, and 5 following remedy completion then years 8,13,18, etc.
	Surface water	9 Fish Sampling Locations	1 passive sampler over 4-8 weeks	5	PCBs Aroclors, PCB homologs, DL-congeners, mercury	Years 1, 3, and 5 following remedy completion then years 8,13,18, etc.
	Pore Water	9 Fish Sampling Locations	1 passive sampler over 4-8 weeks	5	PCBs Aroclors, PCB homologs, DL-congeners, mercury	Years 1, 3, and 5 following remedy completion then years 8,13,18, etc.
5, 8	Fish (Tissue)	9	10 predator, 10 bottom feeder, 10 forage	90 predator, 90 bottom feeder, 90 forage	PCBs Aroclors, PCB homologs, DL-congeners, mercury	Years 1, 3, and 5 following remedy completion then years 8,13,18, etc.
	Fish (Whole)	9	10 predator, 10 bottom feeder, 10 forage	90 predator, 90 bottom feeder, 90 forage	PCBs Aroclors, PCB homologs, DL-congeners, mercury	Years 1, 3, and 5 following remedy completion then years 8,13,18, etc.
	Fish Tracking - Passive	9	TBD	TBD	3 sets data downloads	9 months
	Fish Tracking - Active	9	TBD	TBD	3 sets data downloads	9 months

*The sample size required in each reach (and strata, where applicable) may vary and will be determined based on a statistical evaluation of the sample variance within each reach. The goal is to have an adequate number of samples such that the 95% UCL of the SWAC is within 30% of the calculated SWAC (e.g., a 95% UCL of 0.13 mg/kg for a calculated SWAC of 0.10 mg/kg).

Notes:
1. With the exception of tissue collection for human receptors, sample locations will be consistent throughout all years of monitoring. Tissue collection for human receptors will be collected from the same zones; however, actual sample locations may change depending on Site conditions at the time of sampling.
2. To be determined. The number of samples is dependent upon the final acreage of disturbed marsh areas, which will be determined after construction has been completed.
3. It is anticipated that at least fish tissue sampling will be needed beyond 5 years; modifications to the LTMP including changes to the frequency of sampling would be considered following review of the Year 5 data.

- Since creek bank and sediment data are not current or comprehensive enough to ensure the remedy will address all the contaminated areas, the full extent of the sediment bed and creekbanks will be re-sampled/characterized.
- An objective and spatially comprehensive procedure will be developed for updating and determining the location of creek bed PCBs, sediment deposits, and to develop strata for sediment sampling.
- Sediment sampling will establish a post-construction SWAC in each of the 10 exposure units.
- Sediment and bank locations that exceed the NTE/RALs will be identified for active remediation.
- The sediment sampling design will ensure comparability with SWAC estimates derived in long-term monitoring and establish a statistically robust SWAC and 95th UCL estimate of each of the 10 exposure units, for example using unbiased sampling in a grid. Additional PCB delineation may be necessary to refine the dredge locations.
- All sediment samples will be analyzed for PCB Aroclors, PCB homologs, and total organic carbon.
- Surface sediment sampling locations will be surveyed using conventional ground survey methods or GPS technology.

Updated sampling may result in an increase or decrease of the remediation footprint, and a future decision document revision may be necessary to document the change.

9.5.1.11 ARARs

The following are key ARARs for remediation of the contaminated sediment (See full list of ARARS in Appendix D):

- RCRA regulations at 40 C.F.R. Part 262.11(a)-(d) for the management and disposal of remediation wastes;
- TSCA regulations at 40 C.F.R. Part 761 for the management, storage and disposal of PCB remediation wastes;
- TSCA regulations at 40 C.F.R. § 761.61(c) for risk-based disposal of PCB remediation wastes;
- ADEM water quality regulations under the State of Alabama’s Administrative Code 335-6-10; specifically chronic AWQC for PCBs (0.014 µg/L for aquatic life and 0.000064 µg/L for human health for fish consumption) ;
- CWA regulations at 40 C.F.R. § 230 related to discharge of dredged or fill material in surface waters;
- Fish and Wildlife Coordination Act, 16 U.S.C. §662(a) regarding alteration of the creek and preventing loss of and damage to wildlife resources; and
- CWA Section 404(b)(1) guidelines at 40 C.F.R. part 230 et. seq. for compensatory mitigation of wetlands.

9.5.2 Sediment and Creek Bank Remedial Alternatives

The following seven remedial alternatives for creek banks and sediment are as follows:

SED-1: No action;

SED-2: Creek bank soil source control for contaminated areas with moderate and severe erosion; dredging of sediment in high-energy areas; backfill dredged areas; offsite disposal for excavated soil and dredged sediment; in-place treatment for sediment in low-energy areas; MNR of sediment; long-term monitoring; ICs; and implementation of Soil Management Plan;

SED-3: Creek bank soil source control for contaminated areas with minor, moderate, and severe erosion; dredging of sediment in high-energy areas; backfill dredged areas; offsite disposal for excavated soil and dredged sediment; in-place treatment of sediment in low-energy areas; MNR of sediment; long-term monitoring; ICs; and implementation of Soil Management Plan;

SED-4: Creek bank soil source control for contaminated areas with moderate and severe erosion; dredging of sediment in high- and low-energy areas; backfill dredged areas; offsite disposal for excavated soil and dredged sediment; MNR of sediment; long-term monitoring; ICs; and implementation of Soil Management Plan;

SED-5: Creek bank soil source control for contaminated areas with minor, moderate, and severe erosion; dredging of sediment in high-energy areas; backfill dredged areas; offsite disposal for excavated soil and dredged sediment; capping for low-energy areas; MNR of sediment; long- term monitoring; ICs; and implementation of Soil Management Plan;

SED-6: Creek bank soil source control for contaminated areas with minor, moderate, and severe erosion; dredging of sediment in high- and low-energy areas; backfill dredged areas; offsite disposal for excavated soil and dredged sediment; MNR of sediment; long-term monitoring; ICs; and implementation of Soil Management Plan; and

SED-7: Creek bank soil source control for contaminated areas with minor, moderate, and severe erosion; dredging of contaminated sediment in high- and low-energy areas; backfill dredged areas; offsite treatment of PTW; offsite disposal for excavated soil and dredged sediment; MNR of sediment; long-term monitoring; ICs; and implementation of Soil Management Plan.

ALTERNATIVE SED-1 No Action

Estimated Capital Cost: $0
Estimated Annual Operation & Maintenance (O&M) Cost: $0
Estimated Present Worth Cost: $0

Alternative SED-1 is the no action alternative, which means that no remedial actions would be conducted on sediments or creek banks. SED-1 would not be protective of the environment. Sediment and creek bank soil would remain in place with concentrations above the cleanup levels protective of ecological receptors. Also, this alternative will not reduce the contaminant sources available to downstream receptors. This alternative is intended to serve as a baseline for comparison with the other alternatives.

ALTERNATIVE SED-2: Creek Bank Soil Source Control for Contaminated Areas with Moderate and Severe Erosion; Dredging of Sediment in High-Energy Areas; Backfill Dredged Areas; Offsite Disposal for Excavated Soil and Dredged Sediment; In-place Treatment for Sediment in low-energy areas; MNR of sediment; Long-term Monitoring; ICs; and Implementation of Soil Management Plan

Estimated Capital Cost: $31,600,000
Estimated Annual O&M Cost: $12,000,000
Estimated Present Worth Cost: $43,600,000

SED-2 includes efforts to stabilize creek bank soil with moderate and severe erosion that exceed 2.6 mg/kg total PCB concentrations, dredging with offsite disposal of sediment from high-energy creek areas that exceed the 2.6 mg/kg total PCB concentrations, and in-place treatment for low-energy areas that exceed 2.6 mg/kg total PCB concentrations (Figures 41 and 42). The high-energy areas are not amenable to capping given the thickness of armor stone that would be necessary to protect the underlying sediment from erosion during high-flow events. The existing sediment in the high-energy areas is typically underlain by bedrock; therefore, the removal of additional material to place a cap without changing the hydrology of the creek is not practicable. The high-energy areas targeted for sediment removal include Snow Creek, the main reach of Choccolocco Creek that flows east-to-west through the backwater area, and the portion of Choccolocco Creek located downstream of the backwater area.

The estimated quantity of soil associated with creek bank stabilization efforts for severe erosion is the same for all alternatives and is discussed in the common elements. The estimated quantity of sediment to be dredged from the creeks and disposed of offsite under this remedial alternative is approximately 37,600 cubic yards, and the estimated area to receive in-place treatment is 4.1 acres. The estimated quantity of clean backfill materials for this remedial alternative is 33,800 cubic yards. The estimated quantities of sediment for offsite disposal of sediment dredged from Snow and Choccolocco Creeks with PCB concentrations greater than or equal to 50 mg/kg is 27,900 tons. The estimated quantity of dredged sediment with PCB concentrations less than 50 mg/kg for offsite disposal is 39,200 tons.

The in-place treatment of sediment for the low-energy areas (Figure 41) that exceed 2.6 mg/kg total PCBs, (Figure 42) would include placing activated carbon onto the sediment surface to reduce the bioavailability of the PCBs. Typically, the activated carbon would not significantly raise the elevation or change the hydrology of the low-energy areas, therefore dredging to make room for the cover materials is not expected to be necessary. The activated carbon would be mixed into the upper layer of the sediment matrix through natural processes, including bioturbation and the incorporation of additional sediment that settles out from the water column into these low-velocity areas over time. The activated carbon would absorb the PCBs, thereby reducing the bioavailability. PCBs would become bound to the carbon and not desorbed into the sediment porewater where they could otherwise be transferred to biota.

For the purposes of estimating carbon dosing to treat the in-place sediment, 6% by weight would be applied based on treating a six-inches layer of sediment (i.e., the Biologically Active Zone, BAZ), and the materials are anticipated to be applied over a three-year period. The 6% dosing is an estimation for costing purposes. The actual percentage would be developed during the RD. To minimize concerns for benthic toxicity associated with placing activated carbon and to assist in more evenly applying the materials across the BAZ, this remedial alternative includes placing one-third of the activated carbon over the treatment area, once per year for three years, during the late summer, low-flow period.

Once the construction of the remedial alternative is complete, MNR will be relied upon to achieve further reductions of PCB concentrations in sediment, surface water, and biota over time (see cleanup levels in Table 15). Monitoring will be conducted to track the remedy effectiveness trends and implement a range of short- and long-term remedy monitoring and metrics, including traditional approaches (e.g., assessing PCB concentration trends in sediment, surface water, and biota) to document concentration reductions over time. Optimization including performance of additional dredging and/or in-place treatment of areas within Snow Creek and Choccolocco Creek will be implemented if determined necessary to achieve RAOs. SED-2 would also include the implementation of ICs, including a Soil Management Plan as described in as described in Common Elements of All Alternatives (ROD Part 2 Page 97) and under ICs (ROD Part 2 Page 118).

The following components are part of Alternative SED-2:

- Creek bank soil stabilization (may include excavation) for contaminated areas with moderate and severe erosion;
- Dredging of sediment in high-energy areas;
- Backfilling excavated/dredged areas with clean soil;
- Offsite disposal for excavated/dredged soil and sediment;
- In-place treatment for sediment in low-energy areas with activated carbon;
- Wetland mitigation where needed;
- MNR of PCB concentrations in sediment;
- MNR of PCB concentrations in surface water and biota;
- Optimization of the remedy will be implemented as needed to ensure MNR is progressing as intended;
- Long-term monitoring to assess post-remedy conditions in OU4; and
- ICs in the form of fish advisories, 811 utility clearance system, APCO permits reviews and implementation of the Soil Management Plan.

The duration to implement the field construction components of SED-2 and meet RAO 6 is 3 to 4 years. The time to achieve MNR following remedy construction and meet RAOs 4, 5, 7, 8, 9, and 10 is projected to be 30 to 35 years.

ALTERNATIVE SED-3: Creek Bank Soil Source Control for Contaminated Areas with Minor, Moderate, and Severe Erosion; Dredging of Sediment in High-Energy Areas; Backfill Dredged Areas; Offsite Disposal for Excavated Soil and Dredged Sediment; In-place Treatment of Sediment in Low-energy Areas; MNR of Sediment; Long-term Monitoring; ICs; and Implementation of Soil Management Plan

Estimated Capital Cost: $35,000,000
Estimated Annual O&M Cost: $12,000,000
Estimated Present Worth Cost: $47,400,000

SED-3 includes efforts to stabilize creek bank soil with minor, moderate and severe erosion that exceed 2.6 mg/kg total PCB concentrations, dredging with offsite disposal of sediment from high-energy creek areas that exceed the 2.6 mg/kg total PCB concentrations, and in-place treatment for low-energy areas that exceed 2.6 mg/kg total PCB concentrations (Figures 41 and 42). The high-energy areas are not amenable to capping given the thickness of armor stone that would be necessary to protect the underlying sediment from erosion during high-flow events. The existing sediment in the high-energy areas is typically underlain by bedrock; therefore, the removal of additional material to place a cap without changing the hydrology of the creek is not practicable. The high-energy areas targeted for sediment removal include Snow Creek, the main reach of Choccolocco Creek that flows east-to-west through the backwater area, and the portion of Choccolocco Creek located downstream of the backwater area.

The estimated quantity of soil associated with creek bank stabilization efforts for severe erosion is the same for all alternatives and is discussed in the common elements. The estimated quantity of sediment to be dredged from the creeks and disposed of offsite under this remedial alternative is approximately 37,600 cubic yards, and the estimated area to receive in-place treatment is 4.1 acres. The estimated quantity of clean backfill materials for this remedial alternative is 33,800 cubic yards. The estimated quantities of sediment for offsite disposal of sediment dredged from Snow and Choccolocco Creeks with PCB concentrations greater than or equal to 50 mg/kg is 27,900 tons. The estimated quantity of dredged sediment with PCB concentrations less than 50 mg/kg for offsite disposal is 39,200 tons.

Like SED-2, SED-3 requires the in-place treatment of sediment for the low-energy areas (Figure 41) that exceed 2.6 mg/kg total PCBs, would include placing activated carbon onto the sediment surface to reduce the bioavailability of the PCBs. Typically, the activated carbon would not significantly raise the elevation or change the hydrology of the low-energy areas, therefore dredging to make room for the cover materials is not expected to be necessary. The activated carbon would be mixed into the upper layer of the sediment matrix through natural processes, including bioturbation and the incorporation of additional sediment that settles out from the water column into these low-velocity areas over time. The activated carbon would absorb the PCBs, thereby reducing the bioavailability. PCBs would become bound to the carbon and not desorbed into the sediment porewater where they could otherwise be transferred to biota.

For the purposes of estimating carbon dosing to treat the in-place sediment, 6% by weight would be applied based on treating a six-inches layer of sediment (i.e., the Biologically Active Zone, BAZ), and the materials are anticipated to be applied over a three-year period. The 6% dosing is an estimation for costing purposes. The actual percentage would be developed during the RD. To minimize concerns for benthic toxicity associated with placing activated carbon and to assist in more evenly applying the materials across the BAZ, this remedial alternative includes placing one-third of the activated carbon over the treatment area, once per year for three years, during the late summer, low-flow period.

Once the construction of the remedial alternative is complete, MNR would be relied upon to achieve further reductions of PCB concentrations in sediment, surface water, and biota over time (see cleanup level in Table 15). Monitoring would be conducted to track the remedy effectiveness trends and implement a range of short- and long-term remedy monitoring and metrics, including traditional approaches (e.g., assessing PCB concentration trends in sediment, surface water, and biota) to document concentration reductions over time. Optimization including performance of additional dredging and/or in-place treatment of areas within Snow Creek and Choccolocco Creek would be implemented if determined necessary to achieve RAOs. SED-3 would also include the implementation of ICs, including a Soil Management Plan as described in as described in Common Elements of All Alternatives (ROD Part 2 Page 97) and under ICs (ROD Part 2 Page 118).

The following components are part of Alternative SED-3:

- Creek bank soil stabilization (may include excavation) for contaminated areas with minor, moderate and severe erosion;
- Dredging of sediment in high-energy areas;
- Backfilling excavated/dredged areas with clean soil;
- Offsite disposal for excavated/dredged soil and sediment;
- In-place treatment for sediment in low-energy areas with activated carbon;
- Wetland mitigation where needed;
- MNR of PCB concentrations in sediment;
- MNR of PCB concentrations in surface water and biota;
- Optimization of the remedy would be implemented as needed to ensure MNR is progressing as intended;
- Long-term monitoring to assess post-remedy conditions in OU4; and
- ICs in the form of fish advisories, 811 utility clearance system, APCO permits reviews and implementation of the Soil Management Plan.

The duration to implement the field construction components of SED-3 and meet RAO 6 is three to four years. The time to achieve MNR following remedy construction and meet RAOs 4, 5, 7, 8, 9, and 10 is projected to be 20 to 30 years.

ALTERNATIVE SED-4: Creek Bank Soil Source Control for Contaminated Areas with Moderate and Severe Erosion; Dredging of Sediment in High- and Low-energy Areas; Backfill Dredged Areas; Offsite Disposal for Excavated Soil and Dredged Sediment; MNR of Sediment; Long-term Monitoring; ICs; and Implementation of Soil Management Plan

Estimated Capital Cost: $37,700,000
Estimated Annual O&M Cost: $12,000,000
Estimated Present Worth Cost: $49,700,000

Like SED-2, SED-4 includes efforts to stabilize creek bank soil with moderate and severe erosion that exceed 2.6 mg/kg total PCB concentrations. Unlike SED-2 and SED-3, SED-4 includes dredging with offsite disposal of sediment from high- and low-energy creek areas that exceed the 2.6 mg/kg total PCB concentrations (Figures 41 and 42). The sediment removed through dredging would be transported to a staging area, dewatered, and subsequently transported to an offsite, licensed landfill.

The off-road vehicles used for sediment transport would likely transport the sediment to a localized consolidation area to be dewatered before being shipped offsite for disposal. If the sediment was sufficiently dry that it would pass a paint filter test after a brief period of drying at the consolidation areas, it could be direct-loaded into over-the-road trucks and transported to the offsite disposal facility. Sediment dredged from the low-energy portions of OU4 is expected to be finer grained and require the addition of a dewatering admixture (e.g., Portland cement) to pass the paint filter test.

It is expected that the PCB concentration category for the sediment can be identified prior to removal. This includes classifying general areas as having sediment PCB concentrations greater than or equal to 50 mg/kg and less than 50 mg/kg. The estimated quantity of soil associated with creek bank stabilization efforts for severe erosion is the same for all alternatives and is discussed in the common elements. The estimated quantity of sediment to be dredged under this remedial alternative is 52,100 cubic yards. The estimated quantity of sediment for offsite disposal with PCB concentrations greater than or equal to 50 mg/kg is 48,200 tons. The estimated quantity of materials with PCB concentrations less than 50 mg/kg for offsite disposal is 39,200 tons.

A layer of clean backfill material would be placed in the dredged areas once removal has been completed. For OU4, the approach would be to replace the layer of sediment removed with clean sand backfill up to a maximum layer thickness of one foot. This backfill would replace the biological strata removed during dredging and assist in mitigating the potential for PCB residuals associated with dredging to be present. The estimated quantity of clean backfill materials for this remedial alternative is 40,400 cubic yards.

Once the construction of the remedial alternative is complete, MNR would be relied upon to achieve further reductions of PCB concentrations in sediment, surface water, and biota over time (see cleanup level in Table 15). Monitoring would be conducted to track the remedy effectiveness trends and implement a range of short- and long-term remedy monitoring and metrics, including traditional approaches (e.g., assessing PCB concentration trends in sediment, surface water, and biota) to document concentration reductions over time. Optimization including performance of additional dredging and/or in-place treatment of areas within Snow Creek and Choccolocco Creek would be implemented if determined necessary to achieve RAOs. SED-4 would also include the implementation of ICs, including a Soil Management Plan as described in as described in Common Elements of All Alternatives (ROD Part 2 Page 97) and under ICs (ROD Part 2 Page 118).

The following components are part of Alternative SED-4:

- Creek bank soil stabilization (may include excavation) for contaminated areas with moderate and severe erosion;
- Dredging of sediment in high-energy and low-energy areas;
- Backfilling excavated/dredged areas with clean soil;
- Offsite disposal for excavated/dredged soil and sediment;
- In-place treatment for sediment in low-energy areas with activated carbon;
- Wetland mitigation where needed;
- MNR of PCB concentrations in sediment;
- MNR of PCB concentrations in surface water and biota;
- Optimization of the remedy would be implemented as needed to ensure MNR is progressing as intended;
- Long-term monitoring to assess post-remedy conditions in OU4; and
- ICs in the form of fish advisories, 811 utility clearance system, APCO permits reviews and implementation of the Soil Management Plan.

The duration to implement the field construction components of SED-4 and meet RAO 6 is three to four years. The time to achieve MNR following remedy implementation and meet RAOs 4, 5, 7, 8, 9, and 10 is projected to be 30 to 35 years.

ALTERNATIVE SED-5: Creek Bank Soil Source Control for Contaminated Areas with Minor, Moderate, and Severe Erosion; Dredging of Sediment in High-energy Areas; Backfill Dredged Areas; Offsite Disposal for Excavated Soil and Dredged Sediment; Capping for Low-energy Areas; MNR of Sediment; Long-term Monitoring; ICs; and Implementation of Soil Management Plan

Estimated Capital Cost: $37,100,000
Estimated Annual O&M Cost: $13,500,000
Estimated Present Worth Cost: $50,600,000

SED-5 would include the same source control actions for creek bank soil as SED-3 (i.e., creek bank areas with minor, moderate, and severe erosion). SED-5 would also include sediment removal with offsite disposal for materials from the high-energy portions of the creeks and capping sediment in the low-energy areas (Figure 41). Dredging in the high-energy areas would be conducted using 2.6 mg/kg as an PCB NTE value.

The low-energy portions of sediment targeted for capping include the braided stream network portion of the backwater area. Capping the 4.1 acres of the low-energy areas would include removing the upper one foot of sediment and replacing it with a one-foot layer of clean capping materials (e.g., sand). The one-foot-thick sand cap would provide an effective chemical isolation barrier to prevent PCBs from moving upward and impacting exposure conditions for biota that might otherwise contact sediment in the BAZ that is assumed for this Site to be the 0–6-inch horizon. Removing a one-foot layer of existing sediment prior to placing the cap would be necessary because placing the cap directly over the existing sediment would change the hydraulic characteristics of this braided stream network and could potentially contribute to local flooding.

The estimated quantity of sediment to be dredged under this remedial alternative is 44,200 cubic yards, and the area to be capped is 4.1 acres. The estimated quantities of sediment for offsite disposal of materials with PCB concentrations greater than or equal to 50 mg/kg is 37,200 tons, and the estimated quantity of sediment for offsite disposal with PCB concentrations less than 50 mg/kg is 39,200 tons.

Consistent with other remedial alternatives, up to a one-foot layer of clean backfill materials would be placed in the areas that are dredged and not capped. The combined quantities estimated for clean backfill and cap materials for this remedial alternative is 40,400 cubic yards.

Once the construction of the remedial alternative is complete, MNR would be relied upon to achieve further reductions of PCB concentrations in sediment, surface water, and biota over time (see cleanup level Table 15). Monitoring would be conducted to track the remedy effectiveness trends and implement a range of short- and long-term remedy monitoring and metrics, including traditional approaches (e.g., assessing PCB concentration trends in sediment, surface water, and biota) to document concentration reductions over time. Optimization including performance of additional dredging and/or in-place treatment of areas within Snow Creek and Choccolocco Creek would be implemented if determined necessary to achieve RAOs. SED-5 would also include the implementation of ICs, including a Soil Management Plan as described in as described in Common Elements of All Alternatives (ROD Part 2 Page 97) and under ICs (ROD Part 2 Page 118).

The following components are part of Alternative SED-5:

- Creek bank soil stabilization (may include excavation) for contaminated areas with minor, moderate and severe erosion;
- Dredging of sediment in high-energy areas;
- Capping of sediment in Low-energy areas;
- Backfilling excavated/dredged areas with clean soil;
- Offsite disposal for excavated/dredged soil and sediment;
- Wetland mitigation where needed;
- MNR of PCB concentrations in sediment;
- MNR of PCB concentrations in surface water and biota;
- Optimization of the remedy would be implemented as needed to ensure MNR is progressing as intended;
- Long-term monitoring to assess post-remedy conditions in OU4; and
- ICs in the form of fish advisories, 811 utility clearance system, APCO permits reviews and implementation of the Soil Management Plan.

The duration to implement the field construction components of SED-5 and meet RAO 6 is three years. The time to achieve MNR following remedy implementation and meet RAOs 4, 5, 7, 8, 9, and 10 is projected to be 20 to 30 years.

ALTERNATIVE SED-6: Creek Bank Soil Source Control for Contaminated Areas with Minor, Moderate, and Severe Erosion; Dredging of Sediment in High- and Low-energy Areas; Backfill Dredged Areas; Offsite Disposal for Excavated Soil and Dredged Sediment; MNR of Sediment; Long-term Monitoring; ICs; and Implementation of Soil Management Plan

Estimated Capital Cost: $41,500,000
Estimated Annual O&M Cost: $12,000,000
Estimated Present Worth Cost: $53,500,000

SED-6 is identical to SED-4 with the exception that it includes addressing creek bank soil with minor, moderate and severe erosion that exceed 2.6 mg/kg total PCB concentrations.

Like SED-4, SED-6 includes dredging with offsite disposal of sediment from high- and low-energy creek areas that exceed the 2.6 mg/kg total PCB concentrations (Figures 41 and 42). The sediment removed through dredging would be transported to a staging area, dewatered, and subsequently transported to an offsite, licensed landfill.

The estimated quantity of sediment to be dredged under this remedial alternative is 52,100 cubic yards. The estimated quantities of sediment for offsite disposal of materials with PCB concentrations greater than or equal to 50 mg/kg is 48,200 tons, and the estimated quantity of sediment for offsite disposal with PCB concentrations less than 50 mg/kg is 39,200 tons.

Once the construction of the remedial alternative is complete, MNR would be relied upon to achieve further reductions of PCB concentrations in sediment, surface water, and biota over time (see cleanup Table 15). Monitoring would be conducted to track the remedy effectiveness trends and implement a range of short- and long-term remedy monitoring and metrics, including traditional approaches (e.g., assessing PCB concentration trends in sediment, surface water, and biota) to document concentration reductions over time. Optimization including performance of additional dredging and/or in-place treatment of areas within Snow Creek and Choccolocco Creek would be implemented if determined necessary to achieve RAOs. SED-6 would also include the implementation of ICs, including a Soil Management Plan as described in as described in Common Elements of All Alternatives (ROD Part 2 Page 97) and under ICs (ROD Part 2 Page 118).

The following components are part of Alternative SED-6:

- Creek bank soil stabilization (may include excavation) for contaminated areas with minor, moderate and severe erosion;
- Dredging of sediment in high-energy and low-energy areas;
- Waste characterization of the dredged sediment;
- Backfilling excavated/dredged areas with clean soil;

- Offsite disposal for excavated/dredged soil and sediment;
- Wetland mitigation where needed;
- MNR of PCB concentrations in sediment;
- MNR of PCB concentrations in surface water and biota;
- Optimization of the remedy would be implemented as needed to ensure MNR is progressing as intended;
- Long-term monitoring to assess post-remedy conditions in OU4; and
- ICs in the form of fish advisories, 811 utility clearance system, APCO permit reviews and implementation of the Soil Management Plan.

The duration to implement the field construction components of SED-6 and meet RAO 6 is three to four years. The time to achieve MNR following remedy implementation and meet RAOs 4, 5, 7, 8, 9, and 10 is projected to be 20 to 30 years.

ALTERNATIVE SED-7: Creek Bank Soil Source Control for Contaminated Areas with Minor, Moderate, and Severe Erosion; Dredging of Contaminated Sediment in High- and Low- energy Areas; Backfill Dredged Areas; Offsite Treatment of PTW; Offsite Disposal for Excavated Soil and Dredged Sediment; MNR of Sediment; Long-term Monitoring; ICs; and Implementation of Soil Management Plan

Estimated Capital Cost: $42,000,000
Estimated Annual O&M Cost: $12,000,000
Estimated Present Worth Cost: $54,000,000

SED-7 is like SED-6 with one exception. SED-7 includes the use of offsite treatment (incineration) for a small portion of the excavated sediment. SED-7 includes efforts to stabilize creek bank soil with minor, moderate and severe erosion that exceed 2.6 mg/kg total PCB concentrations and dredging with offsite disposal of sediment from high-energy and low-energy creek areas that exceed the 2.6 mg/kg total PCB concentrations (Figures 41 and 42).

The estimated quantity of soil associated with creek bank stabilization efforts for severe erosion is the same for all alternatives and is discussed in the common elements. The estimated quantity of sediment to be dredged from the creeks under this remedial alternative is approximately 52,100 cubic yards. The estimated quantity of clean backfill materials for this remedial alternative is 40,400 cubic yards. The estimated quantities of sediment for offsite disposal of sediment dredged from Snow and Choccolocco Creeks with PCB concentrations greater than or equal to 50 mg/kg is 48,200 tons. The estimated quantity of dredged sediment with PCB concentrations less than 50 mg/kg for offsite disposal is 39,200 tons.

The dredged sediment would be removed, staged, and dewatered. A small portion of the dredged sediment (with PCB concentrations greater than or equal to 500 mg/kg) would be transported to a licensed facility for offsite treatment. As described for soil, offsite incineration is the most commercially available technology and was used as an example technique for offsite treatment in the screening analysis. Materials would be transported to one of the three TSCA-permitted facilities in

Texas or Kansas and incinerated, and the resulting ash would be disposed of by the treatment facility. The remaining sediment (sediment with PCB concentrations below 500 mg/kg) would be transported to a licensed facility for disposal.

Once the construction of the remedial alternative is complete, MNR would be relied upon to achieve further reductions of PCB concentrations in sediment, surface water, and biota over time (see cleanup level in Table 15). Monitoring would be conducted to track the remedy effectiveness trends and implement a range of short- and long-term remedy monitoring and metrics, including traditional approaches (e.g., assessing PCB concentration trends in sediment, surface water, and biota) to document concentration reductions over time. Optimization including performance of additional dredging and/or in-place treatment of areas within Snow Creek and Choccolocco Creek would be implemented if determined necessary to achieve RAOs. SED-7 would also include the implementation of ICs, including a Soil Management Plan as described in as described in Common Elements of All Alternatives (ROD Part 2 Page 97) and under ICs (ROD Part 2 Page 118).

The following components are part of Alternative SED-7:

- Creek bank soil stabilization (may include excavation) for contaminated areas with moderate and severe erosion;
- Dredging of sediment in high-energy and low-energy areas;
- Backfilling excavated/dredged areas with clean soil;
- Offsite disposal for excavated/dredged soil and sediment;
- Offsite Treatment of PTW;
- Wetland mitigation where needed;
- MNR of PCB concentrations in sediment;
- MNR of PCB concentrations in surface water and biota;
- Optimization of the remedy would be implemented as needed to ensure MNR is progressing as intended;
- Long-term monitoring to assess post-remedy conditions in OU4; and
- ICs in the form of fish advisories, 811 utility clearance system, APCO permits reviews; and implementation of the Soil Management Plan.

The duration to implement the field construction components of SED-7 and meet RAO 6 is three to four years. The time to achieve the MNR sediment cleanup level following remedy implementation and meet RAOs 4, 5, 7, 8, 9, and 10 are projected to be 20 to 30 years.

10. COMPARATIVE EVALUATION OF ALTERNATIVES

Each alternative was evaluated using the nine evaluation criteria in the National Contingency Plan (NCP), 40 C.F.R. Section 300.430(e)(9)(iii). Two of the nine criteria, overall protection of human health and the environment, and compliance with ARARs, are threshold criteria. If an alternative does not meet these two criteria, it cannot be considered as a remedy for the alternatives being compared.

- **Overall Protectiveness of Human Health and the Environment** determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

- **Compliance with ARARs** evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

Five of the criteria are balancing criteria: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume of contaminants through treatment; short-term effectiveness, implementability, and cost. The EPA can make tradeoffs between the alternatives with respect to the balancing criteria.

- **Long-term Effectiveness and Permanence** considers the ability of an alternative to maintain protection of human health and the environment over time.

- **Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment** evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

- **Short-term Effectiveness** considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.

- **Implementability** considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

- **Cost** includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

Two of the criteria are modifying criteria, state/support agency acceptance and community acceptance. These modifying criteria are formally considered after public comment is received on the Proposed Plan and RI/FS, and may be used by the EPA to modify the proposed remedy.

- **State/Support Agency Acceptance** is important to the EPA. ADEM received draft documents and engaged in discussions about draft plans, data, and alternatives. ADEM is a valued partner in providing oversight of cleanup of this Site.

- **Community Acceptance** is also a priority for the EPA. The EPA engaged the community during the RI/FS development. The Community Advisory Group and community Technical Advisor have received draft documents and engaged in discussions about draft plans, data, and alternatives. Community acceptance is evaluated based on input received during the comment period.

This section summarizes the comparison of each category of alternative to the nine CERCLA evaluation criteria and to each other.

10.1 Residential Soil

The cleanup of PCBs in residential soil has been implemented as a NTCRA at most yards/properties where the residential cleanup levels were exceeded (see OU4 FS Figures 4-6a-j). PCBs remain above cleanup levels where access has not been granted. Residual PCB remediation wastes (soil with PCB concentrations greater than 1 mg/kg) remain at depth and under structures on a number of residential properties (Table 1).

In addition to completing the cleanup at one property in OU4 that has not been cleaned up yet, RS-2 would use a soil management approach (i.e., operations and maintenance) to monitor PCB residuals at depth beneath previously remediated yard areas and to monitor locations where structures may be removed over time. The only difference between RS-3 and RS-2 is the approach to address the PCB residuals at depth. Under RS-3, subsurface soil with PCB concentrations between 1 mg/kg and 10 mg/kg would be removed and disposed of onsite. Soil management would only be required to monitor locations where structures may be removed over time and the potential for additional evaluations and/or removal actions at these locations. The onsite soil management area would be used for the disposal of materials with PCB concentrations less than 10 mg/kg that have been characterized with five-point composite samples.

10.1.1 Overall Protection of Human Health and the Environment

Alternative RS-1 would meet this criterion for the properties where removals have been conducted, but would not meet this criterion for the one remaining residential property with surface soil concentrations above 1 mg/kg and where a removal has not been conducted. Alternative RS-1 would not provide for future management of residual PCBs in the subsurface of some properties or under structures. Therefore, Alternative RS-1 will not be evaluated further. Alternatives RS-2 and RS-3 would provide for overall protection of human health and the environment.

10.1.2 Compliance with ARARs

Alternatives RS-2 and RS-3 would both require proper handling and disposal of PCB remediation waste. Both alternatives would meet ARARs.

10.1.3 Long-Term Effectiveness and Permanence

RS-2 and RS-3 alternatives provide long-term effectiveness and permanence where removals/backfill have been or would be completed. RS-2 and RS-3 would both provide protection by completing the necessary removal actions as required and conducting long-term residuals management with RS-3 providing greater permanence through the removal of subsurface soil.

10.1.4 Reduction of Toxicity, Mobility, or Volume through Treatment

The RS alternatives are not treatment alternatives and thus do not reduce the toxicity, mobility or volume of PTW materials, using treatment. For residential exposures, soil with PCB concentrations greater than 100 mg/kg are considered to be PTW based on toxicity.[1] No known residential soil PCB concentration exceed 100 mg/kg.

10.1.5 Short-Term Effectiveness

Short-term impacts are higher for alternative RS-3 than under RS-2. These impacts are associated with returning to properties where surface soil was previously removed and repeating the process to remove subsurface soil with PCB concentration between 1 mg/kg and 10 mg/kg. RS-3 would have a larger environmental impact in terms of energy use and greenhouse gas emissions than RS-2. RS-3 would also take two to three months longer to implement than RS-2.

10.1.6 Implementability

Both RS-2 and RS-3 alternatives are implementable. The components of RS-2 have been or would be implemented in the same manner as previously conducted for the residential properties through the removal actions. RS-3 would be conducted in the same manner but requires excavating to greater depths around structures and other obstructions, which can present implementability challenges. However, those types of challenges can easily be addressed over time.

10.1.7 Cost

RS-2 is estimated to cost $0.4 M, and RS-3 is estimated to cost $1.4 M. The additional $ 1.0 M investment would not reduce current risk, but would ensure no future recontamination from PCBs in subsurface soil, provided soil management of PCBs under structures was maintained.

10.1.8 State/Support Agency Acceptance

State acceptance is important to the EPA. ADEM received draft documents and engaged in discussions about draft plans, data, and alternatives. ADEM is a valued partner in providing oversight in cleanup of this Site . When the Proposed Plan was drafted, the state expressed concern that restrictions in conformance with the AL Uniform Environmental Covenant Act (UECA) restrictions are needed on properties where PCBs remained above concentrations that don't allow for unrestricted use. The EPA explained that IC in the form of the Soil Management Plan, the conservation corridor, and the Alabama 811, one-call system used by local utilities where soil disturbances are planned, will replace the need for a recorded restrictive covenant in conformance with the AL UECA restrictions. The ROD comment letter from ADEM is included in Appendix E.

[1] A Guide on Remedial Actions at Superfund Sites with PCB Contamination. Quick Reference Fact Sheet, U.S. EPA, Office of Emergency and Remedial Response. OSWER Directive 9355.4-01FS, 5 pp, Aug 1990.

10.1.9 Community Acceptance

The Community Advisory Group and community Technical Advisor have received draft documents and engaged in discussions about draft plans, data, and alternatives. There was some concern expressed that the cleanup for PCBs has not been enough, but not specifically related to residential cleanup. In response to several comments, the EPA assured the community that while residential cleanup is close to complete, non-residential soil and sediment remain to be cleaned up. Additionally, soil management of PCBs in subsurface soil and PCBs that might be present under structures will continue to be managed. Comments received during the Proposed Plan comment period were addressed in the Responsiveness Summary included in Part 3 of this document.

10.1.10 Residential Soil Summary

RS-1 was eliminated because it does not provide overall protection where cleanups have not yet been performed and does not provide for management of residual PCBs on residential properties. RS-2 and RS-3 are similar in that surface soil on most of the affected residential properties have already been effectively addressed. Both RS-2 and RS-3 provide for the cleanup of one remaining property when access is obtained. Alternative RS-2 provides less short-term impacts than RS-3. RS-3 provides more long-term effectiveness and permanence that RS-2. There is also a substantial difference in cost between the two approaches ($1.0M). Neither the State nor the community have objected to RS-2.

10.2 Interim Measures

Two alternatives were evaluated to address IMs in Oxford Lake Park: IM-1 and IM-2. IM-1 requires no further action. IM-2 includes maintaining the caps and covers previously put in place in Oxford Lake Park to ensure the PCB concentrations do not increase if soil is disturbed due to PCBs that remain in surface and subsurface soil.

10.2.1 Overall Protection of Human Health and the Environment

Alternative IM-2 would be protective of human health and the environment in the short and long term. Because the no further action alternative (IM-1) does not include long-term monitoring, maintenance, or soil management for the previously constructed caps and covers, it would not offer overall protectiveness.

10.2.2 Compliance with ARARs

IM-2 complies with ARARs by ensuring that any PCB impacted soil that needs to be removed during soil management activities or maintenance is properly disposed. IM-1 would not provide the oversight to ensure that ARARs for disposal of PCB remediation waste are complied with.

10.2.3 Long-Term Effectiveness and Permanence

IM-1 does not include monitoring and, therefore, has no mechanism to ensure long-term effectiveness. IM-2 offers long-term effectiveness and permanence through continued monitoring, maintenance, and repairs, if needed.

10.2.4 Reduction of Toxicity, Mobility, or Volume through Treatment

IM-1 does not include an action and therefore there is no further reduction in toxicity, mobility, or volume through treatment. Although IM-2 does not include treatment to reduce toxicity, mobility, and volume, it does include long-term monitoring to ensure long-term effectiveness of the IMs. No PTW has been identified in the IM areas.

10.2.5 Short-Term Effectiveness

There is no short-term effectiveness associated with IM-1. IM-2 is effective in the short-term because the measures in place would be maintained.

10.2.6 Implementability

IM-1 does not have an action and therefore has no implementability issues. IM-2 would require coordination with landowners to continue with ongoing monitoring, maintenance, and soil management support activities.

10.2.7 Cost

IM-1 does not have a cost as the no further action alternative. IM-2 is estimated to cost $400,000.

10.2.8 State/Support Agency Acceptance

State acceptance is important to the EPA. ADEM received draft documents and engaged in discussions about draft plans, data, and alternatives. ADEM is a valued partner in providing oversight in cleanup of this Site . When the Proposed Plan was drafted, the state expressed concern that restrictions in conformance with the AL Uniform Environmental Covenant Act (UECA) restrictions are needed on properties where PCBs remained above concentrations that don't allow for unrestricted use. The EPA explained that ICs in the form of the Soil Management Plan, the conservation corridor, and the Alabama 811, one-call system used by local utilities where soil disturbances are planned, will replace the need for a recorded restrictive covenant in conformance with the AL UECA restrictions. The ROD comment letter from ADEM is included in Appendix E.

10.2.9 Community Acceptance

The Community Advisory Group and community Technical Advisor have received draft documents and engaged in discussions about draft plans, data, and alternatives. The community has commented on this alternative. During the comment period, a number of comments were received expressing concern about PCBs in soil on the softball fields with no signage to make people aware of the contamination. The PCB contamination does not pose an unacceptable risk under CERCLA and therefore no further action is warranted. The softball field is fenced off, well maintained and monitored to ensure that there is no unauthorized digging on the fields that could result in unacceptable exposure. Comments received during the Proposed Plan comment period were addressed in the Responsiveness Summary included in Part 3 of this document.

10.2.10 Interim Measures Summary

IM-2 alternative relies on measures that have already been constructed and are currently effective and protective. Because IM-1 does not include long-term monitoring to ensure that controls remain in place and are maintained, it would not be protective in the long term. Under IM-2, long-term protectiveness and permanence would be ensured with continued monitoring, maintenance, and implementation of the ICs, including the Soil Management Plan.

10.3 Non-residential Soil

As with all the categories, the first alternative (NRS-1) would be no action. The only other alternative (NRS-2) actively addresses the non-residential soil to protect ecological receptors. The remedial volume for soil under NRS-2 reflects the excavation of soil from the 0–0.6 inches over 71 acres to achieve the ecological RG.

10.3.1 Overall Protection of Human Health and the Environment

The no action alternative, NRS-1, would not be protective of human health and the environment, as it would leave soil with concentrations above acceptable concentrations in surface soil. NRS-2 would remove the soil that poses an unacceptable risk to ecological receptors.

10.3.2 Compliance with ARARs

NRS-1 does not have any ARARs. NRS-2 would comply with ARARs by ensuring that PCB contaminated soil is properly disposed in accordance with regulations.

10.3.3 Long-Term Effectiveness and Permanence

NRS-1 would not be effective in the long term as it does not provide for any additional action including long term actions. NRS-2 provides for long-term effectiveness and permanence by removing and replacing contaminated surface soil to levels that are protective of ecological receptors. Additionally, institutional controls (e.g., investment in the Alabama 811 one-call system, the conservation corridors, deed restrictions) and implementation of the Soil Management Plan would ensure long-term protection.

10.3.4 Reduction of Toxicity, Mobility, or Volume through Treatment

NRS-1 and NRS-2 do not include treatment and would not reduce the toxicity, mobility, or volume of material. NRS-2 does include actions to reduce ecological risk to acceptable levels. No PTW was identified in floodplain soil.

10.3.5 Short-Term Effectiveness

NRS-1 would not be effective in the short-term as no action is taken. NRS-2 would remove and replace contaminated soil from the 0-6 inches bgs over a 71-acre footprint to achieve the cleanup level. This alternative requires offsite truck transport of the excavated soil and therefore may disturb the local neighborhood.

10.3.6 Implementability

NRS-1 has no implementability issues since there is no action. NRS-2 would be implementable using proven technologies and standard construction methods. NRS-2 would have moderate but workable implementability challenges relative to access and coordination with landowners and possibly local officials.

10.3.7 Cost

NRS-1 does not have any estimated costs . The estimated costs for implementing NRS-2, including offsite disposal (landfilling) would be $30.9M.

10.3.8 State/Support Agency Acceptance

State acceptance is important to the EPA. ADEM received draft documents and engaged in discussions about draft plans, data, and alternatives. ADEM is a valued partner in providing oversight in cleanup of this Site . When the Proposed Plan was drafted, the state expressed concern that restrictions in conformance with the AL Uniform Environmental Covenant Act (UECA) restrictions are needed on properties where PCBs remained above concentrations that don't allow for unrestricted use. The EPA explained that ICs in the form of the Soil Management Plan, the conservation corridor, and the Alabama 811, one-call system used by local utilities where soil disturbances are planned, will replace the need for a recorded restrictive covenant in conformance with the AL UECA restrictions. The ROD comment letter from ADEM is included in Appendix E.

10.3.9 Community Acceptance

The Community Advisory Group and community Technical Advisor have received draft documents and engaged in discussions about draft plans, data, and alternatives. The community has commented on this alternative. During the comment period, a number of comments were received expressing concern that large volumes of PCB contaminated soil were being left in place in soil, which could become a threat to human health and the environment in the future. However, the subsurface contamination does not create an unacceptable risk to human health under CERCLA and therefore, action is not warranted. Comments received during the Proposed Plan comment period were addressed in the Responsiveness Summary included in Part 3 of this document.

10.3.10 Non-residential Soil Summary

The no action alternative (NRS-1) would not meet the threshold criteria because it does not include any further action, and therefore it is not protective. NRS-2 would be protective as it achieves the cleanup level for ecological receptors. NRS-2 complies with ARARs, is implementable, ensures long-term effectiveness and permanence, and is cost effective.

10.4 Creek Bank and Sediment Summary

Each of the six active creek bank and sediment alternatives would address the same contamination footprint (determined during RD) to meet the human health and ecological cleanup levels. The alternatives apply different technologies and combinations of technologies, including excavation/dredging, excavation/dredging and capping, and excavation/dredging and in-place treatment. The alternatives also include different offsite disposal methods with alternatives SED-2 through SED-6 using permitted offsite landfills and SED-7 using offsite treatment with incineration for a small quantity of sediment (225 cubic yards) with PCB concentrations ≥ 500 mg/kg. Each of the active remedial alternatives include source control measures to address creek bank areas that are contributing PCB contamination in OU4.

10.4.1 Overall Protection of Human Health and the Environment

SED-1 is the no action alternative. The SED-1 alternative would not meet threshold criteria and is used, in accordance with the NCP, as a reference point for comparison with the other alternatives. All other sediment alternatives are protective of human health and the environment. Stabilizing the creek banks that are the least stable and that have the highest PCB concentrations would address a significant source of PCB loading to Choccolocco Creek. The creek bank actions would be combined with active sediment remediation in Snow Creek, the backwater area, Choccolocco Creek downstream of the backwater area, and any other areas identified in the RD to exceed the sediment PCB NTE/RAL. Residual contaminant concentrations and associated risk following construction will be reduced through MNR. The EPA recognizes there is significant uncertainty associated with the rates and extent of contaminant decline predicted in the site modeling. To address this uncertainty and ensure a protective remedy, a robust monitoring program will be implemented to document that contaminated media are trending towards and achieving remediation goals in the anticipated time frame of 20 years (below Jackson Shoals) and 30 years (at and above Jackson Shoals). If the cleanup levels are not attained in the anticipated time frame, additional remedial activities or optimization measures may be developed, evaluated and selected.

10.4.2 Compliance with ARARs

Each of the active sediment alternatives would be designed and constructed in compliance with ARARs. A number of federal and state, ARARs would have to be met for sediment and creekbank alternatives described below.

10.4.3 Long-Term Effectiveness and Permanence

Each of the active SED alternatives would be effective and permanent. Each alternative would stabilize creek bank soil and remove or isolate creek sediment. The cleanup levels are anticipated to be achieved through a combination of these actions and MNR. A robust sediment and fish tissue monitoring program is included as a part of all alternatives to ensure that the cleanup levels are achieved in the anticipated time frames. Over time, SED-2 and SED-4 would achieve the cleanup levels over 30 to 35 years, and SED-3, SED-5, SED-6, and SED-7 would achieve the cleanup levels in approximately 20 years.

SED-2, SED-3, and SED-5 would implement proven technologies of capping and in-place treatment where they are best suited, which are the low-energy areas of the creek. Capping (SED- 5) uses physical isolation (1-foot cap) to keep the BAZ and the organisms that live in that zone from contacting the underlying sediment where PCBs remain. SED-2 and SED-3 use activated carbon to absorb the PCBs, effectively preventing their bioavailability and bioaccumulation in the food chain. These technologies have been proven effective in aquatic systems. These alternatives' long-term effectiveness and permanence for OU4 would be confirmed through a long-term monitoring and maintenance program. The long-term monitoring program is anticipated to measure and evaluate metrics for surface water, sediment, and biota to track attainment of sediment, fish tissue, and surface water cleanup levels over relevant spatial areas (i.e., for the sediment bed, to ensure no samples exceed 2.6 mg/kg and that a SWAC of 0.1 mg/kg is attained over the 10 ecological exposure areas). The monitoring would be supplemented with passive sampling devices and fish tracking.

All the active creek bank and sediment alternatives include implementation of a Soil Management Plan to manage PCB residuals associated with future infrastructure construction or improvement projects that may occur in creek bank or sediment portions of OU4.

10.4.4 Reduction of Toxicity, Mobility, or Volume through Treatment

SED-2 and SED-3 would reduce the bioavailability of PCBs in sediment through in-place treatment. The addition of activated carbon to the sediment surface would sorb the PCBs, preventing them from being released to surface water and from being bioaccumulated in the food chain. SED-4, SED-6, and SED-7 include the addition of Portland cement to stabilize sediment dredged from the low-energy area that is considered PTW due to elevated concentrations of PCBs prior to off-site disposal. Additionally, SED-7 includes treatment (incineration) of the PTW concentrations in sediment from the low-energy area at an approved offsite incineration facility.

10.4.5 Short-Term Effectiveness

Each of the sediment alternatives would have similar short-term risks and impacts to Site workers and the community. These risks and impacts are associated with removing trees and constructing and removing staging and dewatering areas. Most of this clearing would be located directly along the edge of the creek in the riparian buffer zone. The excavation, staging, and dewatering of sediment along with the necessary truck traffic could cause noise, dust, and odors that might disturb the local communities. Risks to Site workers and the communities might also be associated with dust generated during excavation, stockpiling, and loading trucks for offsite transportation and disposal. Best management practices would be implemented to address these issues.

Although best management practices for sedimentation control would be in place for all activities, work along the creek banks and sediment removal would unavoidably cause a short-term increase in suspended solids in the surface water column and an associated increase in contaminant concentrations in surface water and potentially fish tissue. Creek banks may be stabilized using hard engineering (such as riprap or concrete) in places, which would permanently affect the aesthetics of the creek banks. There are significant, but manageable logistical issues associated with accessing and removing sediment from the different reaches of OU4.

The alternatives that cap (SED-5) or treat sediment in situ (SED-2 and SED-3) would involve less time dredging and less disturbance of sediment that could be resuspended and transported downstream. Therefore, these alternatives would have a shorter duration of temporary increase in surface water, biota, and downstream sediment concentrations than SED-4, SED-6, and SED-7, and the creek would require less time to recover. SED-5 would involve some dredging in the low-energy areas to leave room for the cap, and SED-2 and SED-3 would be less disruptive and have fewer impacts because dredging would not be required prior to placing the activated carbon as part of the treatment process. Although SED-4, SED-6, and SED-7 would be more impactful to surface water, they would also generate greater amounts of sediment to be staged, handled, transported, and areas to be backfilled. This would increase truck traffic, dust, and noise.

Each active alternative would take approximately the same amount of time to complete, approximately three to four years. Although some of the construction activities are different for SED-2, SED-3, and SED-5 (i.e., capping or in-place treatment), the durations for the activities and the associated noise and other disturbances would likely be similar.

Because SED-7 involves transporting contaminated sediment to an out of state incineration facility and would potentially negatively impact communities outside of the OU4 area.

10.4.6 Implementability

Each of the SED alternatives would be implementable using commercially available and proven technologies. Each alternative has specific logistical issues that would be managed using best management and engineering practices. As with some of the other evaluation criteria, such as short-term effectiveness, the logistical issues associated with floodplain/creek bank staging areas and truck traffic would be more noticeable to the local community in proportion to the amount of material that would be transported to and from the Site. The range of active remedial alternatives can be organized into two major groups of implementability, with the first group being more implementable than the second group. The groupings are based on the quantity of sediment removed and transported offsite for disposal. With each group, the active remedial alternatives are organized from most easily implemented to least easily implemented:

- Group 1 (more easily implemented): SED-2, SED-3, and SED-5; and
- Group 2 (less easily implemented): SED-4, SED-6, and SED-7.

10.4.7 Cost

The estimated costs for the alternatives that do not include offsite treatment range from $43.6M for SED-2 to $53.5M for SED-6. The estimated costs for SED-3, SED-4, and SED-5 are in the middle of this range and are $47.4M $49.7M, and $50.6M, respectively. The cost differences between alternatives SED-3 through SED-5 are associated with the various quantities of sediment being dredged, capped, and/or treated in-place. The two different approaches to creek bank source control (i.e., addition of minor erosion areas for some alternatives) also account for a small portion of the differences. SED-7 is the most expensive alternative ($54M) based on transportation and treatment costs associated with offsite treatment (incineration) of PTW.

10.4.8 State/Support Agency Acceptance

State acceptance is important to the EPA. ADEM received draft documents and engaged in discussions about draft plans, data, and alternatives. ADEM is a valued partner in providing oversight in cleanup of this Site . When the Proposed Plan was drafted, the state expressed concern that restrictions in conformance with the AL Uniform Environmental Covenant Act (UECA) restrictions are needed on properties where PCBs remained above concentrations that don't allow for unrestricted use. The EPA explained that ICs in the form of the Soil Management Plan, the conservation corridor, and the Alabama 811, one-call system used by local utilities where soil disturbances are planned, will replace the need for a recorded restrictive covenant in conformance with the AL UECA restrictions. The ROD comment letter from ADEM is included in Appendix E.

10.4.9 Community Acceptance

The Community Advisory Group and community Technical Advisor have received draft documents and engaged in discussions about draft plans, data, and alternatives for years. The community raised many concerns about the creek bank and sediment remedies during the Proposed Plan comment period. The comments ranged from wanting more sediment removal to wanting no sediment removal. There was concern about the water quality impact downstream of the dredging activities, concern about how citizens will be informed when dredging is being performed, concern about what engineering controls can be used to reduce the mobilization of contaminants, and more.

The EPA's Preferred Alternative (SED-6) requires removing sediment with PCB concentrations greater than 2.6 mg/kg and disposal in permitted landfills depending on the PCB concentrations. Most of the activity will be conducted 20 miles upstream of the Choccolocco Creek embayment at Logan Martin Lake. More sediment could be removed to reduce the time required for MNR to achieve cleanup levels. The EPA's analysis indicates that the Preferred Alternative could achieve the proposed protective human health RAOs in much less time with an additional 33 acres of sediment remediation. The increased remedy footprint would generate more habitat disruption and opportunity for sediment resuspension downstream. While it seems logical to assume it is better to dredge all PCBs in sediment now and not rely on MNR, the value of sensitive habitats or areas where endangered species exist may outweigh the benefits of removing the contamination. Consultation with USFWS will be conducted as part of the remedy implementation considering identified location specific ARARs and TBCs.

The EPA will ensure that plans are prepared and implemented to reduce the opportunity for releases of contaminated sediment. Best management practices (BMPs) at contaminated sediment sites have been developed, improved, and effectively implemented over the last few decades. Every effort will be made to reduce contaminated sediment movement. Recommended BMPs for this site include, conducting work during drier portions of the year, and use of sheet piling and silt screens where possible.

A robust communication plan will be developed the ensure the community is informed about the activities planned and on-going and how to get updated information about the cleanup.

Comments received during the Proposed Plan comment period were addressed in the Responsiveness Summary included in Part 3 of this document.

10.4.10 Sediment and Creek Bank (SED) Summary

The six active sediment alternatives are comparable for most of the evaluation criteria. Alternatives SED-3, SED-5, SED-6, and SED-7 all stabilize minor erosion and well as the severe and moderate erosion required in SED-2 and SED-4. Alternatives SED-4, SED-6, and SED-7 all dredge sediment in high- and low-energy areas instead of treating in-situ or capping low energy areas. Only SED-6 and SED-7 require stabilization of minor, moderate, and severe erosive contaminated creek banks. Treatment of PTW sediment (SED-7) versus using Portland cement to stabilize PTW sediment (SED-6) costs an additional $500,000 and provides no additional protection to the community.

Table 17. Comparison of components of sediment alternatives.

Alternative	Creek Bank Stabilization			Dredging		Capping	In-Place Treatment	MNR YEARS	Disposal	Treatment
	Severe	Moderate	Minor	High Energy	Low Energy	Low Enery	Low Energy		Offsite	PTW
SED-1	-	-	-	-	-	-	-	-	-	-
SED-2	X	X	-	X	-	-	X	30-35	X	X
SED-3	X	X	X	X	-	-	X	20-30	X	X
SED-4	X	X	-	X	X	-	-	30-35	X	X
SED-5	X	X	X	X	-	X	-	20-30	X	-
SED-6	X	X	X	X	X	-	-	20-30	X	X
SED-7	X	X	X	X	X	-	-	20-30	X	X

11. PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP §300.430(a)(1)(iii)(A)). PTWs are source materials that include or contain hazardous substances, pollutants or contaminants that act as a reservoir of contaminants that can migrate to groundwater, surface water, or air, or act as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, NAPLs in groundwater may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. Low-level threat wastes are those wastes that generally can be reliably contained and present only a low risk in the event of exposure. The identification of principal and low-level threats is made on a site-specific basis to help streamline and focus waste management options by categorizing the suitability of the waste for treatment or containment.

CERCLA section 121(b)(1) contains a preference or expectation for selecting remedial actions that utilize treatment technologies and permanent solutions to the maximum extent practicable. If the selected remedy does not comply with this preference, the EPA must publish an explanation as to why treatment was not selected. The basis for this statutory provision is that EPA believes that treatment is the best way to address certain hazardous source materials given the technical limitations with the long-term reliability of containment technologies and the seriousness of the human health and environmental consequences of exposure should a release occur.[2]

No threshold of toxicity or risk has been established to equate to a "principal threat".[3] For PCB contamination or PCB waste at Superfund sites, principal threats will generally include material contaminated at concentrations exceeding 100 mg/kg for sites in residential areas and concentrations exceeding 500 mg/kg for sites in industrial areas.[4]

When PTWs are not practicable to treat or remove, reliable and effective long-term containment options can be considered in the FS. In demonstrating impracticability, EPA considers such factors as the media involved, the volume and concentration of contamination, the size and depth of the area impacted, whether containment is even possible, whether groundwater is or is likely to be impacted, the accessibility to the waste material, the onsite containment costs, the availability of effective ICs and engineering controls and the likely threat of exposure over time. Applying these considerations to the portions of OU4 that contain PCB contamination greater than > 500 mg/k, the EPA expects to treat sediment PCB concentrations greater than 500 mg/kg by stabilizing it with cement followed by disposal in an approved off-site landfill.

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[2] A Guide to Principal Threat and Low Level Threat Wastes (OSWER Directive No. 9380.3-06FS, November 1991).
[3] Id., Page2.
[4] Guidance on Remedial Actions for Superfund Sites with PCB Contamination, U.S. EPA, August 1990, (EPA/540/G-90/007), at Page iv.

12. SELECTED REMEDY

Based on consideration of the requirements of CERCLA section 121, the detailed analysis of the remedial alternatives consistent with the NCP, and public comments received on the Proposed Plan, EPA has selected the following four alternatives as the Selected Remedy for OU4:

- Residential Soil - **Alternative RS-2**, Excavation and On- or Offsite Disposal for Surface Soil with PCB Concentrations ≥ 1.0 mg/kg and Subsurface Soil PCB Concentrations ≥ 10.0 mg/kg;
- Interim Measures - **Alternative IM-2**, Long-term Monitoring, Maintenance, ICs and Soil Management;
- Non-Residential Soil - **Alternative NRS-2**, Excavation of Soil in 0–6-inch Soil Horizon, Offsite Disposal, ICs, and Implementation of Soil Management Plan; and
- Sediment and Creek Bank Soil - **Alternative SED-6**, Creek Bank Soil Source Control for Contaminated Areas with Minor, Moderate, and Severe Erosion; Dredging of Sediment in High- and Low-energy Areas; Backfill Dredged Areas; Offsite Disposal for Excavated Soil and Dredged Sediment; MNR of Sediment; Long-term Monitoring; and ICs, including implementation of Soil Management Plan.

12.1 Summary for the Rationale for the Selected Remedy

Based on information currently available, the EPA believes the Selected Remedy meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. These remedial components include removal of contaminated soil and sediment exceeding cleanup levels, onsite or offsite disposal of excavated soil with low levels of PCBs from residential properties, offsite disposal of excavated soil and sediment around interim measures, in non-residential areas, and from Snow Creek and Choccolocco Creek. In addition, the Selected Remedy adopts RCRA corrective action IMs performed under ADEM oversight as final CERCLA remedial actions because EPA has determined that these IMs are protective of human health and the environment by effectively limiting exposures to PCB contamination left in place.

These Selected Remedy (RS-2, IM-2, NRS-2 and SED-6) was selected for a number of reasons:

- A similar residential alternative was selected in the November 8, 2017, ROD for OU1/OU2. To date, monitoring and soil management activities have been effective maintaining the residential remedy in OU1/OU2 and is expected to also be effective in OU4;
- Even though the Oxford Lake Park IMs are located near residential neighborhood, the IMs (which included excavations, backfilling and installed covers including asphalt in some areas) are fenced and closely monitored by the park and City of Oxford staff. The opportunity for exposure to PCBs in soil due to penetration of the cover soil on the softball fields or paved and built-up areas is limited. Although the exposure point concentration on Field A exceeds the ecological cleanup level of 6 mg/kg, the concentration is acceptable for recreational use. IM 2 was selected because the engineering and administrative controls in place for OLP and clean fill in the top 3-12 inches limit ecological impact;

- Non-residential soil (0-6 inches bgs) poses an unacceptable risk to ecological receptors. NRS-2 provides risk reduction needed to environmental receptors; and
- Excavation of sediment in high and low energy areas of OU4 and stabilization of creek banks will allow for MNR to occur and help ensure that recontamination of sediment from does not occur.

12.2 Detailed Description of the Selected Remedy

The Selected Remedy addresses :

- Residential soil;
- Interim measures at Oxford Lake Park;
- Non-residential soil; and
- Sediment and creek banks.

The Selected Remedy for OU4 includes excavation with on-site and off-site disposal of contaminated soil from residential properties. Residential soil has been, for the most part, cleaned up such that surface soil PCB concentrations are less than 1 milligram per kilogram (mg/kg) and subsurface soil PCB concentrations are less than 10 mg/kg. The Selected Remedy requires the residential properties identified for cleanup (1 property) with access issues or exposure issues (wooded with excessive vegetation) continue to be targeted for cleanup. On-site disposal for soil with PCB concentrations less than 10 mg/kg was approved for previous non-time critical removal actions and will continue to be a disposal option for the one remaining residential cleanup, and for management of residential property soil with residual PCB concentrations in the subsurface or under structures. All other soil from residential with PCB concentrations greater than or equal to 10 mg/kg will be disposed of at offsite EPA approved disposal facilities such as a RCRA permitted landfill or TSCA approved chemical waste landfill.

The residential soil remedy, RS-2, includes the following components:

- Follow an approved Soil Management Plan which requires;
    - Periodic attempts to request and gain access to properties identified with PCBs in surface soil above 1 mg/kg, and performance of cleanup described below;
    - Periodic notification of residents that residual PCBs > 1 mg/kg are or may be present in subsurface soil or beneath structures; and
    - PCB sampling and cleanup, if needed, of soil below demolished structures (i.e., buildings, sheds, or paved areas) on properties where previous cleanups have occurred or in areas where PCBs are present in subsurface.
- Residential cleanup includes all activities conducted under the NTCRA, which applies to the one residential property and any properties identified in the future where existing structures are removed;
    - Excavate surface soil (0 – 12 inches bgs) with PCB concentrations greater than or equal to 1 mg/kg and subsurface soil (12-48 inches bgs) with PCB concentrations

greater than or equal to 10 mg/kg;

- Clean interior surfaces of homes with dust concentrations above 1 mg/kg;
- Excavate soil or install barriers in accessible crawl spaces with PCB concentrations in surface soil above 1 mg/kg;
- Dispose of soil with PCB concentrations less than 10 mg/kg onsite at the SSSMA located near the Facility, provided the material passes leachability testing, or at an offsite disposal facility;
- Dispose of soil with PCB concentrations greater than or equal to 10 mg/kg at an EPA approved offsite disposal facility;
- Backfill excavated areas with clean soil and topsoil to approximately the same grades that existed prior to excavation; and
- Re-vegetate the property as close to original conditions as possible.

- ICs include investment in the Alabama 811, one-call system used by local utilities where soil disturbances are planned, and implement a Soil Management Plan described in Common Elements of all Alternatives on ROD Part 2, Page 97.

The components of interim measures remedy, IM-2, are as follows:

- Adopt RCRA IMs (described in ROD Part 2 Section 3.3.1.2) at Oxford Lake Park softball fields, the softball field's parking lot, the tennis court complex, and the southwest portion of the park (with the infrastructure improvement of adding the Miracle Field) as final CERCLA remedies; and
- Implement ICs, including investment in the Alabama 811 one-call system used by local utilities where soil disturbances are planned, maintaining the existing deed restriction for recreational use at Oxford Lake Park, and implementing the Soil Management Plan described in Common Elements of all Alternatives on ROD Part 2, Page 97.

The Selected Remedy requires non-residential floodplain soil removal to protect ecological receptors. The components of the non-residential soil remedy NRS-2 are as follows:

- Excavate surface soil 0–6 inches bgs to achieve PCB SWAC of 6 mg/kg;
- Protect trees with a diameter at breasting height (DBH) greater than 6 inches in the riparian exposure units bordering Choccolocco Creek as much as possible during remediation[5];
- Characterize contaminated soil to determine waste disposal;
- Dispose of excavated soil at an EPA approved off-site disposal facility;
- Backfill excavated areas with clean soil and topsoil; and
- Implement ICs, including investment in the Alabama 811, one-call system used by local utilities where soil disturbances are planned, support for land trust conservation corridors in impacted

[5] Protect certain trees in riparian zone. See comment 88 in ROD Part 3.

portions of the Site; and implementing the Soil Management Plan described in Common Elements of all Alternatives on ROD Part 2, Page 97.

The Selected Remedy for creek bank soil and sediment are required to protect both human and ecological receptors. The components of the Creek Bank and Sediment remedy SED-6 are as follows:

- Creek bank soil stabilization (may include excavation) for contaminated areas with minor, moderate and severe erosion;
- Dredging of sediment in high-energy and low-energy areas;
- Waste characterization of the dredged sediment;
- Backfilling excavated/dredged areas with clean soil;
- Offsite disposal for excavated/dredged soil and sediment;
- Wetland mitigation where needed;
- MNR of PCB concentrations in sediment[6];
- MNR of PCB concentrations in surface water and biota;
- Optimization of the remedy would be implemented as needed to ensure MNR is progressing as intended;
- Long-term monitoring to assess post-remedy conditions in OU4; and
- ICs in the form of fish advisories, 811 utility clearance system, APCO permit reviews and implementation of the Soil Management Plan.

The remedy may be modified based on the remedial design and construction processes. Any changes to the Selected Remedy described in this ROD will be documented using a technical memorandum, an Explanation of Significant Differences (ESD), or ROD amendment, consistent with CERCLA, the NCP and EPA policy and guidance.

12.3 Estimated Selected Remedy Costs

The estimated total present worth cost for the Selected Remedy is $85.2M. The total capital cost is $71.2 M, and the periodic costs were estimated to be $14M. Detailed costs associated with implementing the Selected Remedy are presented in FS Tables 10-1, 10-3, 10-9 and 10-19. A 7% discount rate applied to all costs incurred after the first year to find the present worth cost of the Selected Remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the Selected Remedy. Major changes may be documented in the form of a memorandum in the Site file, an ESD, or a ROD amendment. The cost estimate provided in this ROD is an order-of magnitude engineering estimate that is expected to be within +50 to -30% of the actual project costs.

[6] MNR extended from 20-30 years to 20-40 years due to application of 0.1 mg/kg cleanup level to creek upstream of Jackson Shoals. See comment 94 in ROD Part 3.

12.4 Institutional Controls

Institutional controls are required as part of the Selected Remedy. Institutional controls (such as deed restrictions, zoning restrictions or restrictive covenants), would, depending on implementability, be implemented to protect the engineering components of the OU4 remedy. A final Institutional Controls Implementation Plan (ICIP) will be developed during the remedial design and will identify the ICs available to help protect the remedy integrity and prevent exposure. Currently available ICs are the following:

- Maintenance of deed restrictions or to prohibit excavation within capped areas at the Interim Measure Areas;
- Continuation of support for land trust conservation corridor program;
- Maintenance of Fish Advisory signs to inform recreational fishermen of risk from fish consumption; and
- Investment in the Alabama 811, one-call system used by local utilities where soil disturbances are planned.

In addition, a robust Soil Management Plan would be implemented, in perpetuity, as part of the selected remedy for residential properties and non-residential properties where residual PCB concentrations above 1 mg/kg remain in soil. Soil management activities would include interactive outreach with local landowners or local municipalities regarding any plans to remove the current access constraints, repair or expand utilities in areas of residual contamination, demolition of buildings/structures, removal or clearing of vegetation, etc. An interim Soil Management Plan is currently being implemented for residential properties. The plan will be expanded during RD to include all areas of the Site.

12.5 Five-Year Reviews

Five-year Reviews are required under CERCLA section 121(c) and the 40 C.F.R. §300.430(f)(4)(ii) if the remedial action results in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for unlimited use and unrestricted exposure. PCB remediation waste is being left on residential and non-residential properties and several interim measures that involve containment are being approved as final actions. As such, Five-year Reviews will be conducted at the Site to evaluate the implementation and performance of the Selected Remedies in all Site OUs, and in order to determine if the remedies continue to be protective of human health and the environment.

12.6 Expected Outcome of the Selected Remedy

The intent of the Selected Remedy is to be protective of human health and the environment by reducing risks from the following: PCB contamination on residential properties; PCBs and mercury contamination on non-residential properties; PCBs, mercury, DL-PCB TEQ contamination in sediment and fish, and PCB contamination in surface water and biota. The Selected Remedy will actively address contaminated soil and sediment within OU4, thereby reducing exposure to contaminant concentrations in other media such as surface water, which will significantly reduce human health and ecological risks at the Site to acceptable levels. Remediation of the sediment at the OU4 will also reduce migration of contaminants to the Coosa River. Stabilization of contaminated creek banks conducted in conjunction with the soil and sediment actions, eliminates additional sources of contamination that impact creek sediment and surface water quality.

13. STATUTORY DETERMINATIONS

The purpose of this section is to provide a brief, site-specific description of how the Selected Remedy satisfies the statutory requirements of CERCLA §121 (as required by 40 C.F.R. §300.430(f)(5)(ii)) and explain the five-year review requirements for the Selected Remedy. The Selected Remedy represents the best balance of trade-offs among alternatives with respect to pertinent criteria.

CERCLA Section 121(b)(1), 42 U.S.C. § 9621(b)(1), mandates that remedial actions be "protective of human health and the environment, [be] cost effective, [and use] permanent solutions and alternative treatment technologies or resource recovery alternatives to the maximum extent practicable." Section 121(b)(1) also establishes a preference for remedial actions that use, as a principal element, treatment to reduce the TMV of the hazardous substances, pollutants, and contaminants at a site permanently and significantly. CERLCA Section 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state environmental laws, unless a waiver can be justified.

The EPA has determined that the selected remedy complies with the CERCLA Section 121 Cleanup standards and NCP provisions for remedy selection in 40 CFR § 300.430(f), meets the threshold criteria, and provides the best balance of tradeoffs among the alternatives with respect to the balancing and modifying criteria. These provisions require the selection of remedies that are protective of human health and the environment, comply with ARARs (or justify a waiver from such requirements), are cost effective, and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that use treatment that permanently and significantly reduce the TMV of hazardous substances as a principal element (or justify not satisfying the preference). The following sections discuss how the selected remedy meets these statutory requirements.

13.1 Protection of Human Health and the Environment

The Selected Remedy for contaminated soil and sediment in OU4 will adequately protect human health and the environment through excavation and offsite disposal, containment, engineering controls, and institutional controls.

Exposure levels will be reduced to attain chemical-specific ARAR levels for surface water and for contaminated soil to be within the EPA's generally acceptable risk range of $1x10^{-4}$ to $1x10^{-6}$ for carcinogenic risk and below the HI of 1 for non-carcinogens.

The implementation of the Selected Remedy will not pose unacceptable short-term risks. Precautions will be taken to protect the public during the implementation of the remedy. The remedy seeks to reduce and eliminate soil impacts, surface water impacts, and sediment impacts.

Ecological receptors will be protected from contaminants of concern through implementation of the remedy that removes contaminated floodplain soil and creek sediment in identified segments above eco-based cleanup levels in Table 15. Summary of Cleanup Levels OU4 Media and described in Section 8**.**

13.2 Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA, as amended, specifies, in part, that remedial actions for cleanup of hazardous substances must comply with requirements and standards under federal or more stringent state environmental laws and regulations that are ARARs to the hazardous substances or particular circumstances at a site unless such ARARs are waived under CERCLA section 121(d)(4). See also 40 C.F.R. § 300.430(f)(1)(ii)(B). ARARs include only federal and state environmental or facility siting laws/regulations and do not include occupational safety or worker protection requirements. The 40 C.F.R. § 300.150 requires compliance with Occupational Safety and Health Administration (OSHA) standards; therefore, the CERCLA requirement for compliance with or wavier of ARARs does not apply to OSHA standards.

Under CERCLA section 121(e)(1), federal, state, or local permits are not required for the part of any removal or remedial action conducted entirely on-site as defined in 40 C.F.R. § 300.5. See also 40 C.F.R. §§ 300.400(e)(1) & (2). Also, CERCLA actions must only comply with the "substantive requirements," not the administrative requirements of a regulation. Administrative requirements include permit applications, reporting, record keeping, and consultation with administrative bodies. Although consultation with state and federal agencies responsible for issuing permits is not required, it is recommended for determining compliance with certain requirements such as those typically identified as location specific ARARs.

Applicable requirements, as defined in 40 C.F.R. § 300.5, "means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, or contaminant, remedial action, location, or other circumstance at a CERCLA site. Only those state standards that are identified by the state in a timely manner and that are more stringent than federal requirements may be applicable." Relevant and appropriate requirements, as defined in 40 C.F.R. § 300.5, "means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not 'applicable' to a hazardous substance, pollutant, or contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at a CERCLA site that their use is well suited to the particular site. Only those state standards that are identified by the state in a timely manner and that are more stringent than federal requirements may be relevant and appropriate."

In addition to ARARs, the lead and support agencies may identify other measures to be considered for a particular release. "The TBC category consists of advisories, criteria, or guidance that were developed by the EPA, other federal agencies, or states that may be useful in developing CERCLA remedies." See 40 C.F.R. § 300.400(g)(3).

The selected amended remedy complies with identified chemical-, location-, and action-specific ARARs as well as TBCs. No waiver is necessary for implementation of the selected remedy. The ARARs for the selected remedy include location-specific requirements from the CWA Section 404(b)(1) guidelines and regulations related to discharges from dredged or fill material and wetlands mitigation, as well as Federal Emergency Management Agency regulations for actions in floodplains. Sediments that are resuspended in the removal and capping alternatives may result in temporary noncompliance with chemical specific ARARs such as ADEM water quality criteria, meaning that precautions (i.e., implementation of BMPs) would be used to minimize that outcome. Action-specific ARARs include RCRA and TSCA requirements for characterization, temporary staging, and disposal of contaminated sediment/soil as well as requirements for control of fugitive dust and stormwater runoff during land disturbing activities including excavation. The ARARs for the selected remedy are provided in Appendix D, on Tables D-1, D-2, and D-3.

13.3 Cost-Effectiveness

The Selected Remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition set forth in the NCP was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." See 40 CFR §300.430(f)(1)(ii)(D). This was accomplished by evaluating the "overall effectiveness" of those alternatives that satisfy the threshold criteria. Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction of toxicity, mobility, and volume through treatment; and short- term effectiveness). Overall effectiveness was then compared to costs to determine cost effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs, and, hence, this alternative represents a reasonable value for the money to be spent. The estimated present worth cost of the selected remedy is as follows:

Residential Soil:	RS-2	$ 0.4M
Interim Measures Areas:	IM-2	$ 0.4M
Nonresidential Soil:	NRS-2	$30.9M
Sediment and Creek Bank Soil:	SED-6	$53.5M
	Total	$85.2M

Although alternatives SED-3 and SED-5 offer similar protection and cleanup timeframes as SED-6 for $6M and $3M less, respectively, the permanence provided by complete removal of PTW sediment is worth the added expense, and therefore the remedy is cost-effective. The EPA believes that the Selected Remedy's additional cost provides a significant increase in protection of human health and the environment and is cost-effective.

13.4 Utilization of Permanent Solutions or Alternative Treatment Technologies

EPA has determined that the Selected Remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the site. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined that the Selected Remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and bias against off-site treatment and disposal and considering State and community acceptance.

The Selected Remedy treats the source materials constituting principal threats at the site, achieving significant reductions in PCB concentrations in soil and sediment. The Selected Remedy satisfies the criteria for long-term effectiveness by removing PCB contaminated soil and sediment. Stabilization of PCB contaminated sediment and soil caps will effectively reduce the mobility of and potential for direct contact with PCB contaminants remaining within OU4. The Selected Remedy will require more sediment disturbance in the short term but more long-term permanence than in-situ and soil capping alternatives.

13.5 Preference for Treatment as a Principal Element

CERCLA Section 121(b) specifies remedial actions, which permanently and significantly reduce the toxicity, mobility and/or volume of the hazardous substances, pollutants, and contaminants as a principal element, are to be preferred over remedial actions not involving such treatment. The Selected Remedy uses treatment to stabilize PCB contaminated sediment with concentrations 500 mg/kg or greater (considered PTW) prior to off-site disposal. For OU4 residential area, the concentrations of PCBs in soil are below the PTW level, making disposal in an off-site permitted landfill an appropriate remedial approach.

13.6 Five-Year Review Requirements

Because this Selected Remedy will result in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure, a statutory review pursuant to CERCLA section 121(c) will be conducted within five years after initiation of the remedial action and every five years thereafter to ensure that the remedy is, or will be, protective of human health and the environment. If results of the Five-Year Reviews reveal that remedy integrity is compromised and protection of human health is insufficient, then additional remedial actions will be evaluated by the EPA in consultation with ADEM. The statutory Five-Year Reviews will be conducted in accordance with CERCLA Section 121(c) and the NCP and will be consistent with EPA guidance.

14. DOCUMENTATION OF SIGNIFICANT CHANGES

To fulfill CERCLA §117(b) and NCP §§300.430(f)(5)(iii)(B) and 300.430(f)(3)(ii)(A), the ROD must document and discuss the reasons for any significant changes made to the Preferred Alternative identified in the Proposed Plan. Changes described in this section could have been reasonably anticipated by the public from the time the Proposed Plan and RI/FS Report were released for public comment to the final selection of the remedy. Three changes were made to address comments received during the comment period.

First, the floodplain area over which the non-residential soil cleanup level for PCBs (95% UCL SWAC 6 mg/kg over each five-acre decision units) applies was more narrowly defined to Reaches C1 through C4 where unacceptable risk to terrestrial receptors exists. The floodplain in Reaches C5 through C9 will not require sampling or cleanup in five-acre decision units. Concerns were expressed in comments 83 through 85 about the selection of a five-acre decision unit. While the EPA considers the decision unit size based on the foraging range of the receptors (short tail shrew and carolina wren) protected by the cleanup goal to be appropriate, the concern expressed by the PRPs about the extent of re-sampling required to define the area of cleanup was considered. As stated in the BERA, the mink is the only semi-terrestrial species identified as having an unacceptable risk in all reaches. Although the mink is identified as semi-terrestrial, the mink diet was documented in the BERA as being 99% aquatic. The risk from an aquatic diet will be addressed by the sediment cleanup. Because the risk to the mink will be addressed through the sediment remedy, the floodplain soil remedy will only address terrestrial receptor risks. Unacceptable risk to terrestrial receptor risks is only present in reaches C1 through C4.

Second, comment 88 recommended preventing the removal of trees during remediation with a diameter at breasting height (DBH) greater than six inches in the riparian exposure units bordering Choccolocco Creek. This was requested as a means of minimizing damage to this valuable portion of the floodplain ecosystem that also plays a large role in maintaining creek bank stability. This comment was addressed in Section 12.2 of the Selected Remedy Section of the ROD.

Finally , comment 94 references page 75 of the Proposed Plan that states “The timeframe for sediment PRG and RAO attainment is 20 years below Jackson Shoals and 30 years at and above Jackson Shoals.” The PRPs agree that these goals will be achieved and believe that the timeframes presented in the OU4 ROD should be revised to reflect a range of years as opposed to singular milestones. This approach is consistent with the uncertainty for MNR timeframes discussed by USEPA on page 12 of the OU4 FS Addendum. Using the range of times based on the combination of projections included on Figures 10-1 and 10-2 from the OU4 FS, a projection of 20 to 40 years for the entire reach of OU4 would be appropriate based on the wide range of variables affecting MNR.

The timeframe used in the Proposed Plan was identified in the description of the remedy for each alternative in the FS. As pointed out in comment 96, the FS assumed the remedial goal for sediment upstream of Jackson Shoals was 0.2 mg/kg. Since the goal to protect ecological receptors has been identified as 0.1 mg/kg for the entire creek, the time frame was adjusted to 20 to 40 years. This comment was addressed in Section 12.2 of the Selected Remedy Section of the ROD.

PART 3 – RESPONSIVENESS SUMMARY

1. OVERVIEW

This responsiveness summary provides a summary of the public's comments submitted to the U.S. Environmental Protection Agency (EPA) regarding the Proposed Plan for Operable Unit 4 (0U4) of the Anniston PCB Site (Site), and the EPA's responses to the comments. A responsiveness summary is required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) at 40 Code of Federal Regulation (CFR) § 400.430(f)(3)(F). All comments summarized in this document have been considered in the EPA's final decision for the selection of the remedy for OU4.

The EPA has worked closely with community members and other stakeholders throughout the development of the remedial investigation, feasibility study, and Proposed Plan for OU4. Community participation played an essential role in the development of the Proposed Plan and Record of Decision (ROD) for OU4 at the Site.

2. PROPOSED PLAN COMMENTS

Comment 1: I own property in Michael's cove and have no plans to turn over my yard, my creek bank for any digging or remediation. Y'all have screwed up the waterways enough and we want no part of the planned screw ups for this area. Leave the creeks and waterways alone. We have been swimming and fishing these waters for years and I just got a letter about damages to the creek dating back several years. You folks need to leave it be. Nature will take care of it. Do you have any cases of sickness directly related to PCB's? Probably not. So, leave us alone. The last thing we want is for this current government to touch anything we care about.

> **Response:** While the EPA respects your right to disagree, action is needed to reduce the risk to human and ecological receptors to an acceptable level pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or Superfund. The fish polychlorinated biphenyl (PCB) concentrations are not expected to recover to a level that allows for unrestricted consumption without assistance. While you may feel you are not affected, other members of your community as well as fish eating animals may continue to be harmed without EPA intervention.

Comment 2: What is the process for dredging, and will there be heavy equipment located in one particular area or move throughout?

> **Response:** Dredging is a common underwater sediment treatment technology that involves removing contaminated sediment from a body of water without draining or diverting it. The sediment remedy for OU4 involves approximately 12 acres of sediment upstream of Friendship Road and 13 acres of sediment downstream of friendship road, as well as equipment storage and maintenance areas and sediment processing areas. Equipment will be used throughout the 25-acre area, primarily in the upper reaches (C1-C4 in ROD Part 2 Figure 4-1). The project operations area

and sediment processing area will be near the backwater area. The sediment alternative number six (SED-6) process description from the feasibility study (FS) cost estimate provides a good description of the equipment and activities that the community may see as the sediment remedy progresses:

1. Clearing: It is anticipated that approximately eight acres of land will need to be cleared.
2. Site Facilities: Site facilities include all office trailers, storage units, sanitary facilities, light towers, and generators as well as access to water. This estimate also includes the cost for a fuel truck and truck driver to be on-site throughout the project to fuel construction-related equipment.
3. Haul Road Installation and Maintenance: Haul roads will be 12 feet wide and constructed with nonwoven geotextile overlain with a one-foot-thick layer of crusher run. Haul roads will include pull-off areas to allow for two-way traffic along longer stretches of access road.
4. Staging Area Construction: The Staging Area will be a 1-acre area that includes a perimeter silt fence and a chain link security fence. A sediment processing area (SPA) of 0.25 acre will be located within the Staging Area footprint and consist of a high-density polyethylene (HDPE) liner overlain with crusher run and asphalt paving. Six dewatering bins, separated by bin blocks, will be constructed within the SPA. An additional 0.25 acre will consist of an HDPE liner overlain with a three-inch-thick layer of crusher run which will contain approximately 1,200 feet of geotextile tubes (geotubes) for use for water treatment with a polymer used to assist with the dewatering process, a sump, and a water treatment system. The remaining 0.5 acre of the Staging Area will consist of nonwoven geotextile overlain with three-inch-thick crusher run. This portion of the staging area will remain separate from the dredge material side of the staging area and will be used to stockpile clean materials as well as stage office trailers and parking.
5. Support Pad Construction: Eight support pads will be construction for construction operations. Each 0.5-acre support pad will consist of an HDPE liner overlain with a three-inch-thick layer crusher run and will have a bermed perimeter and a silt fence. A sump will be installed to collect water as dredged material passively dewaters on the support pad. It is assumed a vacuum truck (included in line-item No. 12) will collect this water and transport it to the main staging area for treatment. A portion of each support pad will remain separated from dredging activities to allow space to stockpile clean backfill and topsoil material.
6. Dredging: The dredging approach used will depend on the width of the creek. Where all the sediment can be accessed from the creek bank, dredging will be conducted from the edge of the bank or the edge of the water. Where the creek is too wide to reach all targeted sediment from the edge of the bank or water, stone projections (fingers) will be constructed from the edge of the bank to provide access to reach the target sediment. The fingers will be constructed using crusher run overlaid with crane mats. It is estimated between 40% and 60% of dredging will be conducted using fingers. The cost assumes between 220 and 360 cubic yards of sediment will be removed per day depending on the location and method of dredging. Regardless of which dredging method is used, an excavator will load the sediment into an articulated dump truck for transport to the SPA or support pad. The estimate assumes an over-dredge allowance of three inches. Contractor uptime is assumed to be 50% for dredging from the edge of the water and 30% for dredging from the fingers due to slowdowns associated with constructing the fingers. This line item assumes turbidity curtains will be installed downstream

of the dredging operations and downstream of fingers that extend into the creek.

7. Sediment Processing and Loading: This sediment will be taken to the SPA or support pads and load it into dump trucks for off-site transportation and disposal. It is assumed that Portland cement will be added to material dredged from the low-energy backwater area of Choccolocco Creek to assist with dewatering at a dosage of 10% by weight. The Portland cement will be mixed into the dredged material with an on-site wheel loader.
8. Sediment and Creek Bank Soil Off-Site Transportation and Disposal (Toxic Substance Control Act [TSCA]): Dredged material containing PCBs greater than or equal to 50 mg/kg will be transported and disposed of at Waste Management's TSCA disposal facility located in Emelle, Alabama. This includes dredged material (and the associated Portland cement) and material excavated from the bank of Snow Creek in association with creek bank stabilization. The density of the dredged material is assumed to be 1.4 tons per cubic yard, and the density of bank material is 1.5 tons per cubic yard.
9. Sediment and Creek Bank Soil Off-Site Transportation and Disposal (Non-TSCA): Non-TSCA dredged material will be transported and disposed of at Advanced Disposal's Three Corners Regional non-TSCA disposal facility in Piedmont, Alabama. This includes dredged material and the material excavated from the severely damaged bank of Choccolocco Creek (as described in the Feasibility Study) in association with creek bank stabilization. The density of the dredged material is assumed to be 1.4 tons per cubic yard, and the density of bank material is 1.5 tons per cubic yard.
10. Water Treatment: A temporary water treatment plant (WTP) will be constructed. The WTP includes three pumps, 1,000 feet of piping, a multimedia filter unit, a granulated activated carbon (GAC) filter unit, a bag filter unit, and three tanks. The WTP will be operated throughout the duration of the dredging and sediment processing work, and treated water will be discharged into the creek.
11. Backfill: It is assumed a loader will be used to load an articulated dump truck at the SPA and the support pads that will deliver material to the targeted placement area where an excavator will place the backfill material. The backfill placement approach will be dependent on the width of the creek in the same fashion as dredging. Where all the placement area within the creek can be accessed from the edge of the bank or water, backfill will be placed from the edge of bank or the edge of the water. Where the creek is too wide for the entire placement area to be accessed from the edge of the water, backfill placement will use the stone projections (fingers) constructed from the edge of the bank during the dredging process. Backfill will consist of run-of-bank with a target thickness of 12 inches with no over placement allowance.

Comment 3: How will endangered or threatened species be identified before dredging?

Response: EPA and P/S worked with U.S. Fish and Wildlife Service to identify Threatened and Endangered (T&E) species in the past when preparing the sampling plans for the ecological risk assessment. Construction plans will describe the timing and actions needed to protect endangered or threatened species if found to be present in the areas where work will occur. The EPA and the potentially responsible parties (PRPs) will again work closely with Fish and Wildlife and will make sure that designs and actions taken meet the requirements of any permits needed to work in and around endangered species.

Comment 4: Please consider: 1) limiting work to low flow conditions with an objective, monitorable, limit, and 2) put into place monitoring to limit excessive silt migration downstream. Turbidity monitoring, at least, with a hard "stop work" limit.

Response: The EPA will do everything possible to ensure that work is conducted in a way that limits silt migration downstream during dredging activities. Turbidity monitors will be used to monitor surface water quality, and work will be stopped when needed to reduce sediment migration. Many of the details will be finalized during remedial design (RD). Turbidity limits will consider sensitive receptors, such as species, habitats, and activities that might be affected by the dredging. Environmental dredging buckets with specially designed seals can minimize release of sediment during dredging. Fixed monitoring stations can be used to collect background conditions before dredging and used to verify as reference levels during dredging. The EPA will present more information about the remedial design/remedial action (RD/RA) before any dredging occurs.

Comment 5: One organization asked if the plan will start in the next five years and the entirety of the plan will take 30-40 years.

Response: It is hard to put exact timeframes on the total length of time because the properties along Choccolocco Creek are all privately owned, and we will need to obtain access for sampling and any actions that need to be taken. The EPA estimates that it will take a year to negotiate an agreement with the PRPs to perform the work and anywhere from two to five years to design and another three to five years to implement. After that it will require 20-30 years for the sediment concentrations to recover so that fish and surface water concentrations can recover. Overall, your estimates may be close to what occurs.

Comment 6: I am a property owner of contaminated property in Anniston, Alabama. My property is still of no value to me because of the contamination. We are still waiting for cleanup or buy out from the EPA. Please keep me informed of any decisions that have been or will be made that affects me as a property owner.

Response: The EPA has not required any buyouts of contaminated properties at this Site. Residential properties have been identified with surface soil PCB concentrations greater than 1 mg/kg, and all but a few with no access have been cleaned up.

Residential cleanups have focused on cleaning up cleared or developed residential lots that are easily accessible and have an exposure pathway that creates a potential risk to human health for persons accessing these properties. Densely wooded and unimproved, inaccessible properties have not been addressed and cleaning them up prior to clearing or development is not within the scope of the responsible parties' settlement with the EPA. If the property owner clears the trees on any of the referenced parcels for development as a residential property, the soil will be sampled and cleaned up if PCB concentrations are greater than 1 mg/kg. If the property owner clears the trees on any of the parcels for development as a non-residential property, the soil will be sampled and cleaned up if PCB concentrations are greater than 21 mg/kg.

Comment 7: From form letter (#2) from 446 individuals and organizations.
According to experts, Choccolocco Creek has many areas of poor bank stability, yet it is not clear why zones of high PCB contamination in creek banks soils are not completely or substantially removed during implementation of this remedial action.

Response: Creek bank stabilization has been selected to eliminate erosion of banks with PCB concentrations greater than the sediment removal action level. Bank soil may be removed in areas of severe erosion and replaced with clean soil or riprap to stabilize the banks as shown in Figures 40a and 40b of Part 2 of the ROD. The PCB concentrations and the erosion potential of the banks will be considered during remedial design and long-term monitoring to ensure the remedy is protective. The bank soil in erosive areas will need to be lower than 2.6 mg/kg and in nonerosive areas it will need to meet the soil remedial goal for each exposure unit 6 mg/kg.

Comment 8: From form letter (#2) from 446 individuals and organizations.
We believe that PCB-contaminated sediment remains a future risk that local governments and residents will need to be aware of and manage if conditions change in the creek due to major flooding events, creek bank collapse, and changing climate patterns. This imparts long-term monitoring and maintenance requirements, and could have adverse effects to the waterways if these measures fail or falter over time.

Response: The creek bank and sediment remedy requires long-term monitoring and maintenance of eroding creekbanks with PCB contamination greater than the removal action level. Landowners will not be responsible for the bank maintenance in the areas impacted. The EPA will ensure that engineering experts review the remedial design of the creek bank stabilization and the monitoring reports so that appropriate actions can be taken to prevent recontamination once the cleanup is complete.

Comment 9: From form letter (#2) from 446 individuals and organizations.
The erosion protection includes creek banks having potential for minor, moderate, and severe erosion, and where PCB concentrations in these soils exceed 2.6 mg/kg. This is an improvement on the Feasibility Study, which appeared to conclude that erosion protection in ‘minor’ areas was not required. The remedial actions (sediment removal and erosion protection) proposed for Choccolocco Creek are more comprehensive than some of the options that were considered; however, we are concerned that PCB contaminated sediments will remain in the floodplain.

Response: The floodplain is primarily a depositional environment. These soils primarily erode and enter the creek at the banks. Operation and maintenance of the remedy and long-term monitoring should be effective at locating and preventing general floodplain erosion, particularly where PCBs remain at depth below clean backfill.

Comment 10: From form letter (#2) from 446 individuals and organizations.
The inclusion of Conservation Areas within the Choccolocco Creek corridor will assist in implementing Institutional Controls to respond to flooding and erosion, but is not a guarantee that the response will occur or be effective. It is not clear why hot spots of PCB contaminated soils below 6 inches are not removed while this remedial action is being implemented.

> **Response**: Bank stabilization and long-term monitoring in concert with the conservation corridors should provide the actions needed to protect sediment from this source. The FS alternatives to address PCBs concentrations in subsurface soil were eliminated from the Proposed Plan during EPA review because they were not driven by unacceptable risk.

Comment 11: From form letter (#2) from 446 individuals and organizations.
The Pygmy Scuplin (threatened), Blue Shiner (threatened), Fine-lined pocketbook (threatened), Southern pigtoe (endangered), Painted rocksnail (threatened), and Tulotoma snail (endangered) are all species that can be found in the Choccolocco Creek watershed. Sediment severely impacts the above referenced threatened and endangered species. Increased sediment in Choccolocco Creek will smother habitats, reducing the availability of suitable substrates for feeding, spawning, and shelter. It can also clog the gills of fish and mussels, leading to reduced feeding and reproduction from respiratory stress. Additionally, sediment can fill in the crevices and substrates these species use for spawning and shelter. Sedimentation will further threaten the populations of these imperiled species.

> **Response**: In high energy areas of Choccolocco Creek, sediment will continue to move through the creek bed. During RD, it will be confirmed that the rate of sedimentation is not being significantly changed. Representatives of the Natural Resources Trustees (NRTs) were consulted about and were present during previous sediment sampling events. The EPA expects to consult and work with the NRTs throughout the RD/RA to protect any threatened and endangered species and their habitats.

Comment 12: From form letter (#2) from 446 individuals and organizations.
The remedial actions will not immediately return the fishery to a state that fish can be safely consumed by the public. Monitored Natural Recovery and monitoring are proposed, and recovery is estimated to take two to three decades. Community engagement and education efforts will need to be intensified to prepare the public for the spike in PCB loading during the remediation process. It is critical that EPA encourages the Responsible Party to partner with local groups like Coosa Riverkeeper to help disseminate information about fish consumption advisories, impacts creek access during remediation, and field ongoing questions about the remediation process.

> **Response**: Community engagement is an integral part of all Superfund activities. The EPA welcomes help in distributing information to and from any group with ties to the impacted community. The Community Advisory Group (CAG) was formed with members of interested community groups so that those groups could help share site information. The EPA encourages interested groups and stakeholders to participate in CAG meetings. The CAG has the most

current information about site activities and routinely comments on draft documents.

Comment 13: From form letter (#2) from 446 individuals and organizations.
The sediment remediation criteria of 2.6 mg/kg may not be protective of the invertebrates to fish to human consumption pathway. This needs to be better explained in plain language to the public stakeholders.

Response: The remedy relies on dredging to remove the PCB concentrations known to impact benthic invertebrates based on Site-specific sediment toxicity testing. The FS and ROD are clear that monitored natural recovery (MNR) is needed to reduce sediment concentrations to 0.1 mg/kg in order to protect the fish to human consumption pathway. This point will be clarified in future presentations.

Comment 14: From form letter (#2) from 446 individuals and organizations.
Currently there is a DO NOT EAT ANY species fish consumption advisory on Choccolocco Creek. On Logan Martin Lake, there are multiple advisories: do not eat any striped bass, limit 1 meal per month for blue catfish, channel catfish, and spotted bass. According to Coosa Riverkeeper's creel survey data, 74% of Logan Martin Anglers, including those surveyed on Choccolocco Creek, regularly eat fish caught from the Coosa. Additionally, 31 out of 76 responses claimed that the primary fish they try to catch is catfish, which is one of the species associated with having the highest amount of PCB contaminated tissue. To compound this, 66% of those who claimed they eat fish share their catch with members of their community and family. This wider group includes people over 65, youth under 18, and women who may be pregnant or nursing. This means that there are large swaths of people eating contaminated fish tissue that are not represented by our current survey.

During the remediation process, there should be a major increase in public notification and communication as the remediation is taking place. Examples include press releases to local papers of when and where dredging work will be performed, communication with local livery services, publicly accessible data and information at libraries, direct mail, and signs at locations where sediment removal will be taking place to alert the public.

Response: The EPA and the PRPs will develop a robust communication strategy during remedial design. That program will be discussed with the CAG prior to its final approval. As mentioned in the response to comment 12, the EPA welcomes help in distributing information to and from any group with ties to the impacted community.

Comment 15: From form letter (#2) from 446 individuals and organizations.
The scope of work proposed does not include the removal of obsolete structures, such as low head dams. Not only do these structures further impair aquatic ecology, but they also pose a high risk to anyone recreating on the waterbody. Removal of any low head dam or barrier structure will improve sediment load distribution and yield higher dissolved oxygen levels. The low head dam at Jackson Shoals is an unregulated dam that if removed could reconnect an estimated 304 miles of perennial upstream waterways. Including intermittent streams, it's an estimated 676 miles connected.

Although this dam is breached in one small area, fish passage will continue to be an issue with the remainder of the structure left in place. Restoring free passage for fish and invertebrates will benefit migration patterns, leading to more sustainable population growth and a greater diversity of species. Many tributaries within the scope of OU4 also have low head dams or barrier structures such as Coldwater Creek. The low head dam on Coldwater Creek is also unregulated and has greatly altered the natural substrate, further impacting Choccolocco Creek. The benefit to improving fish passage and aquatic connectivity cannot be overstated and should be considered within the scope of this project.

> **Response**: At this point, no structure removals have been identified as being needed to reach CERCLA cleanup levels. If during the RD it is determined that removal is required, it will be conducted as part of the remedy. If not conducted under CERCLA authority, it is possible that removal of the remaining portion of the dam is being considered by the Natural Resource Trustees as part of their restoration activities. The low head dam at Jackson Shoals is owned by the Alabama Power Company.

Comment 16: From form letter (#2) from 446 individuals and organizations.
The Highway 77 boat ramp is the most utilized boat ramp on Choccolocco Creek and is particularly used by subsistence anglers. During the PCB remediation process, our organization would like to see major improvements to this public access point as a way to increase safe access to Choccolocco Creek. Improvements would include the repaving of the parking lot, better road signage, widening and repaving of the boat ramp, replacing the existing wooden docks, and a dumpster available on site. According to our Creel Survey, the majority of Logan Martin anglers believe that signage is the best method to disseminate Fish Consumption Advisory Information.

> **Response**: Though the PRPs may be interested in assisting with improvements to the Highway 77 boat ramp, the EPA cannot select it as a requirement in the ROD. If during RD it is necessary to upgrade aspects of the existing boat ramp and docks, some improvements may result, but that work may not include all of the items listed in this comment.

Comment 17: From form letter (#2) from 446 individuals and organizations.
The monitoring of natural recovery was not specifically detailed in the Feasibility Study, although there were implications that monitoring, and assessment would continue. The proposed Monitored Natural Recovery (MNR) program is vague. The MNR program should be developed in detail to identify what specific sampling and analyses will be completed, how frequent and intense that sampling will be, and what criteria will be used to determine success or failure. Leaving the site with areas to “wait and see” is not protective of human health. More detail needs to be provided to the public for ongoing monitoring efforts and if issues are detected, how they will be addressed.

> **Response:** The FS and Proposed Plan both included detailed Long-term Monitoring Plans to monitor and assess MNR. More specific plans will be developed during RD.

Comment 18: From form letter (#2) from 446 individuals and organizations.
No significant new data was presented with the Superfund Proposed Plan, although additional

investigation is proposed in support of remedial actions associated with creek bank stabilization. Some of the data sets used to inform the Proposed Plan are from the late 1990s through the mid-2010s. This data is insufficient, and our organization looks forward to the EPA having access to more relevant data during the Remedial Design phase. Specific data should be considered that takes into account climate change, any proposed or future development plans along Choccolocco Creek, and hydrologic modeling.

> **Response**: The RD will rely on data collected during the Preliminary Design Investigation (PDI) which will begin soon after the Consent Decree with P/S is entered by the Court. The RD will consider the impacts of climate change, development, and hydrologic modeling.

Comment 19: From form letter (#2) from 446 individuals and organizations.
Choccolocco Creek is currently listed on the ADEM 303(d) List of Impaired Waters. There are a total of 10 impairments along the span of Choccolocco Creek ranging from Pathogens (E. coli), Priority Organics (PCBs), and Metals (Mercury). For the PCB impairments on Choccolocco Creek, all have been designated for the development of a Total Maximum Daily Load (TMDL); however, there has been no update on the status of the creation and implementation of the TMDL from ADEM or how it may play into the remediation process.

> **Response**: The Site contributes to PCB and Mercury contamination. When a TMDL is developed for the OU4 portions of Choccolocco Creek, the impact of the TMDL on the remedy will be evaluated, and if modification of the remedy is required, it will be addressed. The development of a TMDL will be considered during the RD or Five-Year Review (FYR) process depending on when it occurs.

Comment 20: From form letter (#2) from 446 individuals and organizations.
Sediment loading is a leading pollutant in Alabama. Due to higher amounts of land development, natural erosion, and extreme weather events, large concentrations of sediment can enter our waterways and further degrade water quality. Some pollutants can also thrive in sediment such as E. coli and PCBs. The PCB-contaminated sediment is the focus for the EPA's proposed remediation plan, and there should be considerable focus placed on the implementation of Best Management Practices (BMPs) to mitigate unsafe levels of PCBs or pathogens downstream of the Snow Creek/Choccolocco Creek confluence.

> **Response**: The remedy is fundamentally required to address unacceptable levels of PCBs. Pathogens will not be specifically targeted by the remedial actions in this ROD, but state regulators have been working to bring wastewater treatment facilities into compliance to reduce pathogen releases. Restoration of the riparian corridor will be important to preventing unsafe levels of PCBs present in soil from entering the waterways. BMPs will be employed to assist in preventing contaminated soil movement.

Comment 21: From form letter (#2) from 446 individuals and organizations.
A large proportion of the PCB-contaminated soils/sediments will remain in place, which presents

future risks as aquatic and terrestrial conditions change due to flooding, extreme weather patterns, and land development. Our organization would like to see more PCB-contaminated material removed entirely from OU4 to a permitted landfill away from a public waterway.

> **Response**: The PCB remedial action level (RAL) in sediment is 2.6 mg/kg, so remaining sediment PCB concentrations and bank soil PCB concentrations will be relatively low. The PCB remedial goal for floodplain soil is 6 mg/kg and applies to the top 6 inches of soil. There will be PCBs in subsurface soil at higher concentrations. It will be necessary through periodic monitoring to ensure that the 6 inches of backfill placed where soil has been excavated does not erode or get displaced without activation of the Soil Management Plan. There was no unacceptable risk to human or ecological receptors identified that would require additional excavation under CERCLA authority.

Comment 22: From form letter (#2) from 446 individuals and organizations.
Logan Martin Lake should be evaluated for PCB remediation. It is the water body that has and will continue to receive the PCB contaminated sediment that flows down Choccolocco Creek during the remediation process. Much of Logan Martin Lake and several other tributaries are impaired for PCB contamination, but there has been little to no discussion on remediating PCBs from the reservoir.

> **Response**: The EPA expects to conduct studies in Logan Martin Lake to determine if any CERCLA response activities are necessary to address PCB concentrations in sediment. The Site has been investigated from upstream areas to downstream areas so that sources of contamination could be cleaned up, reducing the possibility of downstream recontamination. Logan Martin Lake is at the downstream end of the Site, but its sediment will benefit from all upstream actions to eliminate continuing sources of PCB contamination.

Comment 23: From form letter (#1) from 442 individuals.
World War I marked the arrival of chemical producers in Anniston. In 1929 Theodore Swann Company became the first of two Monsanto facilities that produced PCBs in the United States. In 1935 Monsanto took over ownership of the Anniston Plant and produced PCBs for 41 years. Monsanto suspended PCB production in 1971. In 1990 Calhoun County where Anniston is located ranked among the worst 20% in the United States, in terms of average risk from hazardous air pollution. It was in 1993 that residents of Anniston learned a large bass in nearby Choccolocco Creek was discovered with blistered scales from PCBs. It was traced back to Solutia/Monsanto landfills where there are over 90 million pounds of PCBs buried.

Community members who reside near hazardous waste sites are likely exposed to PCBs via inhalation. Because of limited air sampling data in residential areas, the magnitude of these exposures via inhalation pose an indeterminate health hazard. An adequate air sampling program in Anniston will require a minimum of 10 samples located in various industrial and residential communities at distances up to three miles from the Monsanto/Solutia Plant site landfills. Samplers need to be collected every six days over a minimum of five years.

Response: Ambient air data for the Site have been collected under separate sampling programs spanning a 14-year period. All of the results show some low [nanograms per cubic meter (ng/m3)] PCB concentrations in air that are above the regional screening level. These concentrations present risk at the low end (1 x 10-6) of the EPA risk range, which equates to a 1 in 1,000,000 excess cancer risk. Based on this data, EPA does not believe the ambient air exposure pathway warrants additional sampling.

Comment 24: From form letter from 442 individuals.
Citizens, past and present, are concerned about the population decline that started in 2009. For years we've been concerned about air quality, which was tested in 2012. The test results were unchanged. The fishing ban which was put into effect in 1994 is still active. We know that PCBs can be destroyed by incineration. Our idea is to build the incinerator on the landfills and using the septic tank approach by sucking the PCBs out of the landfills and straight into the incinerator. The EPA said that incineration would destroy 99.9% of these PCBs.

Response: PCB contaminated soil and bulk-waste can be reliably disposed of and contained in a landfill. Even if PCB vapors could be reliably extracted from a landfill, incineration would likely raise similar concerns in the community as the incinerator previously constructed at the Anniston Army Depot. Permitting of incinerators are difficult and not cost effective in this situation when the contaminants can be safely contained.

Comment 25: From form letter from 442 individuals.
The action by the government has been going on for over two decades. Our community has been destroyed and there's no end in sight. The EPA announces proposed cleanup plan for operable unit 4 Choccolocco Creek. Alternative NRS-2 estimated capital cost is $29,445, 000. Estimated O&M costs are $1,400,000. Alternative SED-5 estimated capital cost is $37,100,000. Estimated O&M cost is $13,445,000. ALTERNATIVE SED-7 estimated capital cost is $42.000,000. Estimated O&M cost is $12,000,000. Money is being spent, but the source of all the problems is being ignored.

Response: The EPA has required over $70,000,000 in cleanup in the Anniston community between the NTCRA, OU1/OU2 RA and OU3 RA. The OU4 Choccolocco Creek cleanup will be roughly another $85,000,000. The cleanup started with the facility and adjacent landfills (OU3) which was the original source. There is no source being intentionally ignored. If additional sources are discovered during the cleanup process or the Five-Year Reviews, actions will be taken to address them as soon as possible.

Comment 26: My experience relates to reports of fish kills and observation of fish kills on Choccolocco, as a result of the release of chemicals likely from the Monsanto plant. The only actual fish kill I witnessed was between 1959 and 1961. It was a devastating kill. The site I observed was from the Alabama Highway 77 bridge eastward for approximately a half mile. There were so many dead fish, turtles, and frogs it covered the entire creek from bank to bank in some areas. While all of the typical species were observed the most abundant fish, I noted was a carp like fish that was called a "Red Horse." Runs of Red Horse were noted each year and apparently related to a spawning run as the schools numbered in hundreds of them. While l heard of many fish kills on Choccolocco earlier, this was the only one l observed. I never heard of other fish kills after that one event.

Around the early l 970's a Soil Channelization project was proposed for Blue Eye Creek. There was local opposition to the project. As a result of the opposition a suit was filed in federal court. I attended two hearings on the suit. At the first hearing the judge admonished the proponents of the project for submitting a less than adequate Environmental Impact report. Upon a second hearing he found in favor of the opponents, stating that the preparers of the Environmental Impact report had again failed to file in his words "a less than state of the art" report.

Shortly afterwards a similar Channelization project was performed on Choccolocco Creek. I am not aware of any opposition to that project. the point of this statement being if the Blue Eye Creek Environmental Report was lacking, this one was likely to be suffering the same issue.

While not sure, exactly after that, a suit was filed in regard to the PCBs in the drainage from the Monsanto Plant and into Choccolocco. The concern raised was the channelization project stirred up the PCBs which had been imbedded in the sediment in the creek bed. While it may not have been raised as an issue, the Environmental Impact statement it should have reported the presence of the PCBs in the creek bed. That knowledge may have led to a determination that channelization would have been detrimental to the environment.

My conclusion being that the proposed plan to clean up the contaminated soil and sediment could lead to a repeat of the earlier work on Choccolocco, allowing a further movement of PCBs to locations further down-stream. This plan would suggest a repeat of prior suits in regard to PCBs in the sediment in the creek being disturbed, which otherwise would remain buried.

Response: The EPA will ensure that cleanup plans are prepared and implemented to reduce the opportunity for releases of contaminated sediment. Work will be conducted during drier portions of the year. Sheet piling and silt screens will be used where possible. BMPs at contaminated sites have been developed and improved over the last few decades. Every effort will be made to reduce contaminated sediment movement.

Comment 27: As a recreational waterway advocate, I need to know how to discuss the difference in people and fish. How do I tell people that the water is safe if the soil is undisturbed, and their kids will be ok kayaking?

Response: Fish live in surface water and may ingest sediment while foraging for benthic organisms. In contrast, recreational users of Choccolocco Creek contact sediment infrequently and while in the water, most sediment will easily rinse off the skin. Sampling results show that most of the PCB contamination in sediment is located in the backwater area, which is owned by a land trust. The highest concentration is more than two feet below the sediment surface. Human exposure by incidental ingestion and dermal contact is limited to the top layer of sediments (about six inches below the sediment surface), and the PCB concentrations in surface sediment downstream of the backwater area range from non-detect to 23.8 mg/kg. Average concentrations for reaches C-3 through C-10 range from 2.4 mg/kg in C6 to 0.3 mg/kg in C-9. Sediment poses a low or insignificant increased risk for getting cancer and a minimal risk for noncancer health effects for people who use the river for recreational activities. In addition, the sediments are underwater and, in many cases, unavailable for human contact. For surface water, the highest level of PCBs is below the federal and state drinking water standard for PCBs in public water systems, and poses an insignificant risk for cancer and a minimal risk for noncancer health effects for people who might occasionally ingest the water while swimming or during other recreational uses of the river. Of more concern to human health are potential releases from two wastewater treatment plants located in the upstream reaches of Choccolocco Creek. ADEM continues to work with those facilities to prevent unpermitted releases.

Comment 28: What continued monitoring will take place now, during and after the remediation takes place?

Response: Baseline monitoring of surface water, sediment, and fish will be conducted before cleanup begins. Turbidity of the water will be monitored while the in-creek work takes place. Table 16 in the ROD provides a framework for long-term monitoring of surface water, sediment, creek banks, and fish concentrations in OU4. Monitoring will be conducted until the objectives of the remedial action are achieved.

Comment 29: I work with safety signage and found it odd that the softball and baseball fields were not marked due to the nature of the situation, it makes me want additional signage with warnings. What additional signage will be put into place?

Response: No warning or safety signage is planned for the softball field. There is no unacceptable risk to players or maintenance staff. The 811-utility clearance system and the Soil Management Plan will be used to ensure conditions at the field do not change due to excavation in the subsurface bringing PCBs in soil to the surface.

Comment 30: I was rather baffled that you yourself haven’t thought about how the EPA will communicate during the remediation process, that tells me that currently people are not as informed as they deserve to be. How will you create a safety system during the process to make the community aware and offer full transparency?

Response: The EPA and Solutia have communicated with affected community members since 2000 with door-to-door visits, mailouts, phone calls, meetings, and information repositories. The effectiveness of communications with the community at large have changed drastically since the site project started, as online newspapers are now often less reliable means of reaching some people than social media outlets and since COVID-19 has resulted in more online means of information distribution. The EPA reaches out to active community groups near sites to help get information out in ways that the community feels will be most effective. When EPA develops plans for the work, it will include a communication strategy that utilizes all the tools available to distribute information. The exact form of effective communication tools in 5, 10, or 15 years may be completely different than what is available now. The EPA's Superfund Program has embraced community engagement since the 1980s and will do whatever is necessary to be transparent about the work being performed.

Comment 31: I understand the nature of this catastrophe on the community and want to see a positive outcome. I worry about the shear fact that the people who are most in jeopardy were not represented at the meeting. I do not think it's appropriate to be short or laugh at any of the people who are asking questions. This is a horrible event that's been going on to long and Anniston deserves the hard truth and facts that the EPA is also at this point at fault for such a delayed and outstanding lack of due diligence on your part. Monsanto is a horrible company and greed fuels their need to create a perfectly manicured world. I do see what you are doing, and I know it's a long road I just hope the road goes through the part of town that's often forgotten.

Response: Two proposed plan meetings were held on weeknight evenings in June and July, and two availability sessions/open houses were held on Saturdays in June and July, to answer questions and inform the interested community members about the investigations, alternatives considered, and the proposed alternative. Fact sheets with the dates and times of meetings, and phone numbers and emails for project staff were mailed to all property owners in OU4. Not all people chose to attend the events offered, however, the EPA is always open to trying to find effective ways to communicate with local groups. No one at EPA intended to disparage meeting participants, and we apologize if that was your impression.

Comment 32: The Trustees support the EPA's Preferred Alternative, particularly NRS-2 and SED-6. We believe removing contaminated soil and sediment to achieve the identified Preliminary Remedial Goal and Remedial Action Level in exposure areas relevant to ecological receptors, excavating sediment to the depth of native or unimpacted sediment in high- and low-energy areas, and offsite disposal of excavated soil and sediment will effectively reduce ongoing injury to natural resources related to contaminants of concern.

Response: The comment is noted. The EPA will work cooperatively with the NRT during the RD/RA phases.

Comment 33: Ongoing bird exposure to PCBs should also be considered as part of remedial success monitoring to help ascertain whether risk to the environment has adequately been addressed by the remedy. This is consistent with the CSTAG suggestions from September 2005. An abundance of data has been generated regarding bird PCB exposure, risk, and effects. Data collected by the Trustees in OU4 could be used as a pre-remediation baseline.

Response: Bird exposure was considered when the remedial goal for soil was selected. There is every expectation that the remedial goal will achieve a protective level for a ground-feeding Carolina Wren in the risk assessment, as well as other terrestrial feeding birds (Blue Jay, Mourning Dove, and Red-Tailed Hawk). The EPA will consider the benefit of continued bird monitoring during RD.

Comment 34: Lower Choccolocco Creek is a Strategic River Reach Unit for Aquatic Species of Conservation Concern in Alabama given, the federally listed species it supports. The Trustees would like to see the use of OU4 by listed species, such as the Blue Shiner (Cyprinella Caerulea), Painted Rocksnail (Leptoxis Taeniata), Tulotoma Snail (Tulotoma Magnifica), and Lacy Elimia (Elimia Crenatella) addressed in remedial planning strategies. Doing so could include presence / absence surveys in areas to be remediated to ensure protection, translocating animals away from harm from remedial activities, replacing removed substrate with materials beneficial to species of concern, etc. The U.S. Fish and Wildlife Service can assist with applicable federal consultations, such as the Endangered Species Act, when the appropriate time arises.

Response: EPA and the PRPs worked with U.S. Fish and Wildlife Service to identify T&E species in the past when preparing the sampling plans for the ecological risk assessment. Construction plans will describe the timing and actions needed to protect endangered or threatened species if found to be present in the areas where work will occur. EPA and the PRPs will again work closely with Fish and Wildlife and will make sure that design and actions EPA takes meet the requirements of any permits needed to work in and around endangered species.

Comment 35: The Proposed Plan discusses the use of riprap as part of remedial strategy. The Trustees do not consider the use of riprap "restoration" (e.g., as suggested in Figure 27a); it does not provide ecological functions such as supporting habitat or runoff reduction and causes permanent ecological service losses that are of concern for the Trustees at this Site. The Trustees encourage EPA to minimize the use of rip rap and incorporate bioengineering techniques to the maximum degree possible. Many other proven techniques and examples of ecological engineering that mimic more natural, stable systems are in widespread use. In 2020, the FWS provided information to the Contaminated Sediments Technical Advisory Group (CSTAG) on examples of bioengineered approaches. Briefly, these techniques include longitudinal peak stone toe protection, root wad revetment, weirs, barbs, reforestation, sediment basins, bed sediment collectors, grade control structures and engineered connection with the floodplain. These more natural techniques are self-sustaining and can be more cost effective over rip rap alternative, which would likely include longer term maintenance and replenishment of the stabilization material. These techniques are successfully being employed by EPA at Superfund sites nationwide such as at the Kalamzaoo River in Michigan, Elk River and LaBarque Creek projects in Missouri, Coeur d'Alene River in Idaho, and Tittabawasee River in Michigan, and are being considered at still other sites such as at Big River and Meramec River in Missouri.

Response: The EPA will require the use of natural techniques as much as possible on creek banks. Most of the banks are on private property and will require cooperation from landowners. Hardening techniques are only proposed where severe erosion potential exists.

Comment 36: The chosen remedy does not specify certain design elements, such as the order in which the creek bank and sediment dredging will occur. I assume it will be in the upstream to downstream order and suggest that continuous monitoring for PCBs occur during this process, including the deposition location of any resuspended PCBs. Such monitoring of the deposition location may find that there are increased PCB levels in these areas that warrant removal, including in Logan Martin Lake.

> **Response:** The work will be conducted from upstream to downstream areas. In order to keep work moving, turbidity of the water is monitored. At present, PCBs in surface water can only be accurately measured by collecting water samples and conducting laboratory tests, which first require filtering the sediment from the water and drying and weighing it. This procedure is too time-consuming for monitoring dredge sites, considering the quick feedback required to allow for implementing timely and effective control measures. To achieve this real-time monitoring, turbidity, a measure of water clarity, is typically used instead. Action limits will be determined during RD that will also refine the scope of the needed work. Depositional areas in-stream can be sampled to ensure the RAL is not exceeded. Studies downstream in Logan Martin Lake will be initiated after this OU4 ROD is signed.

Comment 37: Please find the attached information I mentioned on couple of recent projects that may be of interest to you and your team. The first (MD PCB Site) utilized AquaGate+ PAC as an in-situ remedy to address PCBs in lower impact/concentration areas. The Year 1 Monitoring Data is also summarized and revealed significant reductions in 28 Day Bioaccumulation (> 85%) and In Situ Porewater (>90%), which you indicated were primary drivers as you consider/select your final remedy for this site. Data from the 1-year review (along with several other recent projects/pilot studies) has consistently shown that benthic mixing begins almost immediately upon amendment placement and often within 30 days, there is already substantial reduction in pore water concentrations and overall recovery.

There is another project (EPA Region 5 - Thomson Reservoir) currently beginning construction for a 69-acre area where AquaGate+PAC will be used to mitigate PCB concerns through in-situ treatment:

https://www.pca.state.mn.us/news-and-stories/mpca-releases-assessment-of-thomsonreservoir-project-in-st-louis-river-area-of-concern.

https://www.epa.gov/newsreleases/epa-announces-22-million-help-restore-st-louis-riverminnesota

This in-situ treatment remedy was again selected over dredging after considering previous successful applications where PCB concentrations were significantly reduced with minimal environmental/ecological impact.

> **Response**: The information provided was reviewed. A decision was made to remove the sediment in the backwater area to remove principal threat waste (PTW) and prevent future releases of sediment with high PCB concentrations.

Comment 38: I was concern about the Anniston PCB EPA SITE info. My question is some of the person is not able to attend meeting so how we will get this info. And when will you all be conducting another meeting for Anniston being that we had no knowledge of this information could you please let me know as soon as possible we have many questions.

> **Response:** (Provided by email to respondent due to urgency of timing.) The EPA hosted 4 opportunities for the community to discuss EPA's Proposed Plan to address contamination at the Anniston PCB Operable Unit 4. Two Open Houses were held on a Saturday, one in Anniston on June 22nd at the Anniston Meeting Center and the other one on July 20th at the Lincoln Senior Center. Both were held from 10am to 2pm. The EPA also hosted 2 public meetings, one on June 18th and the last one on July 23rd, both meetings were held at the Oxford Civic Center. Three notices about the meetings and open houses were published in the local paper, The Anniston Star, and fact sheets were mailed to hundreds of property owners in OU4, as well as the local community groups in and around Anniston.
>
> The EPA understood that not everyone would be able to attend the meetings offered so we posted a recorded presentation on the website, along with the technical version and summary version of the Proposed Plan Fact Sheet. You may visit the website by clicking: https://www.epa.gov/superfund/anniston-pcb-site. For your convenience, I am attaching the summarized fact sheet that you may share with others. The comment period began June 1st and ends tomorrow (July 30th at midnight) so you still have an opportunity to send in your comments via email to scully.pam@epa.gov.

Comment 39: I live in Pell City, by Logan Martin Lake. I love going to the lake for fishing and swimming, and I especially love taking my dogs to the lake. It's a truly beautiful place. Many of my happiest memories are along the banks of this lake, whether I'm hiking by the dam, fishing on the docks in Pell City, or swimming in a friend's backyard. However, I saw that the plans will involve leaving some PCB contaminants in the soil in several locations, and that has me concerned. It is known that Choccolocco Creek experiences a lot of erosion along its banks. This means that any PCBs left behind could end up once again exposed to the water ways, and be flushed downstream to Logan Martin Lake. From what I know, our lake hasn't been evaluated for cleanup even though we are directly downstream of Choccolocco Creek. These cancer-causing contaminants are flowing into this beautiful lake, effecting the wildlife and the humans that live here. I'd love to hear about what plans there are to evaluate and decontaminate Logan Martin Lake.

My final concern is related to public knowledge. I am thankfully very familiar with looking up water quality and fish consumption guidelines, but many people in my life are not. The fish in Logan Martin Lake are known to have PCB contamination, and yet the knowledge is not well spread. This is incredibly dangerous to public health, as the families that may rely on those fish to stay fed are those least likely to have the knowledge or abilities to access that information.

I would propose a more thorough cleanup of Choccolocco Creek, an evaluation and plan crested for cleaning the Logan Martin Reservoir, and better public health signage and information. Choccolocco Creek is affecting everything downstream of it, as well as the local areas. Logan Martin Lake is a very heavily used lake, and yet there has been no proposals for correcting the issues with it. And the public has very little knowledge of any of this, so there needs to be multiple channels with which to obtain that information.

Response: The EPA appreciates that you are concerned with the amount of PCBs remaining in the environment upstream of your home in Pell City. The dredging of PCBs in sediment and stabilization of eroding PCB contaminated creek banks will be designed to ensure that PCB contamination does not continue to move downstream at concentrations that can harm human health and wildlife. Special studies of PCB impacts in Logan Martin Lake were proposed in the FS for OU4, and it is anticipated that those studies will be initiated after this ROD is approved. The EPA will work with the County Health Departments and the PRPs to improve signage and information distribution in the community.

Comment 40: According to experts, Choccolocco Creek has many areas of poor bank stability, yet it is not clear why zones of high PCB contamination in creek banks soils are not completely or substantially removed during implementation of this remedial action. The EPA identified and selected thirteen areas along Choccolocco Creek for remedial action for sediment. These areas were selected based on data collected between 1998 and 2009 meaning that some data are over 20 years old. With changing climate patterns, creek bank collapse, and flooding events, the sediment in these areas may have moved or accumulated more PCB-laden sediment. Updated data remains necessary to be certain that the maximum possible amount of PCB-contaminated sediment is removed to protect the public and the environment. This contaminated sediment will continue to be a future risk that local governments and citizens need to be aware of as creek conditions change.

Response: See response to comments 7 and 8.

Comment 41: The proposed erosion protection includes creek banks having potential for minor, moderate, and severe erosion, and where PCB concentrations in these soils exceed 2.6 mg/kg. This is an improvement on the Feasibility Study, which appeared to conclude that erosion protection in ‘minor’ areas was not required. The remedial actions (sediment removal and erosion protection) proposed for Choccolocco Creek are more comprehensive than some of the options that were considered; however, we are concerned that PCB contaminated sediments will remain in the floodplain that could impact gardening, providing water for livestock, and other uses.

Response: See responses to comment 9. Residential yards with gardens have been addresses through a non-time critical removal action. If you have specific concerns about larger agricultural areas or access to creek water for livestock, please contact Pam Scully at scully.pam@epa.gov.

Comment 42: Creek Bank Soil Approach

1) A Pre-Design Investigation Sampling Program is given an allowance with each soil remedial

alternative, but this should be a requirement; 2) Two approaches were mentioned for addressing creek bank source control, but the approach that includes minor, moderate, and severe erosion should be selected as it is more protective of creek banks than the other approach; 3) Measures to isolate areas from release where PCB contamination remains in the soil is included, but the contaminated soil should be removed completely where possible; 4) If PCB contaminated soil is to remain in place, there should be considerable thought regarding the monitoring and stabilization techniques used and those techniques should be more detailed and made publicly available in a timely manner; 5) During the Remedial Design (RD) phase, investigations, sampling, and modeling will be conducted, but it is unclear if this will be conducted under the EPA, ADEM, or another agency; 6) The Proposed Plan states that Pilot Design Studies "could" be included in the RD process as a way of evaluating the performance of remedial techniques in the long term, but this should be a requirement to be the most protective.

Response: Sampling is required to implement the remedy. The preferred remedy in the Proposed Plan and the selected remedy in the ROD includes creek bank source control of areas with PCB concentrations greater than 2.6 mg/kg, and minor, moderate, and severe erosion. The work will be conducted under EPA oversight and all data will be reported to ADEM and the CAG. Pilot studies will be required when needed.

Comment 43: Sediment Approach
This section of the Proposed Plan is very vague. Several methods are mentioned as remediation alternatives, but it seems that the alternative selection will be based on site characteristics of each of the thirteen selected areas. We recommend that the EPA establish, with public input, which remedial alternative will actually be used at each remedial area before the remedial process begins. It would also be helpful to better understand how these alternatives will be managed and who will be responsible for their monitoring. This imparts long-term monitoring and maintenance requirements, and could have adverse effects to the waterways if these measures fail or falter over time. The sediment remediation criteria of 2.6 mg/kg may not be protective of the invertebrates to fish to human consumption pathway. This needs to be better explained in plain language to the public.

Response: The selected remedy requires dredging and offsite disposal of sediment with PCB concentrations greater than 2.6 mg/kg. It does not change by reach. There are fewer exceedances of that goal in the downstream reaches.

Comment 44: Dredging
Removing sediment from the sediment footprint will involve dredging in some form. The Proposed Plan lays out a goal limit of 2.6 mg/kg for the selected area concentrations, but there is no guarantee that all contaminated sediment will be taken out. Four alternatives describe complete sediment removal in the lower-energy portions of the backwater area while the other describes removing a 1-foot layer of sediment before it is replaced with another one-foot layer of sand because the "cap" is not properly armored which will eventually wash away downstream. This should return the water level to its appropriate level, but the EPA must enforce and ensure the proper use of Best Management Practices to prevent downstream siltation or disturbance. The caps, not just in this location, but in all

remedial areas of OU4, must be continuously monitored for deficiencies and PCB concentrations to ensure the remedial alternatives are working successfully. Coosa Riverkeeper is concerned about resuspension and release from dredging and understands that creek bank isolation, flow diversion, sheet piling may be required. Those engineered solutions sound great in theory but will rely on variable low flow conditions and cooperable weather patterns. After speaking with other Waterkeepers and experts from the Environmental Protection Network, it is evident that the best method for removing contaminated sediment is through the use of hydraulic dredging. This methodology will cause less sediment resuspension, which would alleviate some of our concerns for downstream communities along Logan Martin Lake.

Response: The EPA will oversee the work and ensure that all work is done in compliance with environmental regulations and BMPs. Many of the details about the best type of dredging equipment for Choccolocco Creek and the monitoring procedures needed for that equipment will be determined during remedial design. The Coosa Riverkeeper has and should continue to attend CAG meetings to receive the most up-to-date RD details and can comment during those meetings if needed. The draft and final plans will be made available to the CAG and TA for the Site, and the CAG typically makes them available to interested parties. The EPA will also make the final documents available on the Site website: https://www.epa.gov/superfund/anniston-pcb-site.

Comment 45: Backfill
Replacing areas where sediment has been removed with clean backfill seems to be a regular occurrence under this remedial work. Our comments regarding the use and monitoring of Best Management Practices still stand, but we would also like to see the EPA address the changes in creek morphology as this could affect recreational pathways.

Response: There is no plan to change recreation pathways in Choccolocco Creek. Creeks will naturally wander, and the bank stabilization and monitoring plan will take any potential creek morphology changes into account.

Comment 46: Off-Site Disposal
The Proposed Plan details plans for the disposal of soil and sediment to be transported to staging areas, dewatered, and then transported to an offsite, licensed landfill. This is what Coosa Riverkeeper would like to see for all PCB-laden soil and sediment in OU4, and we appreciate that the EPA seems to be moving toward that approach. However, there is no mention of safety precautions that will be required during these operations. Coosa Riverkeeper would like to see that the trucks carrying soil and dewatered material be covered to prevent dust release and ensure all staging areas are lined to prevent further contamination. Any staging or holding areas for the removed material should be lined or covered to prevent runoff in rain events. We hope to see an updated traffic study for this area to have a better understanding of the traffic impact during remediation as well. Coosa Riverkeeper also has concerns for the safety of the workers handling this contaminated material, the public, and the potential for release during transport off site.

Response: All of the health and safety concerns and transportation concerns expressed will be addressed in the RD and RA workplans that are always required for environmental remediation projects. The draft and final plans will be made available to the CAG and TA for the Site, and the CAG typically makes them available to interested parties. The EPA will also make the final documents available on the Site website: https://www.epa.gov/superfund/anniston-pcb-site.

Comment 47: Principal Threat Waste (PTW)
Sediment classified as PTW is any PCB-contaminated sediment with concentrations above 445 mg/kg. To put this number in perspective, the remedial action limit is 2.6 mg/kg. This means that this sediment is extremely toxic. This classification applies to a quantity (228 cubic yards) of sediment in the backwater area of OU4. This is said to be in a low energy area but near higher population densities. According to this section in the Proposed Plan, the success of this remedy will determine the success of the entirety of OU4 remediation. There should be no discussion needed for determining how much of this material will be removed as the answer must be all. We believe that any material with such a high concentration of PCBs as this should be completely removed and not be left underneath a cap that could fail and cause future contamination or downstream effects. For this reason, SED-7 would be the preferred alternative as this would ensure that the higher toxicity levels are mitigated through treatment of this waste.

Response: The Preferred Alternative SED-6 requires complete removal of the PTW and treatment with cement prior to shipment to an offsite disposal facility. SED-7 requires shipment of the sediment to an offsite incineration facility. Incineration facilities are much farther away and would create potential unreasonable risks to other communities during transit for no additional risk reduction to the Anniston community. For those reasons, SED-6 was selected instead of SED-7.

Comment 48: Monitored Natural Recovery is Vague
During the July 23 EPA Hearing, an EPA representative said "[Choccolocco Creek] hasn't fixed itself yet," when referring to the creek's PCB concentrations still being high after fifty-four years since the production of PCBs ceased at OU3. This comment concerns our organization because the process of Monitored Natural Recovery (MNR) is just that—a wait-and-see approach to remediation. It is the opposite of taking action, by relying on clean sediment to cover contaminated sediment. That should not be considered a realistic approach to remediating PCB-laden sediment. Much of the remedial action being selected by the EPA relies heavily on Monitored Natural Recovery as a protective condition once the contaminated material from the designated "hotspots" have been removed. While this condition is mentioned in the proposed plan, there is insufficient detail provided to give confidence in its effectiveness. As a result, Coosa Riverkeeper has an overall lack of confidence in this process achieving the remedial goals. The final remedy should include measurable goals detailed over time such that the public can assess whether sufficient progress towards overall cleanup objectives is being achieved; if not, what alternatives may be pursued to protect the public and the environment.

Two of the biggest disadvantages of MNR are that contaminated sediment will be left behind and it is a slow process that does not prioritize the magnitude of the human health risks. It seems that EPA is both highlighting the human health risks for ingesting fish while also proposing to only remediate roughly 20.4% of Choccolocco Creek's shoreline under the SED-6 preferred alternative. According to the information provided in the proposed plan, MNR is projected to take 20-30 years. This community has waited long enough to get a proposed plan and now they must wait another generation to “wait-and-see” through MNR after the active work is completed over the next decade. The EPA must address this lengthy timeline for MNR and provide the public with greater detail to ensure realistic expectations. The public needs to understand that this will not be a speedy process or that this work will immediately result in safe PCB levels. Any remedy that leaves contaminated sediments behind will certainly include future risks for re-entry of PCB laden sediment into the water column. The EPA should require the PRP remove all contaminated sediment rather than relying on MNR as a remedial solution.

MNR is not a guarantee for total system recovery as much of the site-specific information is unknown or based on outdated data. Selective removal is a localized benefit. Coosa Riverkeeper does not think that recent clean soil deposition should equate to effective remediation.
Pre-design sampling should be conducted by the EPA before remediation to obtain newer data that is more indicative of current site conditions and concentrations so that the maximum amount possible of contaminated sediment is removed. If site remediation will rely on this older data, there could be gaps or errors in the accuracy of identifying all the areas to remediate.

If contaminated sediment is left behind, the EPA should provide a response plan that includes public notification and communication for when, NOT IF, PCB-laden sediment is released into the waterways caused by in-stream work that could impact downstream communities on Choccolocco Creek and Logan Martin Lake. The EPA must work diligently with the local government to build confidence in the success of this plan when so much is left in question. It is concerning to not know the actual monitoring details behind the MNR process. The monitoring frequency, schedule, goals, and notification of MNR should be given more detail and further consideration.

MNR should directly address whether recovery is occurring over the specified timeframe and the EPA should provide progress reports to demonstrate this. Sampling frequency should be based on expected post remediation conditions and contaminant of concerns trends to provide an appropriate basis for remedy decisions. The sample collection frequency should be based on the individual conditions in each area post remediation, not a one size fits all sampling regime. It is mentioned in the Feasibility Study that post-remediation monitoring is planned at one year, three years, and five years with monitoring to follow every five years after. This seems to be typical for MNR, but there is no discussion of how this timing reflects the site’s expected changes in concentrations or how the timing could support remedy effectiveness decisions.

It is important to note that there are also only four stations selected for monitoring along 37 miles of Choccolocco Creek. Monitoring locations should be selected based on the remedy for a particular segment of the impacted waterways. This is a much smaller sample size than would be expected for such a long section of creek and, according to our experts, it is not an adequate number of sample sites for determining remedial success. To put that into perspective, that would be one monitoring station for every 9.25 miles of creek. This cannot possibly be indicative of success as this is leaving a lot to speculation on PCB concentrations or why so few stations are selected for monitoring. It is not enough to only rely on time to fix this issue. There need to be recovery rates or goals established to quantify the success of this process in the long term.

Response: Most sediment remedies rely on a combination of dredging, capping (with or without in-situ treatment), and MNR. The selected remedy uses dredging and MNR. For comparison purposes, the EPA calculated what dredging would be needed to eliminate the need for MNR. The analysis is included in the FS Addendum in the OU4 Administrative Record. The analysis indicates that the remedy could achieve the proposed protective cleanup levels with an additional 33 acres of sediment remediation. The increased remedy footprint could restore the sediment in less time, but would likely generate more habitat disruption and opportunity for sediment resuspension and transport downstream. While it seems logical to assume it is better to dredge all PCBs in sediment now and not rely on MNR, the value of sensitive habitats or areas where endangered species exist may outweigh the benefits of removing the contamination. The EPA decided to move forward with the 25 acres of sediment remediation proposed in the FS.

The most significant feature of MNR is the monitoring. The Proposed Plan (Table 9) and ROD (Table 16) provide an overview of what should be included in the plan, but much greater detail will be developed during RD. There are nine monitoring locations identified in the Proposed Plan and ROD, not four. If additional stations are needed to monitor recovery, they will be added. It is expected that the results of the monitoring will guide changes needed in monitoring.

Comment 49: LTMP Sediment Sampling to Support MNR

If sediment sampling will only be performed in the top six inches of sediment, there could be more PCB contamination past that threshold. While it is great to mention the use of sediment sampling post-remediation, certain details of the sampling are excluded such as the total number of samples, who will conduct the sampling and "own" the data, or whether the data would be indicative of each of the thirteen remediation "hotspots." We encourage the use of publicly available progress reports and concentration goals to create a realistic recovery rate for the post-remediation process and ensure the public that there is progress being made.

Response: The details requested will be developed during RD and sampling data and reports will be shared periodically. The community will have an opportunity to get more information about the RD and RA before work begins.

Comment 50: LTMP Creek Banks

The plan suggests that there will be erosion monitoring after significant flow events or a minimum of annual monitoring. Please define a "significant flow event" and any data points that inform the rationale such as precipitation, flooding, etc. Monitoring after every significant rain event versus once per year is a stark contrast and reiterates our concerns. There should be greater detail in the frequency of this monitoring, and we suggest the creation and implementation of sampling schedules. Our organization is concerned that some of the work proposed could result in the widening of the creek and the resulting impacts to aquatic life.

Response: A significant flow event is a rainfall event that could cause damage to the remedy, which may change as climate impacts lead to storms of higher intensity. There will be greater detail provided about the schedules and criteria for monitoring of creek banks during RD. The existing nature of the creek will be maintained as much as possible.

Comment 51: LTMP Sediment Traps
One organization would like to have a better understanding of the sediment trap deployment locations, the data collection, and discussion of whether these traps could impede recreation. Who will be responsible for maintaining these devices? High velocity or flashy creeks have impacts on turbidity curtains, silt screens, and booms. These BMPs are only as effective as the maintenance and attention to detail of the contractor.

Response: There will be greater detail provided about sediment trap locations, maintenance, and data collection during RD. Every effort will be made not to impede recreation. The PRPs will be responsible for maintaining the devises. BMPs will be used.

Comment 52: LTMP Surface Water Sampling
One organization wanted more surface water sampling stations that are evenly distributed along Choccolocco Creek (Ex: one station per so many feet, yards, miles, etc) to have the best understanding of concentrations in each reach.

Response: There will be greater detail provided about surface water monitoring locations during RD. The current proposal is to monitor surface water at fish sampling locations in order to better understand the fish data as well as attain compliance with ARARs.

Comment 53: LTMP Fish Sampling
Our primary concern relating to fish sampling is over the development of concentration goals or expected recovery rates. We strongly support that the EPA is including fish sampling as part of the LTMP, but there is a lack of discussion of any objectives relating to fish concentrations.

According to 1996 fish tissue data collected by ADEM, the highest concentrations of PCBs were 38.4 mg/kg in Spotted Bass. The PRG for PCBs in fish tissue is 0.08 mg/kg ww and 0.04 mg/kg ww for the upstream and downstream stretches of Jackson Shoals on Choccolocco Creek. The whole body PRG in fish is 1.3 mg/kg dw. We recommend the development of concentration goals or criteria to have a better idea of the expected rate of recovery and to quantify any reductions in PCB concentrations in fish.

Response: There will be greater detail provided about fish monitoring during RD. The PRG concentrations identified in the comment are the cleanup levels.

Comment 54: LTMP Downstream Impacts on Logan Martin Lake
Choccolocco Creek is currently listed on the ADEM 303(d) List of Impaired Waters. There are a total of

10 impairments along the span of Choccolocco Creek ranging from Pathogens (E. coli), Priority Organics (PCBs), and Metals (Mercury). For the PCB impairments on Choccolocco Creek, all have been designated for the development of a Total Maximum Daily Load (TMDL); however, there has been no update on the status of the creation and implementation of the TMDL from ADEM or how it may play into the remediation process.

Response: As stated in the response to Comment 19, the Site contributes to PCB and Mercury contamination. When a TMDL is developed for the OU4 portions of Choccolocco Creek, the impact of this contamination will be evaluated and if modification of the remedy is required, it will be addressed. The impact of a PCB or Mercury TMDL will be considered during the RD or FYR process, depending on when it occurs.

Comment 55: Choccolocco Creek and Logan Martin Lake both have a variety of use classifications ranging from Fish & Wildlife to Swimming/Whole Body Contact. The current approximate remediation zone does not sufficiently address the downstream impacts of PCBs in the sediment on Logan Martin Lake. PCB-laden sediment from Choccolocco Creek continues to flow into Logan Martin Lake resulting in an impairment status for PCB contaminated sediment on the entirety of the reservoir. This impairment has been in place since 1998. Sediment from Choccolocco Creek/Snow Creek accumulates and contributes to ongoing contamination in the lake, exacerbating the issue with high PCB levels in sediment and fish causing an impairment of PCB contaminated sediment.

Sediment loading is a leading pollutant in Alabama. Due to higher amounts of land development, natural erosion, and extreme weather events, large concentrations of sediment can enter our waterways and further degrade water quality. Some pollutants can also thrive in sediment such as E.*coli* and PCBs. The PCB-contaminated sediment is the focus for the EPA's proposed remediation plan, and there should be considerable focus placed on the implementation of Best Management Practices (BMPs) to mitigate unsafe levels of PCBs downstream of the Snow Creek/Choccolocco Creek confluence. Coosa Riverkeeper has seen the impacts of high velocity or flashy creeks on the installation of turbidity curtains, silt screens, and booms and recognizes that BMPs are only as effective as the maintenance and attention to detail of the contractor.

We're concerned that ADEM's historic weak enforcement and field inspections will leave Coosa Riverkeeper as the only entity holding contractors accountable for any BMP failure or mismanagement.

This plan will leave a large proportion of the PCB-contaminated soils/sediments remaining in place, which presents future risks as aquatic and terrestrial conditions change due to flooding, extreme weather patterns, and land development. Our organization would like to see more PCB-contaminated material removed entirely from OU4 to a permitted landfill away from a public waterway. Logan Martin Lake should be evaluated for PCB remediation. In a recent public meeting hosted by Coosa Riverkeeper, an Eastman representative said, "eight miles of creek bank deal with 97% of the PCB loading of the creek bank." This fact seems to justify the dredging and remediation at thirteen hotspots but ignores the downstream impairments from PCB contamination. Much of Logan Martin Lake and several other tributaries are impaired for PCB contamination, but there has been little to no discussion on remediating PCBs from the reservoir. It is unfair for downstream communities to continue to be impacted by PCB contamination through sediment and fish tissue yet not be included in the remediation plan.

Response: Special studies of PCB impacts in Logan Martin Lake were proposed in the FS for OU4, and it is anticipated that those studies will be initiated after this ROD is approved. Data collected 20 years ago indicates that PCB concentrations in sediment tend to settle out in the embayment area (reach C-10 of OU4), and PCBs are also buried beneath sediment in the old riverbed and behind the dam. New data needs to be collected to determine if any actions are needed to address PCBs in sediment in additional areas. EPA, ADEM, and the PRPs will work collaboratively to properly inspect and maintain the CERCLA response measures that will be implemented pursuant to the OU4 ROD.

Comment 56: One organization expressed concern that there needs to be better communication between EPA and Alabama Department of Environmental Management (ADEM). TMDLs have not been developed for Choccolocco Creek, and many waterways across the state are historically and chronically impaired.

Response: EPA is aware that TMDLs are needed for PCBs, Mercury, and pathogens on Choccolocco Creek. The purpose of this Superfund remedy is to reduce the impact of the facility on water quality in Choccolocco Creek to an acceptable level. Nothing being addressed by this remedy will interfere with the development of other TMDLs. ADEM's waste program receives all the data from this Site. The PDI and LTM data will support the development of the Choccolocco Creek TMDLs, if needed.

Comment 57: The Pygmy Sculpin (threatened), Blue Shiner (threatened), Fine-lined pocketbook (threatened), Southern Pigtoe (endangered), Painted Rocksnail (threatened), and Tulotoma snail (endangered) are all species that can be found in the Choccolocco Creek watershed, including OU4. Sediment severely impacts the above referenced threatened and endangered species. Increased sediment in Choccolocco Creek will smother habitats, reducing the availability of suitable substrates for feeding, spawning, and shelter. It can also clog the gills of fish and mussels, leading to reduced feeding and reproduction from respiratory stress. Additionally, sediment can fill in the crevices and substrates these species use for spawning and shelter. Sedimentation will further threaten the populations of these imperiled species. Coosa Riverkeeper has concerns about some of the potential in-stream remediation work that could impact these fragile populations.

Response: Sedimentation is a natural process that is occuring in Choccolocco Creek. Representatives of the Natural Resources Trustees (NRTs) were consulted about and present during previous sediment sampling events. The EPA expects to consult and work with the NRTs throughout the RD/RA stages to protect any threatened and endangered species and their impacted habitats.

Comment 58: Multiple ecological receptors were noted to be impacted by PCB contamination, yet the indicator species of frogs and amphibians were not tested. Although we know that birds, mink, and otters have higher PCB concentrations due to their diets, we believe that frogs and amphibians should also be considered for further study. USFWS recently conducted a study of aquatic species in Choccolocco Creek, with a report to be published soon. Coosa Riverkeeper encourages the EPA to use the study to inform the proposed work, ensuring the highest level of protection for threatened and endangered species.

> **Response**: For reptiles and amphibians, representative species were not identified because a lack of available toxicity data prevents species-specific evaluation of this group. New studies that are relevant are always considered in work being performed through EPA response actions.

Comment 59: The scope of work proposed does not include the removal of obsolete structures, such as low head dams. EPA has taken such actions at other Superfund sites including the Housatonic River in Massachusetts. These structures are likely surrounded by PCB contaminated sediment. Not only do these structures further impair aquatic ecology, but they also pose a high risk to anyone recreating on the waterbody. Removing dams can significantly improve water quality, increasing dissolved oxygen, re-establishing natural water temperature patterns, and reducing downstream erosion. Dam removal restores habitat for species such as those that formerly thrived in shoals long ago flooded by impounded waters. Removal of any low head dam or barrier structure will rapidly restore stream ecosystem processes including sediment transport, flow patterns and floodplain functions. The U.S. Fish & Wildlife Service (USFWS) lists dams and water diversions that change hydrologic conditions and prevent habitat connectivity as a high threat to threatened and endangered species such as the ones referenced in the section above.

Recommendations for dam removal come from a local, state, and federal level. Conversations with agencies regarding the removal of Jackson Shoals dam are positive, and there is enough support from partner groups in the region to make this a feasible solution to improving natural ecology in Choccolocco Creek.

The low head dam at Jackson Shoals is an unregulated dam that, if removed, could reconnect an estimated 304 miles of perennial upstream waterways. Including intermittent streams, the result is an estimated 676 miles connected. Although this dam is breached in one small area, fish passage will continue to be an issue with the remainder of the structure left in place. Restoring free passage for fish and invertebrates will benefit migration patterns, leading to more sustainable population growth and a greater diversity of species. Many tributaries within the scope of OU4 also have low head dams or barrier structures such as Coldwater Creek. The low head dam on Coldwater Creek is also unregulated and has greatly altered the natural substrate, further negatively impacting Choccolocco Creek. The benefit to improving fish passage and aquatic connectivity cannot be overstated, and should be considered within the scope of this project.

> **Response:** See response to Comment 15.

Comment 60: The commenter would like to see major improvements to Highway 77 boat ramp as a way to increase safe access to Choccolocco Creek and inform the public of the potential risks from fish consumption and contact with the contaminated sediments. Improvements would include, but not be limited to the repaving of the parking lot, better road signage, widening and repaving of the boat ramp, replacing the existing wooden docks, and a dumpster available on site. The majority of Logan Martin anglers believe that signage is the best method to disseminate Fish Consumption Advisory Information.

Response: See response to Comment 16.

Comment 61: No significant new data was presented with the Superfund Proposed Plan, although additional investigation is proposed in support of remedial actions associated with creek bank stabilization. Some of the data sets used to inform the Proposed Plan are from the late 1990s through the mid-2010s. These data sets are insufficient, and our organization looks forward to the EPA having access to more up-to-date relevant data during the Remedial Design phase. Specific data should be considered that takes into account climate change, especially the potential for extreme weather events that would impact streamflow or location, any proposed or future development plans along Choccolocco Creek, and hydrologic modeling. This community is concerned about the timeline and potential changes to this plan once newer, more relevant data is available.

Response: The Preliminary Design Investigation (PDI) will include the collection of data on which the design is based. When the remedial design is complete, the EPA will present the new data, the design plans and the remedial action process to the community in meetings and information sessions. The effects of climate change will be considered in the remedial design. Any changes from the Selected Remedy will be documented as necessary. More importantly, remedial action schedules will be formed and shared with the community based on any new data and the remedial design components.

Comment 62: One commenter requested the EPA post and maintain fish consumption advisories in multiple languages, as it does at other contaminated sediment sites, as part of the remedial design since our state public health department will not. In addition, the commenter requested that EPA and the PRP communicate and share its data with Alabama's state toxicologist, Dr. Guárico. The commenter stressed that people are eating fish even though the warnings are in place on Choccolocco Creek and Logan Martin Lake.

Response: The EPA agrees that many anglers may be eating contaminated fish even though fish advisories are in place. The EPA and the Alabama Department of Public Health (ADPH) and the PRPs will continue to inform people about the advisories. The Alabama state toxicologist is welcome to all data collected. The EPA and the PRPs will discuss adding additional languages to the fish advisory signage with the health department and follow their guidance.

Comment 63: On comment proposed performance standards and a timeline for the long-term monitoring plan as follows.

Phase 1: Initial Assessment and Baseline Establishment (Year 1):

- Conduct a comprehensive survey to determine baseline PCB concentrations in fish tissue across different species and locations within Choccolocco Creek.
- Establish baseline levels to determine current average PCB concentration in fish tissue for popular game fish (e.g. crappie, catfish, spotted bass) and share data with state toxicologists. Fish tissue samples should consider gender, lipid content of the fish due to seasonality, and fish migration.
- EPA/Solutia to partner with local groups like Coosa Riverkeeper to disseminate fish consumption advisories in multiple languages and formats, including press releases, signage, direct mail, and publicly accessible data at libraries.

Phase 2: Initial Remediation and Monitoring (Years 2-4)

- Implement initial remediation strategies such as sediment dredging and stabilizing creek banks.
- Monitor PCB and mercury concentrations in fish tissue annually to assess the impact of remediation activities to determine if there is any decrease in PCB concentration from fish tissue at that particular stage of remediation. Fish tissue samples should consider gender, lipid content of the fish due to seasonality, and fish migration.
- Post localized fish consumption advisories quarterly in multiple languages and formats, including press releases, notices through school districts, signage, paid ads, direct mail, and publicly accessible data at libraries.
- Depending on project status, begin proposed restoration projects on Choccolocco Creek including the dam removal above Jackson Shoals and revitalization of the Highway 77 boat ramp.
- EPA/Solutia to partner with local groups like Coosa Riverkeeper to disseminate fish consumption advisories in multiple languages and formats, including press releases, signage, direct mail, and publicly accessible data at libraries.

Phase 3: Stabilization and Intermediate Remediation (Years 5-8)

- Continue dredging and implementing stabilization measures such as erosion control and sediment management within OU4.
- Conduct extensive, annual fish tissue and sediment monitoring to assess progress and refine remediation strategies where remediation has been completed, making adjustments as needed. Fish tissue samples should consider gender, lipid content of the fish due to seasonality, and fish migration.
- Monitor PCB and mercury concentrations in fish tissue annually to assess the impact of remediation activities to determine if there is any decrease in PCB or mercury concentration from fish tissue at that particular stage of remediation.
- Post localized fish consumption advisories quarterly in multiple languages and formats, including press releases, signage, paid ads, direct mail, and publicly accessible data at libraries.

- Begin evaluating potential capping or additional remediation activities if necessary.
- Achieve a 25% reduction from baseline PCB concentrations in fish tissue (e.g., if baseline is 1.0 mg/kg, aim for 0.75 mg/kg).
- EPA/Solutia to partner with local groups like Coosa Riverkeeper to disseminate fish consumption advisories in multiple languages and formats, including press releases, signage, direct mail, and publicly accessible data at libraries.

Phase 4: Advanced Remediation and Habitat Restoration (Years 9-15)

- Focus on advanced remediation techniques and habitat restoration to support ecosystem recovery.
- Monitor PCB and mercury concentrations in fish tissue annually to assess the impact of remediation activities to determine if there is any decrease in PCB or mercury concentration from fish tissue at that particular stage of remediation. Fish tissue samples should consider gender, lipid content of the fish due to seasonality, and fish migration.
- Post localized fish consumption advisories quarterly in multiple languages and formats, including press releases, signage, paid ads, direct mail, and publicly accessible data at libraries.
- Engage in community outreach and education to inform the public about progress and safety.
- Achieve a further 25% reduction in PCB concentrations in fish tissue from Phase 3 levels (e.g., from 0.75 mg/kg to 0.56 mg/kg).
- EPA/Solutia to partner with local groups like Coosa Riverkeeper to disseminate fish consumption advisories in multiple languages and formats, including press releases, signage, direct mail, and publicly accessible data at libraries.

Phase 5: Long-Term Monitoring and Final Cleanup (Years 16-20)

- Conduct final cleanup activities, ensuring long-term stability and prevention of recontamination.
- Begin transitioning to long-term monitoring and maintenance.
- Assess the need for any additional remediation efforts based on ongoing monitoring data.
- Monitor PCB and mercury concentrations in fish tissue annually to assess the impact of remediation activities to determine if there is any decrease in PCB or mercury concentration from fish tissue at that particular stage of remediation.
- Post localized fish consumption advisories (as long as they are still in effect) quarterly in multiple languages and formats, including press releases, signage, paid ads, direct mail, and publicly accessible data at libraries.
- Engage in community outreach and education to inform the public about final clean up and long-term monitoring efforts.
- Reach the U.S. EPA's threshold for unrestricted fish consumption (e.g., 0.05 mg/kg or 50 ppb).

- EPA/Solutia to partner with local groups like Coosa Riverkeeper to disseminate clean-up information in multiple languages and formats, including press releases, signage, direct mail, and publicly accessible data at libraries.

Phase 6: Post-Remediation Monitoring and Maintenance (Years 21-30)

- Conduct regular monitoring to ensure PCB levels remain below target thresholds.
- Implement adaptive management strategies as needed to maintain low PCB concentrations.
- Continue public engagement and update fish consumption advisories as necessary.
- Engage in community outreach and education to inform the public about final clean up and long-term monitoring efforts.
- Maintain PCB concentrations below the EPA's preliminary remediation goals (PRGs): 0.08 mg/kg upstream of Jackson Shoals and 0.04 mg/kg downstream of Jackson Shoals.
- EPA/Solutia to partner with local groups to disseminate clean-up information in multiple languages and formats, including press releases, signage, direct mail, and publicly accessible data at libraries.

Response: The Proposed Plan provided a conceptual Long-Term Monitoring Plan. The final plan will be fully developed during the RD. This recommendation will be considered during that process.

Comment 64: Several organizations expressed disappointment in the community engagement efforts conducted by EPA. They pointed out that the EPA is not a member of the community, and not knowledgeable about the community, river users, or best way to encourage people to submit comments that are meaningful to the agency. They suggested that EPA rely on local environmental groups to supplement public outreach efforts. They pointed out that libraries identified as information repositories were not notified or briefed on the issue, the website, and the materials provided by EPA. They referred to deficiencies recently found by the Office of the Inspector General in EPA Region 7. The OIG found the region to have not effectively engaged with a community regarding a Superfund site. The organizations suggested that the community engagement process and comment period have lacked meaningful community engagement for the Anniston PCB site.

Response: The EPA offices are located in 10 cities and Washington D.C. Superfund Sites are located across 50 states and numerous territories. The EPA recognizes staff do not normally reside in all communities where Superfund sites are located. For that reason, Community Involvement Plans are developed, Community Advisory Groups are formed, and Technical Advisors are funded. The Community Advisor Group (CAG) in Anniston is always looking for new members and organizations to work with to get information out the community. The CAG and EPA provide information on websites, send out flyers and fact sheets, and advertise regular public meetings. Methods for reaching stakeholders in communities are always changing. By involving local community groups, the EPA hopes to reach all interested parties.

Comment 65: EPA, like many other federal agencies, is not always well received in Alabama. The communities around the Anniston PCB site have extra mistrust for EPA and PRP considering the heated legal battles, misinformation, and long timeline for remediation for this project. Meanwhile, families continue to eat fish from local waterways and communities are still negatively impacted by this legacy pollution. Many of these communities are considered in the 80+ percentile of Environmental Justice communities by Executive Order 12898 on Environmental Justice according to the EPA EJ Screen. The commentor would like to play a role in developing general communications, public notification, and social media campaigns. For example, studies show that it is "low risk" but not "no risk" when it comes to swimming in waters with PCB-laden sediment. Although the human health risk shows that ingestion of fish is the primary pathway to PCB exposure it does not mean that families' concerns should be completely ignored or dismissed. Given the fact that the PRP is spending over $85 million dollars, we expect that some of that money will be used to develop a meaningful public communication plan that includes information being shared through digital and non-digital options. With Alabama's literacy ranked among the lowest in the country, it is critical that auditory arrangements to learn this information are also available, such as in-person presentations, public service announcements on local radio stations, robo-calls, or other options that provide equitable access to this critical information.

Response: The EPA tries to establish relationships with local groups to help keep communities informed. That is why a CAG was established. We welcome help from local organizations and local government in getting information out to citizens, including the commentor's organization. EPA has participated in radio interviews, television interviews, newspaper interviews, Chamber of Commerce meetings, and multiple community group meetings. In addition, EPA has sponsored meetings and open houses to answer questions one-on-one with community members. The EPA, PRPs and the members of the CAG have gone door-to-door in the affected neighborhoods to answer questions and ensure to residents that the cleanup is conducted with as little negative disruption to people's lives. Those countless outreach efforts to inform the community about activities that are taking place, particularly those who are impacted personally by the cleanup activities will continue. All local organizations that find it part of their mission to support this cleanup are encouraged to join the CAG to help EPA distribute important information to the community.

Comment 66: Concern was expressed about the lack of public input on the Five-Year Reviews. The commenter requested that EPA consider a public feedback or comment period after each Five-Year Review.

Response: The EPA is always open to comments on Five-Year Reviews or any other documents. The EPA publishes a notice every year about what reviews will be conducted that year. As mentioned during the Proposed Plan public meeting, the second Five-Year Review for the Anniston PCB Site is due to be complete in September 2025. When the review is complete, the EPA is happy to meet and discuss the review and hear any comments about the review from the community. The first review was discussed with the CAG in 2020. Due to COVID, no in person meetings were held, but barring another pandemic, the EPA is happy to meet with the community during or after the review. The EPA expects that interest in the review will increase as additional work is completed. Outreach plans and informational meetings can be adjusted to suit community interest as needed.

Comment 67: I own land on Choccolocco Creek in the Jackson Shoals area. I have fished and paddled Choccolocco most of my life. I have also fished and eaten fish out of Logan Martin Lake and Lay Lake most of my life. My mother was working at Monsanto when I was born in 1957. Mother died of cancer in 1995. I attended 3 of the meetings you held on OU4 and was glad to learn, that about the only way that you can get too high of levels of PCB's from Choccolocco, or the Coosa is by eating the fish from them. It is safe to paddle, fish, wade, irrigate your fields, water your livestock, grow crops, even swallow some water when you swim. So, it is not as hazardous to people as I thought. I learned that the primary goal of the EPA is to make it safe to eat the fish and also to protect the environment of Choccolocco. I also learned that I would have a chance to voice my opinions and concerns and to have questions answered, so here goes. I think that the EPA is focusing too closely on reducing the PCB levels in Choccolocco, so that the PCB level is not harmful for people in the distant future to eat the fish and not enough on the impact that the remedial action will have on the people who use the creek now and in the near future. I also think that you are not considering enough the people who eat the fish out of Lay Lake and Logan Martin Lake now and in the near future.

I believe the water quality in Choccolocco is destined to remain poor for the foreseeable future. As Allen said Choccolocco has more problems beside PCB's. It has the misfortune of being too close in proximity to 2 cities that have always regarded it as part of their sewer system and others, who use it to dump in, as I am sure you are aware. Recently, trichloroethylene has shown up in an Oxford Water Works well. So, I think that if SED-6 is successful we will have gained little more than one less reason why you wouldn't want to eat the fish out of Choccolocco.

As far as the land base receptors are concerned, I consider it a moot point. After viewing the picture of the bank remediation, it is easy to see that there will be little habitat left for them to live in. It also will destroy the natural scenic appearance of Choccolocco forever for the paddlers and sportfishermen who use it, transforming it to little more than a rock lined ditch in which water runs in. In my opinion, dredging with an excavator should not be attempted. Sounds to me like the plan is to dig out all of the PCB's that you can and flush the rest down the creek into the Coosa River. Allen said that dredging will spike the PCB level flowing downstream for 10 to 12 years. It will no doubt lead to more PCB's being consumed by people, at least in the first 30 to 40 years because Choccolocco has very few people who eat the fish out of it. Logan Martin and Lay lakes have thousands of people who eat fish from them. I know there are people who commercially fish Logan Marin Lake because I see them when I am fishing. Allen saying that he would treat the excavator operator like a two-year-old certainly did not bolster my confidence in this process. To me, this means the method used is not sufficient to do the job at this time, and risks making the whole problem worse. And what if there is a flood? Allen stated that he would try to do the dredging in low water periods. That means on Choccolocco, late summer to early winter. This is also hurricane season. Even though the probability is low, it is a very real possibility that a flood can occur at this time, especially considering that it will take three to five years to complete the project. A flood on Choccolocco could mean water flow rates of several hundred times more than average and I fear it could cause record PCB levels flowing down stream if it strikes at just the wrong time.

The remediation SED-6 will also increase the PCB footprint greatly and contaminate other areas. It will use tremendous amounts of natural resources. I read where the cleanup of Superfund Sites is often unsuccessful. I fear that this will be the case here, considering that the remediation SED-6 only covers about 15 percent of the creek bank, and the dredging is less than 5 percent of the creek bed. This, I fear, will cause further remediation and then possibly further remediation until we will not recognize Choccolocco, anymore.

I think that an improved version of SED-1 needs to be considered. It would include the “do not disturb policy” like what the predecessors of the EPA had in place since the 1970”s and monitoring that you deem necessary. It would require Solutia to employ a full-time employee to be in the field on a daily basis, educating fishermen, landowners and anyone who uses the creek or river of the can and can nots when dealing with PCB’s. And being that this improved version of SED-1 is much less costly than SED-6, Solutia could choose to build better relations with the community by giving back in some way. This would eliminate the suspicion that either SED-1 or SED-6 was financially motivated.

I feel that in this case an improved version of SED-1 is the best choice as compared to SED-6. It would protect human health better, by starting now not 40 or 50 years from now, protect the environment better by not destroying it, protect receptors best by protecting their habitat, will not increase the PCB footprint, will not use up valuable natural resources, will not destroy the scenic appearance, will not have additional risk, will not spike PCB’s flowing downstream, will have long term and short term effectiveness and permanence, could be implemented immediately and depending on Solutia, cost much less. It also provides an opportunity for a better technology to be developed. One that is less destructive. After all man went from not flying to space travel in 60 years.

Conclusion: Choccolocco is the most floatable stream in our area. Below Highway 21, it has many wild places and beautiful scenery, remaining practically unchanged in the last 60 years. There seems to be more wildlife and the fishing is much better. Even the water quality seems to be much better. Sixty years ago, you could smell Choccolocco a mile away. The chance for people to safely eat the fish 50 or so years from now seems to be a pitifully low reward to give up a big chunk of it for. I know that everybody would like to snap their fingers and for PCB’s to be gone, but the reality is that PCBs are here to stay until mother nature and father time takes care of the problem. So, it is up to us to decide how to best live with it in the meantime. My opinion is that in consideration of the pluses and minuses, the improved version of SED-1 is the obvious logical answer. I know that you are bound by EPA rules for protecting human health and the environment. Please don’t let them make you make a bad decision.

Response: The EPA understands your concern about maintaining the good qualities of Choccolocco Creek. The proposed sediment remedy uses dredging and MNR to achieve a less intrusive cleanup than would be required if dredging alone was relied on to reach the cleanup levels and remedial action objectives. Because this Site is being addressed under Superfund regulations, action is needed to protect ecological receptors from PCB contamination on land and human and ecological receptors from PCB contamination in fish, which originates from PCB contamination in sediment and surface water. Most of the active remedial activities will take place in the upper reaches of Choccolocco Creek (reaches C1-C4). Monitoring of PCB concentrations in sediment, surface water, and fish will take place over the entire length of OU4. This decision is intended to balance the components of the cleanup so that it is not completely destructive to the creek you care for, while providing a better environment in the future for fishermen, recreators, wildlife, and residents.

Comment 68: In the 1970's it was said that it would take 300 years for the natural recovery of Choccolocco. How long does your research indicate for the natural recovery of Choccolocco?

Response: A natural recovery timeframe for sediment in Choccolocco Creek was not calculated during this investigation. Because of the unacceptable risk associated with OU4, no action is not considered effective.

Comment 69: Where is the clean sediment coming from to cap the bottom of the creek when dredged?

Response: The source for the sediment backfill has not been determined yet. The properties and qualities of the backfill will be established by professionals in the remedial design. The remedial action contractor will locate sources that meet those requirements.

Comment 70: Where is the land field at that will be used to hold the low-level contaminated sediment?

Response: A complete description of the sediment removal and disposal process from the FS is provided in the response to Comment 2. By low-level contaminated sediment, the EPA assumes the commenter means sediment with PCB concentrations less than 50 mg/kg which is considered non-TSCA regulated waste. Non-TSCA dredged material will be transported to and disposed of at Advanced Disposal's Three Corners Regional non-TSCA disposal facility in Piedmont, Alabama. This includes dredged material and the material excavated from the severely damaged bank of Choccolocco Creek (as described in the Feasibility Study) in association with creek bank stabilization.

Comment 71: What is the estimated yearly value of the fish that Choccolocco can produce?

Response: The U.S. Fish and Wildlife Service may produce this type of estimate as part of the damage assessment they are preparing for this site. It is not a parameter that EPA or CERCLA considers.

Comment 72: Will there be any compensation to the landowners for loss of use, damage to, or loss of property values?

Response: If the landowner can demonstrate loss of use, damage to, or loss of property value, the landowner can pursue those claims as necessary. Since access to the property will have to be provided by the landowner for work to be done, it should probably be part of the access agreement with the PRPs. Since this is an environmental cleanup, reducing the contamination on the property and repairing erosive banks may make the property value increase. The EPA hopes the community will support the cleanup activities as an improvement and not a detriment.

Comment 73: I am aware that there are currently proposed remedies for a soil management program and fish consumption advisories for the proposed sediment remedy being considered, and I feel that it is important to advocate for remedies that are both protective of the health of our residents and the environment in which they live. Mainly, I believe that a soil management program that includes Alabama 811 will provide a depth of safety and protection for our local residents. This would include protocols requiring anyone performing intrusive work, including homeowners, developers, and commercial property owners - not just utility companies – to call Alabama 811 before they dig or disrupt the soil. This program should be based on the use of current, legally binding systems and less on observational data. I would also advocate for providing a way for the public, including property owners, tenants, current and future business owners, and the real estate industry to search for records on the removal or remediation status of properties in OU4.

Additionally, it is my hopes that fish consumption advisories will be shared through the use of community resources regarding affected fish and locations. I believe this is an essential part of the proposed sediment remedy. In fact, I believe that it may be best for the EPA to adopt the fish consumption advisories set by the Alabama Department of Public Health for Choccolocco Creek as the Institutional Control for OU4.

Please know that, as a United Way with a local 211 Call Center, we are happy to partner in any way needed to promote the health of our residents and our community. While Alabama 811 is certainly the vehicle for public information regarding digging and excavation work, 211 is a vital helpline for residents needing health and human service information and referral to essential services. This includes assistance for residents who are facing a health crisis, food insecurity, homelessness, and other emergency assistance needs. Our statewide 211 network can also be used to disseminate critical information such as community advisories and connecting residents to Alabama 811. Please consider United Way and 211 as a partner in our communities across Alabama.

Response: The documents used as the basis for this ROD are public records that can be accessed online at https://www.epa.gov/superfund/anniston-pcb-site. Records about nonresidential soil PCB concentrations can found in the online documents, but residential records are kept by the PRPs and EPA because of personal privacy concerns. The EPA remedial project manager and community involvement coordinator's contact information will always be available at the Site webpage above.

Fish advisories are considered informational institutional controls. The EPA will ensure that a robust communication strategy and education program are designed and implemented to address fish advisories with the community.

The 211 Connects Alabama program sounds like an excellent tool to reach parts of the community, and the EPA will share information with United Way about efforts to clean up the Site so that you can disseminate it if you think it is appropriate.

Comment 74: In regard to the multi-generational impact of PCB contamination along Choccolocco creek. Please by all means let's start to clean up one of the most long-term contaminated waterways in America. I've lived along Eastaboga creek and near Choccolocco creek my entire life and have never been able to eat the fish caught from my own property. I'm 62 and hope before I'm gone see this waterway returned to how God wanted it to be. Thank you for your work in moving this project forward ASAP.

Response: The comment is appreciated. The long-term goal of this cleanup effort is to restore fish contaminant concentrations so that fish consumption advisories are no longer needed.

Comment 75: I am writing as a private citizen, and also include my information below. As Executive Director of Cahaba River Society and founder of Kentucky Waterways Alliance, I have been involved with water quality issues for over 30 years. I am a member of Coosa Riverkeeper, and strongly support their concerns and comments on the cleanup plan. This is also personal for me. I grew up spending long summer days on Lake Logan Martin, since when the lake was first filled. Our cabin was at the mouth of Rabbit Branch in Waite Estates. My dad fished all up and down the lake, and we ate those fish regularly from the early 60’s through the early 2000’s. Although ADEM knew of the PCB contamination, the public was not informed for years. We were eating fish laden with cancer-causing PCB’s far past when ADEM knew the risk. That was inexcusable. My sweet sister died of a very horrible blood cancer that destroyed her neck and face. We’ll never know if the lake’s contamination was a cause.

Please ensure the highest possible removal of the PCB-laden soils and sediments. Please employ the highest best practices to prevent mobilization of PCB’s during removal. Please monitor carefully and constantly during the removal and long into the future. Have rapid response to require further containment steps if toxic soils are mobilized during removal, and require further cleanup if the initial plan’s completion does not remove enough contamination.

What about the contamination that rests at the bottom of Logan Martin? Have there been sediment studies to determine the level of contamination there? What can be done about that?

Response: Special studies of PCB impacts in Logan Martin Lake were proposed in the FS for OU4, and it is anticipated that those studies will be initiated after this ROD is approved. Data collected 20 years ago indicates that PCB concentrations in sediment tend to settle out in the embayment area (reach C-10 of OU4), and PCBs are also buried beneath sediment in the old riverbed and behind the dam. New data needs to be collected to determine if any actions are needed to address PCBs in this sediment. The most recent data was collected in 2013 by the US Fish and Wildlife Service for Choccolocco Creek and the area of Logan Martin Lake immediately downstream of Choccolocco Creek. The results for eight samples of PCBs in sediment just downstream from Choccolocco Creek ranged from 0.02 mg/kg to 0.08 mg/kg, all less than the OU4 remedial goal of 0.1 mg/kg PCB concentration in sediment.

Comment 76: How will the contamination of fish be monitored over time, and how will the public be quickly and thoroughly informed?

Response: Proposed Plan (Table 9) and ROD (Table 16) provide an overview of what should be included in the fish monitoring plan, but much greater detail will be developed during RD. A communication plan will be developed during Remedial Design to share this information.

Comment 77: Where will the contaminated sediments be sent? Will communities of color or lower income have those toxic sediments disposed near their backyards? Is the disposal site guaranteed to contain the sediments to absolutely ensure the toxicity does not migrate into their waters?

Response: Dredged material containing PCB concentrations greater than or equal to 50 mg/kg will be transported and disposed of at Waste Management's TSCA disposal facility located in Emelle, Alabama. This includes dredged material (and the associated Portland cement) and material excavated from the bank of Snow Creek in association with creek bank stabilization. The facility in Emelle is permitted and in compliance with its permit requirements. It has been designed to ensure PCB contaminated sediment will not migrate. In accordance with the Superfund Offsite Disposal Rule, which requires that Superfund wastes only be placed in a facility operating in compliance with the Resource Conservation and Recovery Act (RCRA) or other applicable Federal or State requirements, the status of the disposal facility is verified every 60 days while disposal is taking place.

Dredged material containing PCB concentrations less than 50 mg/kg will be transported to and disposed of at Advanced Disposal's Three Corners Regional non-TSCA disposal facility in Piedmont, Alabama. This includes dredged material and the material excavated from the severely damaged bank of Choccolocco Creek (as described in the FS) in association with creek bank stabilization work.

The population of Emelle, Alabama is 24 people, and the largest Emelle racial/ethnic groups are Black (85.1%) followed by White (14.9%) and Hispanic (0.0%). Emelle is in Sumter County, Alabama, with a population around 12,000 people, and the largest racial/ethnic groups are Black (72.3%) followed by White (25.2%) and two or more (1.5%). The population of Piedmont, Alabama is 4,705 people, and the largest racial/ethnic groups are White (84.4%) followed by Black (9.1%) and Hispanic (5.7%). These facilities are the closest to the site and were not selected based on the population demographics.

Comment 78: As a resident of Anniston, Alabama for nearly 35 years, I am honored to provide feedback for the remediation work by Eastman in the Anniston area. I am grateful for the diligent work being done by Eastman to ensure soil management is in place for our area. I see two opportunities to strengthen the efforts:

1. Usage of Alabama 811: The service is already in place; therefore, no additional steps are required to establish a clearing house. Any entity about to dig can simply contact 811 prior to performing the work. By doing so, we can avoid potential hazards, protect essential services, and ensure the safety of everyone involved. This will allow people to make an informed decision about locating and growing in the area.
2. Catch and Release of Fish: The creek adjacent to the remediation site is home to various fish species that contribute to the local ecosystem. As part of our commitment to environmental stewardship, I strongly encourage the continued implementation of catch and release practices for any fish caught in the creek during the project. This approach helps preserve the aquatic life and maintain the ecological balance in the area.

By adhering to these practices, we can not only ensure the success of the soil remediation efforts but also protect and respect our local environment. I appreciate the attention to these considerations and look forward to the continued positive impact of the project on our community.

East Alabama Works, organized by the Alabama Department of Commerce and AIDT, is a not-for-profit organization established to support the workforce needs of Region 2 in the state of Alabama. Our focus is to accelerate economic development by supporting business and industry in recruiting and retaining a new and incumbent workforce through a collaboration of education and community stakeholders which is why this project is so important to me.

Response: The comment is noted.

Comment 79: We are pretty far downstream from Choccolocco Creek. Our house is on lake Mitchell. We love to fish and swim in the lake. We eat the fish regularly and it has been tested to be suitable for frequent consumption. We certainly hope that any PCB removal does not cause excessive spikes in the PCB levels to downstream ecosystems.

Response: The EPA does not expect the remediation in OU4 to impact impoundments below Logan Martin Lake. Steps will be taken to keep as much of the impact within OU4. The active sediment remediation is expected to be isolated to the upper one-third of Choccolocco Creek.

Comment 80: Supports the remedial alternative proposed for residential soil as described on page 99 of the Proposed Plan.

Response: The comment is noted.

Comment 81: Supports the remedial alternative for the IM areas in OU4 as described on page 99 of the Proposed Plan.

Response: The comment is noted.

Comment 82: Supports the soil management approach for all of the proposed remedial alternatives as summarized on page 100 of the Proposed Plan.

Response: The comment is noted.

Comment 83: The Proposed Plan to address nonresidential floodplain soil includes removal of the upper 6 inches of soil based on a surface area weighted 95% upper confidence limit (UCL) concentration of 6 mg/kg over newly proposed 5-acre exposure units (EUs). This is mentioned in multiple locations in the Proposed Plan (page 57 and Table 8) and the OU4 Feasibility Study Addendum (OU4 FS Addendum) prepared by USEPA dated May 29, 2024, and included with the OU4 Administrative Record. In Section 4 of the OU4 FS Addendum, USEPA notes "…EPA is proposing that the floodplain PRG be applied over a 5 acres area representing a home range for small mammals in contact with contaminated soil."

The unilateral adoption of 5-acre EUs in the OU4 FS Addendum is a significant and arbitrary change to the agreed upon EUs used in the OU4 Baseline Ecological Risk Assessment (OU- 4 BERA) that was prepared by P/S and the OU4 BERA Addendum prepared by USEPA. The EUs evaluated in the OU4 BERA and OU4 BERA Addendum are identical in location and size and were developed through collaborative discussions between P/S and USEPA. As presented on page 17 of the Proposed Plan, "this approach was designed to provide sufficient data to characterize exposure point concentrations (EPCs) for PCBs for human and ecological receptors using reasonable exposure assumptions". For the remainder of this comment, the OU4 BERA Addendum is identified as the controlling ecological risk assessment document for OU4 as USEPA identified it as such.

A 5-acre EU is significantly smaller than any area that would encompass a local bird or mammal receptor population and is inconsistent with Principle No. 1 of the USEPA's Office of Solid Waste and Emergency Response Directive Ecological Risk Assessment and Risk Management Principles for Superfund Sites (USEPA 1999), which states that "Superfund's goal is to reduce ecological risks to levels that will result in the recovery and maintenance of healthy local populations and communities of biota." While the EUs developed to support the

OU4 BERA Addendum are in most cases also much smaller than an area likely to encompass an ecological receptor population, they were considered to be reasonable and conservative estimates of areas that could warrant potential action based on ecological population-level exposure. For context, the EUs used by USEPA in preparing the OU4 BERA Addendum appropriately ranged from 30 to 690 acres with an average size of 270 acres.

Arbitrarily implementing the nonresidential floodplain soil remedy using significantly smaller EUs (5 acres) would likely result in large habitat losses within the riparian buffer zone adjacent to Choccolocco Creek. In many cases, these riparian habitat areas are also in legally defined conservation easements specifically designated for habitat preservation and enhancement. In contrast, the EUs included in the OU4 BERA Addendum are protective of the environment in a manner consistent with USEPA guidance and would preserve quality habitat that might otherwise be impacted using proposed 5-acre EUs. Accordingly, P/S request USEPA retain the EUs identified in the OU4 BERA Addendum for the nonresidential soil remedy in OU4 rather than adopting a remedy that requires the development of arbitrary 5-acre EUs as identified in the Proposed Plan. The use of such small EUs is not consistent with actions taken in other riverine environment PCB sites. For example, the size of floodplain areas used by USEPA in their reach-based approach to assess ecological risks for the Housatonic River floodplain were significantly larger than the five-acre areas proposed by USEPA for the OU4 floodplain (ECOLOGICAL RISK ASSESSMENT (ERA), REST OF RIVER, VOLUME 1 AND 2 OF 6, SECTIONS 1 - 12 (fdlp.gov)).

From the perspectives of implementability and community impacts, an enormous number of individual samples would need to be collected in the five-acre EUs. Based on the size of the OU4 floodplain (over 6,000 acres), the number of individual sample locations could easily exceed 10,000. In the event USEPA selects five-acre EUs, only EUs upstream of Silver Run Road should be evaluated during the pre-design investigation and subject to the implementation of the non-residential soil remedy. None of the EUs downstream of Silver Run Road were found to contain PCBs in excess of 6 mg/kg on a 95% UCL as presented in the OU4 BERA Addendum. Use of the five-acre EUs would also delay implementation of the remedy based on the extensive outreach process with local landowners. This includes an initial outreach process to obtain legal access to collect thousands of floodplain samples followed by a second outreach effort that may be necessary to obtain legal access to conduct remediation activities.

Based on these concerns, it would be more appropriate to develop the specific sampling approaches during the PDI that will be conducted for the OU4 floodplain. This would include specifics of the EUs including location, size and configuration; and the specific method(s) that will provide a robust statistical characterization of the areas to be remediated and post- remediation PCB concentrations. Consistent with the findings of the OU4 BERA Addendum, the PDI for floodplain soil should be focused on the upper reaches (i.e., upstream of Silver Run Road). Reserving these details to the PDI Work Plan stage of the project is consistent with the remedial design (RD) for a large complex remedy such as OU4.

Response: The five-acre area was proposed based on the upper bound home range of the short tail shrew and carolina wren. The home ranges for receptors evaluated in the BERA are shown in the table below. While many other receptors have more expansive ranges, these small birds and mammals do not. The cleanup goal of 6 mg/kg was selected in part to protect these receptors as show in Figure 6-1 in the FS, and is appropriate.

While sampling during the PDI will be required to define the exact remedial areas needed to meet the cleanup goals, the EPA included language in the ROD to clarify that the floodplain area over which the non-residential soil cleanup level for PCBs (95% UCL SWAC 6 mg/kg over each 5-acre decision units) applies was more narrowly defined to reaches C1 through C4 where unacceptable risk to terrestrial receptors exists. The floodplain in Reaches C5 through C9 will not require sampling or cleanup in 5-acre decision units. As stated in the BERA, the mink is the only semi-terrestrial species identified as having an unacceptable risk in all reaches. Although the mink is identified as semi-terrestrial, the mink diet was documented in the BERA as being 99% aquatic. The risk from an aquatic diet will be addressed by the sediment cleanup. Because the risk to the mink will be addressed through the sediment remedy, the floodplain soil remedy will only address terrestrial receptor risks. Unacceptable risk to terrestrial receptor risks is only present in reaches C1 through C4.

Receptors	End Points	Home Range:		
		Lower Bound	Central Tendency	Upper Bound
		acres	acres	acres
Avian				
Tree Swallow	Aerial-feeding Insectivore	0.1 Km	225 m	0.74
Carolina Wren	Ground-feeding Invertivore	0.42	1.7	5.40
Belted Kingfisher	Aquatic Ground-feeding	2.5	8.00	12
Blue Jay	Omnivore	--	1746	--
Mourning Dove	Herbivore	247	1800	10,600
Belted Kingfisher	Piscivore	0.7 Km	1.61 Km	4.8 Km
American Osprey	Piscivore	1.7 Km	3-8 km	10 Km
Red-tailed Hawk	Raptor (Carnivore)	148	1659	6089
Great Blue Heron	Wading Carnivore	1.8 Km	3.1 Km	7-8 Km
Mammals				
Little Brown Bat	Mammalian Aerial-feeding Insectivore	0.1 Km	42	74
Short-tailed Shrew	Mammalian Ground-feeding Invertivore	0.25	0.96	4.4
Raccoon	Mammalian Omnivore	48	270	12217
White-tailed Deer	Herbivore	146	715	1284
Mink	Piscivore	1.9 Km	2.15 Km	3.4
River Otter	Piscivore	10 Km	31 Km	
Long-tailed Weasel	Aquatic-dependent Carnivore	30-40	96-338	79-395
Red Fox	Mammalian Terrestrial-dependent Carnivore	141	2563	8447

Comment 84: Statistically Robust Methods for Characterizing Floodplain Soils for Remediation: The information presented on page 57 and Table 8 of the Proposed Plan indicates that the floodplain soil remedy for OU4 will be implemented "…through the 95% Upper Confidence Level (UCL) of the surface weighted average concentrations (SWAC) in each five-acre exposure unit." P/S request that selection of "a statistically robust method or methods" be included in OU4 ROD and that the specific statistical method or methods be developed as part of the PDIs that will be completed as part of the OU4 RD.

Response : See the response to comment 83. The 95% UCL requirement was provided in the EPA comments on the FS and was not implemented by P/S in the revised document. The EPA maintains that the 95% UCL should be required.

Comment 85: Statistically Robust Methods for Characterizing Sediment for Long-term Monitoring Purposes: The information presented on pages 58, 75, 81 and Tables 8 and 9 of the Proposed Plan indicates the statistically robust method to evaluate sediment concentrations over the long- term in Snow and Choccolocco Creeks is the 95% UCL. P/S request that the specific “statistically robust” method for evaluating the long-term performance of the sediment remedy be selected during the PDI as part of the RD process consistent with the process proposed for floodplain soil presented in Comment 5.

Response: The 95% UCL requirement was not eliminated; it was provided in the EPA comments on the FS and was not included by P/S in the revised document. The EPA maintains that the 95% UCL should be required.

Comment 86: Potential Change in the Remedial Volume and Costs for Floodplain Soil Associated with PDI Results May Invalidate the Proposed Plan: The statement included on page 7 of the OU4 FS Addendum “….PRG implementation requirements may affect volume and cost of the floodplain alternatives. There is not sufficient data to provide more accuracy to the volume and cost. Data will be collected during the preliminary remedial design (PDI) to provide a better estimate. FS estimates are order-of-magnitude estimates, which are expected to be accurate within the range of +50 to -30 percent.”

The remedial alternative proposed for nonresidential soil (NRS-2) is based on a soil volume of 57,475 cubic yards evaluated in the OU4 FS and was based upon the maintenance of the EUs adopted in the OU4 BERA. This soil volume removal has an estimated cost of $30.9 million. If the volume of floodplain soil following the PDI process increases to 108,000 cubic yards or more based upon EPA’s unilateral and arbitrary adoption of 5-acre EUs, the resulting cost may exceed the +50% criteria used by USEPA during the remedy selection process (i.e., 1.5 * $30.9 million = $46.4 million). If this situation were to occur following the PDI (i.e., the volume of floodplain soil for remediation exceeded 108,000 cubic yards), the original basis for remedy selection would no longer be valid or consistent with USEPA policy and guidance and USEPA would need to reopen the OU4 ROD for nonresidential soil. Reopening the ROD would then necessitate a revised proposed plan for public review and comment.

Response: If the cost and volumes of the remedy based on RD increase more than 50% of the FS estimate, the changes will be documented as required by CERCLA.

Comment 87: Potential Change in the Remedial Volumes and Costs for Creek Bank Soil and Sediment Associated with PDI Results: The statement on page 92 of the Proposed Plan indicates that the “…Cost estimates are expected to be accurate within a range of +50 to -30 percent.” The removal volumes and costs for SED-6 reflect actions for both creek bank soil and sediment. However, an example scenario in which the removal volume of sediment is increased to approximately 128,000 cubic yards exceeds the 50% cost threshold. If the PDI program results significantly increased the removal volumes (i.e., greater than 128,000 cubic yards), the USEPA, consistent with comment 7, would need to reopen the ROD and issue a revised proposed plan for public review and comment.

Response: If the cost and volumes of the remedy based on RD increase more than 50% of the FS estimate, the changes will be documented as required by CERCLA.

Comment 88: Preserving Riparian Habitat Located Along Choccolocco Creek: The proposed remedy for nonresidential floodplain soil identified on page 99 of the Proposed Plan does not include provisions to preserve quality habitat located in the riparian buffer zone bordering Choccolocco Creek. P/S request that a provision be included in the ROD preventing the removal of trees during remediation with a diameter at breasting height (DBH) greater than 6 inches. This will be an effective means of minimizing damage to this valuable portion of the floodplain ecosystem that also plays a large role in maintaining creek bank stability.

Response: This provision was added to the Selected Remedy description in ROD Part 2 Section 12.2.

Comment 89: Downstream Extent for Evaluating Creek Bank Soils: The USEPA recommends in its Proposed Plan cleanup of all creek banks with minor, moderate or severe erosion with PCB concentrations exceeding 2.6 mg/kg. This is further clarified by USEPA on page 8 of the OU- 4 FS Addendum "The Proposed Plan is proposing a PRG for creek bank soil equal to the not- to-exceed value in sediment for all creek banks with the erosive potential identified in the alternative." The resulting downstream extent of the creek bank remediation was thus changed by USEPA to Highway 77 in the OU4 FS Addendum versus River Mile 29.5 (RM 29.5) in the OU4 FS. The evaluation included with the OU4 FS demonstrated that addressing creek banks located upstream of RM 29.5 would result in a 93% reduction in PCB creek bank inputs. Creek banks downstream of RM 29.5 were negligible as a potential source of PCB input to the creek. Conducting creek bank sampling downstream of RM 29.5 during the OU- 4 PDI would be unnecessarily disruptive to the riparian corridor and the community and should be eliminated from the proposed plan.

Response: A major goal of the remedial action is to ensure that MNR occurs. Eliminating creek bank sources in minor, moderate, and severe erosion areas are necessary so that sediment is not recontaminated. Sampling the erosive banks is not going to create significant disruption to the riparian corridor. The results will provide the information needed to increase confidence in the remedy.

Comment 90: Remedy Optimization: The Proposed Plan states that, for each of SED-2 through SED-7 (p. 84-92), "Optimization including performance of additional dredging (and in-place treatment or capping if included in the alternative) of areas within Snow Creek and Choccolocco Creek will be implemented if determined necessary to achieve RAOs." This additional remedy requirement is unnecessary and provides a means for USEPA to modify the selected remedy in a manner that is arbitrary and capricious and without the opportunity for formal public input.

The National Contingency Plan (NCP) requires a formal review of the remedies selected for sites every 5 years where contamination remains (40 CFR Part 300.430(f)(4)(ii)). The requirement for Five Year Reviews (FYRs) is also identified in §121(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and applies to all OUs at the Site (including OU4). The FYR process is conducted for sites to ensure that the selected remedies remain effective over time. The FYRs also provide an opportunity for modifying the remedy based on a process that includes a detailed evaluation of long-term monitoring results and public input. Including a separate and disconnected remedy optimization process controlled exclusively by EPA for OU4 in addition to the FYR process is not consistent with the law and is not needed to supplement existing safeguards designed and authorized to ensure a protective remedy over time.

> **Response**: The remedy optimization language was included as an efficient way to adjust remedial components so there is no delay in implementing modifications needed to reach cleanup levels. The EPA does not intend to make the decision unilaterally or without data to support any necessary optimization decision. If necessary, assurances can be included in the RD/RA statement of work and Consent Decree.

Comment 91: Applicable or Relevant and Appropriate Requirements (ARARs) for Surface Water: The Proposed Plan (pages 81 and 82) included two Federal ARARs for surface water identified in 40 C.F.R. § 131.36. These two ARARs are chronic ambient water quality criteria (AWQC) for PCBs (0.014 µg/L for wildlife and 0.000064 µg/L for human health). These two Federal ARARs are not legally enforceable and could be identified by USEPA as relevant and appropriate, or to be considered ARARs. The Proposed Plan also identifies parallel regulations under the State of Alabama's Administrative Code 335-6-10.

The Federal and State human health AWQC value (0.000064 µg/L) were included in the Proposed Plan by USEPA through the OU4 FS Addendum (page 8). The State ARAR for wildlife (0.014 µg/L) is a State of Alabama law that is consistently enforced by the State, and thus an ARAR that is applicable to the remedy. The State of Alabama ARAR for human health (0.000064 µg/L) is not consistently enforced by the State and should be waived by the USEPA as part of the ROD process.

> **Response**: The AWQC for PCBs to protect wildlife (0.014 µg/L) and the AWQC for PCBs to protect human health (0.000064 µg/L) are federal and a state water quality criterion. If surface water cleanup levels have not been met by the time fish concentrations recover, the EPA will consider waiving the ARARs.

Comment 92: Numerical Value of the AWQC Value Identified to be Protective of Human Health: The AWQC value identified as a PRG on Table 8 of the Proposed Plan (0.000064 µg/L) was designed to be protective of human health (based on a cancer-based risk standard of 1×10^{-6}) and consumption of surface water as a drinking water source. If USEPA identifies an AWQC to be protective of human health as an ARAR (see comment 91), the AWQC value should be modified to 0.00256 µg/L. This revised value reflects the human health risk standard used to set the PRG for the consumption of fish (i.e., a Hazard Quotient of 1) and elimination of surface water consumption.

> **Response**: Eliminating the consumption of surface water from the AWQC calculation does not change the AWQC because the bioconcentration factor for PCBs is very high. The EPA does not agree with the number calculated for an HQ=1. Calculating a risk-based value does not override the need to comply with ARARs.

Comment 93: Error in the PRG for Fish Upstream of Jackson Shoals: Page 9 of the OU4 FS Addendum incorrectly identifies the fish tissue PRG value for locations upstream of Jackson Shoals as 0.04 mg/kg. This value should be revised to 0.08 mg/kg to be consistent with the value presented in Table 8 of the Proposed Plan and the exposure assumptions used to derive the value in the human health risk assessment.

> **Response**: The error in the FS Addendum was noted.

Comment 94: Timeframes for Monitored Natural Recovery (MNR): USEPA states on page 75 of the Proposed Plan that "The timeframe for sediment PRG and RAO attainment is 20 years below Jackson Shoals and 30 years at and above Jackson Shoals." P/S agree that these goals will be achieved and believe that the timeframes presented in the OU4 ROD should be revised to reflect a range of years as opposed to singular milestones. This approach is consistent with the uncertainty for MNR timeframes discussed by USEPA on page 12 of the OU4 FS Addendum. Using the range of times based on the combination of projections included on Figures 10-1 and 10-2 from the OU4 FS, a projection of 20 to 40 years for the entire reach of OU4 would be appropriate based on the wide range of variables affecting MNR.

> **Response**: The timeframe used in the Proposed Plan was identified in the description of the remedy for each alternative in the FS. As pointed out in comment 96, the FS assumed the remedial goal for sediment upstream of Jackson Shoals was 0.2 mg/kg. Since the goal to protect ecological receptors has been identified as 0.1 mg/kg for the entire creek, the time frame was adjusted to 20 to 40 years.

Comment 95: Remedial Goals for PCBs in Sediment versus PCBs in Fish: Table 8 of the Proposed Plan includes preliminary remedial goals (PRGs) for sediment and fish. The PRGs for sediment are based on highly uncertain calculations in terms of the specific sediment PCB concentration that will yield an expected PCB concentration in fish. These calculations and the associated uncertainties are described in Section 6.3.2 of the OU4 FS. The PRGs for fish were established through the risk assessment process and are fixed values. Except for two sediment concentration PRGs, the concentrations of PCBs in fish are the controlling indicators of whether the remedy is achieving its long-term goals.

The two PRGs directly applicable to sediment from the OU4 FS include PCB concentrations exceeding

2.6 mg.kg to protect benthic organisms and 0.63 mg/kg to protect bats. This latter PRG value (0.63 mg/kg) was not in the Proposed Plan and should be included with the OU- 4 ROD. Language should also be included in the OU4 ROD highlighting the uncertainties associated with calculating fish concentrations based on sediment concentrations and noting that the FYR should focus on PCB concentrations in fish over the long-term and not sediment concentrations.

Response: The EPA found the FS multiple PRGs discussion for sediment confusing. The ROD has a not-to-exceed RAL (i.e., 2.6 mg/kg) and a sediment cleanup level for MNR (i.e., 0.1 mg/kg) that is protective of human and ecological receptors for the entire length of the OU. The EPA acknowledges that there is uncertainty associated with calculating fish concentrations based on sediment concentrations. While the EPA agrees that the OU4 risk is driven by fish concentrations, sediment is the media being cleaned up and modelled/monitored for MNR.

Comment 96: PCB PRG for Sediment Located Upstream of Jackson Shoals: The controlling sediment PRG for areas upstream of Jackson Shoals was unilaterally changed by USEPA in the OU4 FS Addendum (pages 8 and 9). The sediment PRG selected by USEPA in the Proposed Plan (based on the OU4 FS Addendum) was the lowest value for a range of PCB concentrations that are protective for ecological receptors including the most sensitive fish-eating species of mink and otter. P/S are requesting that the controlling PRG for sediment upstream of Jackson Shoals be set at 0.2 mg/kg consistent with the OU4 FS as it will be protective for both human and ecological receptors.

Consistent with the approach presented in Comment 16, the long-term PCB concentration for fish presented in Table 8 (1.3 mg/kg for mink and otter) and not the sediment PCB concentration of 0.1 mg/kg (or 0.2 mg/kg, if changed) should be used to evaluate the long- term protectiveness of the remedy from an ecological perspective along with the other two sediment PRGs (i.e., 2.6 mg/kg and 0.63 mg/kg).

Response: The EPA agrees that upstream of Jackson Shoals the sediment cleanup level for protection of human health is 0.2 mg/kg based on the fish tissue remedial goal which assumes a lower human fish consumption rate than downstream of Jackson Shoals due to reduced accessibility. Ecological receptors are not restricted by accessibility the way humans are, so a single goal was used to be protective of both human and ecological receptors.

Comment 97: Two Commenters stated that the PCB cleanup was insufficient. The community was asked not to consume the fish due to contamination of rivers and lakes. Due to improper cleanup of PCB, residents' health continues to decline. There has been a massive amount of rain in which the flow of water washes the dirt from underneath our homes into the yards. We can no longer visit clinics in surrounding areas. I live in Hobson City, an all-black community and there was more work done in the City of Oxford, predominantly white, no racism intended, than was done for Hobson City. The commenters asked EPA to schedule a meeting for residents in Hobson City.

Response: Hobson City is located outside of the floodplain, so the investigation and cleanup there centered around residential properties that were likely contaminated by the physical movement of contaminated fill material to those locations and not by deposition of sediment during flood events. The Anniston Lead Site and the Anniston PCB Site sampled 174 residential properties in Hobson City between 2001 to 2011. Several of the properties are multi-family complexes. As a result, 13 properties were identified for cleanup: five properties with soil PCB concentrations greater than 1 mg/kg and eight properties with soil lead concentrations greater than 400 mg/kg. Soil on the remaining properties did not exceed the CERCLA removal cleanup levels. If your specific concern is about soil under the house being relocated, please contact the Remedial Project Manager - Pam Scully at (404) 562-8935, and she will check the sampling results and cleanup information to make sure your concerns are resolved.

The PCB cleanup nearby Hobson City is not complete. The cleanup of PCB contaminated non-residential soil in the Snow Creek floodplain, the PCB contaminated sediment in Snow Creek, and an isolated area with PCB groundwater impacts near 11th Street are being designed and will be cleaned up over the next few years. This OU4 ROD documents the selected cleanup alternatives for PCB contamination in Choccolocco Creek and its floodplain.

A project status update will be scheduled in Hobson City, to ensure all interested citizens remain informed about the ongoing EPA cleanup activities.

Comment 98: Updated data is needed to fully evaluate remediation needs in OU4. Alabama Rivers Alliance appreciates that the Proposed Plan includes proposals for additional investigation of the presence and nature of PCB contamination in OU4. We also appreciate the recognition in the Proposed Plan that climate change is altering precipitation patterns, and that these changes will necessarily alter the erosional, depositional, and flow characteristics of Snow Creek and Choccolocco Creek. EPA, ADEM and Eastman must follow through with their commitment to conduct further sampling and investigation during the Preliminary Design Investigation, with a specific focus on data that will reveal changes to precipitation patterns, erosion, and streamflow that have been exacerbated by climate change.

Removal of all PCB-contaminated soil from the floodplain should be considered. The proposed plan lists seven alternatives for creek bank and sediment remediation. Even the most stringent of these alternatives proposes to leave at least some PCB-contaminated sediment and creek bank material in place.

ARA acknowledges the efforts made to stabilize and harden creek bank soil and sediments that are contaminated with PCBs and the inclusion of future efforts to continue these processes in each alternative (excluding the no action alternative). However, given the age of existing PCB contamination data and modeling, and the resulting uncertainties regarding the erosion of contaminated materials, the lack of a creek bank and sediment remediation alternative that proposes the total removal of all contaminated materials is concerning.

At a minimum, the Proposed Plan should evaluate an alternative which would result in the total removal and replacement of all soil and sediment with a PCB concentration greater than 2.6 mg/kg. The uncertainties resulting from the use of data that is a decade or more old are compounded by certain physical characteristics of OU4. The Proposed Plan notes that only three reaches of Choccolocco Creek have streambank sediments characterized as “stable.” Because the areas of minor, moderate, and severe erosion are so widespread throughout OU4, a maximally protective alternative which would result in the total removal of all soil and sediment with a PCB concentration greater than 2.6 mg/kg must be included among the alternatives and should be considered as the preferred course of action.

Response: The floodplain soil cleanup is based on ecological risk in the top 0-6 inches. There was no risk to human or ecological receptors identified that would allow additional soil excavation under CERCLA authority.

The FS includes a number of analyses that consider removal of soil using alternative cleanup levels that were not included in the Proposed Plan. The most extensive floodplain cleanup would remove PCB concentrations in soils from surface to four feet below surface greater than 1 mg/kg. That remedy would impact 533 acres (217 acres of which are riparian), involve removal and replacement of 1.2 million cubic yards of soil, involve 96 landowners and 134 parcels at a cost of $ 485 M. Another floodplain cleanup would remove PCB concentrations in soils from surface to four feet below surface greater than 2 mg/kg. That remedy would impact 327 acres (90 acres of which are riparian), involve removal and replacement of 457, 000 cubic yards of soil, involve 47 landowners and 75 parcels at a cost of $ 243 M.

The selected remedy Alternative NRS-2 would impact an estimated 71 acres (19 acres of which are riparian), involve removal and replacement of an estimated 57,500 cubic yards of soil, involve 22 landowners and 34 parcels at a cost of at least $ 30.9 M (final volumes and costs will be determined during remedial design). Alternative NRS-2 is protective of ecological receptors, and is, therefore, more cost effective and less destructive of riparian and floodplain habitats than either of the alternatives considered for the removal of all PCBs above 2 mg/kg and 1 mg/kg.

The selected sediment remedy (SED-6) already removes PCB concentrations in sediment greater than 2.6 mg/kg.

Comment 99: Public outreach to minimize consumption of contaminated fish must be provided. Recognizing that it is impossible to completely eliminate the consumption of contaminated fish, efforts should be increased to minimize consumption of fish from Choccolocco Creek and Logan Martin Lake by members of the public. Outreach regarding the human health impacts of PCBs as well as the presence of PCBs in Choccolocco Creek, Snow Creek and Logan Martin Lake is critical to protecting human health in and around OU4.

According to ARA member organization Coosa Riverkeeper, 74% of Logan Martin Lake anglers regularly consume fish they catch. This includes anglers who fish from Choccolocco Creek, a waterbody which ADEM and the Alabama Department of Public Health have issued a “do not eat” advisory for all fish species. Logan Martin Lake also has fish consumption advisories, including a "do not eat" advisory for striped bass, and a limit of one serving per month for spotted bass, and two catfish species. All of these advisories are due to PCB contamination of fish tissue. These relatively high levels of consumption of fish known to be contaminated with PCBs present an obstacle to achieving the human health protection goals of the Proposed Plan.

Relatively high levels of consumption of contaminated fish indicate that information regarding safe levels of fish consumption is not reaching the populations most likely to be harmed by PCB contamination in fish tissue. A major effort to increase public outreach, both directly from EPA and ADEM and indirectly through community-based partners like local environmental non-profits would serve to mitigate this threat to human health.

Press releases, direct mail, providing accessible information at libraries and other public institutions, and signs at both boat ramps and dredging locations may be effective tools to increase public awareness, particularly during times when dredging is occurring. EPA and ADEM should partner with organizations who already have connections in the community at large, as well as connections with specific populations that may be at risk of increased exposure due to recreation, dietary patterns, or language barriers, such as anglers, Native Americans, and non-English speaking communities.

> **Response**: Community engagement is an integral part of all Superfund Activities. The EPA welcomes help in distributing information to and from any group with ties to the impacted community. The Community Advisory Group (CAG) was formed with members of interested community groups so that those groups could help raise concerns and distribute information. The EPA encourages interested groups to participate in CAG meetings. The CAG has the most current information about site activities and comments raised on draft documents.

Comment 100: Alternative methods to mitigate PCB contamination and transport should be considered. In addition to the requests outlined above, ARA requests that EPA, ADEM and Eastman consider modifications to the Proposed Plan in order to mitigate the impacts of contamination from the Anniston PCB site. Establishing TMDLs for waters contaminated with PCBs in order to meet ARARs would clearly demonstrate to impacted communities that EPA, ADEM and Eastman are taking a comprehensive approach to PCB contamination. Removing outdated dams that are retaining contaminated sediment would also reconnect more than 300 miles of upstream waterways to Logan Martin Lake, improve dissolved oxygen levels in Choccolocco Creek, and in at least one case, remove a breached and hazardous low-head dam.

Recognizing that the Proposed Plan includes ARARs referencing water quality criteria for PCBs in surface waters, the inclusion of specific language tying this ARAR to the existing ADEM 303(d) listing and the creation of a TMDL for PCBs in Choccolocco Creek would be welcomed. There is no TMDL for the segments of Choccolocco Creek impaired by PCBs, despite the fact that portions of Choccolocco Creek included within OU4 have been listed as impaired since 1996. Establishing a TMDL and TMDL implementation plan for the impaired portions of Choccolocco Creek as well as other downstream waterbodies would demonstrate to the surrounding communities that EPA and ADEM are both working on cleaning up legacy PCB contamination throughout the Choccolocco Creek, Snow Creek, and Logan Martin Lake watersheds. Another option that would also demonstrate a comprehensive commitment to eliminating PCBs throughout the area impacted by the Anniston PCB site would be expanding OU 4 to include portions of Logan Martin Lake listed for PCBs.

> **Response:** When a TMDL is developed for the OU4 portions of Choccolocco Creek, the impact of the TMDL will be evaluated and if modification of the remedy is required, it will be addressed. The development of a TMDL will be considered when it is established.

Comment 101: Removal of low-head dams, including the breached and failing dam at Jackson Shoals, will enhance and reconnect disjunct aquatic habitat, mitigating the impacts of PCB contamination on aquatic life. This opportunity would come at a reduced cost compared with ordinary dam removals. Sediment removal and management is a major cost driver in dam removal projects. Except for the no action alternative, each of the creek bank and sediment remediation alternatives include some amount of in-stream sediment removal. To the extent that the locations identified for in-stream sediment removal are coincident with existing low-head dams, sediment removal activities would effectively reduce the cost to remove low-head dams.

Removal of the dam at Jackson Shoals alone would reconnect approximately 300 miles of upstream habitat in Choccolocco Creek and its tributaries. This dam has been breached. Without intervention, its condition is likely to continue to degrade, presenting a risk of dam failure and damage to downstream property and habitat. Eventually, this dam will either have to be removed or repaired. Removing this barrier will result in more accessible habitat for aquatic species, and may also help diversify habitat, allowing a greater number of species to thrive in Choccolocco Creek. While ARA recognizes that a dam removal in this instance may not be viewed as directly addressing the continuing threat posed by PCB contamination in Choccolocco Creek, increased habitat accessibility would mitigate the existing impacts on the ecology of the creek and its watershed.

> **Response:** At this point, no structure removals have been identified as being needed to reach cleanup levels. If during the remedial design (RD) it is determined that removal of a structure is required, it will be conducted as part of the remedy. If not conducted under CERCLA authority, it is likely that removal of the remaining portion of the dam could be considered by the Natural Resource Trustees as part of their restoration activities. The low head dam at Jackson Shoals is owned by the Alabama Power Company.

Comment 102: I am currently a resident of Pell City and serve as the President of the Logan Martin Lake Protection Association. My family and I have either been enjoying the lake for over the last 20 years and we have been living on the lake for over the last 10 years. I have been following the remediation projects done for OU-1 through OU-3 because we formerly lived in Oxford, AL, and I worked in Oxford until my retirement in 2020.

Much of the existing data used for the plan is from the late 1990's through 2010's. Creek flows, industry, climate, and general weather changes have surely changed some of the levels along the creek and the public would feel much better if they knew that the conditions you are remediating are still there to be corrected.

Response: The EPA agrees that sampling is needed to understand current conditions. When the data is available it will be disseminated to the community through the CAG. The CAG receives all information about ongoing CERCLA response activities. I urge you to attend the Community Advisory Group (CAG) meetings that are held every other month to learn about the activities taking place and to voice any concerns you have. The CAG website and phone number are www.annistoncag.org and (256)741-1429. The EPA will present more information about the RD/RA to the community before any dredging occurs.

Comment 103: That fact that dredging is proposed in creek areas of high flow and low flow really concern the public because sedimentation will be disturbed and naturally flow downstream (potentially to the lake itself). We already have a “no fish consumption” notice for Choccolocco Creek. This would be devastating for the lake community if that became true of the lake itself.

Response: Most of the activity will be conducted 20 miles upstream of the Choccolocco Creek embayment at Logan Martin Lake. The EPA will ensure that plans are prepared and implemented to reduce the opportunity for downstream releases of contaminated sediment. Work will be conducted during drier portions of the year to minimize downstream impacts. Sheet piling and silt screens will be used where possible. BMPs at contaminated sites have been developed and improved over the last few decades. Every effort will be made to reduce contaminated sediment movement.

Comment 104: The downstream impact on Logan Martin Lake has not been clearly communicated to the public and provisions should be made to adequately protect this area and keep the public notified during the remediation process. How far down the creek will dredging occur? Where will the monitoring station locations be located at the end of Choccolocco to see how effective the removal is going? Will this information be easily accessible by the public and used to stop and/or monitor operations.

Response: Many of the details you are asking for will be developed during RD. Extensive resampling will be conducted before the action is implemented. Based on current data, most of the work will occur in the upper four reaches of the OU (C1-C4). The location of the monitoring stations will be based on where the work is being performed. When the RD is complete, the EPA will offer opportunities for the community to learn about the final design and the expected schedule of the remedial activities. At that time, EPA can answer your questions more specifically to address any of your concerns.

Comment 105: I am writing to share my personal experience and the devastating impact that Monsanto Corporation’s pollution has had on my life, health, and community in Anniston, Alabama. I believe it is crucial to voice these concerns and provide my testimony as part of the EPA’s efforts to clean up and remediate the contaminated sites affected by polychlorinated biphenyls (PCBs) released by Monsanto. Growing up in Anniston, I spent countless hours playing in the ditches and creeks near my home, unaware of the toxic pollutants lurking in these areas. These ditches, as I later discovered, were contaminated with PCBs released by Monsanto. As a child, I also consumed produce from our home-based gardens, which were unfortunately grown in contaminated soil. This exposure has had a profound impact on my health and that of my family. In addition to the environmental and health concerns, my family was previously tested and found to have alarmingly high percentages of PCBs in our bodies. The long-term exposure to these hazardous chemicals has resulted in severe health complications. Tragically, my grandmother passed away from a rare disease directly linked to PCB exposure. The grief and anguish caused by her untimely death are compounded by the knowledge that it was preventable, had the contamination not occurred. The contamination has not only affected individual families but has also had a widespread impact on our community. The health risks and diseases associated with PCB exposure have created an atmosphere of fear and uncertainty. Many of us are living with the constant worry of what the future holds for our health and the health of future generations. It is particularly alarming that a majority of the people in our community are suffering from unexplained illnesses, which we believe are due to the continued pollution and exposure to PCBs. Moreover, it is deeply troubling that previous lawsuits mandated Monsanto to undertake continuous cleanup efforts in our community. Despite these legal instructions, the company only performed a one-time cleanup approximately 20 years ago. Since then, there have been no further resources or cleanup efforts provided, and we continue to endure the presence of toxins and pollution in our environment. The lack of sustained remediation has left our community vulnerable and suffering from ongoing exposure to harmful contaminants. Given the severity and persistence of the pollution and its impact on our health, I strongly believe that further legal action against Monsanto should be considered. The company must be held accountable for its ongoing negligence and failure to adequately address the contamination and its effects on our community.

Response: Your testimony is noted, and your opinion is completely understandable. Since the EPA became involved and the Anniston PCB Site was formed, there have been cleanup activities ongoing in the affected communities. While cleanup of a specific residential yard may have only been conducted once, there were hundreds of yards cleaned up between 2003 and 2010, and some residential cleanups are still occuring every year as structures are removed and PCB concentrations in soil are found. There have been periods where plans were being prepared and field activities were not occuring, but the effort to protect human health and the environment has never stopped. The EPA urges you to attend the Community Advisory Group (CAG) meetings that are held every other month to learn about the activities taking place and to voice any concerns you have. The CAG website and phone number are www.annistoncag.org and (256)741-1429.

Comment 106: The EPA's proposed cleanup plan for the Anniston PCB Site, specifically Operable Unit 4 (Choccolocco Creek), offers a glimmer of hope for our community. The preferred cleanup methods, including the removal and disposal of contaminated soil and sediments, dredging of sediment in fast- and slow-moving waters, and long-term monitoring, are essential steps towards restoring the health and safety of our environment. I strongly urge the EPA to implement the proposed cleanup plan with the utmost urgency and thoroughness. It is imperative that all contaminated areas are addressed comprehensively, and that long-term monitoring and institutional controls are put in place to prevent future contamination and ensure the safety of our community.

Response: The comment is noted.

Comment 107: As public comments surrounding the remediation of PCB (polychlorinated biphenyl) contaminated soil take precedence, it is essential to consider the unintended consequences of soil disturbance and removal. While soil removal may hold appeal as a seemingly immediate and direct means of soil decontamination, it is crucial to acknowledge the multifaceted implications, and alternative strategies that warrant exploration for a more sustainable resolution to PCB contamination. The proposed remedial alternative for nonresidential soil described in the Proposed Plan may result in habitat destruction based on the proposed implementation approach. This proposed approach focuses on smaller areas and uses complicated statistics, which will lead to widespread intrusive investigations and larger cleanup areas.

The expanded remedial areas will immensely impact the natural resources (e.g., riparian buffer zones) along the creek and negatively affect landowner and recreational uses. The resulting loss of significant habitat will be devastating and difficult to reproduce. This will certainly reduce the functionality and value for landowners and community members that currently recreate along Choccolocco Creek and in its associated watershed areas. There is also uncertainty about what benefit this proposed approach will have for the ecological receptors.

The soil removal process to remove PCB-contaminated sediments may inadvertently expose previously undisturbed areas to the spread of PCBs, as the soil removal process can dislodge and redistribute contaminated particles downstream and into adjacent land areas. This presents the risk of recontamination, underscoring the potential for an incomplete and cyclical approach to soil remediation that could exacerbate the longevity and scale of the contamination.

The CCW group supports the soil management program included with the proposed remedy for nonresidential soil. Using Alabama 811 will ensure that Solutia is notified so they can evaluate the presence of PCBs prior to the performance of intrusive work. Solutia will then be required to provide the necessary support to confirm proper management of PCB-containing material. Soil management is essential to maintaining the protectiveness of the remedy over time.

Response: While the specifics about the cleanup levels and remedial actions seem set in stone in the ROD, often the circumstances and habitats encountered in the field, with input from landowners and natural resource trustees can alter the way the remedy is implemented during RD. One size does not fit all. Any deviations from the ROD are typically documented during RD/RA and are to be expected when more detailed analyses are conducted. Landowners and the public will not be ignored during this cleanup and every effort will be made to restore areas to natural conditions as much as possible while removing the threats to ecological and human health from the site contamination.

Comment 108: The preferred sediment removal alternatives include creek bank stabilization along Choccolocco Creek and sediment removal. Creek bank stabilization should only go as far as necessary to limit the loading of PCBs into the creek. Our understanding is that creek bank stabilization up to River Mile 29.5 will satisfy this objective. This will lessen the amount of additional intrusive work being performed with unknown benefits. This same lesson should be applied when dredging. We understand that there are PCBs in sediment that need to be removed. We would, however, like restraint provided when dredging to limit the disturbance of PCB-containing material. This will balance the goal of reducing PCBs in fish tissue concentrations with disturbances to the creek and its watershed.

> **Response:** For the most part, the remedy will take place in the upper reaches (C1-C4) of the site. We don't anticipate that banks will require stabilization downstream of River Mile 29.5, but sampling is required to ensure that no severe, moderate, and minor bank erosion areas exist downstream of River Mile 29.5 contain PCB concentrations greater than 2.6 mg/kg.

Comment 109: Fish consumption advisories should continue as needed. These advisories provide people with information about what fish, if any, are safe to consume. The advisories combined with the use of community resources will ensure people know which fish are affected. Our responsibility is to promote the safe use of Choccolocco Creek and the associated watershed areas. In light of the delicate considerations surrounding the remediation of PCB-contaminated soil, it is imperative to approach the issue with a balanced perspective that accounts for the complex nature of the contamination, and the potential ecological repercussions in order to achieve a comprehensive and enduring solution.

> **Response:** Fish advisories will be an integral part of the remedy for OU4 until contaminants in fish tissue are low enough to not be a concern.

Comment 110: As a concerned citizen and environmental professional, I feel it is important to provide my concerns about the OU4 Remediation Plan as it fails to adequately address concerns for protecting public health and the environment. First, I agree with the concerns raised by Coosa Riverkeeper, and you can add my name to the roster of the many people endorsing Coosa Riverkeeper's official comments submitted to your office.

Having participated in many community engagement and environmental education efforts over the years, I have been especially surprised at the lack of effective community outreach efforts by EPA associated with the Anniston PCB Site and in particular during this recent public comment period for the plan for OU4. Though the extension of the comment period to 60 days was appreciated in order to get more people involved, the agency's attention to meaningful engagement with the large number of people impacted by very extensive contamination does little to reassure members of the community. Contemporary understandings of environmental justice issues and how to work with and communicate to the public about EPA decision-making affecting their health and the environment has come a long way (in part thanks to efforts at other divisions at EPA). My overarching comment to you at this time is to please improve your efforts to help people in the community - and those visiting the impacted waterways for recreation - understand the risks and potential impacts. Decades of deferred PCB remediation and lack of accountability by polluters and regulators in the past is not an excuse for not doing a better job now.

Response: The EPA will add you to our mailing list and encourage you to participate in CAG meetings where the status of the work and major achievements are discussed every other month. The EPA welcome your organization to help get information out to impacted or interested communities or groups. The EPA has historically encouraged a number of local organizations and church groups to help facilitate or enhance communications about site activities.

Comment 111: If it is known that two of the main pathways of exposure are inhalation and consumption of fish with PCBs, how are you all ensuring that the public's health is protected through the remediation process for OU4?

Response: The human health exposure pathway identified in the risk assessment was ingestion of contaminated fish tissue. The only way to protect public health until fish tissue concentrations reach protective levels is through fish advisories. Signage at bridges where public access to fish is available provides those advisories. Regular monitoring and maintenance of the signage, and educating any people fishing as well as property owners with access to the creek is the primary way for public health education and protection to be achieved until the remedy is complete.

Comment 112: How will monitoring of the air, soil and water be conducted during this time? If it is known that PCBs have been found more than 40 miles from the initial source, how are you all ensuring other operable units will not be impacted by the work being conducted in OU4?

Response: BMPs will be used to ensure soil and water encountered during remediation are contained and not released to other areas. Sediment is the most difficult to contain and precautions such as sheet piling, and silt screens will be used where possible, as well as scheduling work during low flow periods and dryer weather conditions. The need for air monitoring will be considered during RD and will consist primarily of particulate monitoring and the use of water to suppress fugitive particulate releases.

Comment 113: Have you considered the impact of climate change on the remediation efforts-specifically flooding, wildfires and tornadoes in the impact OU4 that includes the Snow Creek floodplain?

Response: The RD for OU-4 would include a creek migration zone (CMZ) evaluation that would be used to inform the long-term monitoring program. The CMZ assessment will be used to predict lateral movement of the creeks' channels over time to limit residual creek bank sources from becoming a primary source once other sources have been addressed. Climate change predictions will be used to ensure the design will withstand anticipated changes. Since Five-Year Reviews of the remedy will be conducted, any unanticipated climate changes impacts can be addressed as needed to ensure the remedy remains effective.

Comment 114: Will there be potential backwater effects from OU4 to OU-1&2?

> **Response:** OU1/OU2 ends at Highway 78 in Oxford, Alabama. The lower portion of Snow Creek where backwater effects occur due to bridges and obstructions is part of OU4, so no effects are anticipated in OU1/OU2.

Comment 115: Please consider the decades of exposure and impact any mention of clean-up presents to the impacted community. The remediation of the Anniston PCB site is ongoing, while it was expected that clean-up would have been completed years earlier, 20+ years later the remediation is still in progress. Effective community engagement and trauma informed communication is necessary. Please be understanding that when communicating with the impacted community no clean-up can be considered a success when exposure to contaminants remain. There are public health implications that have negatively impacted people's way of life, and concern and care of this should be of paramount concern when the EPA and the PRP is communicating with the impacted communities regarding the clean-up.

> **Response:** Your concern about communication with the impacted community is noted. The EPA will make every effort to be transparent with the community as the work progresses and to always consider the impact of the cleanup on the overall Site community. This work is being done to provide a more protected environment to the community, and the EPA sincerely hopes that the community will benefit from this work in the longrun. The EPA will make every effort to reduce any identified adverse short-term impacts on the community.

Comment 116: Since 1986, I have lived on one of the lakes of the Coosa River. Most of the time, I was a full-time resident. I raised my children on the river and taught most of my seven grandchildren to swim in the river. I have lived in 12 states and at 70 years of age, I believe that the Coosa River is one of the few precious places left in the United States. It is special to not only my family but for many of our friends. Protecting this river for future generations is of unparalleled importance to me. Please, please for so many reasons: clean water, protecting species that are unique to this river, and for the enjoyment of many generations to come, be diligent in the remediation of OU4 of the Anniston PCB Site in Anniston, Alabama. I realize that your job is difficult and there is much pressure NOT to do the right thing. I trust that you have the strength and power to do the right thing.

> **Response:** Your concerns are noted, and the EPA will make every effort to preserve the character of the waterway.

Comment 117: I believe that cleanup is needed. We have had so many deaths due to pollution over the years.

> **Response:** The comment is noted.

Comment 118: Page 9, Site Characteristics, 2nd paragraph: Suggest adding statement such as "likely the result of climate change."

Response: The comment is noted and was checked in the ROD language.

Comment 119: Page 10, Site Characteristics, 2nd paragraph, end. Deep (up to five (5) feet thick) of fine-grained sediment deposits in large portion of the backwater area. Has there been adequate testing/analysis of sediment at this depth?

Response: There has been probing to determine the thickness as well as sampling in the backwater area. There will be more testing during the PDI component of the RD.

Comment 120: Page 10, Site Characteristics, 2nd paragraph. Add a period (.) after the word “applicable” in the last line.

Response: The comment is noted and was checked in the ROD language.

Comment 121: Page 14, Nature and Extent of Contamination/ Soil on Current Residential Properties, 1st paragraph. What is the occupancy status of these 14 properties? If occupied, are the occupants tested for PCB exposure, and if yes, frequency and results.

Response: The OU4 residential properties on page 14 and Table 1 of the Proposed Plan are occupied. The EPA does not test residents for exposure. If they have been tested it was likely done by their doctor or health department. Those results are likely not available to the public.

Comment 122: Page 17, Nature and Extent of Contamination/ Nonresidential Soil, 3rd paragraph. Highest PCB concentration in non-residential soil (353 mg/kg, at sample depth of 24 – 30 inches). Geographic pattern of concentration shows decreasing values relative to a) distance from creek bank, and b) distance downstream from confluence with Snow Creek. Were measurements taken beyond 30 inches depth and at what depth were PCB concentration values ≤ the PRG values for subsurface soil?

Response: Please see Table 2 in the ROD. PCB concentration in soil were primarily found in the top 0 to 12 inches. Subsurface soil was typically sampled until PCB concentrations reached approximately 10 mg/kg or less because that was the residential soil subsurface cleanup goal. One location was found to have PCBs at a 6 to 8 feet depth.

Comment 123: Page 21, Nature and Extent of Contamination/ Nonresidential Soil, 3rd paragraph. “The highest total TEQ concentrations were found in soil…. The distribution of total TEQ in soil relative to PCBs suggests another source may be located downstream in OU4.” What does this observation suggest and what strategies are planned to identify and address the source(s)?

Response: This remedy will address total TEQ from the Site. Although it is not expected, if long-term monitoring indicates the location of another source, the EPA will determine what if anything needs to be done to address any new source and its related contamination.

Comment 124: Page 21, Nature and Extent of Contamination/ Sediment and Creek Banks, 1st paragraph. “OU4 sediment was characterized over a series of phased investigations between 1998 and 2009.” Need updated data to help target best remediation actions; it can also be used to identify concentration trends over time.

Response: There will be new sampling conducted during the PDI component of the RD.

Comment 125: Page 34, Nature and Extent of Contamination/ Ecological Investigations, 2nd paragraph. Suggestion: Describe and provide reference area location (by inclusion on a related map).

Response: There are so many maps needed to show the locations of samples collected in the ecological investigation and the reference areas that a decision was made just to refer readers to the RI and risk assessment documents.

Comment 126: Page 34, Nature and Extent of Contamination/ Ecological Investigations, 6th paragraph. “In general, the highest concentrations of PCBs were associated with the highest concentrations of PAHs, dioxins, and pesticides.” Why the high concentration of PCBs and PAHs, dioxins and pesticides? coincidental, similar properties, similar transport + uptake or sequestration routes, or disposal practices, or other? Will here be any targeted efforts to clean these other non-PCBs during remediation, and if yes, what mechanisms will be involved? Also, if yes to remediation, will the post PCB remediation monitoring also include monitoring of these other toxins?

Response: The sediment in the backwater area has accumulated many contaminants from historical upstream urbanized/industrial areas that decrease in concentration downstream. Those contaminants will be removed from Choccolocco Creek during the sediment dredging required in the backwater area, but they will not be specifically targeted. Since the selected remedy includes dredging, treatment with portland cement, and offsite disposal, these high contaminant concentrations will be permanently removed in this portion of OU4. The only contaminants that will be monitored long-term are PCBs, mercury, and DL-PCBs based on the ecological risk assessment and background concentrations.

Comment 127: Pages 35,36, Nature and Extent of Contamination/ Ecological Investigations, Fig. 19, 20. Suggestion: include reference site data in some/all locations noted in bar graphs.

Response: The figures referenced in the comment are the fish tissue sampling locations for human health. The reference sites were used in the ecological risk assessment. Sorry for the confusion. Figures 19 and 20 should have been placed before page 34.

Comment 128: Page 43, Scope and Role of Operable Unit or Response Action/ Actions taken in OU3, 1st paragraph. “A final groundwater remedy for OU3 with final groundwater remedial goals will be selected in a future decision document.” Why the delay in setting the remedial goal?

Response: The OU3 groundwater remedy was determined to be interim so that monitoring could be conducted to determine whether the groundwater actions taken would restore groundwater or if additional response activities would be needed. The proposed groundwater cleanup levels were included in the ROD but were not finalized with the selected remedy.

Comment 129: Page 45, Summary of OU4 Risks/Risk from Direct Contact Exposure to Soil, 2nd paragraph. End of second sentence. Change “1x10-6” to “1×10^{-6}” to be consistent in style throughout document.

Response: The comment is noted and will be checked in the ROD language.

Comment 130: Page 54, Summary of OU4 Risks/ Threatened and Endangered Species, 1st sentence. “The potential for adverse effects to populations of Threatened and Endangered (T&E) species that may occur in OU4 was qualitatively evaluated based on the risk conclusions for each assessment endpoint that corresponds with the relevant T&E species.” Additionally, a number of T & E species of mollusks have been documented in or potentially occur in the Choccolocco Creek basin and environs. However, it appears there was no actual testing for PCBs and other chemicals of concern in tissues of these T & E and other mollusk species. It would be good to document estimated population and recruitment information and repeat this exercise after remediation to learn if there is any change in the population dynamics because of the remediation efforts. The location and condition of mollusks should be noted, and measures taken to protect their populations during excavation, backfilling and other remediation activities.

Response: EPA and the PRPs will work closely with the US Fish and Wildlife Service and Alabama Natural Resource Trustees and to ensure that designs and actions taken meet the requirements needed to work in and around endangered species. A baseline assessment of habitats in the remedial footprint will be conducted before OU4 work begins.

Comment 131: Page 58, Preliminary Remediation Goals/Sediment PRGs, 2nd paragraph this section; last two complete sentences. “The selected RAL does not achieve protection of human health at the completion of construction. Rather, a risk management decision was made to select a RAL and rely on MNR after remedy construction to achieve protective levels in sediment and fish tissue.” While the active remediation effort will not provide the targeted RAL, the target will be met with MNR. It would be helpful if a model can provide the amount of time (years) for this process until the RAL is met.

Response: Active remediation will be conducted for the RAL of 2.6 mg/kg; the 2.6 mg/kg concentration is a not-to-exceed concentration. MNR is needed to ensure that the remedy meets the final sediment remedial goal of 0.1 mg/kg surface weighted average concentration. The description for SED-6 estimates MNR will take 20-30 years. The models used to estimate the restoration timeframe are provided in the FS.

Comment 132: Page 58, Description of Alternatives 2nd paragraph. “Thermal desorption of PCB contaminated soil was included in RODs for OU1/OU2 and OU3 but were not selected because of concerns that onsite thermal desorption could create addition air pollution ….” Was the change in activity driven by "unfortunate" experience with thermal desorption and concern about community perception of gases evacuated into the region's air column, or other administrative factor such as costs, as noted in the paragraph.

> **Response**: In addition to not being cost effective relative to containment in a landfill, the community is generally wary of the incineration activities that took seven years to complete at the Anniston Army Depot. For years, the EPA has received many questions concerning contaminants in air. Incineration would increase the concerns about air pollution and would likely not be supported by the community.

Comment 133: Page 64, Common Element of All Alternatives/ Remedial Alternatives for Non-Residential Soil Has there been consideration of employing phytoremediation of PCBs, especially in agricultural areas and/or areas that are difficult to access or areas that may experience significant disturbance of the biotic community?

> **Response**: Bioremediation was considered in the December 2019 Technical Memorandum on Remedial Action Objectives and Remedial Technologies, Alternatives, and Screening, but it was determined that is was “not proven effective or reliable for PCBs given the site-specific attributes of the Anniston PCB Site.” Although phytoremediation is environmentally friendly, PCBs are slowly degraded, and the end result may not be uniform if implemented in OU4.

Comment 134: Page 66, Common Element of All Alternatives/ ALTERNATIVE NRS-2 and 2nd paragraph. “The excavated soil would be taken offsite for disposal at an approved facility (landfill). The excavated areas would be backfilled with clean soil to the original grade. Vegetation would be planted to stabilize the newly placed surface soil layer.” Will the replacement soil be similar in properties to what was excavated (organic content, soil type/particle size, pH, etc.)? What type of vegetation will be replanted? Will the replanting attempt to replicate the current vegetation, and/or use native flora, other?

> **Response**: Native soil and plants will be used to restore excavated areas unless there is a special condition or restoration requirement that requires modification.

Comment 135: Page 68, Common Element of All Alternatives/ ALTERNATIVE NRS-2 5th paragraph, 1st “bullet”. “Excavate soil in 0–6 inches soil horizon to achieve PCB SWAC of 6 mg/kg.” Are there any areas where PCB concentrations > 6 mg/kg? If yes, are there plans for deeper excavations to achieve the targeted SWAC.

> **Response**: Table 10-7 in the FS provides a summary of pre- and post-remediation surface (0-6 inches) Soil PCB data by ecological exposure units. This table is based on reaching the goal based on a mean surface weighted average concentration (SWAC) instead of the 95% UCL SWAC required in the ROD, so the post-remediation concentrations will likely decrease. There is no unacceptable risk that will allow for subsurface soil cleanup. Several alternatives were evaluated in the FS to reduce

subsurface soil PCB concentrations, but the EPA determined that those could not be considered in the Proposed Plan.

Comment 136: Page 68, Common Element of All Alternatives/ ALTERNATIVE NRS-2. Will the work be timed to minimize disruptions to wildlife and/or be implemented in segments to facilitate the movement of wildlife from areas of "active disturbance" to "undisturbed" or "newly reworked" areas?

Response: EPA and the PRPs will work closely with the US Fish and Wildlife Service and Alabama Natural Resource Trustees to ensure that work takes place in a sequence and a manner that considers local wildlife to minimize disruptions.

Comment 137: Page 69, Common Elements of the Creek Bank and Sediment Alternatives/Creek Bank Soil Approach, 4th paragraph. "Most of the creek bank areas targeted for potential source control actions are characterized as having moderate or minor erosion and would be addressed using a range of available natural approaches." Do the "natural approaches" include phytoremediation techniques? Phytoremediation can be effective, but care needs to ensure species used and its introduction into the area does not compromise native vegetation and wildlife.

Response: The natural bank stabilization techniques will be determined during RD. Also, see the response to Comment 133.

Comment 138: Page 71, Common Elements of the Creek Bank and Sediment Alternatives/Dredging. Will the timing of the dredging be influenced by flow rate (when predictable)? Can the dredging be limited to the period of the lowest flow rate to minimize downstream spread of PCBs and other material (contaminants and sediment)? Wildlife strategies and behavior (e.g., up/down stream movements; reproductive patterns) of aquatic and semi-aquatic animals be considered in the timing to minimize ecological risks?

Response: The timing of dredging will be determined based on all of the considerations mentioned (i.e., flow rates, wildlife and aquatic life considerations).

Comment 139: Page71, Common Elements of the Creek Bank and Sediment Alternatives/Backfill, 1st paragraph. "For OU4, the approach would be to replace the layer of sediment removed with clean sand up to a maximum layer thickness of 1 foot." Will the composition of the replacement sediment (specifically granular size) be equivalent to what is removed?

Response: The appropriate grainsize and nutrient requirements of the backfill will be determined during RD.

Comment 140: Page 74, Common Elements of the Creek Bank and Sediment Alternatives/ Monitored Natural Recovery, 1st paragraph. "Monitored Natural Recovery (MNR) for sediment relies on natural processes to reduce COC exposure concentrations over time. For PCBs in sediment, the primary MNR mechanism is introducing and mixing relatively cleaner sediment brought into the aquatic system through flow from upstream. Other processes for sediment, such as biodegradation, volatilization, dispersion, adsorption, and dissolution, play a lesser role in MNR of PCBs." This statement suggests that while there may be a slow diminution of PCBs as a result of mixing and downstream movement of contaminants, sedimentation will likely cap the bulk of them and limit their downstream movement and accessibility to biota in the water column and/or hyporheic regions. However, their "buried" presence poses a potential risk with the possibility of dislodgement under extreme streamflow conditions and or human disturbance, such as future dredging.

Response: Scouring of sediments in the embayment area is unlikely because the velocity of water will decrease as it reaches the embayment area where the depth of water is approximately 12 feet deep. During RD, increases in water flow rates will be evaluated to ensure there is no concern (as raised by the Comment) or to address that concern in the RD.

As for human disturbance in the area, the EPA and the PRPs have worked with the US Army Corps of Engineers and the Alabama Power Company to agree on a process to streamline the permit process for residents on the Choccolocco Creek embayment of Logan Martin Lake who want to make changes to docks, boathouses, and seawalls that would involve disturbing sediment. The basic elements of the agreement are as follows:

I. The EPA agrees that Alabama Power Company (APCO) does not need to consult with the EPA prior to approval of the following activities in the Choccolocco Creek embayment area, under its Programmatic General Permit (PGP) issued by the Mobile District, U.S. Army Corps of Engineers (USACE):

APCO-PGP 3 - Construction and/or Maintenance of Fixed Structures

- All PGP-3 projects for maintenance of fixed structures that do not involve any contact with the lake bottom. Examples of such maintenance projects would include top board replacement, re-decking, roof work, etc. on fixed structures.

APCO - PGP 5 - Riprap and Bulkheads

- All PGP-5 projects for the hand placement of rip rap along the shoreline for bank stabilization on both new and maintenance projects.

II. The following activities under the APCO PGP require that the EPA receive a copy of the permit so that the Anniston PCB Site project team: can follow-up with the permittee concerning the need to be diligent with soil and sediment spoil material, even though these activities should not generate spoils:

APCO-PGP 3 - Construction and/or Maintenance of Fixed Structures

- All PGP-3 projects for new construction of fixed structures under the stipulation that pile drivers are used for post installation in lieu of any digging in the lake bottom.

APCO - PGP 4 - Construction and Modification of Boat Ramps

- All PGP-4 projects for the construction of boat ramps with the stipulation that they are precast and slid into place without excavation or dredging of silt.

APCO - PGP 5 - Riprap and Bulkheads

- All PGP-5 projects for maintenance of existing bulkheads/seawalls that do not involve any digging in the lake bottom or displacement of sediment. Examples of such maintenance would include wooden board replacement, repairs to damaged concrete or concrete block, restacking of stacked stone, etc.

III. The EPA should be contacted prior to APCO PGP being used for any projects that involve sediment removal and disposition in the Choccolocco Creek embayment area, specifically the project that fall under the category below.

APCO - PGP 5 - Riprap and Bulkheads

- All PGP-5 projects for the installation of new bulkheads/seawalls where any sediment that is removed from the installation of posts or footers is placed behind the seawall in the same location.

Comment 141: Page 75, Common Elements of the Creek Bank and Sediment Alternatives/ Long-term Monitoring, 1st "bullet" (Sediment Sampling to Support MNR). "Surface sediment samples would be collected for the top 6 inches of sediment at all locations necessary to estimate a SWAC in the ten reaches of Choccolocco Creek." What is the frequency of sampling?

Response: See ROD Table 16.

Comment 142: Page 75, Common Elements of the Creek Bank and Sediment Alternatives/ Long-term Monitoring 2nd "bullet" (Creek Banks). "Creek Banks will be monitored after significant flow events or at a minimum annually to ensure that areas that have been stabilized remain protective and to identify any new areas of concern." Specify monitoring techniques and metrics used. Monitoring should include documentation of changes in 1) movement of creek bank soil; 2) vegetation cover (type, extent). Photographic records over time will be helpful to document and calculate changes.

Response: The specifics of the Long-term Monitoring Plan will be developed during RD.

Comment 143: Page 76 Common Elements of the Creek Bank and Sediment Alternatives/ Long-term Monitoring 4th "bullet" (Surface Water Sampling). "Surface water would be sampled at the same sediment sampling locations using grab sampling and passive sampling techniques." What is the frequency of sampling (both grab and passive), proposed duration, and if repeated, basis for determination of when sampling occurs?

Response: See ROD Table 16.

Comment 144: Page 76, Common Elements of the Creek Bank and Sediment Alternatives/ Long-term Monitoring 5th “bullet” (Porewater Sampling). “Porewater would be sampled using the same passive sampling techniques proposed for surface water sampling and would be sampled at all sampling locations.” What is the proposed frequency and duration of the porewater sampling/monitoring? What is the threshold (value greater than accepted standards) of PCB levels in porewater?

> **Response**: There is no special standard for PCB porewater concentrations. Porewater PE sampling devices would be left in place for 4 to 8 weeks. The sampling would be conducted at the locations and frequencies of the fish sampling. See ROD Table 16.

Comment 145: Page 91, Common Elements of the Creek Bank and Sediment Alternatives/ ALTERNATIVE SED-7, 4th paragraph, last sentence. “SED-2 would also include the implementation of the Soil Management Plan.” Mistake: SED-2 should read SED-7.

> **Response**: The comment is noted and was checked in the ROD language.

Comment 146: Page 95, Comparative Evaluation of Alternatives/Nonresidential Soil, 1st paragraph, 3rd sentence. “The remedial volume for soil under NRS-2 reflects the excavation of soil from the 0–0.6 inches horizon over a to achieve the ecological PRG.” Mistake: should read "... soil from the 0 - 6 inches horizon to achieve the ecological PRG.”

> **Response**: The comment is noted and was checked in the ROD language.

APPENDIX A

HUMAN HEALTH RISK ASSESSMENT TABLES – Fish Tissue Consumption

TABLE A-1
SUMMARY OF ANALYTES DETECTED IN FISH TISSUE - GROUP A
ANNISTON PCB SITE
OU-4

CAS Number	Analyte	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency[a]	Detection Limits[b]	Arithmetic Mean[c]	Standard Deviation[c]
					All Species				
53469219	Aroclor-1242	5.00E-02	4.70E-01	mg/kg	C60231	36/84	2.00E-02 - 4.00E-01	1.79E-01	1.04E-01
11097691	Aroclor-1254	9.30E-02	4.80E+00	mg/kg	C60231	84/84	NA	1.02E+00	7.00E-01
11096825	Aroclor-1260	1.30E-01	4.20E+00	mg/kg	C60231	84/84	NA	9.98E-01	7.47E-01
11100144	Aroclor-1268	1.20E-01	1.20E-01	mg/kg	C60056	1/84	2.00E-02 - 4.00E-01	1.51E-01	8.07E-02
32598144	BZ#105	1.00E-02	5.30E-02	mg/kg	C60073	12/12	NA	2.66E-02	1.48E-02
31508006	BZ#118	2.80E-02	1.50E-01	mg/kg	C60073	12/12	NA	7.80E-02	4.20E-02
57465288	BZ#126	1.90E-02	1.90E-02	mg/kg	C60414	1/12	1.60E-03 - 1.60E-02	7.25E-03	5.35E-03
35065271	BZ#153	5.50E-02	3.20E-01	mg/kg	C60073	12/12	NA	1.78E-01	9.80E-02
38380084	BZ#156	3.40E-03	2.30E-02	mg/kg	C60414	12/12	NA	1.25E-02	7.11E-03
32598133	BZ#77	1.30E-02	2.50E-01	mg/kg	C60073	9/12	4.00E-03 - 8.00E-03	8.07E-02	8.27E-02
2051243	Decachlorobiphenyl	2.00E-03	1.80E-02	mg/kg	C60414	12/12	NA	5.75E-03	4.50E-03
---	Total Homolog PCB	4.80E-01	2.60E+00	mg/kg	C60058	12/12	NA	1.58E+00	7.64E-01
1336363	Total PCBs	2.23E-01	9.47E+00	mg/kg	C60231	84/84	NA	2.11E+00	1.45E+00
---	PCB Dioxin-like Congener TEQ	1.96E-06	1.91E-03	mg/kg	C60414	12/12	NA	1.90E-04	5.44E-04
35822469	1,2,3,4,6,7,8-HpCDD	2.24E-07	2.40E-06	mg/kg	C60073	5/12	1.51E-07 - 6.31E-07	5.62E-07	6.42E-07
67562394	1,2,3,4,6,7,8-HpCDF	1.39E-07	5.29E-07	mg/kg	C60073	5/12	1.15E-07 - 2.71E-07	2.20E-07	1.09E-07
70648269	1,2,3,4,7,8-HxCDF	1.09E-07	3.35E-07	mg/kg	C60073	4/12	1.07E-07 - 3.47E-07	1.85E-07	8.39E-08
57117449	1,2,3,6,7,8-HxCDF	1.30E-07	2.40E-07	mg/kg	C60073	3/12	1.24E-07 - 2.82E-07	1.74E-07	5.57E-08
19408743	1,2,3,7,8,9-HxCDD	2.61E-07	2.61E-07	mg/kg	C60220	1/12	1.02E-07 - 2.09E-07	1.59E-07	4.92E-08
40321764	1,2,3,7,8-PeCDD	1.56E-07	2.01E-07	mg/kg	C60229	3/12	1.07E-07 - 1.99E-07	1.46E-07	3.18E-08
57117416	1,2,3,7,8-PeCDF	2.13E-07	2.15E-06	mg/kg	C60073	7/12	1.69E-07 - 6.08E-07	6.66E-07	5.88E-07
57117314	2,3,4,7,8-PeCDF	4.19E-07	3.99E-06	mg/kg	C60073	10/12	2.13E-07 - 8.19E-07	1.46E-06	1.07E-06
51207319	2,3,7,8-TCDF	7.32E-07	9.61E-05	mg/kg	C60073	12/12	NA	2.25E-05	2.77E-05
3268879	Octa CDD	1.18E-06	1.56E-05	mg/kg	C60073	7/12	5.46E-07 - 1.67E-06	3.29E-06	4.32E-06
39001020	Octa CDF	2.86E-07	1.93E-06	mg/kg	C60073	6/12	2.10E-07 - 3.82E-07	5.07E-07	4.87E-07
---	2,3,7,8-TCDD TEQ	5.11E-07	1.11E-05	mg/kg	C60073	12/12	NA	2.94E-06	3.06E-06
7440382	Arsenic	6.50E-02	3.80E-01	mg/kg	C60250	8/12	1.80E-02 - 1.10E-01	1.20E-01	9.78E-02
7440417	Beryllium	9.00E-03	9.60E-03	mg/kg	C60051	2/12	9.30E-03 - 1.50E-02	1.08E-02	1.85E-03
7440439	Cadmium	9.30E-03	9.30E-03	mg/kg	C60051	1/12	2.20E-03 - 9.00E-03	5.21E-03	2.78E-03
7440473	Chromium	1.10E-01	1.90E-01	mg/kg	C60072	7/12	1.60E-01 - 2.00E-01	1.63E-01	3.37E-02
7439921	Lead	9.00E-03	2.30E-02	mg/kg	C60072	3/12	8.60E-03 - 1.10E-02	1.14E-02	4.32E-03
7439965	Manganese	6.30E-02	7.50E-01	mg/kg	C60068	10/12	7.70E-02 - 9.50E-02	2.68E-01	2.47E-01
7439976	Mercury	3.10E-02	8.70E-01	mg/kg	C60233	84/84	NA	2.81E-01	1.91E-01
7440622	Vanadium	1.90E-02	3.10E-02	mg/kg	C60070	5/12	3.60E-02 - 6.80E-02	3.84E-02	1.42E-02
					Bass				
53469219	Aroclor-1242	1.10E-01	4.70E-01	mg/kg	C60231	17/28	2.00E-02 - 4.00E-01	1.94E-01	1.01E-01
11097691	Aroclor-1254	9.30E-02	4.80E+00	mg/kg	C60231	28/28	NA	1.06E+00	8.83E-01
11096825	Aroclor-1260	1.30E-01	4.20E+00	mg/kg	C60231	28/28	NA	1.01E+00	7.82E-01
11100144	Aroclor-1268	1.20E-01	1.20E-01	mg/kg	C60056	1/28	2.00E-02 - 4.00E-01	1.61E-01	8.64E-02
32598144	BZ#105	1.40E-02	5.00E-02	mg/kg	C60229	5/5	NA	3.18E-02	1.31E-02
31508006	BZ#118	4.00E-02	1.40E-01	mg/kg	C60229	5/5	NA	9.04E-02	3.63E-02
35065271	BZ#153	9.00E-02	2.80E-01	mg/kg	C60229	5/5	NA	2.00E-01	7.28E-02
38380084	BZ#156	6.50E-03	1.90E-02	mg/kg	C60229	5/5	NA	1.45E-02	4.97E-03
32598133	BZ#77	7.50E-02	1.70E-01	mg/kg	C60058	4/5	8.00E-03 - 8.00E-03	1.11E-01	6.82E-02
2051243	Decachlorobiphenyl	3.80E-03	1.00E-02	mg/kg	C60058	5/5	NA	6.00E-03	2.39E-03
---	Total Homolog PCB	1.10E+00	2.60E+00	mg/kg	C60058, C60229	5/5	NA	2.02E+00	6.26E-01
1336363	Total PCBs	2.23E-01	9.47E+00	mg/kg	C60231	28/28	NA	2.21E+00	1.73E+00
---	PCB Dioxin-like Congener TEQ	7.55E-06	2.18E-05	mg/kg	C60058	5/5	NA	1.57E-05	6.72E-06
35822469	1,2,3,4,6,7,8-HpCDD	2.74E-07	2.74E-07	mg/kg	C60220	1/5	2.34E-07 - 3.31E-07	2.95E-07	4.04E-08
67562394	1,2,3,4,6,7,8-HpCDF	2.09E-07	2.09E-07	mg/kg	C60220	1/5	1.15E-07 - 1.98E-07	1.75E-07	3.65E-08
70648269	1,2,3,4,7,8-HxCDF	1.09E-07	1.86E-07	mg/kg	C60058	2/5	1.20E-07 - 3.47E-07	2.01E-07	9.81E-08
57117449	1,2,3,6,7,8-HxCDF	1.30E-07	1.54E-07	mg/kg	C60058	2/5	1.25E-07 - 2.82E-07	1.87E-07	7.11E-08
19408743	1,2,3,7,8,9-HxCDD	2.61E-07	2.61E-07	mg/kg	C60220	1/5	1.08E-07 - 2.02E-07	1.63E-07	6.59E-08
40321764	1,2,3,7,8-PeCDD	2.01E-07	2.01E-07	mg/kg	C60229	1/5	1.14E-07 - 1.99E-07	1.51E-07	4.48E-08

TABLE A-1
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ANNISTON PCB SITE
OU-4

CAS Number	Analyte	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency[a]	Detection Limits[b]	Arithmetic Mean[c]	Standard Deviation[c]
57117416	1,2,3,7,8-PeCDF	6.28E-07	1.37E-06	mg/kg	C60229	3/5	5.12E-07 - 6.08E-07	7.55E-07	3.48E-07
57117314	2,3,4,7,8-PeCDF	1.09E-06	2.61E-06	mg/kg	C60229	4/5	8.19E-07 - 8.19E-07	1.39E-06	7.03E-07
51207319	2,3,7,8-TCDF	1.00E-05	3.69E-05	mg/kg	C60229	5/5	NA	2.45E-05	1.09E-05
3268879	Octa CDD	1.18E-06	5.22E-06	mg/kg	C60058	3/5	6.34E-07 - 1.26E-06	1.92E-06	1.87E-06
39001020	Octa CDF	2.86E-07	3.61E-07	mg/kg	C60229	3/5	2.27E-07 - 3.60E-07	3.04E-07	5.68E-08
---	2,3,7,8-TCDD TEQ	1.59E-06	4.84E-06	mg/kg	C60229	5/5	NA	3.13E-06	1.27E-06
7440382	Arsenic	1.40E-01	1.90E-01	mg/kg	C60058	3/5	5.50E-02 - 1.10E-01	1.33E-01	5.31E-02
7440417	Beryllium	9.60E-03	9.60E-03	mg/kg	C60051	1/5	9.30E-03 - 1.20E-02	1.03E-02	1.16E-03
7440439	Cadmium	9.30E-03	9.30E-03	mg/kg	C60051	1/5	2.50E-03 - 7.80E-03	5.66E-03	3.00E-03
7440473	Chromium	1.10E-01	1.30E-01	mg/kg	C60229	2/5	1.80E-01 - 2.00E-01	1.62E-01	3.96E-02
7439965	Manganese	6.30E-02	8.50E-02	mg/kg	C60058	3/5	7.70E-02 - 9.50E-02	7.80E-02	1.25E-02
7439976	Mercury	2.00E-01	8.70E-01	mg/kg	C60233	28/28	NA	4.16E-01	1.91E-01
7440622	Vanadium	1.90E-02	2.90E-02	mg/kg	C60058	3/5	3.60E-02 - 4.20E-02	2.96E-02	9.56E-03
					Catfish				
53469219	Aroclor-1242	1.00E-01	2.30E-01	mg/kg	C60235	5/28	4.00E-02 - 4.00E-01	1.72E-01	8.56E-02
11097691	Aroclor-1254	1.20E-01	2.60E+00	mg/kg	C60243	28/28	NA	1.14E+00	6.03E-01
11096825	Aroclor-1260	2.90E-01	3.20E+00	mg/kg	C60243	28/28	NA	1.27E+00	8.62E-01
32598144	BZ#105	1.00E-02	3.30E-02	mg/kg	C60414	2/2	NA	2.15E-02	1.63E-02
31508006	BZ#118	2.80E-02	1.10E-01	mg/kg	C60414	2/2	NA	6.90E-02	5.80E-02
57465288	BZ#126	1.90E-02	1.90E-02	mg/kg	C60414	1/2	2.40E-03 - 2.40E-03	1.07E-02	1.17E-02
35065271	BZ#153	5.50E-02	3.20E-01	mg/kg	C60414	2/2	NA	1.88E-01	1.87E-01
38380084	BZ#156	3.40E-03	2.30E-02	mg/kg	C60414	2/2	NA	1.32E-02	1.39E-02
32598133	BZ#77	1.30E-02	1.30E-02	mg/kg	C60234	1/2	8.00E-03 - 8.00E-03	1.05E-02	3.54E-03
2051243	Decachlorobiphenyl	2.20E-03	1.80E-02	mg/kg	C60414	2/2	NA	1.01E-02	1.12E-02
---	Total Homolog PCB	4.80E-01	2.10E+00	mg/kg	C60414	2/2	NA	1.29E+00	1.15E+00
1336363	Total PCBs	4.20E-01	5.80E+00	mg/kg	C60243	28/28	NA	2.44E+00	1.40E+00
---	PCB Dioxin-like Congener TEQ	2.43E-04	1.91E-03	mg/kg	C60414	2/2	NA	1.07E-03	1.18E-03
35822469	1,2,3,4,6,7,8-HpCDD	2.24E-07	2.88E-07	mg/kg	C60234	2/2	NA	2.56E-07	4.53E-08
67562394	1,2,3,4,6,7,8-HpCDF	1.39E-07	1.39E-07	mg/kg	C60414	1/2	2.64E-07 - 2.64E-07	2.02E-07	8.84E-08
40321764	1,2,3,7,8-PeCDD	1.56E-07	1.69E-07	mg/kg	C60234	2/2	NA	1.63E-07	9.19E-09
57117314	2,3,4,7,8-PeCDF	1.63E-06	1.96E-06	mg/kg	C60414	2/2	NA	1.80E-06	2.33E-07
51207319	2,3,7,8-TCDF	7.32E-07	1.62E-06	mg/kg	C60234	2/2	NA	1.18E-06	6.28E-07
---	2,3,7,8-TCDD TEQ	8.87E-07	9.34E-07	mg/kg	C60234	2/2	NA	9.10E-07	3.33E-08
7440473	Chromium	1.20E-01	1.90E-01	mg/kg	C60414	2/2	NA	1.55E-01	4.95E-02
7439965	Manganese	1.50E-01	2.70E-01	mg/kg	C60414	2/2	NA	2.10E-01	8.49E-02
7439976	Mercury	3.10E-02	4.30E-01	mg/kg	C60244	28/28	NA	1.56E-01	9.44E-02
					Panfish				
53469219	Aroclor-1242	5.00E-02	4.60E-01	mg/kg	C60258	14/28	2.00E-02 - 2.00E-01	1.72E-01	1.23E-01
11097691	Aroclor-1254	1.20E-01	2.20E+00	mg/kg	C60257	28/28	NA	8.48E-01	5.62E-01
11096825	Aroclor-1260	1.50E-01	1.90E+00	mg/kg	C60257	28/28	NA	7.13E-01	4.44E-01
32598144	BZ#105	1.00E-02	5.30E-02	mg/kg	C60073	5/5	NA	2.34E-02	1.75E-02
31508006	BZ#118	2.90E-02	1.50E-01	mg/kg	C60073	5/5	NA	6.92E-02	4.85E-02
35065271	BZ#153	5.90E-02	3.20E-01	mg/kg	C60073	5/5	NA	1.52E-01	1.04E-01
38380084	BZ#156	3.80E-03	2.20E-02	mg/kg	C60073	5/5	NA	1.01E-02	7.34E-03
32598133	BZ#77	1.80E-02	2.50E-01	mg/kg	C60073	4/5	4.00E-03 - 4.00E-03	7.88E-02	1.03E-01
2051243	Decachlorobiphenyl	2.00E-03	7.00E-03	mg/kg	C60073	5/5	NA	3.76E-03	2.05E-03
---	Total Homolog PCB	6.60E-01	2.40E+00	mg/kg	C60073	5/5	NA	1.26E+00	6.90E-01
1336363	Total PCBs	2.70E-01	4.40E+00	mg/kg	C60257	28/28	NA	1.69E+00	1.10E+00
---	PCB Dioxin-like Congener TEQ	1.96E-06	3.18E-05	mg/kg	C60073	5/5	NA	1.10E-05	1.23E-05
35822469	1,2,3,4,6,7,8-HpCDD	1.19E-06	2.40E-06	mg/kg	C60073	2/5	1.51E-07 - 6.31E-07	9.51E-07	8.97E-07
67562394	1,2,3,4,6,7,8-HpCDF	1.89E-07	5.29E-07	mg/kg	C60073	3/5	1.36E-07 - 2.71E-07	2.72E-07	1.52E-07
70648269	1,2,3,4,7,8-HxCDF	1.35E-07	3.35E-07	mg/kg	C60073	2/5	1.26E-07 - 1.83E-07	1.82E-07	8.87E-08
57117449	1,2,3,6,7,8-HxCDF	2.40E-07	2.40E-07	mg/kg	C60073	1/5	1.24E-07 - 1.96E-07	1.65E-07	5.08E-08
57117416	1,2,3,7,8-PeCDF	2.13E-07	2.15E-06	mg/kg	C60073	4/5	1.69E-07 - 1.69E-07	7.47E-07	8.48E-07
57117314	2,3,4,7,8-PeCDF	4.19E-07	3.99E-06	mg/kg	C60073	4/5	2.13E-07 - 2.13E-07	1.40E-06	1.60E-06

TABLE A-1
SUMMARY OF ANALYTES DETECTED IN FISH TISSUE - GROUP A
ANNISTON PCB SITE
OU-4

CAS Number	Analyte	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency[a]	Detection Limits[b]	Arithmetic Mean[c]	Standard Deviation[c]
51207319	2,3,7,8-TCDF	1.98E-06	9.61E-05	mg/kg	C60073	5/5	NA	2.90E-05	4.13E-05
3268879	Octa CDD	1.63E-06	1.56E-05	mg/kg	C60073	4/5	5.46E-07 - 5.46E-07	5.52E-06	6.06E-06
39001020	Octa CDF	5.96E-07	1.93E-06	mg/kg	C60073	3/5	2.10E-07 - 2.68E-07	7.80E-07	6.99E-07
---	2,3,7,8-TCDD TEQ	5.11E-07	1.11E-05	mg/kg	C60073	5/5	NA	3.55E-06	4.64E-06
7440382	Arsenic	6.50E-02	3.80E-01	mg/kg	C60250	5/5	NA	1.47E-01	1.31E-01
7440417	Beryllium	9.00E-03	9.00E-03	mg/kg	C60068	1/5	9.30E-03 - 1.30E-02	1.02E-02	1.60E-03
7440473	Chromium	1.20E-01	1.90E-01	mg/kg	C60072	3/5	1.60E-01 - 1.90E-01	1.68E-01	2.95E-02
7439921	Lead	9.00E-03	2.30E-02	mg/kg	C60072	3/5	9.20E-03 - 9.20E-03	1.35E-02	6.32E-03
7439965	Manganese	2.10E-01	7.50E-01	mg/kg	C60068	5/5	NA	4.80E-01	2.49E-01
7439976	Mercury	5.30E-02	7.00E-01	mg/kg	C60253	28/28	NA	2.70E-01	1.78E-01
7440622	Vanadium	2.70E-02	3.10E-02	mg/kg	C60070	2/5	4.20E-02 - 5.40E-02	4.08E-02	1.17E-02

[a]Number of sampling locations at which analyte was detected compared with total number of sampling locations; duplicates at a location were averaged and considered one sample.
[b]Based on nondetected samples.
[c]Nondetects were included at the full detection limit.
mg/kg = Milligrams per kilogram.
NA = Not applicable.

TABLE A-2
SUMMARY OF ANALYTES DETECTED IN FISH TISSUE - GROUP B
ANNISTON PCB SITE
OU-4

CAS Number	Analyte	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency[a]	Detection Limits[b]	Arithmetic Mean[c]	Standard Deviation[c]
All Species									
53469219	Aroclor-1242	2.40E-02	2.70E-01	mg/kg	C60183	32/84	2.00E-02 - 6.00E-01	1.80E-01	1.09E-01
11097691	Aroclor-1254	8.60E-02	6.10E+00	mg/kg	C60185	78/84	2.00E-01 - 4.00E-01	1.12E+00	1.06E+00
11096825	Aroclor-1260	1.10E-01	5.70E+00	mg/kg	C60185	84/84	NA	1.35E+00	1.19E+00
32598144	BZ#105	1.00E-02	7.00E-02	mg/kg	C60183	4/4	NA	2.98E-02	2.83E-02
31508006	BZ#118	3.00E-02	1.90E-01	mg/kg	C60183	4/4	NA	8.40E-02	7.45E-02
35065271	BZ#153	6.40E-02	4.00E-01	mg/kg	C60183	4/4	NA	1.83E-01	1.53E-01
38380084	BZ#156	4.20E-03	3.00E-02	mg/kg	C60183	4/4	NA	1.30E-02	1.18E-02
32598133	BZ#77	3.60E-02	5.10E-02	mg/kg	C60366	2/4	4.00E-03 - 1.60E-02	2.68E-02	2.09E-02
2051243	Decachlorobiphenyl	1.30E-03	1.10E-02	mg/kg	C60183	4/4	NA	5.18E-03	4.15E-03
---	Total Homolog PCB	6.40E-01	3.90E+00	mg/kg	C60183	4/4	NA	1.65E+00	1.55E+00
1336363	Total PCBs	2.36E-01	1.18E+01	mg/kg	C60185	84/84	NA	2.51E+00	2.08E+00
---	PCB Dioxin-like Congener TEQ	4.09E-06	3.25E-04	mg/kg	C60388	4/4	NA	8.68E-05	1.59E-04
35822469	1,2,3,4,6,7,8-HpCDD	2.27E-07	2.27E-07	mg/kg	C60388	1/4	1.57E-07 - 3.76E-07	2.45E-07	9.27E-08
67562394	1,2,3,4,6,7,8-HpCDF	1.82E-07	1.82E-07	mg/kg	C60388	1/4	1.48E-07 - 1.89E-07	1.72E-07	1.81E-08
55673897	1,2,3,4,7,8,9-HpCDF	1.56E-07	1.80E-07	mg/kg	C60388	2/4	1.15E-07 - 1.89E-07	1.60E-07	3.31E-08
70648269	1,2,3,4,7,8-HxCDF	1.20E-07	1.86E-07	mg/kg	C60183	2/4	1.60E-07 - 1.68E-07	1.59E-07	2.79E-08
57117449	1,2,3,6,7,8-HxCDF	1.03E-07	1.03E-07	mg/kg	C60162	1/4	1.76E-07 - 2.34E-07	1.79E-07	5.57E-08
19408743	1,2,3,7,8,9-HxCDD	2.08E-07	2.08E-07	mg/kg	C60366	1/4	1.07E-07 - 1.28E-07	1.40E-07	4.61E-08
57117416	1,2,3,7,8-PeCDF	4.58E-07	8.07E-07	mg/kg	C60183	2/4	2.90E-07 - 3.12E-07	4.67E-07	2.39E-07
57117314	2,3,4,7,8-PeCDF	9.09E-07	1.78E-06	mg/kg	C60183	2/4	5.56E-07 - 1.16E-06	1.10E-06	5.16E-07
51207319	2,3,7,8-TCDF	2.92E-06	1.64E-05	mg/kg	C60183	4/4	NA	8.98E-06	5.84E-06
3268879	Octa CDD	3.91E-06	3.91E-06	mg/kg	C60162	1/4	4.60E-07 - 7.33E-07	1.43E-06	1.65E-06
39001020	Octa CDF	5.35E-07	5.35E-07	mg/kg	C60162	1/4	2.03E-07 - 3.81E-07	3.33E-07	1.58E-07
---	2,3,7,8-TCDD TEQ	8.69E-07	2.43E-06	mg/kg	C60183	4/4	NA	1.44E-06	7.10E-07
7440382	Arsenic	1.80E-02	6.90E-02	mg/kg	C60366	3/4	3.10E-02 - 3.10E-02	3.48E-02	2.35E-02
7440473	Chromium	1.30E-01	2.20E-01	mg/kg	C60366	4/4	NA	1.73E-01	3.77E-02
7439921	Lead	6.10E-02	6.10E-02	mg/kg	C60366	1/4	9.30E-03 - 1.10E-02	2.28E-02	2.55E-02
7439965	Manganese	1.80E-01	1.80E-01	mg/kg	C60183	1/4	9.90E-02 - 1.90E-01	1.52E-01	4.16E-02
7439976	Mercury	1.10E-01	1.30E+00	mg/kg	C60371	84/84	NA	4.26E-01	2.78E-01
Bass									
53469219	Aroclor-1242	6.10E-02	2.70E-01	mg/kg	C60183	10/27	6.00E-02 - 6.00E-01	1.97E-01	1.19E-01
11097691	Aroclor-1254	1.50E-01	6.10E+00	mg/kg	C60185	27/27	NA	1.42E+00	1.14E+00
11096825	Aroclor-1260	1.10E-01	5.70E+00	mg/kg	C60185	27/27	NA	1.45E+00	1.07E+00
32598144	BZ#105	1.00E-02	7.00E-02	mg/kg	C60183	2/2	NA	4.00E-02	4.24E-02
31508006	BZ#118	3.00E-02	1.90E-01	mg/kg	C60183	2/2	NA	1.10E-01	1.13E-01
35065271	BZ#153	6.40E-02	4.00E-01	mg/kg	C60183	2/2	NA	2.32E-01	2.38E-01
38380084	BZ#156	4.20E-03	3.00E-02	mg/kg	C60183	2/2	NA	1.71E-02	1.82E-02
32598133	BZ#77	5.10E-02	5.10E-02	mg/kg	C60366	1/2	1.60E-02 - 1.60E-02	3.35E-02	2.47E-02
2051243	Decachlorobiphenyl	1.30E-03	1.10E-02	mg/kg	C60183	2/2	NA	6.15E-03	6.86E-03
---	Total Homolog PCB	6.40E-01	3.90E+00	mg/kg	C60058, C60229	2/2	NA	2.27E+00	2.31E+00
1336363	Total PCBs	3.29E-01	1.18E+01	mg/kg	C60185	27/27	NA	2.94E+00	2.19E+00
---	PCB Dioxin-like Congener TEQ	6.62E-06	1.13E-05	mg/kg	C60183	2/2	NA	8.94E-06	3.28E-06
55673897	1,2,3,4,7,8,9-HpCDF	1.56E-07	1.56E-07	mg/kg	C60183	1/2	1.89E-07 - 1.89E-07	1.73E-07	2.33E-08
70648269	1,2,3,4,7,8-HxCDF	1.86E-07	1.86E-07	mg/kg	C60183	1/2	1.68E-07 - 1.68E-07	1.77E-07	1.27E-08
19408743	1,2,3,7,8,9-HxCDD	2.08E-07	2.08E-07	mg/kg	C60366	1/2	1.17E-07 - 1.17E-07	1.63E-07	6.43E-08
57117416	1,2,3,7,8-PeCDF	8.07E-07	8.07E-07	mg/kg	C60183	1/2	2.90E-07 - 2.90E-07	5.49E-07	3.66E-07
57117314	2,3,4,7,8-PeCDF	1.78E-06	1.78E-06	mg/kg	C60183	1/2	5.56E-07 - 5.56E-07	1.17E-06	8.65E-07
51207319	2,3,7,8-TCDF	6.10E-06	1.64E-05	mg/kg	C60183	2/2	NA	1.13E-05	7.28E-06
---	2,3,7,8-TCDD TEQ	9.84E-07	2.43E-06	mg/kg	C60183	2/2	NA	1.71E-06	1.02E-06
7440382	Arsenic	6.90E-02	6.90E-02	mg/kg	C60366	1/2	3.10E-02 - 3.10E-02	5.00E-02	2.69E-02
7440473	Chromium	1.30E-01	2.20E-01	mg/kg	C60366	2/2	NA	1.75E-01	6.36E-02
7439921	Lead	6.10E-02	6.10E-02	mg/kg	C60366	1/2	1.10E-02 - 1.10E-02	3.60E-02	3.54E-02
7439965	Manganese	1.80E-01	1.80E-01	mg/kg	C60183	1/2	1.40E-01 - 1.40E-01	1.60E-01	2.83E-02
7439976	Mercury	1.20E-01	1.30E+00	mg/kg	C60371	27/27	NA	6.84E-01	2.55E-01

TABLE A-2
SUMMARY OF ANALYTES DETECTED IN FISH TISSUE - GROUP B
ANNISTON PCB SITE
OU-4

CAS Number	Analyte	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency[a]	Detection Limits[b]	Arithmetic Mean[c]	Standard Deviation[c]
Catfish									
53469219	Aroclor-1242	1.30E-01	1.30E-01	mg/kg	C60377	1/28	2.00E-02 - 4.00E-01	2.06E-01	1.25E-01
11097691	Aroclor-1254	8.60E-02	5.50E+00	mg/kg	C60384	22/28	2.00E-01 - 4.00E-01	1.18E+00	1.33E+00
11096825	Aroclor-1260	1.50E-01	5.60E+00	mg/kg	C60376	28/28	NA	1.97E+00	1.47E+00
32598144	BZ#105	1.00E-02	1.00E-02	mg/kg	C60388	1/1	NA	1.00E-02	
31508006	BZ#118	3.40E-02	3.40E-02	mg/kg	C60388	1/1	NA	3.40E-02	
35065271	BZ#153	8.70E-02	8.70E-02	mg/kg	C60388	1/1	NA	8.70E-02	
38380084	BZ#156	5.70E-03	5.70E-03	mg/kg	C60388	1/1	NA	5.70E-03	
32598133	BZ#77	3.60E-02	3.60E-02	mg/kg	C60388	1/1	NA	3.60E-02	
2051243	Decachlorobiphenyl	4.80E-03	4.80E-03	mg/kg	C60388	1/1	NA	4.80E-03	
---	Total Homolog PCB	6.40E-01	6.40E-01	mg/kg	C60388	1/1	NA	6.40E-01	
1336363	Total PCBs	2.36E-01	1.08E+01	mg/kg	C60384	28/28	NA	3.09E+00	2.52E+00
---	PCB Dioxin-like Congener TEQ	3.25E-04	3.25E-04	mg/kg	C60388	1/1	NA	3.25E-04	
35822469	1,2,3,4,6,7,8-HpCDD	2.27E-07	2.27E-07	mg/kg	C60388	1/1	NA	2.27E-07	
67562394	1,2,3,4,6,7,8-HpCDF	1.82E-07	1.82E-07	mg/kg	C60388	1/1	NA	1.82E-07	
55673897	1,2,3,4,7,8,9-HpCDF	1.80E-07	1.80E-07	mg/kg	C60388	1/1	NA	1.80E-07	
51207319	2,3,7,8-TCDF	2.92E-06	2.92E-06	mg/kg	C60388	1/1	NA	2.92E-06	
---	2,3,7,8-TCDD TEQ	8.69E-07	8.69E-07	mg/kg	C60388	1/1	NA	8.69E-07	
7440382	Arsenic	1.80E-02	1.80E-02	mg/kg	C60388	1/1	NA	1.80E-02	
7440473	Chromium	1.80E-01	1.80E-01	mg/kg	C60388	1/1	NA	1.80E-01	
7439976	Mercury	1.10E-01	1.30E+00	mg/kg	C60384	28/28	NA	3.62E-01	2.44E-01
Panfish									
53469219	Aroclor-1242	2.40E-02	2.50E-01	mg/kg	C60163	21/29	6.00E-02 - 2.00E-01	1.39E-01	6.61E-02
11097691	Aroclor-1254	1.00E-01	2.30E+00	mg/kg	C60163	29/29	NA	7.82E-01	4.76E-01
11096825	Aroclor-1260	1.20E-01	1.80E+00	mg/kg	C60163	29/29	NA	6.57E-01	3.69E-01
32598144	BZ#105	2.90E-02	2.90E-02	mg/kg	C60162	1/1	NA	2.90E-02	
31508006	BZ#118	8.20E-02	8.20E-02	mg/kg	C60162	1/1	NA	8.20E-02	
35065271	BZ#153	1.80E-01	1.80E-01	mg/kg	C60162	1/1	NA	1.80E-01	
38380084	BZ#156	1.20E-02	1.20E-02	mg/kg	C60162	1/1	NA	1.20E-02	
2051243	Decachlorobiphenyl	3.60E-03	3.60E-03	mg/kg	C60162	1/1	NA	3.60E-03	
---	Total Homolog PCB	1.40E+00	1.40E+00	mg/kg	C60162	1/1	NA	1.40E+00	
1336363	Total PCBs	2.44E-01	4.35E+00	mg/kg	C60163	29/29	NA	1.55E+00	8.95E-01
---	PCB Dioxin-like Congener TEQ	4.09E-06	4.09E-06	mg/kg	C60162	1/1	NA	4.09E-06	
70648269	1,2,3,4,7,8-HxCDF	1.20E-07	1.20E-07	mg/kg	C60162	1/1	NA	1.20E-07	
57117449	1,2,3,6,7,8-HxCDF	1.03E-07	1.03E-07	mg/kg	C60162	1/1	NA	1.03E-07	
57117416	1,2,3,7,8-PeCDF	4.58E-07	4.58E-07	mg/kg	C60162	1/1	NA	4.58E-07	
57117314	2,3,4,7,8-PeCDF	9.09E-07	9.09E-07	mg/kg	C60162	1/1	NA	9.09E-07	
51207319	2,3,7,8-TCDF	1.05E-05	1.05E-05	mg/kg	C60162	1/1	NA	1.05E-05	
3268879	Octa CDD	3.91E-06	3.91E-06	mg/kg	C60162	1/1	NA	3.91E-06	
39001020	Octa CDF	5.35E-07	5.35E-07	mg/kg	C60162	1/1	NA	5.35E-07	
---	2,3,7,8-TCDD TEQ	1.49E-06	1.49E-06	mg/kg	C60162	1/1	NA	1.49E-06	
7440382	Arsenic	2.10E-02	2.10E-02	mg/kg	C60162	1/1	NA	2.10E-02	
7440473	Chromium	1.60E-01	1.60E-01	mg/kg	C60162	1/1	NA	1.60E-01	
7439976	Mercury	1.10E-01	5.10E-01	mg/kg	C60166	29/29	NA	2.49E-01	1.02E-01

[a]Number of sampling locations at which analyte was detected compared with total number of sampling locations; duplicates at a location were averaged and considered one sample.
[b]Based on nondetected samples.
[c]Nondetects were included at the full detection limit.
mg/kg = Milligrams per kilogram.
NA = Not applicable.

TABLE A-3

SUMMARY OF ANALYTES DETECTED IN FISH TISSUE - GROUP C

ANNISTON PCB SITE

OU-4

CAS Number	Analyte	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency[a]	Detection Limits[b]	Arithmetic Mean[c]	Standard Deviation[c]
				All Species					
53469219	Aroclor-1242	6.10E-02	2.80E+00	mg/kg	C60286	118/193	4.00E-02 - 2.00E+00	4.06E-01	3.23E-01
12672296	Aroclor-1248	ND	ND	ND	-	ND	4.00E-02 - 2.00E+00	2.67E-01	1.87E-01
11097691	Aroclor-1254	1.90E-01	1.20E+01	mg/kg	C60389	187/193	4.00E-02 - 1.00E+00	2.02E+00	1.51E+00
11096825	Aroclor-1260	1.20E-01	2.20E+01	mg/kg	C60389	193/193	NA	2.05E+00	2.00E+00
37324235	Aroclor-1262	ND	ND	ND	-	ND	4.00E-02 - 2.00E+00	2.67E-01	1.87E-01
11100144	Aroclor-1268	ND	ND	ND	-	ND	4.00E-02 - 2.00E+00	2.67E-01	1.87E-01
32598144	BZ#105	6.90E-03	8.60E-02	mg/kg	C60145	20/20	NA	3.77E-02	1.92E-02
74472370	BZ#114	ND	ND	ND	-	ND	3.20E-03 - 1.60E-02	8.96E-03	3.92E-03
31508006	BZ#118	2.30E-02	2.20E-01	mg/kg	C60145	20/20	NA	1.08E-01	5.15E-02
65510443	BZ#123	ND	ND	ND	-	ND	3.20E-03 - 1.60E-02	8.96E-03	3.92E-03
57465288	BZ#126	ND	ND	ND	-	ND	3.20E-03 - 1.60E-02	8.96E-03	3.92E-03
35065271	BZ#153	6.40E-02	4.40E-01	mg/kg	C60145	20/20	NA	2.35E-01	1.12E-01
38380084	BZ#156	4.50E-03	3.40E-02	mg/kg	C60122	19/20	8.00E-03 - 8.00E-03	1.76E-02	8.63E-03
69782907	BZ#157	ND	ND	ND	-	ND	3.20E-03 - 1.60E-02	8.96E-03	3.92E-03
52663726	BZ#167	1.70E-02	1.70E-02	mg/kg	C60097	1/20	6.40E-03 - 3.20E-02	1.80E-02	7.84E-03
32774166	BZ#169	ND	ND	ND	-	ND	3.20E-03 - 1.60E-02	8.96E-03	3.92E-03
39635319	BZ#189	ND	ND	ND	-	ND	3.20E-03 - 1.60E-02	8.96E-03	3.92E-03
32598133	BZ#77	3.80E-02	1.50E-01	mg/kg	C60313	3/20	3.20E-03 - 1.60E-02	2.02E-02	3.27E-02
70362504	BZ#81	ND	ND	ND	-	ND	6.40E-03 - 3.20E-02	1.79E-02	7.85E-03
2051243	Decachlorobiphenyl	3.00E-03	1.80E-02	mg/kg	C60346	20/20	NA	7.04E-03	3.58E-03
25512429	Total Dichlorobiphenyl	7.10E-03	6.70E-02	mg/kg	C60145	19/20	5.00E-03 - 5.00E-03	1.86E-02	1.37E-02
28655712	Total Heptachlorobiphenyl	9.80E-02	6.80E-01	mg/kg	C60145	20/20	NA	3.73E-01	1.85E-01
26601649	Total Hexachlorobiphenyl	2.10E-01	1.40E+00	mg/kg	C60145	20/20	NA	6.45E-01	3.17E-01
27323188	Total Monochlorobiphenyl	1.00E-03	1.90E-02	mg/kg	C60145	19/20	2.00E-03 - 2.00E-03	4.12E-03	4.28E-03
53742077	Total Nonachlorobiphenyl	1.00E-02	8.40E-02	mg/kg	C60346	20/20	NA	3.24E-02	1.74E-02
31472830	Total Octachlorobiphenyl	3.40E-02	2.90E-01	mg/kg	C60346	20/20	NA	1.23E-01	6.66E-02
25429292	Total Pentachlorobiphenyl	9.40E-02	9.60E-01	mg/kg	C60145	20/20	NA	4.20E-01	2.21E-01
26914330	Total Tetrachlorobiphenyl	5.60E-02	6.50E-01	mg/kg	C60145	20/20	NA	2.88E-01	1.59E-01
25323686	Total Trichlorobiphenyl	3.40E-02	2.90E-01	mg/kg	C60298	20/20	NA	1.21E-01	6.80E-02
---	Total Homolog PCB	7.00E-01	4.20E+00	mg/kg	C60145	20/20	NA	2.03E+00	9.29E-01
1336363	Total PCBs	2.30E-01	3.40E+01	mg/kg	C60389	193/193	NA	4.35E+00	3.45E+00
---	Dioxin/furan and PCB Dioxin-like Congener TEQ	2.42E-06	1.61E-03	mg/kg	C60145	19/19	NA	2.60E-04	5.38E-04
---	PCB Dioxin-like Congener TEQ	1.96E-06	1.61E-03	mg/kg	C60145	20/20	NA	2.47E-04	5.26E-04
35822469	1,2,3,4,6,7,8-HpCDD	1.93E-07	4.09E-06	mg/kg	C60122	5/19	1.32E-07 - 7.40E-07	5.44E-07	8.77E-07
67562394	1,2,3,4,6,7,8-HpCDF	1.51E-07	9.42E-07	mg/kg	C60122	5/19	9.85E-08 - 1.95E-07	1.97E-07	1.88E-07
55673897	1,2,3,4,7,8,9-HpCDF	1.95E-07	2.71E-07	mg/kg	C60196	2/19	9.35E-08 - 2.11E-07	1.55E-07	4.37E-08
39227286	1,2,3,4,7,8-HxCDD	1.22E-07	2.09E-07	mg/kg	C60196	2/19	1.00E-07 - 2.13E-07	1.45E-07	3.35E-08
70648269	1,2,3,4,7,8-HxCDF	1.45E-07	3.21E-07	mg/kg	C60145	5/19	1.10E-07 - 3.65E-07	1.87E-07	7.15E-08
57653857	1,2,3,6,7,8-HxCDD	2.07E-07	4.08E-07	mg/kg	C60145	4/19	8.54E-08 - 2.31E-07	1.86E-07	7.02E-08
57117449	1,2,3,6,7,8-HxCDF	1.30E-07	2.00E-07	mg/kg	C60145	4/19	1.15E-07 - 2.94E-07	1.76E-07	4.78E-08
19408743	1,2,3,7,8,9-HxCDD	1.77E-07	2.29E-07	mg/kg	C60196	2/19	1.05E-07 - 2.33E-07	1.65E-07	4.26E-08
72918219	1,2,3,7,8,9-HxCDF	ND	ND	ND	-	ND	8.31E-08 - 2.50E-07	1.51E-07	4.65E-08
40321764	1,2,3,7,8-PeCDD	2.36E-07	4.97E-07	mg/kg	C60145	4/19	1.00E-07 - 2.05E-07	2.04E-07	1.01E-07
57117416	1,2,3,7,8-PeCDF	2.18E-07	7.65E-07	mg/kg	C60094	5/19	1.05E-07 - 6.26E-07	2.91E-07	1.82E-07
60851345	2,3,4,6,7,8-HxCDF	1.39E-07	1.54E-07	mg/kg	C60145	2/19	8.94E-08 - 2.15E-07	1.52E-07	3.83E-08
57117314	2,3,4,7,8-PeCDF	2.84E-07	2.22E-06	mg/kg	C60145	9/19	1.66E-07 - 8.61E-07	6.96E-07	5.35E-07
1746016	2,3,7,8-TCDD	ND	ND	ND	-	ND	9.47E-08 - 3.35E-07	1.60E-07	5.58E-08
51207319	2,3,7,8-TCDF	3.29E-07	3.05E-06	mg/kg	C60283	15/19	7.31E-07 - 4.75E-06	1.71E-06	1.27E-06
3268879	Octa CDD	1.48E-06	1.14E-04	mg/kg	C60122	10/19	3.80E-07 - 1.84E-06	7.61E-06	2.58E-05
39001020	Octa CDF	2.31E-07	3.72E-06	mg/kg	C60122	3/19	2.02E-07 - 6.33E-07	4.98E-07	7.95E-07
37871004	Total Hepta CDD	1.93E-07	8.30E-06	mg/kg	C60122	6/19	1.32E-07 - 7.66E-07	8.15E-07	1.83E-06
38998753	Total Hepta CDF	2.89E-07	3.37E-06	mg/kg	C60122	5/19	1.05E-07 - 2.03E-07	3.83E-07	7.40E-07
34465468	Total Hexa CDD	2.07E-07	7.07E-07	mg/kg	C60145	4/19	1.18E-07 - 6.69E-07	2.27E-07	1.67E-07
55684941	Total Hexa CDF	3.07E-07	7.30E-07	mg/kg	C60122	5/19	1.13E-07 - 8.19E-07	3.35E-07	2.34E-07
36088229	Total Penta CDD	3.64E-07	4.97E-07	mg/kg	C60145	3/19	1.00E-07 - 2.36E-07	2.04E-07	1.01E-07

TABLE A-3
SUMMARY OF ANALYTES DETECTED IN FISH TISSUE - GROUP C
ANNISTON PCB SITE
OU-4

CAS Number	Analyte	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency[a]	Detection Limits[b]	Arithmetic Mean[c]	Standard Deviation[c]
30402154	Total Penta CDF	6.89E-07	2.34E-06	mg/kg	C60145	9/19	1.70E-07 - 1.49E-06	1.07E-06	6.40E-07
419003575	Total Tetra CDD	ND	ND	ND	-	ND	9.47E-08 - 3.35E-07	1.60E-07	5.58E-08
55722275	Total Tetra CDF	2.41E-07	4.78E-06	mg/kg	C60298	16/19	1.03E-06 - 5.41E-06	2.15E-06	1.68E-06
---	2,3,7,8-TCDD TEQ	2.98E-07	1.37E-06	mg/kg	C60145	19/19	NA	6.83E-07	2.59E-07
7440382	Arsenic	1.70E-02	2.40E-01	mg/kg	C60283	11/20	1.70E-02 - 1.40E-01	4.48E-02	5.33E-02
7440393	Barium	1.60E-01	1.70E-01	mg/kg	C60145	2/20	1.50E-01 - 1.00E+00	3.07E-01	2.13E-01
7440417	Beryllium	ND	ND	ND	-	ND	1.00E-02 - 1.70E-02	1.24E-02	1.73E-03
7440439	Cadmium	ND	ND	ND	-	ND	2.70E-03 - 1.30E-02	5.90E-03	3.14E-03
7440473	Chromium	1.30E-01	2.50E-01	mg/kg	C60313	20/20	NA	1.73E-01	2.97E-02
7440484	Cobalt	ND	ND	ND	-	ND	3.40E-02 - 1.10E-01	5.40E-02	1.86E-02
7439921	Lead	1.10E-02	3.20E-02	mg/kg	C60313	6/20	9.40E-03 - 1.20E-02	1.36E-02	6.23E-03
7439965	Manganese	1.60E-01	1.90E+00	mg/kg	C60313	14/20	8.90E-02 - 2.80E-01	3.61E-01	4.18E-01
7439976	Mercury	2.60E-02	1.90E+00	mg/kg	C60096	192/194	7.10E-02 - 7.30E-02	3.91E-01	2.95E-01
7440020	Nickel	ND	ND	ND	-	ND	5.30E-02 - 6.80E-02	6.17E-02	4.56E-03
7440622	Vanadium	ND	ND	ND	-	ND	3.80E-02 - 1.60E-01	5.49E-02	2.64E-02
---	%Lipids Determination	2.00E-01	3.40E+00	%	C60135	192/193	1.00E-01 - 1.00E-01	7.31E-01	5.89E-01
---	Solids, Percent	1.27E+01	2.41E+01	%	C60109	192/192	NA	2.00E+01	1.66E+00
				Bass					
12674112	Aroclor-1016	ND	ND	ND	-	ND	1.00E-01 - 6.00E-01	2.78E-01	1.24E-01
11104282	Aroclor-1221	ND	ND	ND	-	ND	1.00E-01 - 6.00E-01	2.78E-01	1.24E-01
11141165	Aroclor-1232	ND	ND	ND	-	ND	1.00E-01 - 6.00E-01	2.78E-01	1.24E-01
53469219	Aroclor-1242	2.10E-01	2.80E+00	mg/kg	C60286	54/67	2.00E-01 - 6.00E-01	5.01E-01	3.79E-01
12672296	Aroclor-1248	ND	ND	ND	-	ND	1.00E-01 - 6.00E-01	2.78E-01	1.24E-01
11097691	Aroclor-1254	6.30E-01	6.70E+00	mg/kg	C60100	67/67	NA	2.19E+00	1.23E+00
11096825	Aroclor-1260	6.60E-01	8.20E+00	mg/kg	C60100	67/67	NA	2.11E+00	1.16E+00
37324235	Aroclor-1262	ND	ND	ND	-	ND	1.00E-01 - 6.00E-01	2.78E-01	1.24E-01
11100144	Aroclor-1268	ND	ND	ND	-	ND	1.00E-01 - 6.00E-01	2.78E-01	1.24E-01
32598144	BZ#105	2.80E-02	6.10E-02	mg/kg	C60122	6/6	NA	4.68E-02	1.17E-02
74472370	BZ#114	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	9.33E-03	3.27E-03
31508006	BZ#118	8.20E-02	1.70E-01	mg/kg	C60122	6/6	NA	1.39E-01	3.30E-02
65510443	BZ#123	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	9.33E-03	3.27E-03
57465288	BZ#126	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	9.33E-03	3.27E-03
35065271	BZ#153	1.80E-01	4.00E-01	mg/kg	C60097	6/6	NA	3.18E-01	8.11E-02
38380084	BZ#156	1.40E-02	3.40E-02	mg/kg	C60122	6/6	NA	2.60E-02	6.69E-03
69782907	BZ#157	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	9.33E-03	3.27E-03
52663726	BZ#167	1.70E-02	1.70E-02	mg/kg	C60097	1/6	1.60E-02 - 3.20E-02	1.88E-02	6.46E-03
32774166	BZ#169	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	9.33E-03	3.27E-03
39635319	BZ#189	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	9.33E-03	3.27E-03
32598133	BZ#77	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	9.33E-03	3.27E-03
70362504	BZ#81	ND	ND	ND	-	ND	1.60E-02 - 3.20E-02	1.87E-02	6.53E-03
2051243	Decachlorobiphenyl	3.60E-03	1.10E-02	mg/kg	C60298	6/6	NA	7.03E-03	2.36E-03
25512429	Total Dichlorobiphenyl	1.00E-02	3.10E-02	mg/kg	C60298	6/6	NA	1.87E-02	7.69E-03
28655712	Total Heptachlorobiphenyl	2.50E-01	6.10E-01	mg/kg	C60122	6/6	NA	4.88E-01	1.31E-01
26601649	Total Hexachlorobiphenyl	4.00E-01	9.80E-01	mg/kg	C60298	6/6	NA	8.15E-01	2.15E-01
27323188	Total Monochlorobiphenyl	1.70E-03	5.00E-03	mg/kg	C60298	6/6	NA	3.10E-03	1.29E-03
53742077	Total Nonachlorobiphenyl	1.80E-02	4.70E-02	mg/kg	C60298	6/6	NA	3.67E-02	1.02E-02
31472830	Total Octachlorobiphenyl	7.80E-02	2.00E-01	mg/kg	C60122	6/6	NA	1.60E-01	4.41E-02
25429292	Total Pentachlorobiphenyl	2.60E-01	6.10E-01	mg/kg	C60298	6/6	NA	4.88E-01	1.19E-01
26914330	Total Tetrachlorobiphenyl	2.10E-01	5.20E-01	mg/kg	C60298	6/6	NA	3.38E-01	1.13E-01
25323686	Total Trichlorobiphenyl	4.90E-02	2.90E-01	mg/kg	C60298	6/6	NA	1.65E-01	8.02E-02
---	Total Homolog PCB	1.40E+00	3.30E+00	mg/kg	C60058, C60229	6/6	NA	2.53E+00	6.19E-01
1336363	Total PCBs	1.63E+00	1.49E+01	mg/kg	C60100	67/67	NA	4.75E+00	2.54E+00
---	Dioxin/furan and PCB Dioxin-like Congener TEQ	6.07E-06	1.13E-05	mg/kg	C60122	6/6	NA	8.61E-06	1.76E-06
---	PCB Dioxin-like Congener TEQ	5.00E-06	1.05E-05	mg/kg	C60122	6/6	NA	7.84E-06	1.85E-06
35822469	1,2,3,4,6,7,8-HpCDD	4.09E-06	4.09E-06	mg/kg	C60122	1/6	1.69E-07 - 4.70E-07	9.38E-07	1.55E-06
67562394	1,2,3,4,6,7,8-HpCDF	9.42E-07	9.42E-07	mg/kg	C60122	1/6	1.08E-07 - 1.29E-07	2.55E-07	3.37E-07

TABLE A-3
SUMMARY OF ANALYTES DETECTED IN FISH TISSUE - GROUP C
ANNISTON PCB SITE
OU-4

CAS Number	Analyte	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency[a]	Detection Limits[b]	Arithmetic Mean[c]	Standard Deviation[c]
55673897	1,2,3,4,7,8,9-HpCDF	ND	ND	ND	-	ND	1.23E-07 - 1.44E-07	1.31E-07	9.74E-09
39227286	1,2,3,4,7,8-HxCDD	ND	ND	ND	-	ND	1.12E-07 - 1.72E-07	1.30E-07	2.25E-08
70648269	1,2,3,4,7,8-HxCDF	2.41E-07	2.41E-07	mg/kg	C60094	1/6	1.10E-07 - 1.32E-07	1.41E-07	4.99E-08
57653857	1,2,3,6,7,8-HxCDD	2.52E-07	2.52E-07	mg/kg	C60122	1/6	1.21E-07 - 1.78E-07	1.57E-07	5.12E-08
57117449	1,2,3,6,7,8-HxCDF	1.79E-07	1.79E-07	mg/kg	C60094	1/6	1.15E-07 - 1.64E-07	1.42E-07	2.49E-08
19408743	1,2,3,7,8,9-HxCDD	ND	ND	ND	-	ND	1.17E-07 - 2.10E-07	1.49E-07	4.01E-08
72918219	1,2,3,7,8,9-HxCDF	ND	ND	ND	-	ND	1.14E-07 - 1.38E-07	1.24E-07	1.10E-08
40321764	1,2,3,7,8-PeCDD	ND	ND	ND	-	ND	1.12E-07 - 1.81E-07	1.40E-07	2.85E-08
57117416	1,2,3,7,8-PeCDF	2.18E-07	7.65E-07	mg/kg	C60094	5/6	2.77E-07 - 2.77E-07	3.89E-07	2.13E-07
60851345	2,3,4,6,7,8-HxCDF	1.39E-07	1.39E-07	mg/kg	C60094	1/6	1.14E-07 - 1.37E-07	1.27E-07	1.17E-08
57117314	2,3,4,7,8-PeCDF	6.23E-07	1.22E-06	mg/kg	C60094	5/6	4.92E-07 - 4.92E-07	7.71E-07	2.50E-07
1746016	2,3,7,8-TCDD	ND	ND	ND	-	ND	1.18E-07 - 1.67E-07	1.32E-07	1.83E-08
51207319	2,3,7,8-TCDF	1.72E-06	2.90E-06	mg/kg	C60298	4/6	3.35E-06 - 4.75E-06	2.95E-06	1.04E-06
3268879	Octa CDD	1.48E-06	1.14E-04	mg/kg	C60122	5/6	1.12E-06 - 1.12E-06	2.05E-05	4.58E-05
39001020	Octa CDF	3.72E-06	3.72E-06	mg/kg	C60122	1/6	2.02E-07 - 3.60E-07	8.41E-07	1.41E-06
37871004	Total Hepta CDD	8.30E-06	8.30E-06	mg/kg	C60122	1/6	1.69E-07 - 6.71E-07	1.68E-06	3.25E-06
38998753	Total Hepta CDF	3.37E-06	3.37E-06	mg/kg	C60122	1/6	1.15E-07 - 1.46E-07	6.67E-07	1.32E-06
34465468	Total Hexa CDD	2.52E-07	2.52E-07	mg/kg	C60122	1/6	1.18E-07 - 1.83E-07	1.56E-07	5.30E-08
55684941	Total Hexa CDF	5.60E-07	7.30E-07	mg/kg	C60122	2/6	1.13E-07 - 1.64E-07	3.04E-07	2.71E-07
36088229	Total Penta CDD	ND	ND	ND	-	ND	1.12E-07 - 1.81E-07	1.40E-07	2.85E-08
30402154	Total Penta CDF	1.20E-06	1.98E-06	mg/kg	C60094	5/6	1.15E-06 - 1.15E-06	1.43E-06	3.05E-07
419003575	Total Tetra CDD	ND	ND	ND	-	ND	1.18E-07 - 1.67E-07	1.32E-07	1.83E-08
55722275	Total Tetra CDF	1.72E-06	4.78E-06	mg/kg	C60298	4/6	4.09E-06 - 5.41E-06	3.63E-06	1.38E-06
---	2,3,7,8-TCDD TEQ	6.41E-07	1.07E-06	mg/kg	C60094	6/6	NA	7.69E-07	1.55E-07
7440382	Arsenic	2.00E-02	3.10E-02	mg/kg	C60124	6/6	NA	2.55E-02	3.99E-03
7440393	Barium	ND	ND	ND	-	ND	1.50E-01 - 5.30E-01	2.28E-01	1.48E-01
7440417	Beryllium	ND	ND	ND	-	ND	1.00E-02 - 1.70E-02	1.27E-02	2.34E-03
7440439	Cadmium	ND	ND	ND	-	ND	2.70E-03 - 6.80E-03	3.72E-03	1.53E-03
7440473	Chromium	1.70E-01	2.10E-01	mg/kg	C60298	6/6	NA	1.85E-01	1.52E-02
7440484	Cobalt	ND	ND	ND	-	ND	4.50E-02 - 8.70E-02	5.77E-02	1.48E-02
7439921	Lead	2.10E-02	2.60E-02	mg/kg	C60298	2/6	9.70E-03 - 1.10E-02	1.50E-02	6.83E-03
7439965	Manganese	ND	ND	ND	-	ND	8.90E-02 - 2.80E-01	1.37E-01	7.22E-02
7439976	Mercury	9.00E-02	1.90E+00	mg/kg	C60096	67/67	NA	6.38E-01	3.34E-01
7440020	Nickel	ND	ND	ND	-	ND	5.50E-02 - 6.70E-02	6.30E-02	4.29E-03
7440622	Vanadium	ND	ND	ND	-	ND	4.00E-02 - 7.40E-02	5.48E-02	1.13E-02
---	%Lipids Determination	2.00E-01	1.70E+00	%	C60094	66/67	1.00E-01 - 1.00E-01	5.24E-01	3.13E-01
---	Solids, Percent	1.87E+01	2.32E+01	%	C60286	67/67	NA	2.08E+01	9.62E-01
Catfish									
12674112	Aroclor-1016	ND	ND	ND	-	ND	4.00E-02 - 2.00E+00	3.39E-01	2.81E-01
11104282	Aroclor-1221	ND	ND	ND	-	ND	4.00E-02 - 2.00E+00	3.39E-01	2.81E-01
11141165	Aroclor-1232	ND	ND	ND	-	ND	4.00E-02 - 2.00E+00	3.39E-01	2.81E-01
53469219	Aroclor-1242	6.10E-02	1.80E+00	mg/kg	C60109	20/56	4.00E-02 - 2.00E+00	4.23E-01	3.65E-01
12672296	Aroclor-1248	ND	ND	ND	-	ND	4.00E-02 - 2.00E+00	3.39E-01	2.81E-01
11097691	Aroclor-1254	2.50E-01	1.20E+01	mg/kg	C60389	50/56	4.00E-02 - 1.00E+00	2.49E+00	2.05E+00
11096825	Aroclor-1260	2.30E-01	2.20E+01	mg/kg	C60389	56/56	NA	2.97E+00	3.09E+00
37324235	Aroclor-1262	ND	ND	ND	-	ND	4.00E-02 - 2.00E+00	3.39E-01	2.81E-01
11100144	Aroclor-1268	ND	ND	ND	-	ND	4.00E-02 - 2.00E+00	3.39E-01	2.81E-01
32598144	BZ#105	2.40E-02	8.60E-02	mg/kg	C60145	4/4	NA	5.05E-02	2.71E-02
74472370	BZ#114	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	1.20E-02	4.62E-03
31508006	BZ#118	8.10E-02	2.20E-01	mg/kg	C60145	4/4	NA	1.39E-01	6.40E-02
65510443	BZ#123	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	1.20E-02	4.62E-03
57465288	BZ#126	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	1.20E-02	4.62E-03
35065271	BZ#153	1.80E-01	4.40E-01	mg/kg	C60145	4/4	NA	3.08E-01	1.07E-01
38380084	BZ#156	1.20E-02	2.60E-02	mg/kg	C60145	4/4	NA	2.03E-02	6.24E-03
69782907	BZ#157	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	1.20E-02	4.62E-03
52663726	BZ#167	ND	ND	ND	-	ND	1.60E-02 - 3.20E-02	2.40E-02	9.24E-03

TABLE A-3
SUMMARY OF ANALYTES DETECTED IN FISH TISSUE - GROUP C
ANNISTON PCB SITE
OU-4

CAS Number	Analyte	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency[a]	Detection Limits[b]	Arithmetic Mean[c]	Standard Deviation[c]
32774166	BZ#169	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	1.20E-02	4.62E-03
39635319	BZ#189	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	1.20E-02	4.62E-03
32598133	BZ#77	ND	ND	ND	-	ND	8.00E-03 - 1.60E-02	1.20E-02	4.62E-03
70362504	BZ#81	ND	ND	ND	-	ND	1.60E-02 - 3.20E-02	2.40E-02	9.24E-03
2051243	Decachlorobiphenyl	3.10E-03	1.80E-02	mg/kg	C60346	4/4	NA	9.10E-03	6.49E-03
25512429	Total Dichlorobiphenyl	2.10E-02	6.70E-02	mg/kg	C60145	4/4	NA	3.70E-02	2.05E-02
28655712	Total Heptachlorobiphenyl	2.10E-01	6.80E-01	mg/kg	C60145	4/4	NA	5.00E-01	2.23E-01
26601649	Total Hexachlorobiphenyl	4.30E-01	1.40E+00	mg/kg	C60145	4/4	NA	8.68E-01	4.06E-01
27323188	Total Monochlorobiphenyl	4.90E-03	1.90E-02	mg/kg	C60145	4/4	NA	1.09E-02	5.89E-03
53742077	Total Nonachlorobiphenyl	1.50E-02	8.40E-02	mg/kg	C60346	4/4	NA	4.43E-02	2.97E-02
31472830	Total Octachlorobiphenyl	6.00E-02	2.90E-01	mg/kg	C60346	4/4	NA	1.70E-01	9.83E-02
25429292	Total Pentachlorobiphenyl	2.00E-01	9.60E-01	mg/kg	C60145	4/4	NA	5.50E-01	3.42E-01
26914330	Total Tetrachlorobiphenyl	8.30E-02	6.50E-01	mg/kg	C60145	4/4	NA	3.43E-01	2.42E-01
25323686	Total Trichlorobiphenyl	5.70E-02	1.70E-01	mg/kg	C60145	4/4	NA	9.65E-02	5.09E-02
---	Total Homolog PCB	1.40E+00	4.20E+00	mg/kg	C60145	4/4	NA	2.63E+00	1.18E+00
1336363	Total PCBs	2.30E-01	3.40E+01	mg/kg	C60389	56/56	NA	5.61E+00	4.97E+00
---	Dioxin/furan and PCB Dioxin-like Congener TEQ	8.06E-04	1.61E-03	mg/kg	C60145	4/4	NA	1.21E-03	4.63E-04
---	PCB Dioxin-like Congener TEQ	8.05E-04	1.61E-03	mg/kg	C60145	4/4	NA	1.21E-03	4.63E-04
35822469	1,2,3,4,6,7,8-HpCDD	ND	ND	ND	-	ND	1.59E-07 - 6.68E-07	4.57E-07	2.37E-07
67562394	1,2,3,4,6,7,8-HpCDF	1.51E-07	1.51E-07	mg/kg	C60145	1/4	9.85E-08 - 1.42E-07	1.24E-07	2.65E-08
55673897	1,2,3,4,7,8,9-HpCDF	ND	ND	ND	-	ND	1.12E-07 - 1.53E-07	1.26E-07	1.84E-08
39227286	1,2,3,4,7,8-HxCDD	1.22E-07	1.22E-07	mg/kg	C60145	1/4	1.00E-07 - 1.53E-07	1.20E-07	2.37E-08
70648269	1,2,3,4,7,8-HxCDF	1.78E-07	3.21E-07	mg/kg	C60145	3/4	1.22E-07 - 1.22E-07	2.06E-07	8.38E-08
57653857	1,2,3,6,7,8-HxCDD	2.07E-07	4.08E-07	mg/kg	C60145	3/4	1.59E-07 - 1.59E-07	2.56E-07	1.08E-07
57117449	1,2,3,6,7,8-HxCDF	1.30E-07	2.00E-07	mg/kg	C60145	3/4	1.31E-07 - 1.31E-07	1.55E-07	3.29E-08
19408743	1,2,3,7,8,9-HxCDD	1.77E-07	1.77E-07	mg/kg	C60145	1/4	1.05E-07 - 1.67E-07	1.40E-07	3.73E-08
72918219	1,2,3,7,8,9-HxCDF	ND	ND	ND	-	ND	1.05E-07 - 1.23E-07	1.14E-07	8.41E-09
40321764	1,2,3,7,8-PeCDD	3.64E-07	4.97E-07	mg/kg	C60145	3/4	1.81E-07 - 1.81E-07	3.53E-07	1.30E-07
57117416	1,2,3,7,8-PeCDF	ND	ND	ND	-	ND	1.05E-07 - 2.03E-07	1.33E-07	4.70E-08
60851345	2,3,4,6,7,8-HxCDF	1.54E-07	1.54E-07	mg/kg	C60145	1/4	1.04E-07 - 1.57E-07	1.31E-07	2.84E-08
57117314	2,3,4,7,8-PeCDF	1.32E-06	2.22E-06	mg/kg	C60145	3/4	3.60E-07 - 3.60E-07	1.35E-06	7.65E-07
1746016	2,3,7,8-TCDD	ND	ND	ND	-	ND	1.06E-07 - 1.75E-07	1.29E-07	3.13E-08
51207319	2,3,7,8-TCDF	3.29E-07	5.48E-07	mg/kg	C60145	4/4	NA	4.32E-07	1.05E-07
3268879	Octa CDD	1.75E-06	2.69E-06	mg/kg	C60145	3/4	5.09E-07 - 5.09E-07	1.89E-06	1.02E-06
39001020	Octa CDF	2.31E-07	2.31E-07	mg/kg	C60145	1/4	2.18E-07 - 3.05E-07	2.47E-07	3.94E-08
37871004	Total Hepta CDD	9.45E-07	9.45E-07	mg/kg	C60145	1/4	1.59E-07 - 6.25E-07	5.68E-07	3.23E-07
38998753	Total Hepta CDF	2.89E-07	2.89E-07	mg/kg	C60145	1/4	1.05E-07 - 1.47E-07	1.63E-07	8.60E-08
34465468	Total Hexa CDD	2.07E-07	7.07E-07	mg/kg	C60145	3/4	1.63E-07 - 1.63E-07	3.32E-07	2.53E-07
55684941	Total Hexa CDF	3.07E-07	6.75E-07	mg/kg	C60145	3/4	1.57E-07 - 1.57E-07	3.75E-07	2.18E-07
36088229	Total Penta CDD	3.64E-07	4.97E-07	mg/kg	C60145	3/4	1.81E-07 - 1.81E-07	3.53E-07	1.30E-07
30402154	Total Penta CDF	1.32E-06	2.34E-06	mg/kg	C60145	3/4	3.60E-07 - 3.60E-07	1.45E-06	8.38E-07
419003575	Total Tetra CDD	ND	ND	ND	-	ND	1.06E-07 - 1.75E-07	1.29E-07	3.13E-08
55722275	Total Tetra CDF	3.29E-07	8.85E-07	mg/kg	C60346	4/4	NA	6.05E-07	3.01E-07
---	2,3,7,8-TCDD TEQ	4.32E-07	1.37E-06	mg/kg	C60145	4/4	NA	9.09E-07	3.82E-07
7440382	Arsenic	1.70E-02	1.70E-02	mg/kg	C60142	1/4	1.70E-02 - 2.00E-02	1.80E-02	1.41E-03
7440393	Barium	1.60E-01	1.70E-01	mg/kg	C60145	2/4	1.50E-01 - 1.00E+00	3.70E-01	4.20E-01
7440417	Beryllium	ND	ND	ND	-	ND	1.10E-02 - 1.50E-02	1.25E-02	1.91E-03
7440439	Cadmium	ND	ND	ND	-	ND	2.80E-03 - 5.60E-03	3.73E-03	1.27E-03
7440473	Chromium	1.60E-01	2.00E-01	mg/kg	C60346	4/4	NA	1.78E-01	1.71E-02
7440484	Cobalt	ND	ND	ND	-	ND	4.60E-02 - 8.40E-02	5.83E-02	1.76E-02
7439921	Lead	1.10E-02	1.10E-02	mg/kg	C60346	1/4	9.80E-03 - 1.20E-02	1.07E-02	1.01E-03
7439965	Manganese	1.60E-01	2.50E-01	mg/kg	C60346	4/4	NA	1.88E-01	4.27E-02
7439976	Mercury	4.70E-02	8.90E-01	mg/kg	C60219	55/57	7.10E-02 - 7.30E-02	2.89E-01	1.93E-01
7440020	Nickel	ND	ND	ND	-	ND	5.50E-02 - 6.70E-02	6.05E-02	5.20E-03
7440622	Vanadium	ND	ND	ND	-	ND	4.80E-02 - 6.40E-02	5.28E-02	7.54E-03
---	%Lipids Determination	2.00E-01	3.40E+00	%	C60135	56/56	NA	1.18E+00	8.54E-01

TABLE A-3
SUMMARY OF ANALYTES DETECTED IN FISH TISSUE - GROUP C
ANNISTON PCB SITE
OU-4

CAS Number	Analyte	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency[a]	Detection Limits[b]	Arithmetic Mean[c]	Standard Deviation[c]
---	Solids, Percent	1.27E+01	2.41E+01	%	C60109	56/56	NA	1.87E+01	2.04E+00
Panfish									
12674112	Aroclor-1016	ND	ND	ND	-	ND	4.00E-02 - 6.00E-01	1.98E-01	1.02E-01
11104282	Aroclor-1221	ND	ND	ND	-	ND	4.00E-02 - 6.00E-01	1.98E-01	1.02E-01
11141165	Aroclor-1232	ND	ND	ND	-	ND	4.00E-02 - 6.00E-01	1.98E-01	1.02E-01
53469219	Aroclor-1242	1.20E-01	7.70E-01	mg/kg	C60279	44/70	6.00E-02 - 6.00E-01	3.00E-01	1.59E-01
12672296	Aroclor-1248	ND	ND	ND	-	ND	4.00E-02 - 6.00E-01	1.98E-01	1.02E-01
11097691	Aroclor-1254	1.90E-01	5.90E+00	mg/kg	C60265	70/70	NA	1.49E+00	1.03E+00
11096825	Aroclor-1260	1.20E-01	5.40E+00	mg/kg	C60280	70/70	NA	1.24E+00	9.59E-01
37324235	Aroclor-1262	ND	ND	ND	-	ND	4.00E-02 - 6.00E-01	1.98E-01	1.02E-01
11100144	Aroclor-1268	ND	ND	ND	-	ND	4.00E-02 - 6.00E-01	1.98E-01	1.02E-01
32598144	BZ#105	6.90E-03	5.50E-02	mg/kg	C60269	10/10	NA	2.72E-02	1.44E-02
74472370	BZ#114	ND	ND	ND	-	ND	3.20E-03 - 1.60E-02	7.52E-03	3.60E-03
31508006	BZ#118	2.30E-02	1.40E-01	mg/kg	C60269	10/10	NA	7.64E-02	3.81E-02
65510443	BZ#123	ND	ND	ND	-	ND	3.20E-03 - 1.60E-02	7.52E-03	3.60E-03
57465288	BZ#126	ND	ND	ND	-	ND	3.20E-03 - 1.60E-02	7.52E-03	3.60E-03
35065271	BZ#153	6.40E-02	2.70E-01	mg/kg	C60118	10/10	NA	1.55E-01	7.22E-02
38380084	BZ#156	4.50E-03	1.90E-02	mg/kg	C60118	9/10	8.00E-03 - 8.00E-03	1.16E-02	5.33E-03
69782907	BZ#157	ND	ND	ND	-	ND	3.20E-03 - 1.60E-02	7.52E-03	3.60E-03
52663726	BZ#167	ND	ND	ND	-	ND	6.40E-03 - 3.20E-02	1.50E-02	7.20E-03
32774166	BZ#169	ND	ND	ND	-	ND	3.20E-03 - 1.60E-02	7.52E-03	3.60E-03
39635319	BZ#189	ND	ND	ND	-	ND	3.20E-03 - 1.60E-02	7.52E-03	3.60E-03
32598133	BZ#77	3.80E-02	1.50E-01	mg/kg	C60313	3/10	3.20E-03 - 1.60E-02	2.99E-02	4.51E-02
70362504	BZ#81	ND	ND	ND	-	ND	6.40E-03 - 3.20E-02	1.50E-02	7.20E-03
2051243	Decachlorobiphenyl	3.00E-03	1.10E-02	mg/kg	C60186	10/10	NA	6.22E-03	2.70E-03
25512429	Total Dichlorobiphenyl	7.10E-03	1.60E-02	mg/kg	C60269	9/10	5.00E-03 - 5.00E-03	1.13E-02	3.58E-03
28655712	Total Heptachlorobiphenyl	9.80E-02	4.80E-01	mg/kg	C60269	10/10	NA	2.53E-01	1.20E-01
26601649	Total Hexachlorobiphenyl	2.10E-01	9.30E-01	mg/kg	C60269	10/10	NA	4.54E-01	2.24E-01
27323188	Total Monochlorobiphenyl	1.00E-03	3.20E-03	mg/kg	C60118	9/10	2.00E-03 - 2.00E-03	2.03E-03	6.60E-04
53742077	Total Nonachlorobiphenyl	1.00E-02	4.70E-02	mg/kg	C60087	10/10	NA	2.50E-02	1.22E-02
31472830	Total Octachlorobiphenyl	3.40E-02	1.40E-01	mg/kg	C60087	10/10	NA	8.24E-02	3.66E-02
25429292	Total Pentachlorobiphenyl	9.40E-02	7.40E-01	mg/kg	C60269	10/10	NA	3.27E-01	1.90E-01
26914330	Total Tetrachlorobiphenyl	5.60E-02	5.50E-01	mg/kg	C60269	10/10	NA	2.37E-01	1.44E-01
25323686	Total Trichlorobiphenyl	3.40E-02	2.20E-01	mg/kg	C60283	10/10	NA	1.05E-01	5.92E-02
---	Total Homolog PCB	7.00E-01	3.00E+00	mg/kg	C60269	10/10	NA	1.49E+00	7.03E-01
1336363	Total PCBs	4.30E-01	1.04E+01	mg/kg	C60280	70/70	NA	2.94E+00	1.96E+00
---	Dioxin/furan and PCB Dioxin-like Congener TEQ	2.42E-06	8.71E-06	mg/kg	C60269	9/9	NA	5.64E-06	1.91E-06
---	PCB Dioxin-like Congener TEQ	1.96E-06	1.84E-05	mg/kg	C60313	10/10	NA	6.45E-06	4.55E-06
35822469	1,2,3,4,6,7,8-HpCDD	1.93E-07	3.13E-07	mg/kg	C60269	4/9	1.32E-07 - 7.40E-07	3.21E-07	1.88E-07
67562394	1,2,3,4,6,7,8-HpCDF	2.17E-07	2.78E-07	mg/kg	C60196	3/9	1.09E-07 - 1.95E-07	1.91E-07	5.39E-08
55673897	1,2,3,4,7,8,9-HpCDF	1.95E-07	2.71E-07	mg/kg	C60196	2/9	9.35E-08 - 2.11E-07	1.84E-07	4.83E-08
39227286	1,2,3,4,7,8-HxCDD	2.09E-07	2.09E-07	mg/kg	C60196	1/9	1.18E-07 - 2.13E-07	1.66E-07	3.20E-08
70648269	1,2,3,4,7,8-HxCDF	1.45E-07	1.45E-07	mg/kg	C60186	1/9	1.55E-07 - 3.65E-07	2.09E-07	7.06E-08
57653857	1,2,3,6,7,8-HxCDD	ND	ND	ND	-	ND	8.54E-08 - 2.31E-07	1.74E-07	4.27E-08
57117449	1,2,3,6,7,8-HxCDF	ND	ND	ND	-	ND	1.47E-07 - 2.94E-07	2.07E-07	4.67E-08
19408743	1,2,3,7,8,9-HxCDD	2.29E-07	2.29E-07	mg/kg	C60196	1/9	1.24E-07 - 2.33E-07	1.88E-07	3.83E-08
72918219	1,2,3,7,8,9-HxCDF	ND	ND	ND	-	ND	8.31E-08 - 2.50E-07	1.85E-07	4.69E-08
40321764	1,2,3,7,8-PeCDD	2.36E-07	2.36E-07	mg/kg	C60196	1/9	1.00E-07 - 2.05E-07	1.80E-07	3.78E-08
57117416	1,2,3,7,8-PeCDF	ND	ND	ND	-	ND	1.63E-07 - 6.26E-07	2.97E-07	1.59E-07
60851345	2,3,4,6,7,8-HxCDF	ND	ND	ND	-	ND	8.94E-08 - 2.15E-07	1.78E-07	3.84E-08
57117314	2,3,4,7,8-PeCDF	2.84E-07	2.84E-07	mg/kg	C60118	1/9	1.66E-07 - 8.61E-07	3.56E-07	1.99E-07
1746016	2,3,7,8-TCDD	ND	ND	ND	-	ND	9.47E-08 - 3.35E-07	1.92E-07	6.49E-08
51207319	2,3,7,8-TCDF	6.53E-07	3.05E-06	mg/kg	C60283	7/9	7.31E-07 - 1.03E-06	1.46E-06	9.59E-07
3268879	Octa CDD	2.02E-06	6.46E-06	mg/kg	C60087	2/9	3.80E-07 - 1.84E-06	1.53E-06	1.94E-06
39001020	Octa CDF	7.96E-07	7.96E-07	mg/kg	C60087	1/9	2.13E-07 - 6.33E-07	3.80E-07	2.02E-07
37871004	Total Hepta CDD	1.93E-07	3.13E-07	mg/kg	C60269	4/9	1.32E-07 - 7.66E-07	3.48E-07	2.29E-07

TABLE A-3
SUMMARY OF ANALYTES DETECTED IN FISH TISSUE - GROUP C
ANNISTON PCB SITE
OU-4

CAS Number	Analyte	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency[a]	Detection Limits[b]	Arithmetic Mean[c]	Standard Deviation[c]
38998753	Total Hepta CDF	4.12E-07	6.62E-07	mg/kg	C60087	3/9	1.09E-07 - 2.03E-07	2.91E-07	1.99E-07
34465468	Total Hexa CDD	ND	ND	ND	-	ND	1.24E-07 - 6.69E-07	2.29E-07	1.68E-07
55684941	Total Hexa CDF	ND	ND	ND	-	ND	1.60E-07 - 8.19E-07	3.38E-07	2.40E-07
36088229	Total Penta CDD	ND	ND	ND	-	ND	1.00E-07 - 2.36E-07	1.80E-07	3.78E-08
30402154	Total Penta CDF	6.89E-07	6.89E-07	mg/kg	C60118	1/9	1.70E-07 - 1.49E-06	6.64E-07	4.96E-07
419003575	Total Tetra CDD	ND	ND	ND	-	ND	9.47E-08 - 3.35E-07	1.92E-07	6.49E-08
55722275	Total Tetra CDF	2.41E-07	4.48E-06	mg/kg	C60283	8/9	1.03E-06 - 1.03E-06	1.86E-06	1.47E-06
---	2,3,7,8-TCDD TEQ	2.98E-07	7.17E-07	mg/kg	C60196	9/9	NA	5.26E-07	1.50E-07
7440382	Arsenic	3.10E-02	2.40E-01	mg/kg	C60283	4/10	2.40E-02 - 1.40E-01	6.70E-02	6.98E-02
7440393	Barium	ND	ND	ND	-	ND	1.80E-01 - 6.60E-01	3.28E-01	1.36E-01
7440417	Beryllium	ND	ND	ND	-	ND	1.00E-02 - 1.50E-02	1.21E-02	1.37E-03
7440439	Cadmium	ND	ND	ND	-	ND	3.10E-03 - 1.30E-02	8.08E-03	2.91E-03
7440473	Chromium	1.30E-01	2.50E-01	mg/kg	C60313	10/10	NA	1.63E-01	3.77E-02
7440484	Cobalt	ND	ND	ND	-	ND	3.40E-02 - 1.10E-01	5.01E-02	2.16E-02
7439921	Lead	1.10E-02	3.20E-02	mg/kg	C60313	3/10	9.40E-03 - 1.20E-02	1.40E-02	7.10E-03
7439965	Manganese	1.80E-01	1.90E+00	mg/kg	C60313	10/10	NA	5.64E-01	5.23E-01
7439976	Mercury	2.60E-02	5.30E-01	mg/kg	C60282	70/70	NA	2.38E-01	1.21E-01
7440020	Nickel	ND	ND	ND	-	ND	5.30E-02 - 6.80E-02	6.13E-02	4.76E-03
7440622	Vanadium	ND	ND	ND	-	ND	3.80E-02 - 1.60E-01	5.57E-02	3.71E-02
---	%Lipids Determination	2.00E-01	1.20E+00	%	C60188	70/70	NA	5.73E-01	2.48E-01
---	Solids, Percent	1.71E+01	2.34E+01	%	C60283	69/69	NA	2.02E+01	1.16E+00

[a]Number of sampling locations at which analyte was detected compared with total number of sampling locations; duplicates at a location were averaged and considered one sample.
[b]Based on nondetected samples.
[c]Nondetects were included at the full detection limit.
mg/kg = Milligrams per kilogram.
NA = Not applicable.

TABLE A-4
SUMMARY OF ANALYTES DETECTED IN FISH AND COMPARISON TO FISH RSLS
ANNISTON PCB SITE
OU-4

Analyte	Frequency of Detection	Range of Detected Concentrations (mg/kg)	Location of Maximum Detected Concentration	Average Concentration (mg/kg)	Screening Toxicity Value [a]		COPC Flag
Aroclors							
Aroclor-1242	186 / 361	2.40E-02 - 2.80E+00	HHFL-07	3.01E-01	Evaluated as tPCBs		
Aroclor-1254	349 / 361	8.60E-02 - 1.20E+01	HHFL-05	1.58E+00	Evaluated as tPCBs		
Aroclor-1260	361 / 361	1.10E-01 - 2.20E+01	HHFL-05	1.64E+00	Evaluated as tPCBs		
Aroclor-1268	1 / 361	1.20E-01 - 1.20E-01	HHFL-01	2.15E-01	Evaluated as tPCBs		
Total PCBs (sum of Aroclors)	361 / 361	2.23E-01 - 3.40E+01	HHFL-05	3.40E+00	1.60E-03	C	Yes
PCB Dioxin-like Congeners							
PCB-77	14 / 36	1.30E-02 - 2.50E-01	HHFL-01	4.11E-02	Evaluated as PCB TEQ		
PCB-105	36 / 36	6.90E-03 - 8.60E-02	HHFL-08	3.31E-02	Evaluated as PCB TEQ		
PCB-118	36 / 36	2.30E-02 - 2.20E-01	HHFL-08	9.51E-02	Evaluated as PCB TEQ		
PCB-126	1 / 36	1.90E-02 - 1.90E-02	HHFL-01	8.13E-03	Evaluated as PCB TEQ		
PCB-153	36 / 36	5.50E-02 - 4.40E-01	HHFL-08	2.10E-01	Evaluated as PCB TEQ		
PCB-156	35 / 36	3.40E-03 - 3.40E-02	HHFL-08	1.54E-02	Evaluated as PCB TEQ		
PCB-167	1 / 36	1.70E-02 - 1.70E-02	HHFL-06	1.57E-02	Evaluated as PCB TEQ		
PCB Dioxin-like Congener TEQ	36 / 36	1.96E-06 - 1.91E-03	HHFL-01	2.10E-04	2.40E-08	C	Yes
Dioxin/Furan Congeners							
1,2,3,7,8-PeCDD	7 / 35	1.56E-07 - 4.97E-07	HHFL-08	1.75E-07	Evaluated as 2,3,7,8-TCDD TEQ		
1,2,3,7,8,9-HxCDD	4 / 35	1.77E-07 - 2.61E-07	HHFL-02	1.60E-07	Evaluated as 2,3,7,8-TCDD TEQ		
1,2,3,4,7,8-HxCDD	2 / 35	1.22E-07 - 2.09E-07	HHFL-05	1.37E-07	Evaluated as 2,3,7,8-TCDD TEQ		
1,2,3,6,7,8-HxCDD	4 / 35	2.07E-07 - 4.08E-07	HHFL-08	1.69E-07	Evaluated as 2,3,7,8-TCDD TEQ		
1,2,3,4,6,7,8-HpCDD	11 / 35	1.93E-07 - 4.09E-06	HHFL-08	5.16E-07	Evaluated as 2,3,7,8-TCDD TEQ		
Octa CDD	18 / 35	1.18E-06 - 1.14E-04	HHFL-08	5.42E-06	Evaluated as 2,3,7,8-TCDD TEQ		
2,3,7,8-TCDF	31 / 35	3.29E-07 - 9.61E-05	HHFL-01	9.66E-06	Evaluated as 2,3,7,8-TCDD TEQ		
2,3,4,7,8-PeCDF	21 / 35	2.84E-07 - 3.99E-06	HHFL-01	1.00E-06	Evaluated as 2,3,7,8-TCDD TEQ		
1,2,3,7,8-PeCDF	14 / 35	2.13E-07 - 2.15E-06	HHFL-01	4.40E-07	Evaluated as 2,3,7,8-TCDD TEQ		
1,2,3,6,7,8-HxCDF	8 / 35	1.03E-07 - 2.40E-07	HHFL-01	1.75E-07	Evaluated as 2,3,7,8-TCDD TEQ		
1,2,3,4,7,8-HxCDF	11 / 35	1.09E-07 - 3.35E-07	HHFL-01	1.83E-07	Evaluated as 2,3,7,8-TCDD TEQ		
2,3,4,6,7,8-HxCDF	2 / 35	1.39E-07 - 1.54E-07	HHFL-08	1.43E-07	Evaluated as 2,3,7,8-TCDD TEQ		
1,2,3,4,6,7,8-HpCDF	11 / 35	1.39E-07 - 9.42E-07	HHFL-08	2.02E-07	Evaluated as 2,3,7,8-TCDD TEQ		
1,2,3,4,7,8,9-HpCDF	4 / 35	1.56E-07 - 2.71E-07	HHFL-05	1.55E-07	Evaluated as 2,3,7,8-TCDD TEQ		
Octa CDF	10 / 35	2.31E-07 - 3.72E-06	HHFL-08	4.82E-07	Evaluated as 2,3,7,8-TCDD TEQ		
2,3,7,8-TCDD TEQ	35 / 35	2.98E-07 - 1.11E-05	HHFL-01	1.54E-06	2.40E-08	C	Yes
Inorganics							
Arsenic	22 / 36	1.70E-02 - 3.80E-01	HHFL-02	6.86E-02	2.10E-03	C	No
Barium	2 / 36	1.60E-01 - 1.70E-01	HHFL-08	2.85E-01	2.70E+01	NC	No
Beryllium	2 / 36	9.00E-03 - 9.60E-03	HHFL-01	1.20E-02	2.70E-01	NC	No
Cadmium	1 / 36	9.30E-03 - 9.30E-03	HHFL-01	5.61E-03	1.40E-01	NC	No
Chromium	31 / 36	1.10E-01 - 2.50E-01	HHFL-09	1.69E-01	6.30E-03	C	No
Lead	10 / 36	9.00E-03 - 6.10E-02	HHFL-03	1.39E-02	1.10E-02	C	No
Manganese	25 / 36	6.30E-02 - 1.90E+00	HHFL-09	3.06E-01	1.90E+01	NC	No
Mercury	360 / 362	2.60E-02 - 1.90E+00	HHFL-06	3.74E-01	1.40E-02	NC	Yes
Vanadium	5 / 36	1.90E-02 - 3.10E-02	HHFL-01	4.97E-02	6.80E-01	NC	No

[a] Fish RSLs (May, 2012).
C = cancer based, target risk equals 1E-06.
NC = noncancer based, hazard index equals 0.1.
Chromium assumed to be in the hexavalent form.
Methyl mercury RSL used for mercury.

TABLE A-5
EXPOSURE POINT CONCENTRATION SUMMARY -
LOCATION A FISH ANNISTON PCB SITE OU-4

TABLE A-6
EXPOSURE POINT CONCENTRATION SUMMARY - LOCATION A FISH
ANNISTON PCB SITE
OU-4

Scenario Timeframe: Current/Future
Medium: Fish Tissue
Exposure Medium: Location A Fish Tissue

Exposure Point	Contaminant of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Group A	**All Species**								
	Total PCBs	mg/kg	2.11	2.38	9.47	2.38	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	PCB Dioxin-like Congener TEQ	mg/kg	0.000012	0.000016	0.000032	0.000016	mg/kg	95% Student's-t UCL - Normal	ProUCL Recommendation
	2,3,7,8-TCDD TEQ	mg/kg	0.0000029	0.0000051	0.000011	0.0000051	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	Mercury	mg/kg	0.28	0.32	0.87	0.32	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	Bass								
	Total PCBs	mg/kg	2.2	2.75	9.5	2.75	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	PCB Dioxin-like Congener TEQ	mg/kg	0.000015	NC	0.000021	0.000021	mg/kg	75^{th} Percentile*	See Text
	2,3,7,8-TCDD TEQ	mg/kg	0.0000031	NC	0.0000048	0.0000039	mg/kg	75^{th} Percentile*	See Text
	Mercury	mg/kg	0.42	0.48	0.87	0.48	mg/kg	95% H-UCL - Lognormal	ProUCL Recommendation
	Catfish								
	Total PCBs	mg/kg	2.44	2.97	5.8	2.97	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	PCB Dioxin-like Congener TEQ	mg/kg	0.0000042	NC	0.0000058	0.0000058	mg/kg	Maximum*	See Text
	2,3,7,8-TCDD TEQ	mg/kg	0.00000091	NC	0.00000093	0.00000093	mg/kg	Maximum*	See Text
	Mercury	mg/kg	0.16	0.19	0.43	0.19	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	Panfish								
	Total PCBs	mg/kg	1.69	2.1	4.4	2.11	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	PCB Dioxin-like Congener TEQ	mg/kg	0.000011	NC	0.000032	0.000013	mg/kg	75^{th} Percentile*	See Text
	2,3,7,8-TCDD TEQ	mg/kg	0.0000036	NC	0.000011	0.0000050	mg/kg	75^{th} Percentile*	See Text
	Mercury	mg/kg	0.27	0.34	0.70	0.34	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation

NC = Not calculated due to insufficient sample size.

* The maximum concentration used for EPC due to less than 3 samples collected; the 75th percentile used for EPC when 3-7 samples collected.

TABLE A-7
EXPOSURE POINT CONCENTRATION SUMMARY - LOCATION B FISH
ANNISTON PCB SITE
OU-4

Scenario Timeframe: Current/Future
Medium: Fish Tissue
Exposure Medium: Location B Fish Tissue

Exposure Point	Contaminant of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic - Data Distribution	Rationale
Group B	**All Species**								
	Total PCBs	mg/kg	2.51	2.88	11.8	2.88	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	PCB Dioxin-like Congener TEQ	mg/kg	0.0000065	NC	0.000010	0.0000074	mg/kg	75th Percentile*	See Text
	2,3,7,8-TCDD TEQ	mg/kg	0.0000014	NC	0.0000024	0.0000017	mg/kg	75th Percentile*	See Text
	Mercury	mg/kg	0.43	0.48	1.3	0.48	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	Bass								
	Total PCBs	mg/kg	2.9	4.77	11.8	4.77	mg/kg	95% Chebyshev (Mean, Sd) UCL - Not Discernable	ProUCL Recommendation
	PCB Dioxin-like Congener TEQ	mg/kg	0.0000084	NC	0.000010	0.000010	mg/kg	Maximum*	See Text
	2,3,7,8-TCDD TEQ	mg/kg	0.0000017	NC	0.0000024	0.0000024	mg/kg	Maximum*	See Text
	Mercury	mg/kg	0.68	0.77	1.3	0.77	mg/kg	95% Student's-t UCL - Normal	ProUCL Recommendation
	Catfish								
	Total PCBs	mg/kg	3.09	4.01	10.8	4.01	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	PCB Dioxin-like Congener TEQ	mg/kg	0.0000051	NC	0.0000051	0.0000051	mg/kg	Maximum*	See Text
	2,3,7,8-TCDD TEQ	mg/kg	0.00000087	NC	0.00000087	0.00000087	mg/kg	Maximum*	See Text
	Mercury	mg/kg	0.36	0.44	1.3	0.44	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	Panfish								
	Total PCBs	mg/kg	1.55	1.86	4.4	1.86	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	PCB Dioxin-like Congener TEQ	mg/kg	0.0000041	NC	0.0000041	0.0000041	mg/kg	Maximum*	See Text
	2,3,7,8-TCDD TEQ	mg/kg	0.0000015	NC	0.0000015	0.0000015	mg/kg	Maximum*	See Text
	Mercury	mg/kg	0.25	0.28	0.51	0.28	mg/kg	95% Student's-t UCL - Normal	ProUCL Recommendation

NC = Not calculated due to insufficient sample size.

* The maximum concentration used for EPC due to less than 3 samples collected; the 75th percentile used for EPC when 3-7 samples collected.

TABLE A-8
EXPOSURE POINT CONCENTRATION SUMMARY - LOCATION C FISH
ANNISTON PCB SITE
OU-4

Scenario Timeframe: Current/Future
Medium: Fish Tissue
Exposure Medium: Location C Fish Tissue

Exposure Point	Contaminant of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Group C	**All Species**								
	Total PCBs	mg/kg	4.35	5.43	34	5.43	mg/kg	95% Chebyshev (Mean, Sd) UCL - Not Discernable	ProUCL Recommendation
	PCB Dioxin-like Congener TEQ	mg/kg	0.0000069	0.0000083	0.000018	0.0000083	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	2,3,7,8-TCDD TEQ	mg/kg	0.00000068	0.00000079	0.0000014	0.00000079	mg/kg	95% Student's-t UCL - Normal	ProUCL Recommendation
	Mercury	mg/kg	0.39	0.43	1.9	0.43	mg/kg	95% KM (BCA) UCL - Lognormal	ProUCL Recommendation
	Bass								
	Total PCBs	mg/kg	4.75	5.24	14.9	5.24	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	PCB Dioxin-like Congener TEQ	mg/kg	0.0000073	NC	0.000010	0.0000081	mg/kg	75th Percentile*	See Text
	2,3,7,8-TCDD TEQ	mg/kg	0.00000077	NC	0.0000011	0.00000077	mg/kg	75th Percentile*	See Text
	Mercury	mg/kg	0.64	0.71	1.9	0.71	mg/kg	95% Student's-t UCL - Normal	ProUCL Recommendation
	Catfish								
	Total PCBs	mg/kg	5.61	6.68	34	6.68	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	PCB Dioxin-like Congener TEQ	mg/kg	0.0000075	NC	0.000012	0.0000088	mg/kg	75th Percentile*	See Text
	2,3,7,8-TCDD TEQ	mg/kg	0.00000091	NC	0.0000014	0.0000010	mg/kg	75th Percentile*	See Text
	Mercury	mg/kg	0.29	0.33	0.89	0.33	mg/kg	95% KM (BCA) UCL - Gamma	ProUCL Recommendation
	Panfish								
	Total PCBs	mg/kg	2.94	3.32	10.4	3.32	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	PCB Dioxin-like Congener TEQ	mg/kg	0.0000064	0.0000094	0.000018	0.0000094	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation
	2,3,7,8-TCDD TEQ	mg/kg	0.00000053	0.00000062	0.00000072	0.00000062	mg/kg	95% Student's-t UCL - Normal	ProUCL Recommendation
	Mercury	mg/kg	0.24	0.27	0.53	0.27	mg/kg	95% Approximate Gamma UCL - Gamma	ProUCL Recommendation

NC = Not calculated due to insufficient sample size.

* The maximum concentration used for EPC due to less than 3 samples collected; the 75th percentile used for EPC when 3-7 samples collected.

TABLE A-9
FISH INGESTION EXPOSURE PARAMETERS
ANNISTON PCB SITE
OU-4

Scenario Timeframe: Current/Future
Medium: Fish
Exposure Medium: Fish

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational Fishermen	Young Child (1 to 6 years) and Adult (age-adjusted)	Fish Tissue	C_f	Concentration in Fish	mg/kg	Group- and COPC-specific	See Tables 5-1 through 5-3	Group- and COPC-specific	See Tables 5-1 through 5-3	Chronic daily intake - cancer (mg/kg-day) = C_f x IRFadj x FI x CF x IAF x EF x 1/AT-C
				IRFadj	Age-adjusted fish ingestion rate	g-yr/kg-day	16.3	Calculated	1.5	Calculated	
				IRFc	Fish Ingestion Rate - child	g/day	15	one-half the adult ingestion rate	1.41	one-half the adult ingestion rate	
				IRFa	Fish Ingestion Rate - adult	g/day	30	ADEM, 1993	2.83	Arcadis, 2009	Chronic daily intake - noncancer (mg/kg-day) = C_f x IRFadj x FI x CF x IAF x EF x 1/AT-NC
				FI	Fraction of Ingested Fish from Choccolocco Creek	unitless	River mile 0-10 = 1 River mile 10-37 = 0.5	See Section 5.2.2.2	River mile 0-10 = 1 River mile 10-37 = 0.5	See Section 5.2.2.2	
				CF	Conversion Factor	kg/g	1.00E-03	Unit conversion factor	1.00E-03	Unit conversion factor	
				IAF	Gastrointestinal Absorption Factor	unitless	1	tPCBs = EPA, 1986; rest = default	1	tPCBs = EPA, 1986; rest = default	where:
				EF	Exposure Frequency	days/year	350	Professional judgment	350	Professional judgment	IRFadj = (IRFc x EDc x 1/BWc)+(IRFa x EDa x 1/BWa)
				EDc	Exposure Duration - child	years	6	Calculated based on young child's age	6	Calculated based on young child's age	
				EDa	Exposure Duration - adult	years	24	Professional judgment	24	Professional judgment	
				BWc	Body Weight - child	kg	15	EPA, 2008	15	EPA, 2008	
				BWa	Body Weight - adult	kg	70	EPA, 1989	70	EPA, 1989	
				AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
				AT-NC	Averaging Time (Non-Cancer)	days	10,950	Total ED (30 years) x 365 days/year	10,950	ED x 365 days/year	

TABLE A-10

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - FISH INGESTION - GROUP A - PRIMARY COPCS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Fish	Fish Tissue	Group A Fish Tissue	Ingestion	**All Species**												
				Total PCBs	2.38E+00	mg/kg	5.3E-04	mg/kg-day	2.0E+00	mg/kg-day	1E-03	1.2E-03	mg/kg-day	2.0E-05	mg/kg-day	62
				Mercury	3.18E-01	mg/kg	7.1E-05	mg/kg-day	NA	---	NA	1.7E-04	mg/kg-day	1.0E-04	mg/kg-day	2
			All Species Total								1E-03					64
			All Species PCB Dioxin-like Congener TEQ		1.64E-05	mg/kg	3.7E-09	mg/kg-day	1.3E+05	mg/kg-day	5E-04	8.6E-09	mg/kg-day	7.0E-10	mg/kg-day	12
			Ingestion	**Bass**												
				Total PCBs	2.75E+00	mg/kg	6.1E-04	mg/kg-day	2.0E+00	mg/kg-day	1E-03	1.4E-03	mg/kg-day	2.0E-05	mg/kg-day	72
				Mercury	4.84E-01	mg/kg	1.1E-04	mg/kg-day	NA	---	NA	2.5E-04	mg/kg-day	1.0E-04	mg/kg-day	3
			Bass Total								1E-03					74
			Bass PCB Dioxin-like Congener TEQ		2.06E-05	mg/kg	4.6E-09	mg/kg-day	1.3E+05	mg/kg-day	6E-04	1.1E-08	mg/kg-day	7.0E-10	mg/kg-day	15
			Ingestion	**Catfish**												
				Total PCBs	2.97E+00	mg/kg	6.6E-04	mg/kg-day	2.0E+00	mg/kg-day	1E-03	1.5E-03	mg/kg-day	2.0E-05	mg/kg-day	77
				Mercury	1.90E-01	mg/kg	4.2E-05	mg/kg-day	NA	---	NA	9.9E-05	mg/kg-day	1.0E-04	mg/kg-day	1
			Catfish Total								1E-03					78
			Catfish PCB Dioxin-like Congener TEQ		5.78E-06	mg/kg	1.3E-09	mg/kg-day	1.3E+05	mg/kg-day	2E-04	3.0E-09	mg/kg-day	7.0E-10	mg/kg-day	4
			Ingestion	**Panfish**												
				Total PCBs	2.11E+00	mg/kg	4.7E-04	mg/kg-day	2.0E+00	mg/kg-day	9E-04	1.1E-03	mg/kg-day	2.0E-05	mg/kg-day	55
				Mercury	3.38E-01	mg/kg	7.5E-05	mg/kg-day	NA	---	NA	1.8E-04	mg/kg-day	1.0E-04	mg/kg-day	2
			Panfish Total								9E-04					57
			Panfish PCB Dioxin-like Congener TEQ		1.25E-05	mg/kg	2.8E-09	mg/kg-day	1.3E+05	mg/kg-day	4E-04	6.5E-09	mg/kg-day	7.0E-10	mg/kg-day	9

TABLE A-11

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - FISH INGESTION - GROUP A - TEQS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Fish	Fish Tissue	Group A Fish Tissue	Ingestion	**All Species**												
				PCB Dioxin-like Congener TEQ	1.64E-05	mg/kg	3.7E-09	mg/kg-day	1.3E+05	mg/kg-day	5E-04	8.6E-09	mg/kg-day	7.0E-10	mg/kg-day	12
				2,3,7,8-TCDD TEQ	5.14E-06	mg/kg	1.1E-09	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.7E-09	mg/kg-day	7.0E-10	mg/kg-day	4
			All Species Total TEQ								6E-04					16
			Ingestion	**Bass**												
				PCB Dioxin-like Congener TEQ	2.06E-05	mg/kg	4.6E-09	mg/kg-day	1.3E+05	mg/kg-day	6E-04	1.1E-08	mg/kg-day	7.0E-10	mg/kg-day	15
				2,3,7,8-TCDD TEQ	3.92E-06	mg/kg	8.7E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.0E-09	mg/kg-day	7.0E-10	mg/kg-day	3
			Bass Total TEQ								7E-04					18
			Ingestion	**Catfish**												
				PCB Dioxin-like Congener TEQ	5.78E-06	mg/kg	1.3E-09	mg/kg-day	1.3E+05	mg/kg-day	2E-04	3.0E-09	mg/kg-day	7.0E-10	mg/kg-day	4
				2,3,7,8-TCDD TEQ	9.34E-07	mg/kg	2.1E-10	mg/kg-day	1.3E+05	mg/kg-day	3E-05	4.9E-10	mg/kg-day	7.0E-10	mg/kg-day	0.7
			Catfish Total TEQ								2E-04					5
			Ingestion	**Panfish**												
				PCB Dioxin-like Congener TEQ	1.25E-05	mg/kg	2.8E-09	mg/kg-day	1.3E+05	mg/kg-day	4E-04	6.5E-09	mg/kg-day	7.0E-10	mg/kg-day	9
				2,3,7,8-TCDD TEQ	5.02E-06	mg/kg	1.1E-09	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.6E-09	mg/kg-day	7.0E-10	mg/kg-day	4
			Panfish Total TEQ								5E-04					13

TABLE A-12

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - FISH INGESTION - GROUP A - PRIMARY COPCS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Fish	Fish Tissue	Group A Fish Tissue	Ingestion	**All Species**												
				Total PCBs	2.38E+00	mg/kg	5.0E-05	mg/kg-day	1.0E+00	mg/kg-day	5E-05	1.2E-04	mg/kg-day	2.0E-05	mg/kg-day	6
				Mercury	3.18E-01	mg/kg	6.7E-06	mg/kg-day	NA	---	NA	1.6E-05	mg/kg-day	1.0E-04	mg/kg-day	0.2
			All Species Total								5E-05					6
			All Species PCB Dioxin-like Congener TEQ		1.64E-05	mg/kg	3.5E-10	mg/kg-day	1.3E+05	mg/kg-day	4E-05	8.1E-10	mg/kg-day	7.0E-10	mg/kg-day	1
			Ingestion	**Bass**												
				Total PCBs	2.75E+00	mg/kg	5.8E-05	mg/kg-day	1.0E+00	mg/kg-day	6E-05	1.3E-04	mg/kg-day	2.0E-05	mg/kg-day	7
				Mercury	4.84E-01	mg/kg	1.0E-05	mg/kg-day	NA	---	NA	2.4E-05	mg/kg-day	1.0E-04	mg/kg-day	0.2
			Bass Total								6E-05					7
			Bass PCB Dioxin-like Congener TEQ		2.06E-05	mg/kg	4.3E-10	mg/kg-day	1.3E+05	mg/kg-day	6E-05	1.0E-09	mg/kg-day	7.0E-10	mg/kg-day	1
			Ingestion	**Catfish**												
				Total PCBs	2.97E+00	mg/kg	6.2E-05	mg/kg-day	1.0E+00	mg/kg-day	6E-05	1.5E-04	mg/kg-day	2.0E-05	mg/kg-day	7
				Mercury	1.90E-01	mg/kg	4.0E-06	mg/kg-day	NA	---	NA	9.3E-06	mg/kg-day	1.0E-04	mg/kg-day	0.09
			Catfish Total								6E-05					7
			Catfish PCB Dioxin-like Congener TEQ		5.78E-06	mg/kg	1.2E-10	mg/kg-day	1.3E+05	mg/kg-day	2E-05	2.8E-10	mg/kg-day	7.0E-10	mg/kg-day	0.4
			Ingestion	**Panfish**												
				Total PCBs	2.11E+00	mg/kg	4.4E-05	mg/kg-day	1.0E+00	mg/kg-day	4E-05	1.0E-04	mg/kg-day	2.0E-05	mg/kg-day	5
				Mercury	3.38E-01	mg/kg	7.1E-06	mg/kg-day	NA	---	NA	1.7E-05	mg/kg-day	1.0E-04	mg/kg-day	0.2
			Panfish Total								4E-05					5
			Panfish PCB Dioxin-like Congener TEQ		1.25E-05	mg/kg	2.6E-10	mg/kg-day	1.3E+05	mg/kg-day	3E-05	6.2E-10	mg/kg-day	7.0E-10	mg/kg-day	0.9

TABLE A-13

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - FISH INGESTION - GROUP A - TEQS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Fish	Fish Tissue	Group A Fish Tissue	Ingestion	**All Species**												
				PCB Dioxin-like Congener TEQ	1.64E-05	mg/kg	3.5E-10	mg/kg-day	1.3E+05	mg/kg-day	4E-05	8.1E-10	mg/kg-day	7.0E-10	mg/kg-day	1
				2,3,7,8-TCDD TEQ	5.14E-06	mg/kg	1.1E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-05	2.5E-10	mg/kg-day	7.0E-10	mg/kg-day	0.4
			All Species Total TEQ								6E-05					2
			Ingestion	**Bass**												
				PCB Dioxin-like Congener TEQ	2.06E-05	mg/kg	4.3E-10	mg/kg-day	1.3E+05	mg/kg-day	6E-05	1.0E-09	mg/kg-day	7.0E-10	mg/kg-day	1
				2,3,7,8-TCDD TEQ	3.92E-06	mg/kg	8.2E-11	mg/kg-day	1.3E+05	mg/kg-day	1E-05	1.9E-10	mg/kg-day	7.0E-10	mg/kg-day	0.3
			Bass Total TEQ								7E-05					2
			Ingestion	**Catfish**												
				PCB Dioxin-like Congener TEQ	5.78E-06	mg/kg	1.2E-10	mg/kg-day	1.3E+05	mg/kg-day	2E-05	2.8E-10	mg/kg-day	7.0E-10	mg/kg-day	0.4
				2,3,7,8-TCDD TEQ	9.34E-07	mg/kg	2.0E-11	mg/kg-day	1.3E+05	mg/kg-day	3E-06	4.6E-11	mg/kg-day	7.0E-10	mg/kg-day	0.07
			Catfish Total TEQ								2E-05					0.5
			Ingestion	**Panfish**												
				PCB Dioxin-like Congener TEQ	1.25E-05	mg/kg	2.6E-10	mg/kg-day	1.3E+05	mg/kg-day	3E-05	6.2E-10	mg/kg-day	7.0E-10	mg/kg-day	0.9
				2,3,7,8-TCDD TEQ	5.02E-06	mg/kg	1.1E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-05	2.5E-10	mg/kg-day	7.0E-10	mg/kg-day	0.4
			Panfish Total TEQ								5E-05					1

TABLE A-14

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - FISH INGESTION - GROUP B - PRIMARY COPCS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Fish	Fish Tissue	Group B Fish Tissue	Ingestion	**All Species**												
				Total PCBs	2.88E+00	mg/kg	3.2E-04	mg/kg-day	2.0E+00	mg/kg-day	6E-04	7.5E-04	mg/kg-day	2.0E-05	mg/kg-day	37
				Mercury	4.79E-01	mg/kg	5.3E-05	mg/kg-day	NA	---	NA	1.2E-04	mg/kg-day	1.0E-04	mg/kg-day	1
			All Species Total								6E-04					39
			All Species PCB Dioxin-like Congener TEQ		7.39E-06	mg/kg	8.2E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-04	1.9E-09	mg/kg-day	7.0E-10	mg/kg-day	3
			Ingestion	**Bass**												
				Total PCBs	4.77E+00	mg/kg	5.3E-04	mg/kg-day	2.0E+00	mg/kg-day	1E-03	1.2E-03	mg/kg-day	2.0E-05	mg/kg-day	62
				Mercury	7.67E-01	mg/kg	8.6E-05	mg/kg-day	NA	---	NA	2.0E-04	mg/kg-day	1.0E-04	mg/kg-day	2
			Bass Total								1E-03					64
			Bass PCB Dioxin-like Congener TEQ		1.03E-05	mg/kg	1.1E-09	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.7E-09	mg/kg-day	7.0E-10	mg/kg-day	4
			Ingestion	**Catfish**												
				Total PCBs	4.01E+00	mg/kg	4.5E-04	mg/kg-day	2.0E+00	mg/kg-day	9E-04	1.0E-03	mg/kg-day	2.0E-05	mg/kg-day	52
				Mercury	4.40E-01	mg/kg	4.9E-05	mg/kg-day	NA	---	NA	1.1E-04	mg/kg-day	1.0E-04	mg/kg-day	1
			Catfish Total								9E-04					53
			Catfish PCB Dioxin-like Congener TEQ		5.09E-06	mg/kg	5.7E-10	mg/kg-day	1.3E+05	mg/kg-day	7E-05	1.3E-09	mg/kg-day	7.0E-10	mg/kg-day	2
			Ingestion	**Panfish**												
				Total PCBs	1.86E+00	mg/kg	2.1E-04	mg/kg-day	2.0E+00	mg/kg-day	4E-04	4.8E-04	mg/kg-day	2.0E-05	mg/kg-day	24
				Mercury	2.81E-01	mg/kg	3.1E-05	mg/kg-day	NA	---	NA	7.3E-05	mg/kg-day	1.0E-04	mg/kg-day	0.7
			Panfish Total								4E-04					25
			Panfish PCB Dioxin-like Congener TEQ		4.09E-06	mg/kg	4.6E-10	mg/kg-day	1.3E+05	mg/kg-day	6E-05	1.1E-09	mg/kg-day	7.0E-10	mg/kg-day	2

TABLE A-15

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - FISH INGESTION - GROUP B - TEQS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Fish	Fish Tissue	Group B Fish Tissue	Ingestion	**All Species**												
				PCB Dioxin-like Congener TEQ	7.39E-06	mg/kg	8.2E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-04	1.9E-09	mg/kg-day	7.0E-10	mg/kg-day	3
				2,3,7,8-TCDD TEQ	1.73E-06	mg/kg	1.9E-10	mg/kg-day	1.3E+05	mg/kg-day	3E-05	4.5E-10	mg/kg-day	7.0E-10	mg/kg-day	0.6
			All Species Total TEQ								1E-04					3
			Ingestion	**Bass**												
				PCB Dioxin-like Congener TEQ	1.03E-05	mg/kg	1.1E-09	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.7E-09	mg/kg-day	7.0E-10	mg/kg-day	4
				2,3,7,8-TCDD TEQ	2.43E-06	mg/kg	2.7E-10	mg/kg-day	1.3E+05	mg/kg-day	4E-05	6.3E-10	mg/kg-day	7.0E-10	mg/kg-day	0.9
			Bass Total TEQ								2E-04					5
			Ingestion	**Catfish**												
				PCB Dioxin-like Congener TEQ	5.09E-06	mg/kg	5.7E-10	mg/kg-day	1.3E+05	mg/kg-day	7E-05	1.3E-09	mg/kg-day	7.0E-10	mg/kg-day	2
				2,3,7,8-TCDD TEQ	8.69E-07	mg/kg	9.7E-11	mg/kg-day	1.3E+05	mg/kg-day	1E-05	2.3E-10	mg/kg-day	7.0E-10	mg/kg-day	0.3
			Catfish Total TEQ								9E-05					2
			Ingestion	**Panfish**												
				PCB Dioxin-like Congener TEQ	4.09E-06	mg/kg	4.6E-10	mg/kg-day	1.3E+05	mg/kg-day	6E-05	1.1E-09	mg/kg-day	7.0E-10	mg/kg-day	2
				2,3,7,8-TCDD TEQ	1.49E-06	mg/kg	1.7E-10	mg/kg-day	1.3E+05	mg/kg-day	2E-05	3.9E-10	mg/kg-day	7.0E-10	mg/kg-day	0.6
			Panfish Total TEQ								8E-05					2

TABLE A-16

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - FISH INGESTION - GROUP B - PRIMARY COPCS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Fish	Fish Tissue	Group B Fish Tissue	Ingestion	**All Species**												
				Total PCBs	2.88E+00	mg/kg	6.0E-05	mg/kg-day	1.0E+00	mg/kg-day	6E-05	1.4E-04	mg/kg-day	2.0E-05	mg/kg-day	7
				Mercury	4.79E-01	mg/kg	1.0E-05	mg/kg-day	NA	---	NA	2.3E-05	mg/kg-day	1.0E-04	mg/kg-day	0.2
			All Species Total								6E-05					7
			All Species PCB Dioxin-like Congener TEQ		7.39E-06	mg/kg	1.6E-10	mg/kg-day	1.3E+05	mg/kg-day	2E-05	3.6E-10	mg/kg-day	7.0E-10	mg/kg-day	0.5
			Ingestion	**Bass**												
				Total PCBs	4.77E+00	mg/kg	1.0E-04	mg/kg-day	1.0E+00	mg/kg-day	1E-04	2.3E-04	mg/kg-day	2.0E-05	mg/kg-day	12
				Mercury	7.67E-01	mg/kg	1.6E-05	mg/kg-day	NA	---	NA	3.8E-05	mg/kg-day	1.0E-04	mg/kg-day	0.4
			Bass Total								1E-04					12
			Bass PCB Dioxin-like Congener TEQ		1.03E-05	mg/kg	2.2E-10	mg/kg-day	1.3E+05	mg/kg-day	3E-05	5.1E-10	mg/kg-day	7.0E-10	mg/kg-day	0.7
			Ingestion	**Catfish**												
				Total PCBs	4.01E+00	mg/kg	8.4E-05	mg/kg-day	1.0E+00	mg/kg-day	8E-05	2.0E-04	mg/kg-day	2.0E-05	mg/kg-day	10
				Mercury	4.40E-01	mg/kg	9.2E-06	mg/kg-day	NA	---	NA	2.2E-05	mg/kg-day	1.0E-04	mg/kg-day	0.2
			Catfish Total								8E-05					10
			Catfish PCB Dioxin-like Congener TEQ		5.09E-06	mg/kg	1.1E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-05	2.5E-10	mg/kg-day	7.0E-10	mg/kg-day	0.4
			Ingestion	**Panfish**												
				Total PCBs	1.86E+00	mg/kg	3.9E-05	mg/kg-day	1.0E+00	mg/kg-day	4E-05	9.1E-05	mg/kg-day	2.0E-05	mg/kg-day	5
				Mercury	2.81E-01	mg/kg	5.9E-06	mg/kg-day	NA	---	NA	1.4E-05	mg/kg-day	1.0E-04	mg/kg-day	0.1
			Panfish Total								4E-05					5
			Panfish PCB Dioxin-like Congener TEQ		4.09E-06	mg/kg	8.6E-11	mg/kg-day	1.3E+05	mg/kg-day	1E-05	2.0E-10	mg/kg-day	7.0E-10	mg/kg-day	0.3

TABLE A-17

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - FISH INGESTION - GROUP B - TEQS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Fish	Fish Tissue	Group B Fish Tissue	Ingestion	**All Species**												
				PCB Dioxin-like Congener TEQ	7.39E-06	mg/kg	1.6E-10	mg/kg-day	1.3E+05	mg/kg-day	2E-05	3.6E-10	mg/kg-day	7.0E-10	mg/kg-day	0.5
				2,3,7,8-TCDD TEQ	1.73E-06	mg/kg	3.6E-11	mg/kg-day	1.3E+05	mg/kg-day	5E-06	8.5E-11	mg/kg-day	7.0E-10	mg/kg-day	0.1
			All Species Total TEQ								2E-05					0.6
			Ingestion	**Bass**												
				PCB Dioxin-like Congener TEQ	1.03E-05	mg/kg	2.2E-10	mg/kg-day	1.3E+05	mg/kg-day	3E-05	5.1E-10	mg/kg-day	7.0E-10	mg/kg-day	0.7
				2,3,7,8-TCDD TEQ	2.43E-06	mg/kg	5.1E-11	mg/kg-day	1.3E+05	mg/kg-day	7E-06	1.2E-10	mg/kg-day	7.0E-10	mg/kg-day	0.2
			Bass Total TEQ								3E-05					0.9
			Ingestion	**Catfish**												
				PCB Dioxin-like Congener TEQ	5.09E-06	mg/kg	1.1E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-05	2.5E-10	mg/kg-day	7.0E-10	mg/kg-day	0.4
				2,3,7,8-TCDD TEQ	8.69E-07	mg/kg	1.8E-11	mg/kg-day	1.3E+05	mg/kg-day	2E-06	4.3E-11	mg/kg-day	7.0E-10	mg/kg-day	0.06
			Catfish Total TEQ								2E-05					0.4
			Ingestion	**Panfish**												
				PCB Dioxin-like Congener TEQ	4.09E-06	mg/kg	8.6E-11	mg/kg-day	1.3E+05	mg/kg-day	1E-05	2.0E-10	mg/kg-day	7.0E-10	mg/kg-day	0.3
				2,3,7,8-TCDD TEQ	1.49E-06	mg/kg	3.1E-11	mg/kg-day	1.3E+05	mg/kg-day	4E-06	7.3E-11	mg/kg-day	7.0E-10	mg/kg-day	0.1
			Panfish Total TEQ								2E-05					0.4

TABLE A-18

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - FISH INGESTION - GROUP C - PRIMARY COPCS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Fish	Fish Tissue	Group C Fish Tissue	Ingestion	**All Species**												
				Total PCBs	5.43E+00	mg/kg	6.1E-04	mg/kg-day	2.0E+00	mg/kg-day	1E-03	1.4E-03	mg/kg-day	2.0E-05	mg/kg-day	71
				Mercury	4.30E-01	mg/kg	4.8E-05	mg/kg-day	NA	---	NA	1.1E-04	mg/kg-day	1.0E-04	mg/kg-day	1
			All Species Total								1E-03					72
			All Species PCB Dioxin-like Congener TEQ		8.33E-06	mg/kg	9.3E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.2E-09	mg/kg-day	7.0E-10	mg/kg-day	3
			Ingestion	**Bass**												
				Total PCBs	5.24E+00	mg/kg	5.8E-04	mg/kg-day	2.0E+00	mg/kg-day	1E-03	1.4E-03	mg/kg-day	2.0E-05	mg/kg-day	68
				Mercury	7.06E-01	mg/kg	7.9E-05	mg/kg-day	NA	---	NA	1.8E-04	mg/kg-day	1.0E-04	mg/kg-day	2
			Bass Total								1E-03					70
			Bass PCB Dioxin-like Congener TEQ		8.10E-06	mg/kg	9.0E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.1E-09	mg/kg-day	7.0E-10	mg/kg-day	3
			Ingestion	**Catfish**												
				Total PCBs	6.68E+00	mg/kg	7.5E-04	mg/kg-day	2.0E+00	mg/kg-day	1E-03	1.7E-03	mg/kg-day	2.0E-05	mg/kg-day	87
				Mercury	3.33E-01	mg/kg	3.7E-05	mg/kg-day	NA	---	NA	8.7E-05	mg/kg-day	1.0E-04	mg/kg-day	0.9
			Catfish Total								1E-03					88
			Catfish PCB Dioxin-like Congener TEQ		8.78E-06	mg/kg	9.8E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.3E-09	mg/kg-day	7.0E-10	mg/kg-day	3
			Ingestion	**Panfish**												
				Total PCBs	3.32E+00	mg/kg	3.7E-04	mg/kg-day	2.0E+00	mg/kg-day	7E-04	8.6E-04	mg/kg-day	2.0E-05	mg/kg-day	43
				Mercury	2.66E-01	mg/kg	3.0E-05	mg/kg-day	NA	---	NA	6.9E-05	mg/kg-day	1.0E-04	mg/kg-day	0.7
			Panfish Total								7E-04					44
			Panfish PCB Dioxin-like Congener TEQ		9.43E-06	mg/kg	1.1E-09	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.5E-09	mg/kg-day	7.0E-10	mg/kg-day	4

TABLE A-19

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - FISH INGESTION - GROUP C - TEQS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Fish	Fish Tissue	Group C Fish Tissue	Ingestion	**All Species**												
				PCB Dioxin-like Congener TEQ	8.33E-06	mg/kg	9.3E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.2E-09	mg/kg-day	7.0E-10	mg/kg-day	3
				2,3,7,8-TCDD TEQ	7.86E-07	mg/kg	8.8E-11	mg/kg-day	1.3E+05	mg/kg-day	1E-05	2.0E-10	mg/kg-day	7.0E-10	mg/kg-day	0.3
			All Species Total TEQ								1E-04					3
			Ingestion	**Bass**												
				PCB Dioxin-like Congener TEQ	8.10E-06	mg/kg	9.0E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.1E-09	mg/kg-day	7.0E-10	mg/kg-day	3
				2,3,7,8-TCDD TEQ	7.68E-07	mg/kg	8.6E-11	mg/kg-day	1.3E+05	mg/kg-day	1E-05	2.0E-10	mg/kg-day	7.0E-10	mg/kg-day	0.3
			Bass Total TEQ								1E-04					3
			Ingestion	**Catfish**												
				PCB Dioxin-like Congener TEQ	8.78E-06	mg/kg	9.8E-10	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.3E-09	mg/kg-day	7.0E-10	mg/kg-day	3
				2,3,7,8-TCDD TEQ	1.04E-06	mg/kg	1.2E-10	mg/kg-day	1.3E+05	mg/kg-day	2E-05	2.7E-10	mg/kg-day	7.0E-10	mg/kg-day	0.4
			Catfish Total TEQ								1E-04					4
			Ingestion	**Panfish**												
				PCB Dioxin-like Congener TEQ	9.43E-06	mg/kg	1.1E-09	mg/kg-day	1.3E+05	mg/kg-day	1E-04	2.5E-09	mg/kg-day	7.0E-10	mg/kg-day	4
				2,3,7,8-TCDD TEQ	6.19E-07	mg/kg	6.9E-11	mg/kg-day	1.3E+05	mg/kg-day	9E-06	1.6E-10	mg/kg-day	7.0E-10	mg/kg-day	0.2
			Panfish Total TEQ								1E-04					4

TABLE A-20

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - FISH INGESTION - GROUP C - PRIMARY COPCS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Fish	Fish Tissue	Group C Fish Tissue	Ingestion	**All Species**												
				Total PCBs	5.43E+00	mg/kg	1.1E-04	mg/kg-day	1.0E+00	mg/kg-day	1E-04	2.7E-04	mg/kg-day	2.0E-05	mg/kg-day	13
				Mercury	4.30E-01	mg/kg	9.0E-06	mg/kg-day	NA	---	NA	2.1E-05	mg/kg-day	1.0E-04	mg/kg-day	0.2
			All Species Total								1E-04					14
			All Species PCB Dioxin-like Congener TEQ		8.33E-06	mg/kg	1.8E-10	mg/kg-day	1.3E+05	mg/kg-day	2E-05	4.1E-10	mg/kg-day	7.0E-10	mg/kg-day	0.6
			Ingestion	**Bass**												
				Total PCBs	5.24E+00	mg/kg	1.1E-04	mg/kg-day	1.0E+00	mg/kg-day	1E-04	2.6E-04	mg/kg-day	2.0E-05	mg/kg-day	13
				Mercury	7.06E-01	mg/kg	1.5E-05	mg/kg-day	NA	---	NA	3.5E-05	mg/kg-day	1.0E-04	mg/kg-day	0.3
			Bass Total								1E-04					13
			Bass PCB Dioxin-like Congener TEQ		8.10E-06	mg/kg	1.7E-10	mg/kg-day	1.3E+05	mg/kg-day	2E-05	4.0E-10	mg/kg-day	7.0E-10	mg/kg-day	0.6
			Ingestion	**Catfish**												
				Total PCBs	6.68E+00	mg/kg	1.4E-04	mg/kg-day	1.0E+00	mg/kg-day	1E-04	3.3E-04	mg/kg-day	2.0E-05	mg/kg-day	16
				Mercury	3.33E-01	mg/kg	7.0E-06	mg/kg-day	NA	---	NA	1.6E-05	mg/kg-day	1.0E-04	mg/kg-day	0.2
			Catfish Total								1E-04					17
			Catfish PCB Dioxin-like Congener TEQ		8.78E-06	mg/kg	1.8E-10	mg/kg-day	1.3E+05	mg/kg-day	2E-05	4.3E-10	mg/kg-day	7.0E-10	mg/kg-day	0.6
			Ingestion	**Panfish**												
				Total PCBs	3.32E+00	mg/kg	7.0E-05	mg/kg-day	1.0E+00	mg/kg-day	7E-05	1.6E-04	mg/kg-day	2.0E-05	mg/kg-day	8
				Mercury	2.66E-01	mg/kg	5.6E-06	mg/kg-day	NA	---	NA	1.3E-05	mg/kg-day	1.0E-04	mg/kg-day	0.1
			Panfish Total								7E-05					8
			Panfish PCB Dioxin-like Congener TEQ		9.43E-06	mg/kg	2.0E-10	mg/kg-day	1.3E+05	mg/kg-day	3E-05	4.6E-10	mg/kg-day	7.0E-10	mg/kg-day	0.7

TABLE A-21

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - FISH INGESTION - GROUP C - TEQS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Fish	Fish Tissue	Group C Fish Tissue	Ingestion	**All Species**												
				PCB Dioxin-like Congener TEQ	8.33E-06	mg/kg	1.8E-10	mg/kg-day	1.3E+05	mg/kg-day	2E-05	4.1E-10	mg/kg-day	7.0E-10	mg/kg-day	0.6
				2,3,7,8-TCDD TEQ	7.86E-07	mg/kg	1.7E-11	mg/kg-day	1.3E+05	mg/kg-day	2E-06	3.9E-11	mg/kg-day	7.0E-10	mg/kg-day	0.06
			All Species Total TEQ								2E-05					0.6
			Ingestion	**Bass**												
				PCB Dioxin-like Congener TEQ	8.10E-06	mg/kg	1.7E-10	mg/kg-day	1.3E+05	mg/kg-day	2E-05	4.0E-10	mg/kg-day	7.0E-10	mg/kg-day	0.6
				2,3,7,8-TCDD TEQ	7.68E-07	mg/kg	1.6E-11	mg/kg-day	1.3E+05	mg/kg-day	2E-06	3.8E-11	mg/kg-day	7.0E-10	mg/kg-day	0.05
			Bass Total TEQ								2E-05					0.6
			Ingestion	**Catfish**												
				PCB Dioxin-like Congener TEQ	8.78E-06	mg/kg	1.8E-10	mg/kg-day	1.3E+05	mg/kg-day	2E-05	4.3E-10	mg/kg-day	7.0E-10	mg/kg-day	0.6
				2,3,7,8-TCDD TEQ	1.04E-06	mg/kg	2.2E-11	mg/kg-day	1.3E+05	mg/kg-day	3E-06	5.1E-11	mg/kg-day	7.0E-10	mg/kg-day	0.07
			Catfish Total TEQ								3E-05					0.7
			Ingestion	**Panfish**												
				PCB Dioxin-like Congener TEQ	9.43E-06	mg/kg	2.0E-10	mg/kg-day	1.3E+05	mg/kg-day	3E-05	4.6E-10	mg/kg-day	7.0E-10	mg/kg-day	0.7
				2,3,7,8-TCDD TEQ	6.19E-07	mg/kg	1.3E-11	mg/kg-day	1.3E+05	mg/kg-day	2E-06	3.0E-11	mg/kg-day	7.0E-10	mg/kg-day	0.04
			Panfish Total TEQ								3E-05					0.7

TABLE A-22

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - FISH INGESTION - GROUP A - PRIMARY COPCS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish Tissue	Group A Fish Tissue	**All Species**									
			Total PCBs	1E-03	---	---	1E-03	Eyes, Immune system	62	---	---	62
			Mercury	---	---	---	---	Nervous system	2	---	---	2
			All Species Total	1E-03	---	---	1E-03		64	---	---	64
			All Species PCB Dioxin-like Congener TEQ	5E-04	---	---	5E-04	Developmental	12	---	---	12
			Bass									
			Total PCBs	1E-03	---	---	1E-03	Eyes, Immune system	72	---	---	72
			Mercury	---	---	---	---	Nervous system	3	---	---	3
			Bass Total	1E-03	---	---	1E-03		74	---	---	74
			Bass PCB Dioxin-like Congener TEQ	6E-04	---	---	6E-04	Developmental	15	---	---	15
			Catfish									
			Total PCBs	1E-03	---	---	1E-03	Eyes, Immune system	77	---	---	77
			Mercury	---	---	---	---	Nervous system	1	---	---	1
			Catfish Total	1E-03	---	---	1E-03		78	---	---	78
			Catfish PCB Dioxin-like Congener TEQ	2E-04	---	---	2E-04	Developmental	4	---	---	4
			Panfish									
			Total PCBs	9E-04	---	---	9E-04	Eyes, Immune system	55	---	---	55
			Mercury	---	---	---	---	Nervous system	2	---	---	2
			Panfish Total	9E-04	---	---	9E-04		57	---	---	57
			Panfish PCB Dioxin-like Congener TEQ	4E-04	---	---	4E-04	Developmental	9	---	---	9

TABLE A-23

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - FISH INGESTION - GROUP A - TEQS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish Tissue	Group A Fish Tissue	**All Species**									
			PCB Dioxin-like Congener TEQ	5E-04	---	---	5E-04	Developmental	12	---	---	12
			2,3,7,8-TCDD TEQ	1E-04	---	---	1E-04	Developmental	4	---	---	4
			All Species Total TEQ	6E-04	---	---	6E-04		16	---	---	16
			Bass									
			PCB Dioxin-like Congener TEQ	6E-04	---	---	6E-04	Developmental	15	---	---	15
			2,3,7,8-TCDD TEQ	1E-04	---	---	1E-04	Developmental	3	---	---	3
			Bass Total TEQ	7E-04	---	---	7E-04		18	---	---	18
			Catfish									
			PCB Dioxin-like Congener TEQ	2E-04	---	---	2E-04	Developmental	4	---	---	4
			2,3,7,8-TCDD TEQ	3E-05	---	---	3E-05	Developmental	0.7	---	---	0.7
			Catfish Total TEQ	2E-04	---	---	2E-04		5	---	---	5
			Panfish									
			PCB Dioxin-like Congener TEQ	4E-04	---	---	4E-04	Developmental	9	---	---	9
			2,3,7,8-TCDD TEQ	1E-04	---	---	1E-04	Developmental	4	---	---	4
			Panfish Total TEQ	5E-04	---	---	5E-04		13	---	---	13

TABLE A-24

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - FISH INGESTION - GROUP A - PRIMARY COPCS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish Tissue	Group A Fish Tissue	**All Species**									
			Total PCBs	5E-05	---	---	5E-05	Eyes, Immune system	6	---	---	6
			Mercury	---	---	---	---	Nervous system	0.2	---	---	0.2
			All Species Total	5E-05	---	---	5E-05		6	---	---	6
			All Species PCB Dioxin-like Congener TEQ	4E-05	---	---	4E-05	Developmental	1	---	---	1
			Bass									
			Total PCBs	6E-05	---	---	6E-05	Eyes, Immune system	7	---	---	7
			Mercury	---	---	---	---	Nervous system	0.2	---	---	0.2
			Bass Total	6E-05	---	---	6E-05		7	---	---	7
			Bass PCB Dioxin-like Congener TEQ	6E-05	---	---	6E-05	Developmental	1	---	---	1
			Catfish									
			Total PCBs	6E-05	---	---	6E-05	Eyes, Immune system	7	---	---	7
			Mercury	---	---	---	---	Nervous system	0.09	---	---	0.09
			Catfish Total	6E-05	---	---	6E-05		7	---	---	7
			Catfish PCB Dioxin-like Congener TEQ	2E-05	---	---	2E-05	Developmental	0.4	---	---	0.4
			Panfish									
			Total PCBs	4E-05	---	---	4E-05	Eyes, Immune system	5	---	---	5
			Mercury	---	---	---	---	Nervous system	0.2	---	---	0.2
			Panfish Total	4E-05	---	---	4E-05		5	---	---	5
			Panfish PCB Dioxin-like Congener TEQ	3E-05	---	---	3E-05	Developmental	0.9	---	---	0.9

TABLE A-25

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - FISH INGESTION - GROUP A - TEQS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish Tissue	Group A Fish Tissue	**All Species**									
			PCB Dioxin-like Congener TEQ	4E-05	---	---	4E-05	Developmental	1	---	---	1
			2,3,7,8-TCDD TEQ	1E-05	---	---	1E-05	Developmental	0.4	---	---	0.4
			All Species Total TEQ	6E-05	---	---	6E-05		2	---	---	2
			Bass									
			PCB Dioxin-like Congener TEQ	6E-05	---	---	6E-05	Developmental	1	---	---	1
			2,3,7,8-TCDD TEQ	1E-05	---	---	1E-05	Developmental	0.3	---	---	0.3
			Bass Total TEQ	7E-05	---	---	7E-05		2	---	---	2
			Catfish									
			PCB Dioxin-like Congener TEQ	2E-05	---	---	2E-05	Developmental	0.4	---	---	0.4
			2,3,7,8-TCDD TEQ	3E-06	---	---	3E-06	Developmental	0.07	---	---	0.07
			Catfish Total TEQ	2E-05	---	---	2E-05		0.5	---	---	0.5
			Panfish									
			PCB Dioxin-like Congener TEQ	3E-05	---	---	3E-05	Developmental	0.9	---	---	0.9
			2,3,7,8-TCDD TEQ	1E-05	---	---	1E-05	Developmental	0.4	---	---	0.4
			Panfish Total TEQ	5E-05	---	---	5E-05		1	---	---	1

TABLE A-26

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - FISH INGESTION - GROUP B - PRIMARY COPCS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish Tissue	Group B Fish Tissue	**All Species**									
			Total PCBs	6E-04	---	---	6E-04	Eyes, Immune system	37	---	---	37
			Mercury	---	---	---	---	Nervous system	1	---	---	1
			All Species Total	6E-04	---	---	6E-04		39	---	---	39
			All Species PCB Dioxin-like Congener TEQ	1E-04	---	---	1E-04	Developmental	3	---	---	3
			Bass									
			Total PCBs	1E-03	---	---	1E-03	Eyes, Immune system	62	---	---	62
			Mercury	---	---	---	---	Nervous system	2	---	---	2
			Bass Total	1E-03	---	---	1E-03		64	---	---	64
			Bass PCB Dioxin-like Congener TEQ	1E-04	---	---	1E-04	Developmental	4	---	---	4
			Catfish									
			Total PCBs	9E-04	---	---	9E-04	Eyes, Immune system	52	---	---	52
			Mercury	---	---	---	---	Nervous system	1	---	---	1
			Catfish Total	9E-04	---	---	9E-04		53	---	---	53
			Catfish PCB Dioxin-like Congener TEQ	7E-05	---	---	7E-05	Developmental	2	---	---	2
			Panfish									
			Total PCBs	4E-04	---	---	4E-04	Eyes, Immune system	24	---	---	24
			Mercury	---	---	---	---	Nervous system	0.7	---	---	0.7
			Panfish Total	4E-04	---	---	4E-04		25	---	---	25
			Panfish PCB Dioxin-like Congener TEQ	6E-05	---	---	6E-05	Developmental	2	---	---	2

TABLE A-27

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - FISH INGESTION - GROUP B - TEQS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish Tissue	Group B Fish Tissue	**All Species**									
			PCB Dioxin-like Congener TEQ	1E-04	---	---	1E-04	Developmental	3	---	---	3
			2,3,7,8-TCDD TEQ	3E-05	---	---	3E-05	Developmental	0.6	---	---	0.6
			All Species Total TEQ	1E-04	---	---	1E-04		3	---	---	3
			Bass									
			PCB Dioxin-like Congener TEQ	1E-04	---	---	1E-04	Developmental	4	---	---	4
			2,3,7,8-TCDD TEQ	4E-05	---	---	4E-05	Developmental	0.9	---	---	0.9
			Bass Total TEQ	2E-04	---	---	2E-04		5	---	---	5
			Catfish									
			PCB Dioxin-like Congener TEQ	7E-05	---	---	7E-05	Developmental	2	---	---	2
			2,3,7,8-TCDD TEQ	1E-05	---	---	1E-05	Developmental	0.3	---	---	0.3
			Catfish Total TEQ	9E-05	---	---	9E-05		2	---	---	2
			Panfish									
			PCB Dioxin-like Congener TEQ	6E-05	---	---	6E-05	Developmental	2	---	---	2
			2,3,7,8-TCDD TEQ	2E-05	---	---	2E-05	Developmental	0.6	---	---	0.6
			Panfish Total TEQ	8E-05	---	---	8E-05		2	---	---	2

TABLE A-28

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - FISH INGESTION - GROUP B - PRIMARY COPCS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish Tissue	Group B Fish Tissue	**All Species**									
			Total PCBs	6E-05	---	---	6E-05	Eyes, Immune system	7	---	---	7
			Mercury	---	---	---	---	Nervous system	0.2	---	---	0.2
			All Species Total	6E-05	---	---	6E-05		7	---	---	7
			All Species PCB Dioxin-like Congener TEQ	2E-05	---	---	2E-05	Developmental	0.5	---	---	0.5
			Bass									
			Total PCBs	1E-04	---	---	1E-04	Eyes, Immune system	12	---	---	12
			Mercury	---	---	---	---	Nervous system	0.4	---	---	0.4
			Bass Total	1E-04	---	---	1E-04		12	---	---	12
			Bass PCB Dioxin-like Congener TEQ	3E-05	---	---	3E-05	Developmental	0.7	---	---	0.7
			Catfish									
			Total PCBs	8E-05	---	---	8E-05	Eyes, Immune system	10	---	---	10
			Mercury	---	---	---	---	Nervous system	0.2	---	---	0.2
			Catfish Total	8E-05	---	---	8E-05		10	---	---	10
			Catfish PCB Dioxin-like Congener TEQ	1E-05	---	---	1E-05	Developmental	0.4	---	---	0.4
			Panfish									
			Total PCBs	4E-05	---	---	4E-05	Eyes, Immune system	5	---	---	5
			Mercury	---	---	---	---	Nervous system	0.1	---	---	0.1
			Panfish Total	4E-05	---	---	4E-05		5	---	---	5
			Panfish PCB Dioxin-like Congener TEQ	1E-05	---	---	1E-05	Developmental	0.3	---	---	0.3

TABLE A-29

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - FISH INGESTION - GROUP B - TEQS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish Tissue	Group B Fish Tissue	**All Species**									
			PCB Dioxin-like Congener TEQ	2E-05	---	---	2E-05	Developmental	0.5	---	---	0.5
			2,3,7,8-TCDD TEQ	5E-06	---	---	5E-06	Developmental	0.1	---	---	0.1
			All Species Total TEQ	2E-05	---	---	2E-05		0.6	---	---	0.6
			Bass									
			PCB Dioxin-like Congener TEQ	3E-05	---	---	3E-05	Developmental	0.7	---	---	0.7
			2,3,7,8-TCDD TEQ	7E-06	---	---	7E-06	Developmental	0.2	---	---	0.2
			Bass Total TEQ	3E-05	---	---	3E-05		0.9	---	---	0.9
			Catfish									
			PCB Dioxin-like Congener TEQ	1E-05	---	---	1E-05	Developmental	0.4	---	---	0.4
			2,3,7,8-TCDD TEQ	2E-06	---	---	2E-06	Developmental	0.06	---	---	0.06
			Catfish Total TEQ	2E-05	---	---	2E-05		0.4	---	---	0.4
			Panfish									
			PCB Dioxin-like Congener TEQ	1E-05	---	---	1E-05	Developmental	0.3	---	---	0.3
			2,3,7,8-TCDD TEQ	4E-06	---	---	4E-06	Developmental	0.1	---	---	0.1
			Panfish Total TEQ	2E-05	---	---	2E-05		0.4	---	---	0.4

TABLE A-30

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - FISH INGESTION - GROUP C - PRIMARY COPCS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish Tissue	Group C Fish Tissue	**All Species**									
			Total PCBs	1E-03	---	---	1E-03	Eyes, Immune system	71	---	---	71
			Mercury	---	---	---	---	Nervous system	1	---	---	1
			All Species Total	1E-03	---	---	1E-03		72	---	---	72
			All Species PCB Dioxin-like Congener TEQ	1E-04	---	---	1E-04	Developmental	3	---	---	3
			Bass									
			Total PCBs	1E-03	---	---	1E-03	Eyes, Immune system	68	---	---	68
			Mercury	---	---	---	---	Nervous system	2	---	---	2
			Bass Total	1E-03	---	---	1E-03		70	---	---	70
			Bass PCB Dioxin-like Congener TEQ	1E-04	---	---	1E-04	Developmental	3	---	---	3
			Catfish									
			Total PCBs	1E-03	---	---	1E-03	Eyes, Immune system	87	---	---	87
			Mercury	---	---	---	---	Nervous system	0.9	---	---	0.9
			Catfish Total	1E-03	---	---	1E-03		88	---	---	88
			Catfish PCB Dioxin-like Congener TEQ	1E-04	---	---	1E-04	Developmental	3	---	---	3
			Panfish									
			Total PCBs	7E-04	---	---	7E-04	Eyes, Immune system	43	---	---	43
			Mercury	---	---	---	---	Nervous system	0.7	---	---	0.7
			Panfish Total	7E-04	---	---	7E-04		44	---	---	44
			Panfish PCB Dioxin-like Congener TEQ	1E-04	---	---	1E-04	Developmental	4	---	---	4

TABLE A-31

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - FISH INGESTION - GROUP C - TEQS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish Tissue	Group C Fish Tissue	**All Species**									
			PCB Dioxin-like Congener TEQ	1E-04	---	---	1E-04	Developmental	3	---	---	3
			2,3,7,8-TCDD TEQ	1E-05	---	---	1E-05	Developmental	0.3	---	---	0.3
			All Species Total TEQ	1E-04	---	---	1E-04		3	---	---	3
			Bass									
			PCB Dioxin-like Congener TEQ	1E-04	---	---	1E-04	Developmental	3	---	---	3
			2,3,7,8-TCDD TEQ	1E-05	---	---	1E-05	Developmental	0.3	---	---	0.3
			Bass Total TEQ	1E-04	---	---	1E-04		3	---	---	3
			Catfish									
			PCB Dioxin-like Congener TEQ	1E-04	---	---	1E-04	Developmental	3	---	---	3
			2,3,7,8-TCDD TEQ	2E-05	---	---	2E-05	Developmental	0.4	---	---	0.4
			Catfish Total TEQ	1E-04	---	---	1E-04		4	---	---	4
			Panfish									
			PCB Dioxin-like Congener TEQ	1E-04	---	---	1E-04	Developmental	4	---	---	4
			2,3,7,8-TCDD TEQ	9E-06	---	---	9E-06	Developmental	0.2	---	---	0.2
			Panfish Total TEQ	1E-04	---	---	1E-04		4	---	---	4

TABLE H-A--32

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - FISH INGESTION - GROUP C - PRIMARY COPCS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish Tissue	Group C Fish Tissue	**All Species**									
			Total PCBs	1E-04	---	---	1E-04	Eyes, Immune system	13	---	---	13
			Mercury	---	---	---	---	Nervous system	0.2	---	---	0.2
			All Species Total	1E-04	---	---	1E-04		14	---	---	14
			All Species PCB Dioxin-like Congener TEQ	2E-05	---	---	2E-05	Developmental	0.6	---	---	0.6
			Bass									
			Total PCBs	1E-04	---	---	1E-04	Eyes, Immune system	13	---	---	13
			Mercury	---	---	---	---	Nervous system	0.3	---	---	0.3
			Bass Total	1E-04	---	---	1E-04		13	---	---	13
			Bass PCB Dioxin-like Congener TEQ	2E-05	---	---	2E-05	Developmental	0.6	---	---	0.6
			Catfish									
			Total PCBs	1E-04	---	---	1E-04	Eyes, Immune system	16	---	---	16
			Mercury	---	---	---	---	Nervous system	0.2	---	---	0.2
			Catfish Total	1E-04	---	---	1E-04		17	---	---	17
			Catfish PCB Dioxin-like Congener TEQ	2E-05	---	---	2E-05	Developmental	0.6	---	---	0.6
			Panfish									
			Total PCBs	7E-05	---	---	7E-05	Eyes, Immune system	8	---	---	8
			Mercury	---	---	---	---	Nervous system	0.1	---	---	0.1
			Panfish Total	7E-05	---	---	7E-05		8	---	---	8
			Panfish PCB Dioxin-like Congener TEQ	3E-05	---	---	3E-05	Developmental	0.7	---	---	0.7

TABLE A-33

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - FISH INGESTION - GROUP C - TEQS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU-4

Scenario Timeframe: Current/Future
Receptor Population: Recreational Fisherman
Receptor Age: Age-Adjusted

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish Tissue	Group C Fish Tissue	**All Species**									
			PCB Dioxin-like Congener TEQ	2E-05	---	---	2E-05	Developmental	0.6	---	---	0.6
			2,3,7,8-TCDD TEQ	2E-06	---	---	2E-06	Developmental	0.06	---	---	0.06
			All Species Total TEQ	2E-05	---	---	2E-05		0.6	---	---	0.6
			Bass									
			PCB Dioxin-like Congener TEQ	2E-05	---	---	2E-05	Developmental	0.6	---	---	0.6
			2,3,7,8-TCDD TEQ	2E-06	---	---	2E-06	Developmental	0.05	---	---	0.05
			Bass Total TEQ	2E-05	---	---	2E-05		0.6	---	---	0.6
			Catfish									
			PCB Dioxin-like Congener TEQ	2E-05	---	---	2E-05	Developmental	0.6	---	---	0.6
			2,3,7,8-TCDD TEQ	3E-06	---	---	3E-06	Developmental	0.07	---	---	0.07
			Catfish Total TEQ	3E-05	---	---	3E-05		0.7	---	---	0.7
			Panfish									
			PCB Dioxin-like Congener TEQ	3E-05	---	---	3E-05	Developmental	0.7	---	---	0.7
			2,3,7,8-TCDD TEQ	2E-06	---	---	2E-06	Developmental	0.04	---	---	0.04
			Panfish Total TEQ	3E-05	---	---	3E-05		0.7	---	---	0.7

APPENDIX B

HUMAN HEALTH RISK ASSESSMENT TABLES – Direct Contact

TABLE B-1
SUMMARY OF ANALYTES DETECTED IN FLOODPLAIN SOIL (0 TO 1 FT BGS) AND COMPARISON TO RESIDENTIAL SOIL RSLS
ANNISTON PCB SITE
OU-4

Contaminant	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Detected Concentration	Detection Frequency	Average Concentration (mg/kg)	Screening Toxicity Value [a]	COPC Flag
Aroclors								
Aroclor-1242	4.70E-02	1.10E+01	mg/kg	C3S-02	111/1601	2.25E-01	Evaluated as tPCBs	
Aroclor-1248	2.60E-01	1.50E+00	mg/kg	C3NX-27, C3SX-05	5/1601	1.93E-01	Evaluated as tPCBs	
Aroclor-1254	3.70E-02	1.20E+02	mg/kg	C3S-04	647/1601	1.49E+00	Evaluated as tPCBs	
Aroclor-1260	3.60E-02	8.10E+01	mg/kg	C3S-02	852/1601	1.26E+00	Evaluated as tPCBs	
Aroclor-1268	3.70E-02	4.70E+00	mg/kg	C3N-05	407/1601	2.26E-01	Evaluated as tPCBs	
Total PCBs (sum of Aroclors)	3.60E-02	2.28E+02	mg/kg	NHA-5	931/1696	3.51E+00	1.10E-01 NC	Yes
PCB Dioxin-like Congeners								
PCB-77	1.90E-03	3.20E-01	mg/kg	C8N-12	11/137	1.22E-02	Evaluated as PCB TEQ	
PCB-105	2.10E-03	1.40E-01	mg/kg	C3NF-07	127/137	4.24E-02	Evaluated as PCB TEQ	
PCB-114	8.90E-03	8.90E-03	mg/kg	C4S-41	1/137	6.44E-03	Evaluated as PCB TEQ	
PCB-118	1.90E-03	2.80E-01	mg/kg	C3NF-07	131/137	8.05E-02	Evaluated as PCB TEQ	
PCB-123	4.10E-03	2.30E-02	mg/kg	C8N-12	2/137	6.52E-03	Evaluated as PCB TEQ	
PCB-126	2.00E-03	4.40E-02	mg/kg	C7S-37	17/137	7.51E-03	Evaluated as PCB TEQ	
PCB-153	3.20E-03	4.40E-01	mg/kg	C9N-01	132/137	1.36E-01	Evaluated as PCB TEQ	
PCB-156	1.60E-03	4.80E-02	mg/kg	C3NF-07	121/137	1.50E-02	Evaluated as PCB TEQ	
PCB-157	1.80E-03	1.70E-02	mg/kg	C3NF-07	35/137	6.62E-03	Evaluated as PCB TEQ	
PCB-167	2.70E-03	1.50E-02	mg/kg	C4S-31	20/137	1.16E-02	Evaluated as PCB TEQ	
PCB-189	1.50E-03	1.50E-03	mg/kg	C9N-01	1/137	5.94E-03	Evaluated as PCB TEQ	
PCB Dioxin-like Congener TEQ	1.41E-04	4.42E-03	mg/kg	C7S-37	132/137	7.58E-04	4.50E-06 C	Yes
Dioxin/Furan Congeners								
2,3,7,8-TCDD	1.21E-07	7.50E-07	mg/kg	C8N-12	12/131	5.05E-07	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,7,8-PeCDD	1.70E-07	1.56E-06	mg/kg	C4SF-33	35/131	6.58E-07	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,4,7,8-HxCDD	1.90E-07	3.19E-06	mg/kg	C6N-14	99/131	1.12E-06	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,6,7,8-HxCDD	1.95E-07	1.76E-05	mg/kg	C4NF-41	110/131	3.01E-06	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,7,8,9-HxCDD	3.16E-07	8.40E-06	mg/kg	C4N-06	106/131	2.93E-06	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,4,6,7,8-HpCDD	1.18E-05	4.25E-04	mg/kg	C4NF-41	131/131	8.59E-05	Evaluated as 2,3,7,8-TCDD TEQ	
Octa CDD	4.41E-04	9.38E-03	mg/kg	C3NX-11	131/131	2.46E-03	Evaluated as 2,3,7,8-TCDD TEQ	
2,3,7,8-TCDF	7.70E-07	7.86E-04	mg/kg	C8N-12	120/131	6.16E-05	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,7,8-PeCDF	4.00E-07	1.21E-03	mg/kg	C8N-19	78/131	4.55E-05	Evaluated as 2,3,7,8-TCDD TEQ	
2,3,4,7,8-PeCDF	4.70E-07	7.37E-05	mg/kg	C5S-15	118/131	1.12E-05	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,4,7,8-HxCDF	5.90E-07	1.83E-04	mg/kg	C5N-12	122/131	2.51E-05	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,6,7,8-HxCDF	1.10E-06	3.76E-04	mg/kg	C8N-12	119/131	4.07E-05	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,7,8,9-HxCDF	2.20E-07	4.73E-06	mg/kg	C2S-18	41/131	1.14E-06	Evaluated as 2,3,7,8-TCDD TEQ	
2,3,4,6,7,8-HxCDF	3.10E-07	1.63E-05	mg/kg	C5S-15	99/131	4.07E-06	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,4,6,7,8-HpCDF	1.68E-06	1.56E-04	mg/kg	C6S-04	92/131	3.17E-05	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,4,7,8,9-HpCDF	1.80E-07	5.45E-05	mg/kg	C5S-15	115/131	7.22E-06	Evaluated as 2,3,7,8-TCDD TEQ	
Octa CDF	2.20E-06	2.52E-04	mg/kg	C4NF-41	127/131	6.03E-05	Evaluated as 2,3,7,8-TCDD TEQ	
2,3,7,8-TCDD TEQ	9.24E-07	1.74E-04	mg/kg	C6S-04	131/131	2.18E-05	4.50E-06 C	Yes
Volatile and Semi-Volatile Organic Compounds								
1,2,4-Trichlorobenzene	1.50E-03	3.00E-02	mg/kg	C8S-19	3/23	6.22E-03	6.20E+00 NC	No
1,2-Dichlorobenzene	8.10E-03	8.10E-03	mg/kg	C8S-19	1/21	5.59E-03	1.90E+02 NC	No
1,4-Dichlorobenzene	9.60E-03	9.60E-03	mg/kg	C8S-19	1/21	5.66E-03	2.40E+00 C	No
2-Butanone	5.10E-03	1.30E+00	mg/kg	C8S-19	23/23	8.21E-02	2.80E+03 NC	No
Acetone	7.80E-02	1.50E+01	mg/kg	C8S-19	23/23	9.03E-01	6.10E+03 NC	No
Acetophenone	2.00E-02	5.60E-02	mg/kg	C8S-19	16/23	1.32E-01	7.80E+02 NC	No
Benzaldehyde	5.80E-02	6.70E-02	mg/kg	C7N-31	3/23	3.25E-01	7.80E+02 NC	No
Benzene	1.10E-03	7.90E-03	mg/kg	C8S-19	2/23	5.38E-03	1.10E+00 C	No
Bis(2-Ethylhexyl)phthalate	1.90E-02	9.80E-02	mg/kg	C7S-57	15/23	1.55E-01	3.50E+01 C	No
Bromomethane	5.50E-02	5.50E-02	mg/kg	C8S-19	1/23	7.79E-03	7.30E-01 NC	No
Carbon Disulfide	1.10E-03	1.10E-02	mg/kg	C8S-19	2/23	5.51E-03	8.20E+01 NC	No
Chloromethane	4.40E-03	3.60E-02	mg/kg	C8S-19	2/23	6.75E-03	1.20E+01 NC	No
Methyl Acetate	1.20E-02	8.80E-01	mg/kg	C8S-19	23/23	1.26E-01	7.80E+03 NC	No
Methylene Chloride	2.50E-02	2.50E-02	mg/kg	C8S-19	1/23	6.32E-03	3.60E+01 NC	No
Toluene	1.30E-03	2.50E-02	mg/kg	C8S-19	3/23	6.03E-03	5.00E+02 NC	No
Pesticides								
4,4'-DDE	3.10E-02	4.60E-02	mg/kg	C7S-28	2/23	1.69E-01	1.40E+00 C	No
4,4'-DDT	2.20E-02	2.20E-02	mg/kg	C8N-12	1/23	1.75E-01	1.70E+00 C	No
Caprolactam	2.70E-02	4.70E-02	mg/kg	C7S-57	4/23	3.08E-01	3.10E+03 NC	No
PAHs								
Benzo(a)anthracene	1.70E-02	8.40E-02	mg/kg	C7S-37	10/23	2.22E-01	1.50E-01 C	Yes
Benzo(a)pyrene	2.00E-02	8.30E-02	mg/kg	C7S-37	9/23	2.38E-01	1.50E-02 C	Yes
Benzo(b)fluoranthene	1.80E-02	9.90E-02	mg/kg	C7S-37	10/23	2.26E-01	1.50E-01 C	Yes
Benzo(g,h,i)perylene	3.10E-02	5.70E-02	mg/kg	C7S-37	6/23	2.81E-01	1.40E+01 NC	No
Benzo(k)fluoranthene	1.90E-02	1.20E-01	mg/kg	C7S-37	9/23	2.40E-01	1.50E+00 C	Yes
Chrysene	1.80E-02	1.30E-01	mg/kg	C7S-37	12/23	2.00E-01	1.50E+01 C	Yes
Fluoranthene	2.20E-02	1.90E-01	mg/kg	C7S-37	12/23	2.11E-01	2.30E+02 NC	No
Indeno(1,2,3-cd)pyrene	3.10E-02	6.30E-02	mg/kg	C7S-37	6/23	2.79E-01	1.50E-01 C	Yes
Phenanthrene	2.60E-02	6.70E-02	mg/kg	C7S-37	6/23	2.79E-01	1.40E+01 NC	No
Pyrene	1.90E-02	1.50E-01	mg/kg	C7S-37	12/23	2.05E-01	1.70E+02 NC	No

TABLE B-1
SUMMARY OF ANALYTES DETECTED IN FLOODPLAIN SOIL (0 TO 1 FT BGS) AND COMPARISON TO RESIDENTIAL SOIL RSLS
ANNISTON PCB SITE
OU-4

Contaminant	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Detected Concentration	Detection Frequency	Average Concentration (mg/kg)	Screening Toxicity Value [a]	COPC Flag
Inorganics								
Aluminum	5.95E+03	2.08E+04	mg/kg	C8S-19	23/23	1.09E+04	7.70E+03 NC	Yes
Antimony	6.20E-01	1.50E+00	mg/kg	C7N-40	12/23	7.07E-01	3.10E+00 NC	No
Arsenic	2.60E+00	1.85E+01	mg/kg	C7S-28	138/138	6.64E+00	3.90E-01 C	Yes
Barium	5.60E+00	2.81E+02	mg/kg	C6N-10	138/138	1.02E+02	1.50E+03 NC	No
Beryllium	2.10E-01	1.30E+00	mg/kg	C4S-04	138/138	6.47E-01	1.60E+01 NC	No
Cadmium	5.80E-02	2.10E+00	mg/kg	C8N-19	104/138	3.31E-01	7.00E+00 NC	No
Calcium	2.66E+02	1.43E+03	mg/kg	C8S-19	23/23	7.57E+02	NA	No
Chromium	4.60E+00	7.97E+01	mg/kg	C3S-04	138/138	1.68E+01	2.90E-01 C	Yes
Cobalt	2.70E+00	3.51E+01	mg/kg	C6N-10	138/138	8.62E+00	2.30E+00 NC	Yes
Copper	4.80E+00	2.33E+01	mg/kg	C8N-19	23/23	1.21E+01	3.10E+02 NC	No
Cyanide	1.60E-01	6.60E-01	mg/kg	C7S-28	11/23	1.85E-01	4.70E+00 NC	No
Iron	9.54E+03	4.28E+04	mg/kg	C7S-28	23/23	1.77E+04	5.50E+03 NC	Yes
Lead	5.40E+00	1.30E+02	mg/kg	C3S-04	138/138	2.77E+01	4.00E+02	No
Magnesium	3.84E+02	1.50E+03	mg/kg	C8S-19	23/23	7.90E+02	NA	No
Manganese	9.85E+01	4.31E+03	mg/kg	C7S-28	138/138	8.30E+02	1.80E+02 NC	Yes
Mercury	4.80E-03	3.34E+01	mg/kg	C3S-02	1120/1128	1.05E+00	2.30E+00 NC	Yes
Nickel	3.10E+00	1.83E+01	mg/kg	C7N-40	138/138	7.25E+00	1.50E+02 NC	No
Potassium	3.64E+02	1.75E+03	mg/kg	C7N-40	23/23	6.62E+02	NA	No
Thallium	5.40E-01	1.50E+00	mg/kg	C7N-40, C8S-12	16/23	1.35E+00	7.80E-02 NC	No
Vanadium	7.90E+00	4.54E+01	mg/kg	C7SF-09	138/138	2.05E+01	3.90E+01 NC	No
Zinc	1.80E+01	1.27E+02	mg/kg	C8N-19	23/23	5.36E+01	2.30E+03 NC	No

[a] Residential soil RSLs (April 2012).
NC = noncancer based, hazard index equals 0.1.
C = cancer based, target risk equals 1E-06.
Chromium assumed to be in the hexavalent form.

TABLE TABLE B-2

SUMMARY OF ANALYTES DETECTED IN FLOODPLAIN SOIL (1 TO 4 FT BGS) AND COMPARISON TO RESIDENTIAL SOIL RSLS

ANNISTON PCB SITE

Contaminant	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Detected Concentration	Detection Frequency	Average Concentration (mg/kg)	Screening Toxicity Value [a]	COPC Flag
Aroclors								
Aroclor-1242	2.50E-01	1.20E+00	mg/kg	C3S-22	2/77	2.07E+00	Evaluated as tPCBs	
Aroclor-1248	3.80E-01	3.80E-01	mg/kg	C3SX-04	1/77	2.07E+00	Evaluated as tPCBs	
Aroclor-1254	4.50E-02	2.20E+02	mg/kg	C4S-01	69/77	1.08E+01	Evaluated as tPCBs	
Aroclor-1260	4.10E-02	1.10E+02	mg/kg	C2N-28	72/77	7.66E+00	Evaluated as tPCBs	
Aroclor-1268	4.50E-02	3.80E+00	mg/kg	C4S-04	28/77	2.28E+00	Evaluated as tPCBs	
Total PCBs (sum of Aroclors)	8.60E-02	3.53E+02	mg/kg	OLGP-065	212/240	3.05E+01	1.10E-01 NC	Yes
PCB Dioxin-like Congeners								
PCB-105	4.50E-02	7.60E-02	mg/Kg	C4S-03	4/4	5.95E-02	Evaluated as PCB TEQ	
PCB-118	1.20E-01	1.40E-01	mg/Kg	C4S-03	4/4	1.25E-01	Evaluated as PCB TEQ	
PCB-126	2.10E-02	2.60E-02	mg/kg	C3SX-01	2/4	1.54E-02	Evaluated as PCB TEQ	
PCB-153	1.70E-01	2.10E-01	mg/Kg	C3SX-01	4/4	1.95E-01	Evaluated as PCB TEQ	
PCB-156	1.90E-02	2.60E-02	mg/Kg	C4S-03	4/4	2.23E-02	Evaluated as PCB TEQ	
PCB-157	7.00E-03	7.00E-03	mg/Kg	C4N-06	1/4	1.10E-02	Evaluated as PCB TEQ	
PCB-167	8.70E-03	1.10E-02	mg/kg	C3SX-01	2/4	1.24E-02	Evaluated as PCB TEQ	
PCB Dioxin-like Congener TEQ	6.88E-04	7.99E-04	mg/Kg	C4S-03	4/4	1.55E-03	4.50E-06 C	Yes
Dioxin/Furan Congeners								
1,2,3,7,8-PeCDD	1.70E-07	8.38E-07	mg/kg	C4N-06	3/3	5.03E-07	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,4,7,8-HxCDD	3.10E-07	1.39E-06	mg/kg	C4N-06	3/3	8.23E-07	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,6,7,8-HxCDD	7.60E-07	5.34E-06	mg/kg	C4N-06	3/3	2.58E-06	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,7,8,9-HxCDD	8.80E-07	4.23E-06	mg/kg	C4N-06	3/3	2.59E-06	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,4,6,7,8-HpCDD	2.31E-05	1.30E-04	mg/kg	C4N-06	3/3	7.11E-05	Evaluated as 2,3,7,8-TCDD TEQ	
Octa CDD	1.17E-03	2.90E-03	mg/kg	C3SX-01	3/3	2.04E-03	Evaluated as 2,3,7,8-TCDD TEQ	
2,3,7,8-TCDF	1.20E-05	1.70E-05	mg/kg	C4N-06	3/3	1.46E-05	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,7,8-PeCDF	4.73E-06	5.79E-06	mg/kg	C4N-06	3/3	5.27E-06	Evaluated as 2,3,7,8-TCDD TEQ	
2,3,4,7,8-PeCDF	6.21E-06	1.44E-05	mg/kg	C4N-06	3/3	9.36E-06	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,4,7,8-HxCDF	1.68E-05	2.40E-05	mg/kg	C3SX-01	3/3	2.13E-05	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,6,7,8-HxCDF	3.49E-06	1.03E-05	mg/kg	C3SX-01	3/3	6.76E-06	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,7,8,9-HxCDF	4.80E-07	7.60E-07	mg/kg	C3SX-01	3/3	6.49E-07	Evaluated as 2,3,7,8-TCDD TEQ	
2,3,4,6,7,8-HxCDF	1.90E-06	4.10E-06	mg/kg	C4N-06	3/3	3.26E-06	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,4,6,7,8-HpCDF	1.08E-05	8.20E-05	mg/kg	C3SX-01	3/3	4.35E-05	Evaluated as 2,3,7,8-TCDD TEQ	
1,2,3,4,7,8,9-HpCDF	3.28E-06	8.82E-06	mg/kg	C4N-06	3/3	6.50E-06	Evaluated as 2,3,7,8-TCDD TEQ	
Octa CDF	2.18E-05	1.15E-04	mg/kg	C3SX-01	3/3	7.93E-05	Evaluated as 2,3,7,8-TCDD TEQ	
2,3,7,8-TCDD TEQ	1.42E-05	1.42E-05	mg/kg	C4N-06	3/3	1.07E-05	4.50E-06 C	Yes
Inorganics								
Aluminum	1.02E+04	1.47E+04	mg/kg	C7S-37	2/2	1.25E+04	7.70E+03 NC	Yes
Antimony	6.90E-01	8.80E-01	mg/kg	C8N-19	2/2	7.85E-01	3.10E+00 NC	No
Arsenic	4.60E+00	8.50E+00	mg/kg	C3SX-01	5/5	6.64E+00	3.90E-01 C	Yes
Barium	9.26E+01	1.99E+02	mg/kg	C4S-01	5/5	1.41E+02	1.50E+03 NC	No
Beryllium	5.60E-01	1.00E+00	mg/kg	C4N-03	5/5	8.18E-01	1.60E+01 NC	No
Cadmium	2.60E-01	2.50E+00	mg/kg	C8N-19	3/5	8.06E-01	7.00E+00 NC	No
Calcium	5.52E+02	1.22E+03	mg/kg	C8N-19	2/2	8.86E+02	NA	No
Chromium	1.07E+01	5.17E+01	mg/kg	C4S-01	5/5	2.64E+01	2.90E-01 C	Yes
Cobalt	9.70E+00	1.25E+01	mg/kg	C3SX-01	5/5	1.08E+01	2.30E+00 NC	Yes
Copper	1.28E+01	2.99E+01	mg/kg	C8N-19	2/2	2.14E+01	3.10E+02 NC	No
Iron	1.81E+04	2.00E+04	mg/kg	C7S-37	2/2	1.91E+04	5.50E+03 NC	Yes
Lead	1.40E+01	1.11E+02	mg/kg	C4S-01	5/5	4.59E+01	4.00E+02	No
Magnesium	9.39E+02	9.92E+02	mg/kg	C7S-37	2/2	9.66E+02	NA	No
Manganese	7.22E+02	8.99E+02	mg/kg	C7S-37	5/5	8.27E+02	1.80E+02 NC	Yes
Mercury	1.80E-02	5.90E+00	mg/kg	C8N-19	23/24	8.79E-01	2.30E+00 NC	Yes
Nickel	7.70E+00	1.61E+01	mg/kg	C4S-01	5/5	1.09E+01	1.50E+02 NC	No
Potassium	6.29E+02	7.25E+02	mg/kg	C7S-37	2/2	6.77E+02	NA	No
Thallium	5.50E-01	6.20E-01	mg/kg	C7S-37	2/2	5.85E-01	7.80E-02 NC	No
Vanadium	1.42E+01	2.41E+01	mg/kg	C7S-37	5/5	2.01E+01	3.90E+01 NC	No
Zinc	7.01E+01	1.79E+02	mg/kg	C8N-19	2/2	1.25E+02	2.30E+03 NC	No

[a] Residential soil RSLs (April 2012).

NC = noncancer based, hazard index equals 0.1.

C = cancer based, target risk equals 1E-06.

Chromium assumed to be in the hexavalent form.

TABLE B-3
SUMMARY OF METALS DETECTED IN BACKGROUND SOIL (0 TO 1 FT BGS) FROM FORT MCCLELLAN
ANNISTON PCB SITE
OU-4

Analyte	Frequency of Detection	Range of Detected Concentrations (mg/kg)	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Average plus 2 SDs (mg/kg)	2X Average Concentration (mg/kg)
Aluminum	70 / 70	2.40E+03 - 3.99E+04	8.15E+03	6.10E+03	2.03E+04	1.63E+04
Antimony	47 / 69	1.10E-01 - 2.60E+00	9.90E-01	1.30E+00	3.59E+00	1.98E+00
Arsenic	66 / 66	8.20E-01 - 4.90E+01	6.86E+00	8.00E+00	2.29E+01	1.37E+01
Barium	70 / 70	1.10E+01 - 2.88E+02	6.20E+01	5.40E+01	1.70E+02	1.24E+02
Beryllium	54 / 54	6.20E-02 - 8.70E-01	4.00E-01	2.20E-01	8.40E-01	8.00E-01
Cadmium	45 / 70	2.40E-02 - 2.10E-01	1.40E-01	1.60E-01	4.60E-01	2.80E-01
Calcium	66 / 70	6.30E+01 - 1.79E+04	8.61E+02	2.27E+03	5.39E+03	1.72E+03
Chromium	70 / 70	2.00E+00 - 1.34E+02	1.85E+01	2.00E+01	5.85E+01	3.70E+01
Cobalt	68 / 70	3.90E-01 - 7.10E+01	7.57E+00	1.20E+01	3.16E+01	1.51E+01
Copper	69 / 70	1.30E+00 - 2.40E+01	6.36E+00	4.40E+00	1.52E+01	1.27E+01
Iron	70 / 70	2.51E+03 - 5.63E+04	1.71E+04	1.16E+04	4.02E+04	3.42E+04
Lead	70 / 70	2.90E+00 - 8.30E+01	2.00E+01	1.50E+01	5.00E+01	4.00E+01
Magnesium	70 / 70	6.00E+01 - 9.60E+03	5.16E+02	1.27E+03	3.05E+03	1.03E+03
Manganese	70 / 70	8.00E+00 - 6.85E+03	7.89E+02	1.19E+03	3.17E+03	1.58E+03
Mercury	23 / 70	3.10E-02 - 3.20E-01	4.00E-02	4.60E-02	1.32E-01	8.00E-02
Nickel	56 / 70	1.80E+00 - 2.20E+01	5.17E+00	4.20E+00	1.36E+01	1.03E+01
Potassium	60 / 70	1.04E+02 - 6.01E+03	4.00E+02	9.46E+02	2.29E+03	8.00E+02
Thallium	55 / 68	1.50E-02 - 3.40E+01	1.71E+00	5.90E+00	1.35E+01	3.42E+00
Vanadium	70 / 70	4.70E+00 - 1.58E+02	2.94E+01	2.60E+01	8.14E+01	5.88E+01
Zinc	64 / 70	4.60E+00 - 2.09E+02	2.03E+01	2.60E+01	7.23E+01	4.06E+01

Source of background: Background Metals Survey Report, Fort McClellan, Anniston, Alabama (SAIC, 1998).

TABLE B-4
COMPARISONS OF SITE SURFACE SOIL METALS CONCENTRATIONS WITH BACKGROUND SOIL LEVELS
ANNISTON PCB SITE
OU-4

Analyte	Site		Fort McClellan Background			Ratio of Site
	Maximum (mg/kg)	Average (mg/kg)	Maximum (mg/kg)	Average (mg/kg)	2X Average (mg/kg)	Maximum to Background Level of 2X Average
Aluminum *	2.08E+04	1.09E+04	3.99E+04	8.15E+03	1.63E+04	1.3
Antimony	1.50E+00	7.07E-01	2.60E+00	9.90E-01	1.98E+00	0.76
Arsenic *	1.85E+01	6.70E+00	4.90E+01	6.86E+00	1.37E+01	1.3
Barium	2.81E+02	1.00E+02	2.88E+02	6.20E+01	1.24E+02	2.3
Beryllium	1.30E+00	6.50E-01	8.70E-01	4.00E-01	8.00E-01	1.6
Cadmium	2.10E+00	3.21E-01	2.10E-01	1.40E-01	2.80E-01	7.5
Calcium	1.43E+03	7.57E+02	1.79E+04	8.61E+02	1.72E+03	0.83
Chromium *	7.97E+01	1.69E+01	1.34E+02	1.85E+01	3.70E+01	2.2
Cobalt *	3.51E+01	8.74E+00	7.10E+01	7.57E+00	1.51E+01	2.3
Copper	2.33E+01	1.21E+01	2.40E+01	6.36E+00	1.27E+01	1.8
Iron *	4.28E+04	1.77E+04	5.63E+04	1.71E+04	3.42E+04	1.3
Lead	1.30E+02	2.71E+01	8.30E+01	2.00E+01	4.00E+01	3.2
Magnesium	1.50E+03	7.90E+02	9.60E+03	5.16E+02	1.03E+03	1.5
Manganese *	4.31E+03	8.25E+02	6.85E+03	7.89E+02	1.58E+03	2.7
Mercury *	3.34E+01	9.95E-01	3.20E-01	4.00E-02	8.00E-02	418
Nickel	1.83E+01	7.32E+00	2.20E+01	5.17E+00	1.03E+01	1.8
Potassium	1.75E+03	6.62E+02	6.01E+03	4.00E+02	8.00E+02	2.2
Thallium *	1.50E+00	1.35E+00	3.40E+01	1.71E+00	3.42E+00	0.44
Vanadium *	4.54E+01	2.04E+01	1.58E+02	2.94E+01	5.88E+01	0.77
Zinc	1.27E+02	5.36E+01	2.09E+02	2.03E+01	4.06E+01	3.1

* Maximum detected site concentration exceeded the residential soil RSL (see Table 3-8).

TABLE B-5

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C1-EU2	Ingestion	Total PCBs	4.61E+01	mg/kg	6.3E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-06	4.4E-06	mg/kg-day	2.0E-05	mg/kg-day	0.2
			Ingestion Total								1E-06					0.2
			PCB Dioxin-like Congener TEQ Ingestion		9.32E-05	mg/kg	1.3E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-07	8.8E-12	mg/kg-day	7.0E-10	mg/kg-day	0.01
			Dermal	Total PCBs	4.61E+01	mg/kg	2.7E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	5E-06	1.9E-05	mg/kg-day	2.0E-05	mg/kg-day	0.9
			Dermal Total								5E-06					0.9
			PCB Dioxin-like Congener TEQ Dermal		9.32E-05	mg/kg	5.4E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-07	3.8E-11	mg/kg-day	7.0E-10	mg/kg-day	0.05
		C1-EU2 Total									7E-06					1
		Surface Soil at C2N-EU1	Ingestion	Total PCBs	1.63E+01	mg/kg	2.2E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-07	1.5E-06	mg/kg-day	2.0E-05	mg/kg-day	0.08
				Mercury	1.33E+00	mg/kg	6.0E-08	mg/kg-day	NA	---	NA	4.2E-07	mg/kg-day	3.0E-04	mg/kg-day	0.001
			Ingestion Total								4E-07					0.08
			PCB Dioxin-like Congener TEQ Ingestion		3.29E-05	mg/kg	4.5E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-08	3.1E-12	mg/kg-day	7.0E-10	mg/kg-day	0.004
			Dermal	Total PCBs	1.63E+01	mg/kg	9.4E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-06	6.6E-06	mg/kg-day	2.0E-05	mg/kg-day	0.3
				Mercury	1.33E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-06					0.3
			PCB Dioxin-like Congener TEQ Dermal		3.29E-05	mg/kg	1.9E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-07	1.3E-11	mg/kg-day	7.0E-10	mg/kg-day	0.02
		C2N-EU1 Total									3E-06					0.4
		Surface Soil at C3N-EU1	Ingestion	Total PCBs	2.32E+01	mg/kg	3.2E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	6E-07	2.2E-06	mg/kg-day	2.0E-05	mg/kg-day	0.1
				Mercury	3.32E+00	mg/kg	1.5E-07	mg/kg-day	NA	---	NA	1.1E-06	mg/kg-day	3.0E-04	mg/kg-day	0.004
			Ingestion Total								6E-07					0.1
			PCB Dioxin-like Congener TEQ Ingestion		4.14E-05	mg/kg	5.6E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-08	3.9E-12	mg/kg-day	7.0E-10	mg/kg-day	0.006
			Dermal	Total PCBs	2.32E+01	mg/kg	1.3E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	3E-06	9.4E-06	mg/kg-day	2.0E-05	mg/kg-day	0.5
				Mercury	3.32E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								3E-06					0.5
			PCB Dioxin-like Congener TEQ Dermal		4.14E-05	mg/kg	2.4E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-07	1.7E-11	mg/kg-day	7.0E-10	mg/kg-day	0.02
		C3N-EU1 Total									4E-06					0.6
		Surface Soil at C3N-EU2	Ingestion	Total PCBs	3.69E+01	mg/kg	5.0E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-06	3.5E-06	mg/kg-day	2.0E-05	mg/kg-day	0.2
				Mercury	4.62E+00	mg/kg	2.1E-07	mg/kg-day	NA	---	NA	1.5E-06	mg/kg-day	3.0E-04	mg/kg-day	0.005
			Ingestion Total								1E-06					0.2
			PCB Dioxin-like Congener TEQ Ingestion		9.70E-05	mg/kg	1.3E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-07	9.2E-12	mg/kg-day	7.0E-10	mg/kg-day	0.01
			Dermal	Total PCBs	3.69E+01	mg/kg	2.1E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-06	1.5E-05	mg/kg-day	2.0E-05	mg/kg-day	0.7
				Mercury	4.62E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								4E-06					0.7
			PCB Dioxin-like Congener TEQ Dermal		9.70E-05	mg/kg	5.6E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-07	3.9E-11	mg/kg-day	7.0E-10	mg/kg-day	0.06
		C3N-EU2 Total									6E-06					1

TABLE B-5

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C4N-EU1	Ingestion	Total PCBs	8.12E+00	mg/kg	1.1E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-07	7.7E-07	mg/kg-day	2.0E-05	mg/kg-day	0.04
				Mercury	2.28E+00	mg/kg	1.0E-07	mg/kg-day	NA	---	NA	7.2E-07	mg/kg-day	3.0E-04	mg/kg-day	0.002
			Ingestion Total								2E-07					0.04
			PCB Dioxin-like Congener TEQ Ingestion		1.84E-05	mg/kg	2.5E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-08	1.7E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
			Dermal	Total PCBs	8.12E+00	mg/kg	4.7E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	9E-07	3.3E-06	mg/kg-day	2.0E-05	mg/kg-day	0.2
				Mercury	2.28E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								9E-07					0.2
			PCB Dioxin-like Congener TEQ Dermal		1.84E-05	mg/kg	1.1E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-07	7.4E-12	mg/kg-day	7.0E-10	mg/kg-day	0.01
		C4N-EU1 Total									1E-06					0.2
		Surface Soil at C4N-EU2	Ingestion	Total PCBs	8.50E+00	mg/kg	1.2E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-07	8.1E-07	mg/kg-day	2.0E-05	mg/kg-day	0.04
				Mercury	2.74E+00	mg/kg	1.2E-07	mg/kg-day	NA	---	NA	8.7E-07	mg/kg-day	3.0E-04	mg/kg-day	0.003
			Ingestion Total								2E-07					0.04
			PCB Dioxin-like Congener TEQ Ingestion		1.79E-05	mg/kg	2.4E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-08	1.7E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
			Dermal	Total PCBs	8.50E+00	mg/kg	4.9E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-06	3.4E-06	mg/kg-day	2.0E-05	mg/kg-day	0.2
				Mercury	2.74E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-06					0.2
			PCB Dioxin-like Congener TEQ Dermal		1.79E-05	mg/kg	1.0E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-07	7.2E-12	mg/kg-day	7.0E-10	mg/kg-day	0.01
		C4N-EU2 Total									1E-06					0.2
		Surface Soil at C4S-EU1	Ingestion	Total PCBs	1.63E+01	mg/kg	2.2E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-07	1.6E-06	mg/kg-day	2.0E-05	mg/kg-day	0.08
				Mercury	3.47E+00	mg/kg	1.6E-07	mg/kg-day	NA	---	NA	1.1E-06	mg/kg-day	3.0E-04	mg/kg-day	0.004
			Ingestion Total								4E-07					0.08
			PCB Dioxin-like Congener TEQ Ingestion		3.98E-05	mg/kg	5.4E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-08	3.8E-12	mg/kg-day	7.0E-10	mg/kg-day	0.005
			Dermal	Total PCBs	1.63E+01	mg/kg	9.4E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-06	6.6E-06	mg/kg-day	2.0E-05	mg/kg-day	0.3
				Mercury	3.47E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-06					0.3
			PCB Dioxin-like Congener TEQ Dermal		3.98E-05		2.3E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-07	1.6E-11	mg/kg-day	7.0E-10	mg/kg-day	0.02
		C4S-EU1 Total									3E-06					0.4
		Surface Soil at C4S-EU2	Ingestion	Total PCBs	2.51E+00	mg/kg	3.4E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	7E-08	2.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	1.27E+00	mg/kg	5.7E-08	mg/kg-day	NA	---	NA	4.0E-07	mg/kg-day	3.0E-04	mg/kg-day	0.001
			Ingestion Total								7E-08					0.01
			PCB Dioxin-like Congener TEQ Ingestion		5.12E-06	mg/kg	7.0E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-09	4.9E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0007
			Dermal	Total PCBs	2.51E+00	mg/kg	1.4E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	3E-07	1.0E-06	mg/kg-day	2.0E-05	mg/kg-day	0.05
				Mercury	1.27E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								3E-07					0.05
			PCB Dioxin-like Congener TEQ Dermal		5.12E-06	mg/kg	2.9E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-08	2.1E-12	mg/kg-day	7.0E-10	mg/kg-day	0.003
		C4S-EU2 Total									4E-07					0.07

TABLE B-5

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C4S-EU3	Ingestion	Total PCBs	5.50E+00	mg/kg	7.5E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-07	5.2E-07	mg/kg-day	2.0E-05	mg/kg-day	0.03
				Mercury	1.69E+00	mg/kg	7.6E-08	mg/kg-day	NA	---	NA	5.3E-07	mg/kg-day	3.0E-04	mg/kg-day	0.002
			Ingestion Total								1E-07					0.03
			PCB Dioxin-like Congener TEQ Ingestion		1.11E-05	mg/kg	1.5E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	1.1E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
			Dermal	Total PCBs	5.50E+00	mg/kg	3.2E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	6E-07	2.2E-06	mg/kg-day	2.0E-05	mg/kg-day	0.1
				Mercury	1.69E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								6E-07					0.1
			PCB Dioxin-like Congener TEQ Dermal		1.11E-05	mg/kg	6.4E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	8E-08	4.5E-12	mg/kg-day	7.0E-10	mg/kg-day	0.006
		C4S-EU3 Total									9E-07					0.1
		Surface Soil at C5N-EU1	Ingestion	Total PCBs	6.05E+00	mg/kg	8.2E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-07	5.7E-07	mg/kg-day	2.0E-05	mg/kg-day	0.03
				Mercury	1.51E+00	mg/kg	6.8E-08	mg/kg-day	NA	---	NA	4.8E-07	mg/kg-day	3.0E-04	mg/kg-day	0.002
			Ingestion Total								2E-07					0.03
			PCB Dioxin-like Congener TEQ Ingestion		1.22E-05	mg/kg	1.6E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	1.2E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
			Dermal	Total PCBs	6.05E+00	mg/kg	3.5E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	7E-07	2.4E-06	mg/kg-day	2.0E-05	mg/kg-day	0.1
				Mercury	1.51E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								7E-07					0.1
			PCB Dioxin-like Congener TEQ Dermal		1.22E-05	mg/kg	7.0E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-08	4.9E-12	mg/kg-day	7.0E-10	mg/kg-day	0.007
		C5N-EU1 Total									1E-06					0.2
		Surface Soil at C5S-EU1	Ingestion	Total PCBs	1.33E+00	mg/kg	1.8E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-08	1.3E-07	mg/kg-day	2.0E-05	mg/kg-day	0.006
				Mercury	8.86E-01	mg/kg	4.0E-08	mg/kg-day	NA	---	NA	2.8E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0009
			Ingestion Total								4E-08					0.007
			PCB Dioxin-like Congener TEQ Ingestion		2.63E-06	mg/kg	3.6E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-09	2.5E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0004
			Dermal	Total PCBs	1.33E+00	mg/kg	7.7E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-07	5.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.03
				Mercury	8.86E-01	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-07					0.03
			PCB Dioxin-like Congener TEQ Dermal		2.63E-06	mg/kg	1.5E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	1.1E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
		C5S-EU1 Total									2E-07					0.04
		Surface Soil at C6N-EU1	Ingestion	Total PCBs	2.14E+00	mg/kg	2.9E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	6E-08	2.0E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	1.41E+00	mg/kg	6.4E-08	mg/kg-day	NA	---	NA	4.5E-07	mg/kg-day	3.0E-04	mg/kg-day	0.001
			Ingestion Total								6E-08					0.01
			PCB Dioxin-like Congener TEQ Ingestion		4.14E-06	mg/kg	5.6E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-09	3.9E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0006
			Dermal	Total PCBs	2.14E+00	mg/kg	1.2E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-07	8.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.04
				Mercury	1.41E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-07					0.04
			PCB Dioxin-like Congener TEQ Dermal		4.14E-06	mg/kg	2.4E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-08	1.7E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
		C6N-EU1 Total									3E-07					0.06

TABLE B-5

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Soil	Surface Soil	Surface Soil at C6S-EU1	Ingestion	Total PCBs	2.88E+00	mg/kg	3.9E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	8E-08	2.7E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	2.95E+00	mg/kg	1.3E-07	mg/kg-day	NA	---	NA	9.3E-07	mg/kg-day	3.0E-04	mg/kg-day	0.003
			Ingestion Total								8E-08					0.02
			PCB Dioxin-like Congener TEQ Ingestion		5.84E-06	mg/kg	7.9E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	5.5E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0008
			Dermal	Total PCBs	2.88E+00	mg/kg	1.7E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	3E-07	1.2E-06	mg/kg-day	2.0E-05	mg/kg-day	0.06
				Mercury	2.95E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								3E-07					0.06
			PCB Dioxin-like Congener TEQ Dermal		5.84E-06	mg/kg	3.4E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-08	2.3E-12	mg/kg-day	7.0E-10	mg/kg-day	0.003
		C6S-EU1 Total									5E-07					0.08
		Surface Soil at C7S-EU1	Ingestion	Total PCBs	1.32E+00	mg/kg	1.8E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-08	1.3E-07	mg/kg-day	2.0E-05	mg/kg-day	0.006
				Mercury	6.77E-01	mg/kg	3.1E-08	mg/kg-day	NA	---	NA	2.1E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0007
			Ingestion Total								4E-08					0.007
			PCB Dioxin-like Congener TEQ Ingestion		2.61E-06	mg/kg	3.5E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-09	2.5E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0004
			Dermal	Total PCBs	1.32E+00	mg/kg	7.6E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-07	5.3E-07	mg/kg-day	2.0E-05	mg/kg-day	0.03
				Mercury	6.77E-01	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-07					0.03
			PCB Dioxin-like Congener TEQ Dermal		2.61E-06	mg/kg	1.5E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	1.1E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
		C7S-EU1 Total									2E-07					0.04
		Surface Soil at C8N-EU1	Ingestion	Total PCBs	3.09E+00	mg/kg	4.2E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	8E-08	2.9E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	1.57E+00	mg/kg	7.1E-08	mg/kg-day	NA	---	NA	5.0E-07	mg/kg-day	3.0E-04	mg/kg-day	0.002
			Ingestion Total								8E-08					0.02
			PCB Dioxin-like Congener TEQ Ingestion		7.22E-06	mg/kg	9.8E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	6.9E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
			Dermal	Total PCBs	3.09E+00	mg/kg	1.8E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-07	1.2E-06	mg/kg-day	2.0E-05	mg/kg-day	0.06
				Mercury	1.57E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								4E-07					0.06
			PCB Dioxin-like Congener TEQ Dermal		7.22E-06	mg/kg	4.2E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-08	2.9E-12	mg/kg-day	7.0E-10	mg/kg-day	0.004
		C8N-EU1 Total									5E-07					0.08

TABLE B-6

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Soil	Surface Soil	Surface Soil at C1-EU2	Ingestion	Total PCBs	4.61E+01	mg/kg	1.2E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-06	2.8E-06	mg/kg-day	2.0E-05	mg/kg-day	0.1
			Ingestion Total								2E-06					0.1
			PCB Dioxin-like Congener TEQ Ingestion		9.32E-05	mg/kg	2.4E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-07	5.7E-12	mg/kg-day	7.0E-10	mg/kg-day	0.008
			Dermal	Total PCBs	4.61E+01	mg/kg	8.0E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-06	1.9E-06	mg/kg-day	2.0E-05	mg/kg-day	0.09
			Dermal Total								2E-06					0.09
			PCB Dioxin-like Congener TEQ Dermal		9.32E-05	mg/kg	1.6E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-07	3.8E-12	mg/kg-day	7.0E-10	mg/kg-day	0.005
		C1-EU2 Total									5E-06					0.2
		Surface Soil at C2N-EU1	Ingestion	Total PCBs	1.63E+01	mg/kg	4.3E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	9E-07	1.0E-06	mg/kg-day	2.0E-05	mg/kg-day	0.05
				Mercury	1.33E+00	mg/kg	1.2E-07	mg/kg-day	NA	---	NA	2.7E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0009
			Ingestion Total								9E-07					0.05
			PCB Dioxin-like Congener TEQ Ingestion		3.29E-05	mg/kg	8.6E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-07	2.0E-12	mg/kg-day	7.0E-10	mg/kg-day	0.003
			Dermal	Total PCBs	1.63E+01	mg/kg	2.8E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	6E-07	6.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.03
				Mercury	1.33E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								6E-07					0.03
			PCB Dioxin-like Congener TEQ Dermal		3.29E-05	mg/kg	5.7E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-08	1.3E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
		C2N-EU1 Total									2E-06					0.09
		Surface Soil at C3N-EU1	Ingestion	Total PCBs	2.32E+01	mg/kg	6.1E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-06	1.4E-06	mg/kg-day	2.0E-05	mg/kg-day	0.07
				Mercury	3.32E+00	mg/kg	2.9E-07	mg/kg-day	NA	---	NA	6.8E-07	mg/kg-day	3.0E-04	mg/kg-day	0.002
			Ingestion Total								1E-06					0.07
			PCB Dioxin-like Congener TEQ Ingestion		4.14E-05	mg/kg	1.1E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-07	2.5E-12	mg/kg-day	7.0E-10	mg/kg-day	0.004
			Dermal	Total PCBs	2.32E+01	mg/kg	4.0E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	8E-07	9.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.05
				Mercury	3.32E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								8E-07					0.05
			PCB Dioxin-like Congener TEQ Dermal		4.14E-05	mg/kg	7.1E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-08	1.7E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
		C3N-EU1 Total									2E-06					0.1
		Surface Soil at C3N-EU2	Ingestion	Total PCBs	3.69E+01	mg/kg	9.6E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-06	2.2E-06	mg/kg-day	2.0E-05	mg/kg-day	0.11
				Mercury	4.62E+00	mg/kg	4.0E-07	mg/kg-day	NA	---	NA	9.4E-07	mg/kg-day	3.0E-04	mg/kg-day	0.003
			Ingestion Total								2E-06					0.1
			PCB Dioxin-like Congener TEQ Ingestion		9.70E-05	mg/kg	2.5E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-07	5.9E-12	mg/kg-day	7.0E-10	mg/kg-day	0.008
			Dermal	Total PCBs	3.69E+01	mg/kg	6.4E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-06	1.5E-06	mg/kg-day	2.0E-05	mg/kg-day	0.07
				Mercury	4.62E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-06					0.07
			PCB Dioxin-like Congener TEQ Dermal		9.70E-05		1.7E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-07	3.9E-12	mg/kg-day	7.0E-10	mg/kg-day	0.006
		C3N-EU2 Total									4E-06					0.2

TABLE B-6

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C4N-EU1	Ingestion	Total PCBs	8.12E+00	mg/kg	2.1E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-07	5.0E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
				Mercury	2.28E+00	mg/kg	2.0E-07	mg/kg-day	NA	---	NA	4.6E-07	mg/kg-day	3.0E-04	mg/kg-day	0.002
			Ingestion Total								4E-07					0.03
			PCB Dioxin-like Congener TEQ Ingestion		1.84E-05	mg/kg	4.8E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-08	1.1E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
			Dermal	Total PCBs	8.12E+00	mg/kg	1.4E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	3E-07	3.3E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
				Mercury	2.28E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								3E-07					0.02
			PCB Dioxin-like Congener TEQ Dermal		1.84E-05	mg/kg	3.2E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-08	7.4E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
		C4N-EU1 Total									8E-07					0.05
		Surface Soil at C4N-EU2	Ingestion	Total PCBs	8.50E+00	mg/kg	2.2E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-07	5.2E-07	mg/kg-day	2.0E-05	mg/kg-day	0.03
				Mercury	2.74E+00	mg/kg	2.4E-07	mg/kg-day	NA	---	NA	5.6E-07	mg/kg-day	3.0E-04	mg/kg-day	0.002
			Ingestion Total								4E-07					0.03
			PCB Dioxin-like Congener TEQ Ingestion		1.79E-05	mg/kg	4.7E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-08	1.1E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
			Dermal	Total PCBs	8.50E+00	mg/kg	1.5E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	3E-07	3.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
				Mercury	2.74E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								3E-07					0.02
			PCB Dioxin-like Congener TEQ Dermal		1.79E-05	mg/kg	3.1E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-08	7.2E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
		C4N-EU2 Total									8E-07					0.05
		Surface Soil at C4S-EU1	Ingestion	Total PCBs	1.63E+01	mg/kg	4.3E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	9E-07	1.0E-06	mg/kg-day	2.0E-05	mg/kg-day	0.05
				Mercury	3.47E+00	mg/kg	3.0E-07	mg/kg-day	NA	---	NA	7.1E-07	mg/kg-day	3.0E-04	mg/kg-day	0.002
			Ingestion Total								9E-07					0.05
			PCB Dioxin-like Congener TEQ Ingestion		3.98E-05	mg/kg	1.0E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-07	2.4E-12	mg/kg-day	7.0E-10	mg/kg-day	0.003
			Dermal	Total PCBs	1.63E+01	mg/kg	2.8E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	6E-07	6.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.03
				Mercury	3.47E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								6E-07					0.03
			PCB Dioxin-like Congener TEQ Dermal		3.98E-05	mg/kg	6.9E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-08	1.6E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
		C4S-EU1 Total									2E-06					0.09
		Surface Soil at C4S-EU2	Ingestion	Total PCBs	2.51E+00	mg/kg	6.6E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-07	1.5E-07	mg/kg-day	2.0E-05	mg/kg-day	0.008
				Mercury	1.27E+00	mg/kg	1.1E-07	mg/kg-day	NA	---	NA	2.6E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0009
			Ingestion Total								1E-07					0.009
			PCB Dioxin-like Congener TEQ Ingestion		5.12E-06	mg/kg	1.3E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	3.1E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0004
			Dermal	Total PCBs	2.51E+00	mg/kg	4.3E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	9E-08	1.0E-07	mg/kg-day	2.0E-05	mg/kg-day	0.005
				Mercury	1.27E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								9E-08					0.005
			PCB Dioxin-like Congener TEQ Dermal		5.12E-06	mg/kg	8.8E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	2.1E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0003
		C4S-EU2 Total									2E-07					0.01

TABLE B-6

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Soil	Surface Soil	Surface Soil at C4S-EU3	Ingestion	Total PCBs	5.50E+00	mg/kg	1.4E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	3E-07	3.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
				Mercury	1.69E+00	mg/kg	1.5E-07	mg/kg-day	NA	---	NA	3.4E-07	mg/kg-day	3.0E-04	mg/kg-day	0.001
			Ingestion Total								3E-07					0.02
			PCB Dioxin-like Congener TEQ Ingestion		1.11E-05	mg/kg	2.9E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-08	6.8E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
			Dermal	Total PCBs	5.50E+00	mg/kg	9.5E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-07	2.2E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	1.69E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-07					0.01
			PCB Dioxin-like Congener TEQ Dermal		1.11E-05	mg/kg	1.9E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	4.5E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0006
		C4S-EU3 Total									5E-07					0.03
		Surface Soil at C5N-EU1	Ingestion	Total PCBs	6.05E+00	mg/kg	1.6E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	3E-07	3.7E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
				Mercury	1.51E+00	mg/kg	1.3E-07	mg/kg-day	NA	---	NA	3.1E-07	mg/kg-day	3.0E-04	mg/kg-day	0.001
			Ingestion Total								3E-07					0.02
			PCB Dioxin-like Congener TEQ Ingestion		1.22E-05	mg/kg	3.2E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-08	7.4E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
			Dermal	Total PCBs	6.05E+00	mg/kg	1.0E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-07	2.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	1.51E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-07					0.01
			PCB Dioxin-like Congener TEQ Dermal		1.22E-05	mg/kg	2.1E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-08	4.9E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0007
		C5N-EU1 Total									6E-07					0.03
		Surface Soil at C5S-EU1	Ingestion	Total PCBs	1.33E+00	mg/kg	3.5E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	7E-08	8.1E-08	mg/kg-day	2.0E-05	mg/kg-day	0.004
				Mercury	8.86E-01	mg/kg	7.7E-08	mg/kg-day	NA	---	NA	1.8E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0006
			Ingestion Total								7E-08					0.005
			PCB Dioxin-like Congener TEQ Ingestion		2.63E-06	mg/kg	6.9E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-09	1.6E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
			Dermal	Total PCBs	1.33E+00	mg/kg	2.3E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	5E-08	5.4E-08	mg/kg-day	2.0E-05	mg/kg-day	0.003
				Mercury	8.86E-01	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								5E-08					0.003
			PCB Dioxin-like Congener TEQ Dermal		2.63E-06	mg/kg	4.5E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-09	1.1E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
		C5S-EU1 Total									1E-07					0.008
		Surface Soil at C6N-EU1	Ingestion	Total PCBs	2.14E+00	mg/kg	5.6E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-07	1.3E-07	mg/kg-day	2.0E-05	mg/kg-day	0.007
				Mercury	1.41E+00	mg/kg	1.2E-07	mg/kg-day	NA	---	NA	2.9E-07	mg/kg-day	3.0E-04	mg/kg-day	0.001
			Ingestion Total								1E-07					0.007
			PCB Dioxin-like Congener TEQ Ingestion		4.14E-06	mg/kg	1.1E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	2.5E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0004
			Dermal	Total PCBs	2.14E+00	mg/kg	3.7E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	7E-08	8.6E-08	mg/kg-day	2.0E-05	mg/kg-day	0.004
				Mercury	1.41E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								7E-08					0.004
			PCB Dioxin-like Congener TEQ Dermal		4.14E-06	mg/kg	7.1E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-09	1.7E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
		C6N-EU1 Total									2E-07					0.01

TABLE B-6

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C6S-EU1	Ingestion	Total PCBs	2.88E+00	mg/kg	7.5E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-07	1.8E-07	mg/kg-day	2.0E-05	mg/kg-day	0.009
				Mercury	2.95E+00	mg/kg	2.6E-07	mg/kg-day	NA	---	NA	6.0E-07	mg/kg-day	3.0E-04	mg/kg-day	0.002
			Ingestion Total								2E-07					0.01
			PCB Dioxin-like Congener TEQ Ingestion		5.84E-06	mg/kg	1.5E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	3.6E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0005
			Dermal	Total PCBs	2.88E+00	mg/kg	5.0E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-07	1.2E-07	mg/kg-day	2.0E-05	mg/kg-day	0.006
				Mercury	2.95E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-07					0.006
			PCB Dioxin-like Congener TEQ Dermal		5.84E-06	mg/kg	1.0E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	2.4E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0003
		C6S-EU1 Total									3E-07					0.02
		Surface Soil at C7S-EU1	Ingestion	Total PCBs	1.32E+00	mg/kg	3.5E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	7E-08	8.1E-08	mg/kg-day	2.0E-05	mg/kg-day	0.004
				Mercury	6.77E-01	mg/kg	5.9E-08	mg/kg-day	NA	---	NA	1.4E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0005
			Ingestion Total								7E-08					0.004
			PCB Dioxin-like Congener TEQ Ingestion		2.61E-06	mg/kg	6.8E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-09	1.6E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
			Dermal	Total PCBs	1.32E+00	mg/kg	2.3E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	5E-08	5.3E-08	mg/kg-day	2.0E-05	mg/kg-day	0.003
				Mercury	6.77E-01	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								5E-08					0.003
			PCB Dioxin-like Congener TEQ Dermal		2.61E-06	mg/kg	4.5E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-09	1.1E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
		C7S-EU1 Total									1E-07					0.008
		Surface Soil at C8N-EU1	Ingestion	Total PCBs	3.09E+00	mg/kg	8.1E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-07	1.9E-07	mg/kg-day	2.0E-05	mg/kg-day	0.009
				Mercury	1.57E+00	mg/kg	1.4E-07	mg/kg-day	NA	---	NA	3.2E-07	mg/kg-day	3.0E-04	mg/kg-day	0.001
			Ingestion Total								2E-07					0.01
			PCB Dioxin-like Congener TEQ Ingestion		7.22E-06	mg/kg	1.9E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	4.4E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0006
			Dermal	Total PCBs	3.09E+00	mg/kg	5.3E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-07	1.2E-07	mg/kg-day	2.0E-05	mg/kg-day	0.006
				Mercury	1.57E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-07					0.006
			PCB Dioxin-like Congener TEQ Dermal		7.22E-06	mg/kg	1.2E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	2.9E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0004
		C8N-EU1 Total									3E-07					0.02

TABLE B-7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C1-EU1	Ingestion	Total PCBs	1.05E+01	mg/kg	1.0E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-06	1.2E-05	mg/kg-day	6.0E-05	mg/kg-day	0.2
			Ingestion Total								2E-06					0.2
			PCB Dioxin-like Congener TEQ Ingestion		2.11E-05	mg/kg	2.1E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-07	2.4E-11	mg/kg-day	7.0E-10	mg/kg-day	0.03
			Dermal	Total PCBs	1.05E+01	mg/kg	8.6E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-06	1.0E-05	mg/kg-day	6.0E-05	mg/kg-day	0.2
			Dermal Total								2E-06					0.2
			PCB Dioxin-like Congener TEQ Dermal		2.11E-05	mg/kg	1.7E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-07	2.0E-11	mg/kg-day	7.0E-10	mg/kg-day	0.03
		C1-EU1 Total									4E-06					0.4
		Surface Soil at C3S-EU1	Ingestion	Total PCBs	1.95E+01	mg/kg	1.9E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-06	2.2E-05	mg/kg-day	6.0E-05	mg/kg-day	0.4
				Mercury	8.96E+00	mg/kg	2.9E-06	mg/kg-day	NA	---	NA	3.4E-05	mg/kg-day	3.0E-03	mg/kg-day	0.01
			Ingestion Total								4E-06					0.4
			PCB Dioxin-like Congener TEQ Ingestion		3.93E-05	mg/kg	3.8E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-07	4.5E-11	mg/kg-day	7.0E-10	mg/kg-day	0.06
			Dermal	Total PCBs	1.95E+01	mg/kg	1.6E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	3E-06	1.9E-05	mg/kg-day	6.0E-05	mg/kg-day	0.3
				Mercury	8.96E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-03	mg/kg-day	NA
			Dermal Total								3E-06					0.3
			PCB Dioxin-like Congener TEQ Dermal		3.93E-05	mg/kg	3.2E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-07	3.8E-11	mg/kg-day	7.0E-10	mg/kg-day	0.05
		C3S-EU1 Total									8E-06					0.8
		Surface Soil at C3S-EU2	Ingestion	Total PCBs	2.36E+01	mg/kg	2.3E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	5E-06	2.7E-05	mg/kg-day	6.0E-05	mg/kg-day	0.4
				Mercury	3.90E+00	mg/kg	1.3E-06	mg/kg-day	NA	---	NA	1.5E-05	mg/kg-day	3.0E-03	mg/kg-day	0.005
			Ingestion Total								5E-06					0.5
			PCB Dioxin-like Congener TEQ Ingestion		1.07E-04	mg/kg	1.0E-11	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-06	1.2E-10	mg/kg-day	7.0E-10	mg/kg-day	0.2
			Dermal	Total PCBs	2.36E+01	mg/kg	1.9E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-06	2.3E-05	mg/kg-day	6.0E-05	mg/kg-day	0.4
				Mercury	3.90E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-03	mg/kg-day	NA
			Dermal Total								4E-06					0.4
			PCB Dioxin-like Congener TEQ Dermal		1.07E-04	mg/kg	8.8E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-06	1.0E-10	mg/kg-day	7.0E-10	mg/kg-day	0.1
		C3S-EU2 Total									1E-05					1

TABLE B-8

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C1-EU1	Ingestion	Total PCBs	1.05E+01	mg/kg	2.8E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	6E-07	2.0E-06	mg/kg-day	2.0E-05	mg/kg-day	0.1
			Ingestion Total								6E-07					0.1
			PCB Dioxin-like Congener TEQ Ingestion		2.11E-05	mg/kg	5.7E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-08	4.0E-12	mg/kg-day	7.0E-10	mg/kg-day	0.006
			Dermal	Total PCBs	1.05E+01	mg/kg	1.2E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-06	8.4E-06	mg/kg-day	2.0E-05	mg/kg-day	0.4
			Dermal Total								2E-06					0.4
			PCB Dioxin-like Congener TEQ Dermal		2.11E-05	mg/kg	2.4E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-07	1.7E-11	mg/kg-day	7.0E-10	mg/kg-day	0.02
		C1-EU1 Total									3E-06					0.6
		Surface Soil at C3S-EU1	Ingestion	Total PCBs	1.95E+01	mg/kg	5.3E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-06	3.7E-06	mg/kg-day	2.0E-05	mg/kg-day	0.2
				Mercury	8.96E+00	mg/kg	8.1E-07	mg/kg-day	NA	---	NA	5.7E-06	mg/kg-day	3.0E-04	mg/kg-day	0.02
			Ingestion Total								1E-06					0.2
			PCB Dioxin-like Congener TEQ Ingestion		3.93E-05	mg/kg	1.1E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-07	7.5E-12	mg/kg-day	7.0E-10	mg/kg-day	0.01
			Dermal	Total PCBs	1.95E+01	mg/kg	2.2E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-06	1.6E-05	mg/kg-day	2.0E-05	mg/kg-day	0.8
				Mercury	8.96E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								4E-06					0.8
			PCB Dioxin-like Congener TEQ Dermal		3.93E-05	mg/kg	4.5E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-07	3.2E-11	mg/kg-day	7.0E-10	mg/kg-day	0.05
		C3S-EU1 Total									6E-06					1
		Surface Soil at C3S-EU2	Ingestion	Total PCBs	2.36E+01	mg/kg	6.4E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-06	4.5E-06	mg/kg-day	2.0E-05	mg/kg-day	0.2
				Mercury	3.90E+00	mg/kg	3.5E-07	mg/kg-day	NA	---	NA	2.5E-06	mg/kg-day	3.0E-04	mg/kg-day	0.008
			Ingestion Total								1E-06					0.2
			PCB Dioxin-like Congener TEQ Ingestion		1.07E-04	mg/kg	2.9E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-07	2.0E-11	mg/kg-day	7.0E-10	mg/kg-day	0.03
			Dermal	Total PCBs	2.36E+01	mg/kg	2.7E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	5E-06	1.9E-05	mg/kg-day	2.0E-05	mg/kg-day	1
				Mercury	3.90E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								5E-06					1
			PCB Dioxin-like Congener TEQ Dermal		1.07E-04	mg/kg	1.2E-11	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-06	8.6E-11	mg/kg-day	7.0E-10	mg/kg-day	0.1
		C3S-EU2 Total									9E-06					1

TABLE B-9

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C1-EU1	Ingestion	Total PCBs	1.05E+01	mg/kg	5.5E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-06	1.3E-06	mg/kg-day	2.0E-05	mg/kg-day	0.06
			Ingestion Total								1E-06					0.06
			PCB Dioxin-like Congener TEQ Ingestion		2.11E-05	mg/kg	1.1E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-07	2.6E-12	mg/kg-day	7.0E-10	mg/kg-day	0.004
			Dermal	Total PCBs	1.05E+01	mg/kg	3.6E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	7E-07	8.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.04
			Dermal Total								7E-07					0.04
			PCB Dioxin-like Congener TEQ Dermal		2.11E-05	mg/kg	7.3E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-08	1.7E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
		C1-EU1 Total									2E-06					0.1
		Surface Soil at C3S-EU1	Ingestion	Total PCBs	1.95E+01	mg/kg	1.0E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-06	2.4E-06	mg/kg-day	2.0E-05	mg/kg-day	0.1
				Mercury	8.96E+00	mg/kg	1.6E-06	mg/kg-day	NA	---	NA	3.6E-06	mg/kg-day	3.0E-04	mg/kg-day	0.01
			Ingestion Total								2E-06					0.1
			PCB Dioxin-like Congener TEQ Ingestion		3.93E-05	mg/kg	2.1E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-07	4.8E-12	mg/kg-day	7.0E-10	mg/kg-day	0.007
			Dermal	Total PCBs	1.95E+01	mg/kg	6.7E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-06	1.6E-06	mg/kg-day	2.0E-05	mg/kg-day	0.08
				Mercury	8.96E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-06					0.08
			PCB Dioxin-like Congener TEQ Dermal		3.93E-05	mg/kg	1.4E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-07	3.2E-12	mg/kg-day	7.0E-10	mg/kg-day	0.005
		C3S-EU1 Total									4E-06					0.2
		Surface Soil at C3S-EU2	Ingestion	Total PCBs	2.36E+01	mg/kg	1.2E-06	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-06	2.9E-06	mg/kg-day	2.0E-05	mg/kg-day	0.1
				Mercury	3.90E+00	mg/kg	6.8E-07	mg/kg-day	NA	---	NA	1.6E-06	mg/kg-day	3.0E-04	mg/kg-day	0.005
			Ingestion Total								2E-06					0.1
			PCB Dioxin-like Congener TEQ Ingestion		1.07E-04	mg/kg	5.6E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-07	1.3E-11	mg/kg-day	7.0E-10	mg/kg-day	0.02
			Dermal	Total PCBs	2.36E+01	mg/kg	8.2E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-06	1.9E-06	mg/kg-day	2.0E-05	mg/kg-day	0.1
				Mercury	3.90E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-06					0.1
			PCB Dioxin-like Congener TEQ Dermal		1.07E-04	mg/kg	3.7E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-07	8.6E-12	mg/kg-day	7.0E-10	mg/kg-day	0.01
		C3S-EU2 Total									5E-06					0.3

TABLE B-10
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
ANNISTON PCB SITE
OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C1-EU2	Ingestion	Total PCBs	4.61E+01	mg/kg	7.8E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	8E-08	5.5E-07	mg/kg-day	2.0E-05	mg/kg-day	0.03
			Ingestion Total								8E-08					0.03
			PCB Dioxin-like Congener TEQ Ingestion		9.32E-05	mg/kg	1.6E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	1.1E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
			Dermal	Total PCBs	4.61E+01	mg/kg	1.3E-07	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-07	9.3E-07	mg/kg-day	2.0E-05	mg/kg-day	0.05
			Dermal Total								1E-07					0.05
			PCB Dioxin-like Congener TEQ Dermal		9.32E-05	mg/kg	2.7E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-08	1.9E-12	mg/kg-day	7.0E-10	mg/kg-day	0.003
		C1-EU2 Total									3E-07					0.08
		Surface Soil at C2N-EU1	Ingestion	Total PCBs	1.63E+01	mg/kg	2.8E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-08	1.9E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	1.33E+00	mg/kg	7.5E-09	mg/kg-day	NA	---	NA	5.3E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0002
			Ingestion Total								3E-08					0.01
			PCB Dioxin-like Congener TEQ Ingestion		3.29E-05	mg/kg	5.6E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-09	3.9E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0006
			Dermal	Total PCBs	1.63E+01	mg/kg	4.7E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	5E-08	3.3E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
				Mercury	1.33E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								5E-08					0.02
			PCB Dioxin-like Congener TEQ Dermal		3.29E-05	mg/kg	9.5E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	6.6E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0009
		C2N-EU1 Total									1E-07					0.03
		Surface Soil at C3N-EU1	Ingestion	Total PCBs	2.32E+01	mg/kg	3.9E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	4E-08	2.8E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	3.32E+00	mg/kg	1.9E-08	mg/kg-day	NA	---	NA	1.3E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0004
			Ingestion Total								4E-08					0.01
			PCB Dioxin-like Congener TEQ Ingestion		4.14E-05	mg/kg	7.0E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-09	4.9E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0007
			Dermal	Total PCBs	2.32E+01	mg/kg	6.7E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	7E-08	4.7E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
				Mercury	3.32E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								7E-08					0.02
			PCB Dioxin-like Congener TEQ Dermal		4.14E-05	mg/kg	1.2E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	8.3E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
		C3N-EU1 Total									2E-07					0.05
		Surface Soil at C3N-EU2	Ingestion	Total PCBs	3.69E+01	mg/kg	6.2E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	6E-08	4.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
				Mercury	4.62E+00	mg/kg	2.6E-08	mg/kg-day	NA	---	NA	1.8E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0006
			Ingestion Total								6E-08					0.02
			PCB Dioxin-like Congener TEQ Ingestion		9.70E-05	mg/kg	1.6E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	1.2E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
			Dermal	Total PCBs	3.69E+01	mg/kg	1.1E-07	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-07	7.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.04
				Mercury	4.62E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-07					0.04
			PCB Dioxin-like Congener TEQ Dermal		9.70E-05	mg/kg	2.8E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-08	2.0E-12	mg/kg-day	7.0E-10	mg/kg-day	0.003
		C3N-EU2 Total									3E-07					0.08

TABLE B-10

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Soil	Surface Soil	Surface Soil at C4N-EU1	Ingestion	Total PCBs	8.12E+00	mg/kg	1.4E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-08	9.6E-08	mg/kg-day	2.0E-05	mg/kg-day	0.005
				Mercury	2.28E+00	mg/kg	1.3E-08	mg/kg-day	NA	---	NA	9.0E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0003
			Ingestion Total								1E-08					0.005
			PCB Dioxin-like Congener TEQ Ingestion		1.84E-05	mg/kg	3.1E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-09	2.2E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0003
			Dermal	Total PCBs	8.12E+00	mg/kg	2.3E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-08	1.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.008
				Mercury	2.28E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-08					0.008
			PCB Dioxin-like Congener TEQ Dermal		1.84E-05	mg/kg	5.3E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-09	3.7E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0005
		C4N-EU1 Total									6E-08					0.02
		Surface Soil at C4N-EU2	Ingestion	Total PCBs	8.50E+00	mg/kg	1.4E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-08	1.0E-07	mg/kg-day	2.0E-05	mg/kg-day	0.005
				Mercury	2.74E+00	mg/kg	1.5E-08	mg/kg-day	NA	---	NA	1.1E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0004
			Ingestion Total								1E-08					0.005
			PCB Dioxin-like Congener TEQ Ingestion		1.79E-05	mg/kg	3.0E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-09	2.1E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0003
			Dermal	Total PCBs	8.50E+00	mg/kg	2.4E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-08	1.7E-07	mg/kg-day	2.0E-05	mg/kg-day	0.009
				Mercury	2.74E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-08					0.009
			PCB Dioxin-like Congener TEQ Dermal		1.79E-05	mg/kg	5.2E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-09	3.6E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0005
		C4N-EU2 Total									6E-08					0.02
		Surface Soil at C4S-EU1	Ingestion	Total PCBs	1.63E+01	mg/kg	2.8E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-08	1.9E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	3.47E+00	mg/kg	2.0E-08	mg/kg-day	NA	---	NA	1.4E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0005
			Ingestion Total								3E-08					0.01
			PCB Dioxin-like Congener TEQ Ingestion		3.98E-05	mg/kg	6.8E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-09	4.7E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0007
			Dermal	Total PCBs	1.63E+01	mg/kg	4.7E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	5E-08	3.3E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
				Mercury	3.47E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								5E-08					0.02
			PCB Dioxin-like Congener TEQ Dermal		3.98E-05	mg/kg	1.1E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	8.0E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
		C4S-EU1 Total									1E-07					0.03
		Surface Soil at C4S-EU2	Ingestion	Total PCBs	2.51E+00	mg/kg	4.3E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	4E-09	3.0E-08	mg/kg-day	2.0E-05	mg/kg-day	0.001
				Mercury	1.27E+00	mg/kg	7.2E-09	mg/kg-day	NA	---	NA	5.0E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0002
			Ingestion Total								4E-09					0.002
			PCB Dioxin-like Congener TEQ Ingestion		5.12E-06	mg/kg	8.7E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	6.1E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00009
			Dermal	Total PCBs	2.51E+00	mg/kg	7.2E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	7E-09	5.1E-08	mg/kg-day	2.0E-05	mg/kg-day	0.003
				Mercury	1.27E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								7E-09					0.003
			PCB Dioxin-like Congener TEQ Dermal		5.12E-06	mg/kg	1.5E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-09	1.0E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0001
		C4S-EU2 Total									2E-08					0.005

TABLE B-10

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C4S-EU3	Ingestion	Total PCBs	5.50E+00	mg/kg	9.3E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	9E-09	6.5E-08	mg/kg-day	2.0E-05	mg/kg-day	0.003
				Mercury	1.69E+00	mg/kg	9.5E-09	mg/kg-day	NA	---	NA	6.7E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0002
			Ingestion Total								9E-09					0.003
			PCB Dioxin-like Congener TEQ Ingestion		1.11E-05	mg/kg	1.9E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-09	1.3E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
			Dermal	Total PCBs	5.50E+00	mg/kg	1.6E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-08	1.1E-07	mg/kg-day	2.0E-05	mg/kg-day	0.006
				Mercury	1.69E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-08					0.006
			PCB Dioxin-like Congener TEQ Dermal		1.11E-05	mg/kg	3.2E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-09	2.2E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0003
		C4S-EU3 Total									4E-08					0.01
		Surface Soil at C5N-EU1	Ingestion	Total PCBs	6.05E+00	mg/kg	1.0E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-08	7.2E-08	mg/kg-day	2.0E-05	mg/kg-day	0.004
				Mercury	1.51E+00	mg/kg	8.5E-09	mg/kg-day	NA	---	NA	6.0E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0002
			Ingestion Total								1E-08					0.004
			PCB Dioxin-like Congener TEQ Ingestion		1.22E-05	mg/kg	2.1E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-09	1.4E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
			Dermal	Total PCBs	6.05E+00	mg/kg	1.7E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-08	1.2E-07	mg/kg-day	2.0E-05	mg/kg-day	0.006
				Mercury	1.51E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-08					0.006
			PCB Dioxin-like Congener TEQ Dermal		1.22E-05	mg/kg	3.5E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-09	2.4E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0003
		C5N-EU1 Total									4E-08					0.01
		Surface Soil at C5S-EU1	Ingestion	Total PCBs	1.33E+00	mg/kg	2.3E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-09	1.6E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0008
				Mercury	8.86E-01	mg/kg	5.0E-09	mg/kg-day	NA	---	NA	3.5E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0001
			Ingestion Total								2E-09					0.0009
			PCB Dioxin-like Congener TEQ Ingestion		2.63E-06	mg/kg	4.5E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-10	3.1E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00004
			Dermal	Total PCBs	1.33E+00	mg/kg	3.8E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	4E-09	2.7E-08	mg/kg-day	2.0E-05	mg/kg-day	0.001
				Mercury	8.86E-01	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								4E-09					0.001
			PCB Dioxin-like Congener TEQ Dermal		2.63E-06	mg/kg	7.6E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	5.3E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00008
		C5S-EU1 Total									9E-09					0.003
		Surface Soil at C6N-EU1	Ingestion	Total PCBs	2.14E+00	mg/kg	3.6E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	4E-09	2.5E-08	mg/kg-day	2.0E-05	mg/kg-day	0.001
				Mercury	1.41E+00	mg/kg	8.0E-09	mg/kg-day	NA	---	NA	5.6E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0002
			Ingestion Total								4E-09					0.001
			PCB Dioxin-like Congener TEQ Ingestion		4.14E-06	mg/kg	7.0E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-10	4.9E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00007
			Dermal	Total PCBs	2.14E+00	mg/kg	6.2E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	6E-09	4.3E-08	mg/kg-day	2.0E-05	mg/kg-day	0.002
				Mercury	1.41E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								6E-09					0.002
			PCB Dioxin-like Congener TEQ Dermal		4.14E-06	mg/kg	1.2E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-09	8.3E-14	mg/kg-day	7.0E-10	mg/kg-day	0.0001
		C6N-EU1 Total									1E-08					0.004

TABLE B-10

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C6S-EU1	Ingestion	Total PCBs	2.88E+00	mg/kg	4.9E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	5E-09	3.4E-08	mg/kg-day	2.0E-05	mg/kg-day	0.002
				Mercury	2.95E+00	mg/kg	1.7E-08	mg/kg-day	NA	---	NA	1.2E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0004
			Ingestion Total								5E-09					0.002
			PCB Dioxin-like Congener TEQ Ingestion		5.84E-06	mg/kg	9.9E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	6.9E-14	mg/kg-day	7.0E-10	mg/kg-day	0.0001
			Dermal	Total PCBs	2.88E+00	mg/kg	8.3E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	8E-09	5.8E-08	mg/kg-day	2.0E-05	mg/kg-day	0.003
				Mercury	2.95E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								8E-09					0.003
			PCB Dioxin-like Congener TEQ Dermal		5.84E-06	mg/kg	1.7E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-09	1.2E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
		C6S-EU1 Total									2E-08					0.006
		Surface Soil at C7S-EU1	Ingestion	Total PCBs	1.32E+00	mg/kg	2.2E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-09	1.6E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0008
				Mercury	6.77E-01	mg/kg	3.8E-09	mg/kg-day	NA	---	NA	2.7E-08	mg/kg-day	3.0E-04	mg/kg-day	0.00009
			Ingestion Total								2E-09					0.0009
			PCB Dioxin-like Congener TEQ Ingestion		2.61E-06	mg/kg	4.4E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-10	3.1E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00004
			Dermal	Total PCBs	1.32E+00	mg/kg	3.8E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	4E-09	2.7E-08	mg/kg-day	2.0E-05	mg/kg-day	0.001
				Mercury	6.77E-01	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								4E-09					0.001
			PCB Dioxin-like Congener TEQ Dermal		2.61E-06	mg/kg	7.5E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	5.3E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00008
		C7S-EU1 Total									9E-09					0.003
		Surface Soil at C8N-EU1	Ingestion	Total PCBs	3.09E+00	mg/kg	5.2E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	5E-09	3.7E-08	mg/kg-day	2.0E-05	mg/kg-day	0.002
				Mercury	1.57E+00	mg/kg	8.9E-09	mg/kg-day	NA	---	NA	6.2E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0002
			Ingestion Total								5E-09					0.002
			PCB Dioxin-like Congener TEQ Ingestion		7.22E-06	mg/kg	1.2E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-09	8.6E-14	mg/kg-day	7.0E-10	mg/kg-day	0.0001
			Dermal	Total PCBs	3.09E+00	mg/kg	8.9E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	9E-09	6.2E-08	mg/kg-day	2.0E-05	mg/kg-day	0.003
				Mercury	1.57E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								9E-09					0.003
			PCB Dioxin-like Congener TEQ Dermal		7.22E-06	mg/kg	2.1E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-09	1.5E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
		C8N-EU1 Total									2E-08					0.007

TABLE B-11

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C1-EU2	Ingestion	Total PCBs	4.61E+01	mg/kg	7.5E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	8E-08	3.5E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
			Ingestion Total								8E-08					0.02
			PCB Dioxin-like Congener TEQ Ingestion		9.32E-05	mg/kg	1.5E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	7.1E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
			Dermal	Total PCBs	4.61E+01	mg/kg	4.0E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	4E-08	1.9E-07	mg/kg-day	2.0E-05	mg/kg-day	0.009
			Dermal Total								4E-08					0.009
			PCB Dioxin-like Congener TEQ Dermal		9.32E-05	mg/kg	8.0E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	3.8E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0005
		C1-EU2 Total									1E-07					0.03
		Surface Soil at C2N-EU1	Ingestion	Total PCBs	1.63E+01	mg/kg	2.7E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-08	1.2E-07	mg/kg-day	2.0E-05	mg/kg-day	0.006
				Mercury	1.33E+00	mg/kg	7.3E-09	mg/kg-day	NA	---	NA	3.4E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0001
			Ingestion Total								3E-08					0.006
			PCB Dioxin-like Congener TEQ Ingestion		3.29E-05	mg/kg	5.4E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-09	2.5E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0004
			Dermal	Total PCBs	1.63E+01	mg/kg	1.4E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-08	6.6E-08	mg/kg-day	2.0E-05	mg/kg-day	0.003
				Mercury	1.33E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-08					0.003
			PCB Dioxin-like Congener TEQ Dermal		3.29E-05	mg/kg	2.8E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-09	1.3E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
		C2N-EU1 Total									5E-08					0.01
		Surface Soil at C3N-EU1	Ingestion	Total PCBs	2.32E+01	mg/kg	3.8E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	4E-08	1.8E-07	mg/kg-day	2.0E-05	mg/kg-day	0.009
				Mercury	3.32E+00	mg/kg	1.8E-08	mg/kg-day	NA	---	NA	8.4E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0003
			Ingestion Total								4E-08					0.009
			PCB Dioxin-like Congener TEQ Ingestion		4.14E-05	mg/kg	6.8E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-09	3.2E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0005
			Dermal	Total PCBs	2.32E+01	mg/kg	2.0E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-08	9.4E-08	mg/kg-day	2.0E-05	mg/kg-day	0.005
				Mercury	3.32E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-08					0.005
			PCB Dioxin-like Congener TEQ Dermal		4.14E-05	mg/kg	3.6E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-09	1.7E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
		C3N-EU1 Total									7E-08					0.01
		Surface Soil at C3N-EU2	Ingestion	Total PCBs	3.69E+01	mg/kg	6.0E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	6E-08	2.8E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	4.62E+00	mg/kg	2.5E-08	mg/kg-day	NA	---	NA	1.2E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0004
			Ingestion Total								6E-08					0.01
			PCB Dioxin-like Congener TEQ Ingestion		9.70E-05	mg/kg	1.6E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	7.4E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
			Dermal	Total PCBs	3.69E+01	mg/kg	3.2E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-08	1.5E-07	mg/kg-day	2.0E-05	mg/kg-day	0.007
				Mercury	4.62E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								3E-08					0.007
			PCB Dioxin-like Congener TEQ Dermal		9.70E-05	mg/kg	8.4E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	3.9E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0006
		C3N-EU2 Total									1E-07					0.02

TABLE B-11

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C4N-EU1	Ingestion	Total PCBs	8.12E+00	mg/kg	1.3E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-08	6.2E-08	mg/kg-day	2.0E-05	mg/kg-day	0.003
				Mercury	2.28E+00	mg/kg	1.2E-08	mg/kg-day	NA	---	NA	5.8E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0002
			Ingestion Total								1E-08					0.003
			PCB Dioxin-like Congener TEQ Ingestion		1.84E-05	mg/kg	3.0E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-09	1.4E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
			Dermal	Total PCBs	8.12E+00	mg/kg	7.0E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	7E-09	3.3E-08	mg/kg-day	2.0E-05	mg/kg-day	0.002
				Mercury	2.28E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								7E-09					0.002
			PCB Dioxin-like Congener TEQ Dermal		1.84E-05	mg/kg	1.6E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-09	7.4E-14	mg/kg-day	7.0E-10	mg/kg-day	0.0001
		C4N-EU1 Total									3E-08					0.005
		Surface Soil at C4N-EU2	Ingestion	Total PCBs	8.50E+00	mg/kg	1.4E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-08	6.5E-08	mg/kg-day	2.0E-05	mg/kg-day	0.003
				Mercury	2.74E+00	mg/kg	1.5E-08	mg/kg-day	NA	---	NA	7.0E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0002
			Ingestion Total								1E-08					0.003
			PCB Dioxin-like Congener TEQ Ingestion		1.79E-05	mg/kg	2.9E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-09	1.4E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
			Dermal	Total PCBs	8.50E+00	mg/kg	7.3E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	7E-09	3.4E-08	mg/kg-day	2.0E-05	mg/kg-day	0.002
				Mercury	2.74E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								7E-09					0.002
			PCB Dioxin-like Congener TEQ Dermal		1.79E-05	mg/kg	1.5E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-09	7.2E-14	mg/kg-day	7.0E-10	mg/kg-day	0.0001
		C4N-EU2 Total									3E-08					0.005
		Surface Soil at C4S-EU1	Ingestion	Total PCBs	1.63E+01	mg/kg	2.7E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-08	1.2E-07	mg/kg-day	2.0E-05	mg/kg-day	0.006
				Mercury	3.47E+00	mg/kg	1.9E-08	mg/kg-day	NA	---	NA	8.8E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0003
			Ingestion Total								3E-08					0.007
			PCB Dioxin-like Congener TEQ Ingestion		3.98E-05	mg/kg	6.5E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	8E-09	3.0E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0004
			Dermal	Total PCBs	1.63E+01	mg/kg	1.4E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-08	6.6E-08	mg/kg-day	2.0E-05	mg/kg-day	0.003
				Mercury	3.47E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-08					0.003
			PCB Dioxin-like Congener TEQ Dermal		3.98E-05	mg/kg	3.4E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-09	1.6E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
		C4S-EU1 Total									5E-08					0.01
		Surface Soil at C4S-EU2	Ingestion	Total PCBs	2.51E+00	mg/kg	4.1E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	4E-09	1.9E-08	mg/kg-day	2.0E-05	mg/kg-day	0.001
				Mercury	1.27E+00	mg/kg	6.9E-09	mg/kg-day	NA	---	NA	3.2E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0001
			Ingestion Total								4E-09					0.001
			PCB Dioxin-like Congener TEQ Ingestion		5.12E-06	mg/kg	8.4E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	3.9E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00006
			Dermal	Total PCBs	2.51E+00	mg/kg	2.2E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-09	1.0E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0005
				Mercury	1.27E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-09					0.0005
			PCB Dioxin-like Congener TEQ Dermal		5.12E-06	mg/kg	4.4E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-10	2.1E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00003
		C4S-EU2 Total									8E-09					0.002

TABLE B-11

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C4S-EU3	Ingestion	Total PCBs	5.50E+00	mg/kg	9.0E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	9E-09	4.2E-08	mg/kg-day	2.0E-05	mg/kg-day	0.002
				Mercury	1.69E+00	mg/kg	9.2E-09	mg/kg-day	NA	---	NA	4.3E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0001
			Ingestion Total								9E-09					0.002
			PCB Dioxin-like Congener TEQ Ingestion		1.11E-05	mg/kg	1.8E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-09	8.4E-14	mg/kg-day	7.0E-10	mg/kg-day	0.0001
			Dermal	Total PCBs	5.50E+00	mg/kg	4.7E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	5E-09	2.2E-08	mg/kg-day	2.0E-05	mg/kg-day	0.001
				Mercury	1.69E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								5E-09					0.001
			PCB Dioxin-like Congener TEQ Dermal		1.11E-05	mg/kg	9.5E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	4.5E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00006
		C4S-EU3 Total									2E-08					0.004
		Surface Soil at C5N-EU1	Ingestion	Total PCBs	6.05E+00	mg/kg	9.9E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-08	4.6E-08	mg/kg-day	2.0E-05	mg/kg-day	0.002
				Mercury	1.51E+00	mg/kg	8.2E-09	mg/kg-day	NA	---	NA	3.8E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0001
			Ingestion Total								1E-08					0.002
			PCB Dioxin-like Congener TEQ Ingestion		1.22E-05	mg/kg	2.0E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-09	9.3E-14	mg/kg-day	7.0E-10	mg/kg-day	0.0001
			Dermal	Total PCBs	6.05E+00	mg/kg	5.2E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	5E-09	2.4E-08	mg/kg-day	2.0E-05	mg/kg-day	0.001
				Mercury	1.51E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								5E-09					0.001
			PCB Dioxin-like Congener TEQ Dermal		1.22E-05	mg/kg	1.1E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	4.9E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00007
		C5N-EU1 Total									2E-08					0.004
		Surface Soil at C5S-EU1	Ingestion	Total PCBs	1.33E+00	mg/kg	2.2E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-09	1.0E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0005
				Mercury	8.86E-01	mg/kg	4.8E-09	mg/kg-day	NA	---	NA	2.3E-08	mg/kg-day	3.0E-04	mg/kg-day	0.00008
			Ingestion Total								2E-09					0.0006
			PCB Dioxin-like Congener TEQ Ingestion		2.63E-06	mg/kg	4.3E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-10	2.0E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00003
			Dermal	Total PCBs	1.33E+00	mg/kg	1.2E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-09	5.4E-09	mg/kg-day	2.0E-05	mg/kg-day	0.0003
				Mercury	8.86E-01	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-09					0.0003
			PCB Dioxin-like Congener TEQ Dermal		2.63E-06	mg/kg	2.3E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-10	1.1E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00002
		C5S-EU1 Total									4E-09					0.0009
		Surface Soil at C6N-EU1	Ingestion	Total PCBs	2.14E+00	mg/kg	3.5E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-09	1.6E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0008
				Mercury	1.41E+00	mg/kg	7.7E-09	mg/kg-day	NA	---	NA	3.6E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0001
			Ingestion Total								3E-09					0.0009
			PCB Dioxin-like Congener TEQ Ingestion		4.14E-06	mg/kg	6.8E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-10	3.2E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00005
			Dermal	Total PCBs	2.14E+00	mg/kg	1.8E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-09	8.6E-09	mg/kg-day	2.0E-05	mg/kg-day	0.0004
				Mercury	1.41E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-09					0.0004
			PCB Dioxin-like Congener TEQ Dermal		4.14E-06	mg/kg	3.6E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-10	1.7E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00002
		C6N-EU1 Total									7E-09					0.001

TABLE B-11

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C6S-EU1	Ingestion	Total PCBs	2.88E+00	mg/kg	4.7E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	5E-09	2.2E-08	mg/kg-day	2.0E-05	mg/kg-day	0.001
				Mercury	2.95E+00	mg/kg	1.6E-08	mg/kg-day	NA	---	NA	7.5E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0002
			Ingestion Total								5E-09					0.001
			PCB Dioxin-like Congener TEQ Ingestion		5.84E-06	mg/kg	9.5E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	4.5E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00006
			Dermal	Total PCBs	2.88E+00	mg/kg	2.5E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-09	1.2E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0006
				Mercury	2.95E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-09					0.0006
			PCB Dioxin-like Congener TEQ Dermal		5.84E-06	mg/kg	5.0E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-10	2.4E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00003
		C6S-EU1 Total									9E-09					0.002
		Surface Soil at C7S-EU1	Ingestion	Total PCBs	1.32E+00	mg/kg	2.2E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-09	1.0E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0005
				Mercury	6.77E-01	mg/kg	3.7E-09	mg/kg-day	NA	---	NA	1.7E-08	mg/kg-day	3.0E-04	mg/kg-day	0.00006
			Ingestion Total								2E-09					0.0006
			PCB Dioxin-like Congener TEQ Ingestion		2.61E-06	mg/kg	4.3E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-10	2.0E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00003
			Dermal	Total PCBs	1.32E+00	mg/kg	1.1E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-09	5.3E-09	mg/kg-day	2.0E-05	mg/kg-day	0.0003
				Mercury	6.77E-01	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-09					0.0003
			PCB Dioxin-like Congener TEQ Dermal		2.61E-06	mg/kg	2.3E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-10	1.1E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00002
		C7S-EU1 Total									4E-09					0.0009
		Surface Soil at C8N-EU1	Ingestion	Total PCBs	3.09E+00	mg/kg	5.1E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	5E-09	2.4E-08	mg/kg-day	2.0E-05	mg/kg-day	0.001
				Mercury	1.57E+00	mg/kg	8.5E-09	mg/kg-day	NA	---	NA	4.0E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0001
			Ingestion Total								5E-09					0.001
			PCB Dioxin-like Congener TEQ Ingestion		7.22E-06	mg/kg	1.2E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-09	5.5E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00008
			Dermal	Total PCBs	3.09E+00	mg/kg	2.7E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-09	1.2E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0006
				Mercury	1.57E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								3E-09					0.0006
			PCB Dioxin-like Congener TEQ Dermal		7.22E-06	mg/kg	6.2E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	8E-10	2.9E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00004
		C8N-EU1 Total									1E-08					0.002

TABLE B-12

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C1-EU1	Ingestion	Total PCBs	1.05E+01	mg/kg	1.3E-07	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-07	1.5E-06	mg/kg-day	6.0E-05	mg/kg-day	0.02
			Ingestion Total								1E-07					0.02
			PCB Dioxin-like Congener TEQ Ingestion		2.11E-05	mg/kg	2.6E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-08	3.0E-12	mg/kg-day	7.0E-10	mg/kg-day	0.004
			Dermal	Total PCBs	1.05E+01	mg/kg	5.7E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	6E-08	6.7E-07	mg/kg-day	6.0E-05	mg/kg-day	0.01
			Dermal Total								6E-08					0.01
			PCB Dioxin-like Congener TEQ Dermal		2.11E-05	mg/kg	1.2E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	1.3E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
		C1-EU1 Total									2E-07					0.04
		Surface Soil at C3S-EU1	Ingestion	Total PCBs	1.95E+01	mg/kg	2.4E-07	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-07	2.8E-06	mg/kg-day	6.0E-05	mg/kg-day	0.05
				Mercury	8.96E+00	mg/kg	3.6E-07	mg/kg-day	NA	---	NA	4.3E-06	mg/kg-day	3.0E-03	mg/kg-day	0.001
			Ingestion Total								2E-07					0.05
			PCB Dioxin-like Congener TEQ Ingestion		3.93E-05	mg/kg	4.8E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-08	5.6E-12	mg/kg-day	7.0E-10	mg/kg-day	0.008
			Dermal	Total PCBs	1.95E+01	mg/kg	1.1E-07	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-07	1.2E-06	mg/kg-day	6.0E-05	mg/kg-day	0.02
				Mercury	8.96E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-03	mg/kg-day	NA
			Dermal Total								1E-07					0.02
			PCB Dioxin-like Congener TEQ Dermal		3.93E-05	mg/kg	2.2E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-08	2.5E-12	mg/kg-day	7.0E-10	mg/kg-day	0.004
		C3S-EU1 Total									4E-07					0.08
		Surface Soil at C3S-EU2	Ingestion	Total PCBs	2.36E+01	mg/kg	2.9E-07	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-07	3.4E-06	mg/kg-day	6.0E-05	mg/kg-day	0.06
				Mercury	3.90E+00	mg/kg	1.6E-07	mg/kg-day	NA	---	NA	1.8E-06	mg/kg-day	3.0E-03	mg/kg-day	0.0006
			Ingestion Total								3E-07					0.06
			PCB Dioxin-like Congener TEQ Ingestion		1.07E-04	mg/kg	1.3E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-07	1.5E-11	mg/kg-day	7.0E-10	mg/kg-day	0.02
			Dermal	Total PCBs	2.36E+01	mg/kg	1.3E-07	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-07	1.5E-06	mg/kg-day	6.0E-05	mg/kg-day	0.03
				Mercury	3.90E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-03	mg/kg-day	NA
			Dermal Total								1E-07					0.03
			PCB Dioxin-like Congener TEQ Dermal		1.07E-04	mg/kg	5.9E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	8E-08	6.8E-12	mg/kg-day	7.0E-10	mg/kg-day	0.01
		C3S-EU2 Total									7E-07					0.1

TABLE B-13

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C1-EU1	Ingestion	Total PCBs	1.05E+01	mg/kg	3.6E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	4E-08	2.5E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
			Ingestion Total								4E-08					0.01
			PCB Dioxin-like Congener TEQ Ingestion		2.11E-05	mg/kg	7.2E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-09	5.0E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0007
			Dermal	Total PCBs	1.05E+01	mg/kg	6.0E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	6E-08	4.2E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
			Dermal Total								6E-08					0.02
			PCB Dioxin-like Congener TEQ Dermal		2.11E-05	mg/kg	1.2E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	8.5E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
		C1-EU1 Total									1E-07					0.04
		Surface Soil at C3S-EU1	Ingestion	Total PCBs	1.95E+01	mg/kg	6.6E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	7E-08	4.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
				Mercury	8.96E+00	mg/kg	1.0E-07	mg/kg-day	NA	---	NA	7.1E-07	mg/kg-day	3.0E-04	mg/kg-day	0.002
			Ingestion Total								7E-08					0.03
			PCB Dioxin-like Congener TEQ Ingestion		3.93E-05	mg/kg	1.3E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	9.3E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
			Dermal	Total PCBs	1.95E+01	mg/kg	1.1E-07	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-07	7.8E-07	mg/kg-day	2.0E-05	mg/kg-day	0.04
				Mercury	8.96E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-07					0.04
			PCB Dioxin-like Congener TEQ Dermal		3.93E-05	mg/kg	2.3E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-08	1.6E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
		C3S-EU1 Total									2E-07					0.07
		Surface Soil at C3S-EU2	Ingestion	Total PCBs	2.36E+01	mg/kg	8.0E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	8E-08	5.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.03
				Mercury	3.90E+00	mg/kg	4.4E-08	mg/kg-day	NA	---	NA	3.1E-07	mg/kg-day	3.0E-04	mg/kg-day	0.001
			Ingestion Total								8E-08					0.03
			PCB Dioxin-like Congener TEQ Ingestion		1.07E-04	mg/kg	3.6E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-08	2.5E-12	mg/kg-day	7.0E-10	mg/kg-day	0.004
			Dermal	Total PCBs	2.36E+01	mg/kg	1.4E-07	mg/kg-day	1.0E+00	(mg/kg-day)-1	1E-07	9.5E-07	mg/kg-day	2.0E-05	mg/kg-day	0.05
				Mercury	3.90E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-07					0.05
			PCB Dioxin-like Congener TEQ Dermal		1.07E-04	mg/kg	6.2E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	8E-08	4.3E-12	mg/kg-day	7.0E-10	mg/kg-day	0.006
		C3S-EU2 Total									3E-07					0.09

TABLE B-14
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
ANNISTON PCB SITE
OU4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at C1-EU1	Ingestion	Total PCBs	1.05E+01	mg/kg	3.4E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-08	1.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.008
			Ingestion Total								3E-08					0.008
			PCB Dioxin-like Congener TEQ Ingestion		2.11E-05	mg/kg	6.9E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-09	3.2E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0005
			Dermal	Total PCBs	1.05E+01	mg/kg	1.8E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-08	8.4E-08	mg/kg-day	2.0E-05	mg/kg-day	0.004
			Dermal Total								2E-08					0.004
			PCB Dioxin-like Congener TEQ Dermal		2.11E-05	mg/kg	3.6E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-09	1.7E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
		C1-EU1 Total									7E-08					0.01
		Surface Soil at C3S-EU1	Ingestion	Total PCBs	1.95E+01	mg/kg	6.4E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	6E-08	3.0E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	8.96E+00	mg/kg	9.8E-08	mg/kg-day	NA	---	NA	4.6E-07	mg/kg-day	3.0E-04	mg/kg-day	0.002
			Ingestion Total								6E-08					0.02
			PCB Dioxin-like Congener TEQ Ingestion		3.93E-05	mg/kg	1.3E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	6.0E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0009
			Dermal	Total PCBs	1.95E+01	mg/kg	3.4E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-08	1.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.008
				Mercury	8.96E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								3E-08					0.008
			PCB Dioxin-like Congener TEQ Dermal		3.93E-05	mg/kg	6.8E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	9E-09	3.2E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0005
		C3S-EU1 Total									1E-07					0.03
		Surface Soil at C3S-EU2	Ingestion	Total PCBs	2.36E+01	mg/kg	7.7E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	8E-08	3.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
				Mercury	3.90E+00	mg/kg	4.2E-08	mg/kg-day	NA	---	NA	2.0E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0007
			Ingestion Total								8E-08					0.02
			PCB Dioxin-like Congener TEQ Ingestion		1.07E-04	mg/kg	3.5E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-08	1.6E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
			Dermal	Total PCBs	2.36E+01	mg/kg	4.1E-08	mg/kg-day	1.0E+00	(mg/kg-day)-1	4E-08	1.9E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	3.90E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								4E-08					0.01
			PCB Dioxin-like Congener TEQ Dermal		1.07E-04	mg/kg	1.9E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	8.6E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
		C3S-EU2 Total									2E-07					0.03

TABLE B-15

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Total Soil	Total Soil at C1-EU2	Ingestion	Total PCBs	6.69E+01	mg/kg	3.7E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	7E-08	2.6E-06	mg/kg-day	2.0E-05	mg/kg-day	0.1
			Ingestion Total								7E-08					0.1
			PCB Dioxin-like Congener TEQ Ingestion		1.35E-04	mg/kg	7.5E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	5.2E-12	mg/kg-day	7.0E-10	mg/kg-day	0.007
			Dermal	Total PCBs	6.69E+01	mg/kg	2.2E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-08	1.6E-06	mg/kg-day	2.0E-05	mg/kg-day	0.08
			Dermal Total								4E-08					0.08
			PCB Dioxin-like Congener TEQ Dermal		1.35E-04	mg/kg	4.5E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-09	3.1E-12	mg/kg-day	7.0E-10	mg/kg-day	0.004
		C1-EU2 Total									1E-07					0.2
		Total Soil at C2N-EU1	Ingestion	Total PCBs	3.62E+01	mg/kg	2.0E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-08	1.4E-06	mg/kg-day	2.0E-05	mg/kg-day	0.07
				Mercury	1.33E+00	mg/kg	2.5E-09	mg/kg-day	NA	---	NA	1.7E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0006
			Ingestion Total								4E-08					0.07
			PCB Dioxin-like Congener TEQ Ingestion		7.31E-05	mg/kg	4.0E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-09	2.8E-12	mg/kg-day	7.0E-10	mg/kg-day	0.004
			Dermal	Total PCBs	3.62E+01	mg/kg	1.2E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-08	8.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.04
				Mercury	1.33E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-08					0.04
			PCB Dioxin-like Congener TEQ Dermal		7.31E-05	mg/kg	2.4E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-09	1.7E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
		C2N-EU1 Total									7E-08					0.1
		Total Soil at C4N-EU1	Ingestion	Total PCBs	6.08E+00	mg/kg	3.4E-09	mg/kg-day	2.0E+00	(mg/kg-day)-1	7E-09	2.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	2.12E+00	mg/kg	3.9E-09	mg/kg-day	NA	---	NA	2.7E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0009
			Ingestion Total								7E-09					0.01
			PCB Dioxin-like Congener TEQ Ingestion		1.33E-05	mg/kg	7.4E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	5.2E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0007
			Dermal	Total PCBs	6.08E+00	mg/kg	2.0E-09	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-09	1.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.007
				Mercury	2.12E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								4E-09					0.007
			PCB Dioxin-like Congener TEQ Dermal		1.33E-05	mg/kg	4.4E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-10	3.1E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0004
		C4N-EU1 Total									1E-08					0.02
		Total Soil at C5N-EU1	Ingestion	Total PCBs	1.19E+01	mg/kg	6.6E-09	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-08	4.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.02
				Mercury	1.51E+00	mg/kg	2.8E-09	mg/kg-day	NA	---	NA	1.9E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0006
			Ingestion Total								1E-08					0.02
			PCB Dioxin-like Congener TEQ Ingestion		2.39E-05	mg/kg	1.3E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-09	9.3E-13	mg/kg-day	7.0E-10	mg/kg-day	0.001
			Dermal	Total PCBs	1.19E+01	mg/kg	3.9E-09	mg/kg-day	2.0E+00	(mg/kg-day)-1	8E-09	2.8E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
				Mercury	1.51E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								8E-09					0.01
			PCB Dioxin-like Congener TEQ Dermal		2.39E-05	mg/kg	8.0E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	5.6E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0008
		C5N-EU1 Total									2E-08					0.04

TABLE B-16
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE
OU4

Scenario Timeframe: Current/Future
Receptor Population: Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Total Soil	Total Soil at C1-EU2	Ingestion	Total PCBs	6.69E+01	mg/kg	2.8E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-09	2.0E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
			Ingestion Total								3E-09					0.01
			PCB Dioxin-like Congener TEQ Ingestion		1.35E-04	mg/kg	5.7E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-10	4.0E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0006
			Dermal	Total PCBs	6.69E+01	mg/kg	3.7E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	4E-09	2.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.01
			Dermal Total								4E-09					0.01
			PCB Dioxin-like Congener TEQ Dermal		1.35E-04	mg/kg	7.5E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	5.2E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0007
		C1-EU2 Total									8E-09					0.02
		Total Soil at C2N-EU1	Ingestion	Total PCBs	3.62E+01	mg/kg	1.5E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-09	1.1E-07	mg/kg-day	2.0E-05	mg/kg-day	0.005
				Mercury	1.33E+00	mg/kg	1.9E-10	mg/kg-day	NA	---	NA	1.3E-08	mg/kg-day	3.0E-04	mg/kg-day	0.00004
			Ingestion Total								2E-09					0.005
			PCB Dioxin-like Congener TEQ Ingestion		7.31E-05	mg/kg	3.1E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-10	2.1E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0003
			Dermal	Total PCBs	3.62E+01	mg/kg	2.0E-09	mg/kg-day	1.0E+00	(mg/kg-day)-1	2E-09	1.4E-07	mg/kg-day	2.0E-05	mg/kg-day	0.007
				Mercury	1.33E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-09					0.007
			PCB Dioxin-like Congener TEQ Dermal		7.31E-05	mg/kg	4.0E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	5E-10	2.8E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0004
		C2N-EU1 Total									4E-09					0.01
		Total Soil at C4N-EU1	Ingestion	Total PCBs	6.08E+00	mg/kg	2.6E-10	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-10	1.8E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0009
				Mercury	2.12E+00	mg/kg	3.0E-10	mg/kg-day	NA	---	NA	2.1E-08	mg/kg-day	3.0E-04	mg/kg-day	0.00007
			Ingestion Total								3E-10					0.001
			PCB Dioxin-like Congener TEQ Ingestion		1.33E-05	mg/kg	5.6E-16	mg/kg-day	1.3E+05	(mg/kg-day)-1	7E-11	3.9E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00006
			Dermal	Total PCBs	6.08E+00	mg/kg	3.4E-10	mg/kg-day	1.0E+00	(mg/kg-day)-1	3E-10	2.4E-08	mg/kg-day	2.0E-05	mg/kg-day	0.001
				Mercury	2.12E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								3E-10					0.001
			PCB Dioxin-like Congener TEQ Dermal		1.33E-05	mg/kg	7.4E-16	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-10	5.2E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00007
		C4N-EU1 Total									8E-10					0.002
		Total Soil at C5N-EU1	Ingestion	Total PCBs	1.19E+01	mg/kg	5.0E-10	mg/kg-day	1.0E+00	(mg/kg-day)-1	5E-10	3.5E-08	mg/kg-day	2.0E-05	mg/kg-day	0.002
				Mercury	1.51E+00	mg/kg	2.1E-10	mg/kg-day	NA	---	NA	1.5E-08	mg/kg-day	3.0E-04	mg/kg-day	0.00005
			Ingestion Total								5E-10					0.002
			PCB Dioxin-like Congener TEQ Ingestion		2.39E-05	mg/kg	1.0E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-10	7.0E-14	mg/kg-day	7.0E-10	mg/kg-day	0.0001
			Dermal	Total PCBs	1.19E+01	mg/kg	6.6E-10	mg/kg-day	1.0E+00	(mg/kg-day)-1	7E-10	4.6E-08	mg/kg-day	2.0E-05	mg/kg-day	0.002
				Mercury	1.51E+00	mg/kg	NA	mg/kg-day	NA	---	NA	NA	mg/kg-day	3.0E-04	mg/kg-day	NA
			Dermal Total								7E-10					0.002
			PCB Dioxin-like Congener TEQ Dermal		2.39E-05	mg/kg	1.3E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-10	9.3E-14	mg/kg-day	7.0E-10	mg/kg-day	0.0001
		C5N-EU1 Total									1E-09					0.004

TABLE B-17

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Farmer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at Ag-EU1	Ingestion	Total PCBs	4.25E+01	mg/kg	5.7E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-06	1.0E-06	mg/kg-day	2.0E-05	mg/kg-day	0.05
				Mercury	1.34E+01	mg/kg	6.0E-07	mg/kg-day	NA	---	NA	1.1E-06	mg/kg-day	3.0E-04	mg/kg-day	0.004
			Ingestion Total								1E-06					0.05
			PCB Dioxin-like Congener TEQ Ingestion		8.59E-05	mg/kg	1.2E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-07	2.0E-12	mg/kg-day	7.0E-10	mg/kg-day	0.003
			Dermal	Total PCBs	4.25E+01	mg/kg	7.5E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-06	1.3E-06	mg/kg-day	2.0E-05	mg/kg-day	0.07
				Mercury	1.34E+01	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-06					0.07
			PCB Dioxin-like Congener TEQ Dermal		8.59E-05	mg/kg	1.5E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-07	2.7E-12	mg/kg-day	7.0E-10	mg/kg-day	0.004
		Ag-EU1 Total									3E-06					0.1
		Surface Soil at Ag-EU2	Ingestion	Total PCBs	2.23E+01	mg/kg	3.0E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	6E-07	5.2E-07	mg/kg-day	2.0E-05	mg/kg-day	0.03
				Mercury	3.15E+00	mg/kg	1.4E-07	mg/kg-day	NA	---	NA	2.5E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0008
			Ingestion Total								6E-07					0.03
			PCB Dioxin-like Congener TEQ Ingestion		4.50E-05	mg/kg	6.0E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	8E-08	1.1E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
			Dermal	Total PCBs	2.23E+01	mg/kg	4.0E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	8E-07	6.9E-07	mg/kg-day	2.0E-05	mg/kg-day	0.03
				Mercury	3.15E+00	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								8E-07					0.03
			PCB Dioxin-like Congener TEQ Dermal		4.50E-05	mg/kg	8.0E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-07	1.4E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
		Ag-EU2 Total									2E-06					0.07
		Surface Soil at Ag-EU3	Ingestion	Total PCBs	2.87E+01	mg/kg	3.8E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	8E-07	6.7E-07	mg/kg-day	2.0E-05	mg/kg-day	0.03
				Mercury	4.97E+00	mg/kg	2.2E-07	mg/kg-day	NA	---	NA	3.9E-07	mg/kg-day	3.0E-04	mg/kg-day	0.001
			Ingestion Total								8E-07					0.03
			PCB Dioxin-like Congener TEQ Ingestion		5.79E-05	mg/kg	7.8E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-07	1.4E-12	mg/kg-day	7.0E-10	mg/kg-day	0.002
			Dermal	Total PCBs	2.87E+01	mg/kg	5.1E-07	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-06	8.9E-07	mg/kg-day	2.0E-05	mg/kg-day	0.04
				Mercury	4.97E+00	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-06					0.04
			PCB Dioxin-like Congener TEQ Dermal		5.79E-05	mg/kg	1.0E-12	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-07	1.8E-12	mg/kg-day	7.0E-10	mg/kg-day	0.003
		Ag-EU3 Total									2E-06					0.08
		Surface Soil at Ag-EU4	Ingestion	Total PCBs	1.74E+00	mg/kg	2.3E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	5E-08	4.1E-08	mg/kg-day	2.0E-05	mg/kg-day	0.002
				Mercury	1.66E+00	mg/kg	7.4E-08	mg/kg-day	NA	---	NA	1.3E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0004
			Ingestion Total								5E-08					0.002
			PCB Dioxin-like Congener TEQ Ingestion		3.45E-06	mg/kg	4.6E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-09	8.1E-14	mg/kg-day	7.0E-10	mg/kg-day	0.0001
			Dermal	Total PCBs	1.74E+00	mg/kg	3.1E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	6E-08	5.4E-08	mg/kg-day	2.0E-05	mg/kg-day	0.003
				Mercury	1.66E+00	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								6E-08					0.003
			PCB Dioxin-like Congener TEQ Dermal		3.45E-06	mg/kg	6.1E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	8E-09	1.1E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
		Ag-EU4 Total									1E-07					0.005

TABLE B-17
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
ANNISTON PCB SITE
OU4

Scenario Timeframe: Current/Future
Receptor Population: Farmer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
		Surface Soil at Ag-EU5	Ingestion	Total PCBs	5.29E+00	mg/kg	7.1E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-07	1.2E-07	mg/kg-day	2.0E-05	mg/kg-day	0.006
				Mercury	1.65E+00	mg/kg	7.4E-08	mg/kg-day	NA	---	NA	1.3E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0004
			Ingestion Total								1E-07					0.007
			PCB Dioxin-like Congener TEQ Ingestion		1.06E-05	mg/kg	1.4E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	2.5E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0004
			Dermal	Total PCBs	5.29E+00	mg/kg	9.4E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-07	1.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.008
				Mercury	1.65E+00	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-07					0.008
			PCB Dioxin-like Congener TEQ Dermal		1.06E-05	mg/kg	1.9E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	3.3E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0005
		Ag-EU5 Total									4E-07					0.02
		Surface Soil at Ag-EU6	Ingestion	Total PCBs	4.08E-02	mg/kg	5.5E-10	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-09	9.6E-10	mg/kg-day	2.0E-05	mg/kg-day	0.00005
				Mercury	2.14E-01	mg/kg	9.6E-09	mg/kg-day	NA	---	NA	1.7E-08	mg/kg-day	3.0E-04	mg/kg-day	0.00006
			Ingestion Total								1E-09					0.0001
			PCB Dioxin-like Congener TEQ Ingestion		1.94E-08	mg/kg	2.6E-16	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-11	4.6E-16	mg/kg-day	7.0E-10	mg/kg-day	0.0000007
			Dermal	Total PCBs	4.08E-02	mg/kg	7.2E-10	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-09	1.3E-09	mg/kg-day	2.0E-05	mg/kg-day	0.00006
				Mercury	2.14E-01	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-09					0.00006
			PCB Dioxin-like Congener TEQ Dermal		1.94E-08	mg/kg	3.4E-16	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-11	6.0E-16	mg/kg-day	7.0E-10	mg/kg-day	0.0000009
		Ag-EU6 Total									3E-09					0.0002
		Surface Soil at Ag-EU7	Ingestion	Total PCBs	7.97E-01	mg/kg	1.1E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-08	1.9E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0009
				Mercury	5.25E-01	mg/kg	2.3E-08	mg/kg-day	NA	---	NA	4.1E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0001
			Ingestion Total								2E-08					0.001
			PCB Dioxin-like Congener TEQ Ingestion		1.55E-06	mg/kg	2.1E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-09	3.6E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00005
			Dermal	Total PCBs	7.97E-01	mg/kg	1.4E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	3E-08	2.5E-08	mg/kg-day	2.0E-05	mg/kg-day	0.001
				Mercury	5.25E-01	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								3E-08					0.001
			PCB Dioxin-like Congener TEQ Dermal		1.55E-06	mg/kg	2.7E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-09	4.8E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00007
		Ag-EU7 Total									6E-08					0.002
		Surface Soil at Ag-EU8	Ingestion	Total PCBs	4.44E-01	mg/kg	6.0E-09	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-08	1.0E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0005
				Mercury	1.20E+00	mg/kg	5.4E-08	mg/kg-day	NA	---	NA	9.4E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0003
			Ingestion Total								1E-08					0.0008
			PCB Dioxin-like Congener TEQ Ingestion		8.34E-07	mg/kg	1.1E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	2.0E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00003
			Dermal	Total PCBs	4.44E-01	mg/kg	7.9E-09	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-08	1.4E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0007
				Mercury	1.20E+00	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-08					0.0007
			PCB Dioxin-like Congener TEQ Dermal		8.34E-07	mg/kg	1.5E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-09	2.6E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00004
		Ag-EU8 Total									3E-08					0.002

TABLE B-18

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Farmer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at Ag-EU1	Ingestion	Total PCBs	4.25E+01	mg/kg	7.1E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-07	1.2E-07	mg/kg-day	2.0E-05	mg/kg-day	0.006
				Mercury	1.34E+01	mg/kg	7.5E-08	mg/kg-day	NA	---	NA	1.3E-07	mg/kg-day	3.0E-04	mg/kg-day	0.0004
			Ingestion Total								1E-07					0.007
			PCB Dioxin-like Congener TEQ Ingestion		8.59E-05	mg/kg	1.4E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	2.5E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0004
			Dermal	Total PCBs	4.25E+01	mg/kg	9.4E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-07	1.6E-07	mg/kg-day	2.0E-05	mg/kg-day	0.008
				Mercury	1.34E+01	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-07					0.008
			PCB Dioxin-like Congener TEQ Dermal		8.59E-05	mg/kg	1.9E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	3.3E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0005
		Ag-EU1 Total									4E-07					0.02
		Surface Soil at Ag-EU2	Ingestion	Total PCBs	2.23E+01	mg/kg	3.7E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	7E-08	6.5E-08	mg/kg-day	2.0E-05	mg/kg-day	0.003
				Mercury	3.15E+00	mg/kg	1.8E-08	mg/kg-day	NA	---	NA	3.1E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0001
			Ingestion Total								7E-08					0.003
			PCB Dioxin-like Congener TEQ Ingestion		4.50E-05	mg/kg	7.6E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	1.3E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
			Dermal	Total PCBs	2.23E+01	mg/kg	4.9E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-07	8.6E-08	mg/kg-day	2.0E-05	mg/kg-day	0.004
				Mercury	3.15E+00	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-07					0.004
			PCB Dioxin-like Congener TEQ Dermal		4.50E-05	mg/kg	1.0E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	1.7E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
		Ag-EU2 Total									2E-07					0.008
		Surface Soil at Ag-EU3	Ingestion	Total PCBs	2.87E+01	mg/kg	4.8E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-07	8.4E-08	mg/kg-day	2.0E-05	mg/kg-day	0.004
				Mercury	4.97E+00	mg/kg	2.8E-08	mg/kg-day	NA	---	NA	4.9E-08	mg/kg-day	3.0E-04	mg/kg-day	0.0002
			Ingestion Total								1E-07					0.004
			PCB Dioxin-like Congener TEQ Ingestion		5.79E-05	mg/kg	9.7E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-08	1.7E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0002
			Dermal	Total PCBs	2.87E+01	mg/kg	6.3E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-07	1.1E-07	mg/kg-day	2.0E-05	mg/kg-day	0.006
				Mercury	4.97E+00	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								1E-07					0.006
			PCB Dioxin-like Congener TEQ Dermal		5.79E-05	mg/kg	1.3E-13	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-08	2.2E-13	mg/kg-day	7.0E-10	mg/kg-day	0.0003
		Ag-EU3 Total									3E-07					0.01
		Surface Soil at Ag-EU4	Ingestion	Total PCBs	1.74E+00	mg/kg	2.9E-09	mg/kg-day	2.0E+00	(mg/kg-day)-1	6E-09	5.1E-09	mg/kg-day	2.0E-05	mg/kg-day	0.0003
				Mercury	1.66E+00	mg/kg	9.3E-09	mg/kg-day	NA	---	NA	1.6E-08	mg/kg-day	3.0E-04	mg/kg-day	0.00005
			Ingestion Total								6E-09					0.0003
			PCB Dioxin-like Congener TEQ Ingestion		3.45E-06	mg/kg	5.8E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	8E-10	1.0E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00001
			Dermal	Total PCBs	1.74E+00	mg/kg	3.8E-09	mg/kg-day	2.0E+00	(mg/kg-day)-1	8E-09	6.7E-09	mg/kg-day	2.0E-05	mg/kg-day	0.0003
				Mercury	1.66E+00	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								8E-09					0.0003
			PCB Dioxin-like Congener TEQ Dermal		3.45E-06	mg/kg	7.6E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	1E-09	1.3E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00002
		Ag-EU4 Total									2E-08					0.0007

TABLE B-18

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU4

Scenario Timeframe: Current/Future
Receptor Population: Farmer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
		Surface Soil at Ag-EU5	Ingestion	Total PCBs	5.29E+00	mg/kg	8.9E-09	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-08	1.6E-08	mg/kg-day	2.0E-05	mg/kg-day	0.0008
				Mercury	1.65E+00	mg/kg	9.2E-09	mg/kg-day	NA	---	NA	1.6E-08	mg/kg-day	3.0E-04	mg/kg-day	0.00005
			Ingestion Total								2E-08					0.0008
			PCB Dioxin-like Congener TEQ Ingestion		1.06E-05	mg/kg	1.8E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-09	3.1E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00004
			Dermal	Total PCBs	5.29E+00	mg/kg	1.2E-08	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-08	2.0E-08	mg/kg-day	2.0E-05	mg/kg-day	0.001
				Mercury	1.65E+00	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-08					0.001
			PCB Dioxin-like Congener TEQ Dermal		1.06E-05	mg/kg	2.4E-14	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-09	4.1E-14	mg/kg-day	7.0E-10	mg/kg-day	0.00006
		Ag-EU5 Total									5E-08					0.002
		Surface Soil at Ag-EU6	Ingestion	Total PCBs	4.08E-02	mg/kg	6.8E-11	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-10	1.2E-10	mg/kg-day	2.0E-05	mg/kg-day	0.000006
				Mercury	2.14E-01	mg/kg	1.2E-09	mg/kg-day	NA	---	NA	2.1E-09	mg/kg-day	3.0E-04	mg/kg-day	0.000007
			Ingestion Total								1E-10					0.00001
			PCB Dioxin-like Congener TEQ Ingestion		1.94E-08	mg/kg	3.3E-17	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-12	5.7E-17	mg/kg-day	7.0E-10	mg/kg-day	0.00000008
			Dermal	Total PCBs	4.08E-02	mg/kg	9.0E-11	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-10	1.6E-10	mg/kg-day	2.0E-05	mg/kg-day	0.000008
				Mercury	2.14E-01	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-10					0.000008
			PCB Dioxin-like Congener TEQ Dermal		1.94E-08	mg/kg	4.3E-17	mg/kg-day	1.3E+05	(mg/kg-day)-1	6E-12	7.5E-17	mg/kg-day	7.0E-10	mg/kg-day	0.0000001
		Ag-EU6 Total									3E-10					0.00002
		Surface Soil at Ag-EU7	Ingestion	Total PCBs	7.97E-01	mg/kg	1.3E-09	mg/kg-day	2.0E+00	(mg/kg-day)-1	3E-09	2.3E-09	mg/kg-day	2.0E-05	mg/kg-day	0.0001
				Mercury	5.25E-01	mg/kg	2.9E-09	mg/kg-day	NA	---	NA	5.1E-09	mg/kg-day	3.0E-04	mg/kg-day	0.00002
			Ingestion Total								3E-09					0.0001
			PCB Dioxin-like Congener TEQ Ingestion		1.55E-06	mg/kg	2.6E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	3E-10	4.5E-15	mg/kg-day	7.0E-10	mg/kg-day	0.000006
			Dermal	Total PCBs	7.97E-01	mg/kg	1.8E-09	mg/kg-day	2.0E+00	(mg/kg-day)-1	4E-09	3.1E-09	mg/kg-day	2.0E-05	mg/kg-day	0.0002
				Mercury	5.25E-01	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								4E-09					0.0002
			PCB Dioxin-like Congener TEQ Dermal		1.55E-06	mg/kg	3.4E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	4E-10	6.0E-15	mg/kg-day	7.0E-10	mg/kg-day	0.000009
		Ag-EU7 Total									7E-09					0.0003
		Surface Soil at Ag-EU8	Ingestion	Total PCBs	4.44E-01	mg/kg	7.4E-10	mg/kg-day	2.0E+00	(mg/kg-day)-1	1E-09	1.3E-09	mg/kg-day	2.0E-05	mg/kg-day	0.00007
				Mercury	1.20E+00	mg/kg	6.7E-09	mg/kg-day	NA	---	NA	1.2E-08	mg/kg-day	3.0E-04	mg/kg-day	0.00004
			Ingestion Total								1E-09					0.0001
			PCB Dioxin-like Congener TEQ Ingestion		8.34E-07	mg/kg	1.4E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-10	2.4E-15	mg/kg-day	7.0E-10	mg/kg-day	0.000003
			Dermal	Total PCBs	4.44E-01	mg/kg	9.8E-10	mg/kg-day	2.0E+00	(mg/kg-day)-1	2E-09	1.7E-09	mg/kg-day	2.0E-05	mg/kg-day	0.00009
				Mercury	1.20E+00	mg/kg	NA	---	NA	---	NA	NA	---	3.0E-04	mg/kg-day	NA
			Dermal Total								2E-09					0.00009
			PCB Dioxin-like Congener TEQ Dermal		8.34E-07	mg/kg	1.8E-15	mg/kg-day	1.3E+05	(mg/kg-day)-1	2E-10	3.2E-15	mg/kg-day	7.0E-10	mg/kg-day	0.000005
		Ag-EU8 Total									4E-09					0.0002

TABLE B-19

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU2	Total PCBs	1E-06	---	5E-06	7E-06	Eyes, Immune system	0.2	---	0.9	1
		C1-EU2 Total		1E-06	---	5E-06	7E-06		0.2	---	0.9	1
		C1-EU2 PCB Dioxin-like Congener TEQ		2E-07	---	7E-07	9E-07	Developmental	0.01	---	0.05	0.07
		Surface Soil at C2N-EU1	Total PCBs	4E-07	---	2E-06	2E-06	Eyes, Immune system	0.08	---	0.3	0.4
			Mercury	---	---	---	---	Immune system	0.001	---	---	0.001
		C2N-EU1 Total		4E-07	---	2E-06	2E-06		0.08	---	0.3	0.4
		C2N-EU1 PCB Dioxin-like Congener TEQ		6E-08	---	2E-07	3E-07	Developmental	0.004	---	0.02	0.02
		Surface Soil at C3N-EU1	Total PCBs	6E-07	---	3E-06	3E-06	Eyes, Immune system	0.1	---	0.5	0.6
			Mercury	---	---	---	---	Immune system	0.004	---	---	0.004
		C3N-EU1 Total		6E-07	---	3E-06	3E-06		0.1	---	0.5	0.6
		C3N-EU1 PCB Dioxin-like Congener TEQ		7E-08	---	3E-07	4E-07	Developmental	0.006	---	0.02	0.03
		Surface Soil at C3N-EU2	Total PCBs	1E-06	---	4E-06	5E-06	Eyes, Immune system	0.2	---	0.7	0.9
			Mercury	---	---	---	---	Immune system	0.005	---	---	0.005
		C3N-EU2 Total		1E-06	---	4E-06	5E-06		0.2	---	0.7	0.9
		C3N-EU2 PCB Dioxin-like Congener TEQ		2E-07	---	7E-07	9E-07	Developmental	0.01	---	0.06	0.07
		Surface Soil at C4N-EU1	Total PCBs	2E-07	---	9E-07	1E-06	Eyes, Immune system	0.04	---	0.2	0.2
			Mercury	---	---	---	---	Immune system	0.002	---	---	0.002
		C4N-EU1 Total		2E-07	---	9E-07	1E-06		0.04	---	0.2	0.2
		C4N-EU1 PCB Dioxin-like Congener TEQ		3E-08	---	1E-07	2E-07	Developmental	0.002	---	0.01	0.01
		Surface Soil at C4N-EU2	Total PCBs	2E-07	---	1E-06	1E-06	Eyes, Immune system	0.04	---	0.2	0.2
			Mercury	---	---	---	---	Immune system	0.003	---	---	0.003
		C4N-EU2 Total		2E-07	---	1E-06	1E-06		0.04	---	0.2	0.2
		C4N-EU2 PCB Dioxin-like Congener TEQ		3E-08	---	1E-07	2E-07	Developmental	0.002	---	0.01	0.01
		Surface Soil at C4S-EU1	Total PCBs	4E-07	---	2E-06	2E-06	Eyes, Immune system	0.08	---	0.3	0.4
			Mercury	---	---	---	---	Immune system	0.004	---	---	0.004
		C4S-EU1 Total		4E-07	---	2E-06	2E-06		0.08	---	0.3	0.4
		C4S-EU1 PCB Dioxin-like Congener TEQ		7E-08	---	3E-07	4E-07	Developmental	0.005	---	0.02	0.03
		Surface Soil at C4S-EU2	Total PCBs	7E-08	---	3E-07	4E-07	Eyes, Immune system	0.01	---	0.05	0.06
			Mercury	---	---	---	---	Immune system	0.001	---	---	0.001
		C4S-EU2 Total		7E-08	---	3E-07	4E-07		0.01	---	0.05	0.06
		C4S-EU2 PCB Dioxin-like Congener TEQ		9E-09	---	4E-08	5E-08	Developmental	0.0007	---	0.003	0.004
		Surface Soil at C4S-EU3	Total PCBs	1E-07	---	6E-07	8E-07	Eyes, Immune system	0.03	---	0.1	0.1
			Mercury	---	---	---	---	Immune system	0.002	---	---	0.002
		C4S-EU3 Total		1E-07	---	6E-07	8E-07		0.03	---	0.1	0.1
		C4S-EU3 PCB Dioxin-like Congener TEQ		2E-08	---	8E-08	1E-07	Developmental	0.002	---	0.006	0.008
		Surface Soil at C5N-EU1	Total PCBs	2E-07	---	7E-07	9E-07	Eyes, Immune system	0.03	---	0.1	0.2
			Mercury	---	---	---	---	Immune system	0.002	---	---	0.002
		C5N-EU1 Total		2E-07	---	7E-07	9E-07		0.03	---	0.1	0.2
		C5N-EU1 PCB Dioxin-like Congener TEQ		2E-08	---	9E-08	1E-07	Developmental	0.002	---	0.007	0.009

TABLE B-19

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C5S-EU1	Total PCBs	4E-08	---	2E-07	2E-07	Eyes, Immune system	0.006	---	0.03	0.03
			Mercury	---	---	---	---	Immune system	0.0009	---	---	0.0009
		C5S-EU1 Total		4E-08	---	2E-07	2E-07		0.007	---	0.03	0.03
		C5S-EU1 PCB Dioxin-like Congener TEQ		5E-09	---	2E-08	2E-08	Developmental	0.0004	---	0.002	0.002
		Surface Soil at C6N-EU1	Total PCBs	6E-08	---	2E-07	3E-07	Eyes, Immune system	0.01	---	0.04	0.05
			Mercury	---	---	---	---	Immune system	0.001	---	---	0.001
		C6N-EU1 Total		6E-08	---	2E-07	3E-07		0.01	---	0.04	0.05
		C6N-EU1 PCB Dioxin-like Congener TEQ		7E-09	---	3E-08	4E-08	Developmental	0.0006	---	0.002	0.003
		Surface Soil at C6S-EU1	Total PCBs	8E-08	---	3E-07	4E-07	Eyes, Immune system	0.01	---	0.06	0.07
			Mercury	---	---	---	---	Immune system	0.003	---	---	0.003
		C6S-EU1 Total		8E-08	---	3E-07	4E-07		0.02	---	0.06	0.07
		C6S-EU1 PCB Dioxin-like Congener TEQ		1E-08	---	4E-08	5E-08	Developmental	0.0008	---	0.003	0.004
		Surface Soil at C7S-EU1	Total PCBs	4E-08	---	2E-07	2E-07	Eyes, Immune system	0.006	---	0.03	0.03
			Mercury	---	---	---	---	Immune system	0.0007	---	---	0.0007
		C7S-EU1 Total		4E-08	---	2E-07	2E-07		0.007	---	0.03	0.03
		C7S-EU1 PCB Dioxin-like Congener TEQ		5E-09	---	2E-08	2E-08	Developmental	0.0004	---	0.002	0.002
		Surface Soil at C8N-EU1	Total PCBs	8E-08	---	4E-07	4E-07	Eyes, Immune system	0.01	---	0.06	0.08
			Mercury	---	---	---	---	Immune system	0.002	---	---	0.002
		C8N-EU1 Total		8E-08	---	4E-07	4E-07		0.02	---	0.06	0.08
		C8N-EU1 PCB Dioxin-like Congener TEQ		1E-08	---	5E-08	7E-08	Developmental	0.0010	---	0.004	0.005

TABLE B-20

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU2	Total PCBs	2E-06	---	2E-06	4E-06	Eyes, Immune system	0.1	---	0.09	0.2
		C1-EU2 Total		2E-06	---	2E-06	4E-06		0.1	---	0.09	0.2
		C1-EU2 PCB Dioxin-like Congener TEQ		3E-07	---	2E-07	5E-07	Developmental	0.008	---	0.005	0.01
		Surface Soil at C2N-EU1	Total PCBs	9E-07	---	6E-07	1E-06	Eyes, Immune system	0.05	---	0.03	0.08
			Mercury	---	---	---	---	Immune system	0.0009	---	---	0.0009
		C2N-EU1 Total		9E-07	---	6E-07	1E-06		0.05	---	0.03	0.08
		C2N-EU1 PCB Dioxin-like Congener TEQ		1E-07	---	7E-08	2E-07	Developmental	0.003	---	0.002	0.005
		Surface Soil at C3N-EU1	Total PCBs	1E-06	---	8E-07	2E-06	Eyes, Immune system	0.07	---	0.05	0.1
			Mercury	---	---	---	---	Immune system	0.002	---	---	0.002
		C3N-EU1 Total		1E-06	---	8E-07	2E-06		0.07	---	0.05	0.1
		C3N-EU1 PCB Dioxin-like Congener TEQ		1E-07	---	9E-08	2E-07	Developmental	0.004	---	0.002	0.006
		Surface Soil at C3N-EU2	Total PCBs	2E-06	---	1E-06	3E-06	Eyes, Immune system	0.1	---	0.07	0.2
			Mercury	---	---	---	---	Immune system	0.003	---	---	0.003
		C3N-EU2 Total		2E-06	---	1E-06	3E-06		0.1	---	0.07	0.2
		C3N-EU2 PCB Dioxin-like Congener TEQ		3E-07	---	2E-07	5E-07	Developmental	0.008	---	0.006	0.01
		Surface Soil at C4N-EU1	Total PCBs	4E-07	---	3E-07	7E-07	Eyes, Immune system	0.02	---	0.02	0.04
			Mercury	---	---	---	---	Immune system	0.002	---	---	0.002
		C4N-EU1 Total		4E-07	---	3E-07	7E-07		0.03	---	0.02	0.04
		C4N-EU1 PCB Dioxin-like Congener TEQ		6E-08	---	4E-08	1E-07	Developmental	0.002	---	0.001	0.003
		Surface Soil at C4N-EU2	Total PCBs	4E-07	---	3E-07	7E-07	Eyes, Immune system	0.03	---	0.02	0.04
			Mercury	---	---	---	---	Immune system	0.002	---	---	0.002
		C4N-EU2 Total		4E-07	---	3E-07	7E-07		0.03	---	0.02	0.04
		C4N-EU2 PCB Dioxin-like Congener TEQ		6E-08	---	4E-08	1E-07	Developmental	0.002	---	0.001	0.003
		Surface Soil at C4S-EU1	Total PCBs	9E-07	---	6E-07	1E-06	Eyes, Immune system	0.05	---	0.03	0.08
			Mercury	---	---	---	---	Immune system	0.002	---	---	0.002
		C4S-EU1 Total		9E-07	---	6E-07	1E-06		0.05	---	0.03	0.09
		C4S-EU1 PCB Dioxin-like Congener TEQ		1E-07	---	9E-08	2E-07	Developmental	0.003	---	0.002	0.006
		Surface Soil at C4S-EU2	Total PCBs	1E-07	---	9E-08	2E-07	Eyes, Immune system	0.008	---	0.005	0.01
			Mercury	---	---	---	---	Immune system	0.0009	---	---	0.0009
		C4S-EU2 Total		1E-07	---	9E-08	2E-07		0.009	---	0.005	0.01
		C4S-EU2 PCB Dioxin-like Congener TEQ		2E-08	---	1E-08	3E-08	Developmental	0.0004	---	0.0003	0.0007
		Surface Soil at C4S-EU3	Total PCBs	3E-07	---	2E-07	5E-07	Eyes, Immune system	0.02	---	0.01	0.03
			Mercury	---	---	---	---	Immune system	0.001	---	---	0.001
		C4S-EU3 Total		3E-07	---	2E-07	5E-07		0.02	---	0.01	0.03
		C4S-EU3 PCB Dioxin-like Congener TEQ		4E-08	---	2E-08	6E-08	Developmental	0.0010	---	0.0006	0.002
		Surface Soil at C5N-EU1	Total PCBs	3E-07	---	2E-07	5E-07	Eyes, Immune system	0.02	---	0.01	0.03
			Mercury	---	---	---	---	Immune system	0.001	---	---	0.001
		C5N-EU1 Total		3E-07	---	2E-07	5E-07		0.02	---	0.01	0.03
		C5N-EU1 PCB Dioxin-like Congener TEQ		4E-08	---	3E-08	7E-08	Developmental	0.001	---	0.0007	0.002

TABLE B-20

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C5S-EU1	Total PCBs	7E-08	---	5E-08	1E-07	Eyes, Immune system	0.004	---	0.003	0.007
			Mercury	---	---	---	---	Immune system	0.0006	---	---	0.0006
		C5S-EU1 Total		7E-08	---	5E-08	1E-07		0.005	---	0.003	0.007
		C5S-EU1 PCB Dioxin-like Congener TEQ		9E-09	---	6E-09	1E-08	Developmental	0.0002	---	0.0002	0.0004
		Surface Soil at C6N-EU1	Total PCBs	1E-07	---	7E-08	2E-07	Eyes, Immune system	0.007	---	0.004	0.01
			Mercury	---	---	---	---	Immune system	0.001	---	---	0.001
		C6N-EU1 Total		1E-07	---	7E-08	2E-07		0.007	---	0.004	0.01
		C6N-EU1 PCB Dioxin-like Congener TEQ		1E-08	---	9E-09	2E-08	Developmental	0.0004	---	0.0002	0.0006
		Surface Soil at C6S-EU1	Total PCBs	2E-07	---	1E-07	3E-07	Eyes, Immune system	0.009	---	0.006	0.01
			Mercury	---	---	---	---	Immune system	0.002	---	---	0.002
		C6S-EU1 Total		2E-07	---	1E-07	3E-07		0.01	---	0.006	0.02
		C6S-EU1 PCB Dioxin-like Congener TEQ		2E-08	---	1E-08	3E-08	Developmental	0.0005	---	0.0003	0.0008
		Surface Soil at C7S-EU1	Total PCBs	7E-08	---	5E-08	1E-07	Eyes, Immune system	0.004	---	0.003	0.007
			Mercury	---	---	---	---	Immune system	0.0005	---	---	0.0005
		C7S-EU1 Total		7E-08	---	5E-08	1E-07		0.004	---	0.003	0.007
		C7S-EU1 PCB Dioxin-like Congener TEQ		9E-09	---	6E-09	1E-08	Developmental	0.0002	---	0.0002	0.0004
		Surface Soil at C8N-EU1	Total PCBs	2E-07	---	1E-07	3E-07	Eyes, Immune system	0.009	---	0.006	0.02
			Mercury	---	---	---	---	Immune system	0.001	---	---	0.001
		C8N-EU1 Total		2E-07	---	1E-07	3E-07		0.01	---	0.006	0.02
		C8N-EU1 PCB Dioxin-like Congener TEQ		2E-08	---	2E-08	4E-08	Developmental	0.0006	---	0.0004	0.001

TABLE B-21

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU1	Total PCBs	2E-06	---	2E-06	4E-06	Eyes, Immune system	0.2	---	0.2	0.4
		C1-EU1 Total		2E-06	---	2E-06	4E-06		0.2	---	0.2	0.4
		C1-EU1 PCB Dioxin-like Congener TEQ		3E-07	---	2E-07	5E-07	Developmental	0.03	---	0.03	0.06
		Surface Soil at C3S-EU1	Total PCBs	4E-06	---	3E-06	7E-06	Eyes, Immune system	0.4	---	0.3	0.7
			Mercury	---	---	---	---	Immune system	0.01	---	---	0.01
		C3S-EU1 Total		4E-06	---	3E-06	7E-06		0.4	---	0.3	0.7
		C3S-EU1 PCB Dioxin-like Congener TEQ		5E-07	---	4E-07	9E-07	Developmental	0.06	---	0.05	0.1
		Surface Soil at C3S-EU2	Total PCBs	5E-06	---	4E-06	8E-06	Eyes, Immune system	0.4	---	0.4	0.8
			Mercury	---	---	---	---	Immune system	0.005	---	---	0.005
		C3S-EU2 Total		5E-06	---	4E-06	8E-06		0.5	---	0.4	0.8
		C3S-EU2 PCB Dioxin-like Congener TEQ		1E-06	---	1E-06	3E-06	Developmental	0.2	---	0.1	0.3

TABLE B-22

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU1	Total PCBs	6E-07	---	2E-06	3E-06	Eyes, Immune system	0.1	---	0.4	0.5
		C1-EU1 Total		6E-07	---	2E-06	3E-06		0.1	---	0.4	0.5
		C1-EU1 PCB Dioxin-like Congener TEQ		7E-08	---	3E-07	4E-07	Developmental	0.006	---	0.02	0.03
		Surface Soil at C3S-EU1	Total PCBs	1E-06	---	4E-06	6E-06	Eyes, Immune system	0.2	---	0.8	1
			Mercury	---	---	---	---	Immune system	0.02	---	---	0.02
		C3S-EU1 Total		1E-06	---	4E-06	6E-06		0.2	---	0.8	1
		C3S-EU1 PCB Dioxin-like Congener TEQ		1E-07	---	6E-07	7E-07	Developmental	0.01	---	0.05	0.06
		Surface Soil at C3S-EU2	Total PCBs	1E-06	---	5E-06	7E-06	Eyes, Immune system	0.2	---	1	1
			Mercury	---	---	---	---	Immune system	0.008	---	---	0.008
		C3S-EU2 Total		1E-06	---	5E-06	7E-06		0.2	---	1	1
		C3S-EU2 PCB Dioxin-like Congener TEQ		4E-07	---	2E-06	2E-06	Developmental	0.03	---	0.1	0.2

TABLE B-23

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU1	Total PCBs	1E-06	---	7E-07	2E-06	Eyes, Immune system	0.06	---	0.04	0.1
		C1-EU1 Total		1E-06	---	7E-07	2E-06		0.06	---	0.04	0.1
		C1-EU1 PCB Dioxin-like Congener TEQ		1E-07	---	9E-08	2E-07	Developmental	0.004	---	0.002	0.006
		Surface Soil at C3S-EU1	Total PCBs	2E-06	---	1E-06	3E-06	Eyes, Immune system	0.1	---	0.08	0.2
			Mercury	---	---	---	---	Immune system	0.01	---	---	0.01
		C3S-EU1 Total		2E-06	---	1E-06	3E-06		0.1	---	0.08	0.2
		C3S-EU1 PCB Dioxin-like Congener TEQ		3E-07	---	2E-07	4E-07	Developmental	0.007	---	0.005	0.01
		Surface Soil at C3S-EU2	Total PCBs	2E-06	---	2E-06	4E-06	Eyes, Immune system	0.1	---	0.1	0.2
			Mercury	---	---	---	---	Immune system	0.005	---	---	0.005
		C3S-EU2 Total		2E-06	---	2E-06	4E-06		0.1	---	0.10	0.2
		C3S-EU2 PCB Dioxin-like Congener TEQ		7E-07	---	5E-07	1E-06	Developmental	0.02	---	0.01	0.03

TABLE B-24

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU2	Total PCBs	8E-08	---	1E-07	2E-07	Eyes, Immune system	0.03	---	0.05	0.07
		C1-EU2 Total		8E-08	---	1E-07	2E-07		0.03	---	0.05	0.07
		C1-EU2 PCB Dioxin-like Congener TEQ		2E-08	---	3E-08	6E-08	Developmental	0.002	---	0.003	0.004
		Surface Soil at C2N-EU1	Total PCBs	3E-08	---	5E-08	7E-08	Eyes, Immune system	0.010	---	0.02	0.03
			Mercury	---	---	---	---	Immune system	0.0002	---	---	0.0002
		C2N-EU1 Total		3E-08	---	5E-08	7E-08		0.01	---	0.02	0.03
		C2N-EU1 PCB Dioxin-like Congener TEQ		7E-09	---	1E-08	2E-08	Developmental	0.0006	---	0.0009	0.002
		Surface Soil at C3N-EU1	Total PCBs	4E-08	---	7E-08	1E-07	Eyes, Immune system	0.01	---	0.02	0.04
			Mercury	---	---	---	---	Immune system	0.0004	---	---	0.0004
		C3N-EU1 Total		4E-08	---	7E-08	1E-07		0.01	---	0.02	0.04
		C3N-EU1 PCB Dioxin-like Congener TEQ		9E-09	---	2E-08	2E-08	Developmental	0.0007	---	0.001	0.002
		Surface Soil at C3N-EU2	Total PCBs	6E-08	---	1E-07	2E-07	Eyes, Immune system	0.02	---	0.04	0.06
			Mercury	---	---	---	---	Immune system	0.0006	---	---	0.0006
		C3N-EU2 Total		6E-08	---	1E-07	2E-07		0.02	---	0.04	0.06
		C3N-EU2 PCB Dioxin-like Congener TEQ		2E-08	---	4E-08	6E-08	Developmental	0.002	---	0.003	0.004
		Surface Soil at C4N-EU1	Total PCBs	1E-08	---	2E-08	4E-08	Eyes, Immune system	0.005	---	0.008	0.01
			Mercury	---	---	---	---	Immune system	0.0003	---	---	0.0003
		C4N-EU1 Total		1E-08	---	2E-08	4E-08		0.005	---	0.008	0.01
		C4N-EU1 PCB Dioxin-like Congener TEQ		4E-09	---	7E-09	1E-08	Developmental	0.0003	---	0.0005	0.0008
		Surface Soil at C4N-EU2	Total PCBs	1E-08	---	2E-08	4E-08	Eyes, Immune system	0.005	---	0.009	0.01
			Mercury	---	---	---	---	Immune system	0.0004	---	---	0.0004
		C4N-EU2 Total		1E-08	---	2E-08	4E-08		0.005	---	0.009	0.01
		C4N-EU2 PCB Dioxin-like Congener TEQ		4E-09	---	7E-09	1E-08	Developmental	0.0003	---	0.0005	0.0008
		Surface Soil at C4S-EU1	Total PCBs	3E-08	---	5E-08	7E-08	Eyes, Immune system	0.01	---	0.02	0.03
			Mercury	---	---	---	---	Immune system	0.0005	---	---	0.0005
		C4S-EU1 Total		3E-08	---	5E-08	7E-08		0.01	---	0.02	0.03
		C4S-EU1 PCB Dioxin-like Congener TEQ		9E-09	---	1E-08	2E-08	Developmental	0.0007	---	0.001	0.002
		Surface Soil at C4S-EU2	Total PCBs	4E-09	---	7E-09	1E-08	Eyes, Immune system	0.001	---	0.003	0.004
			Mercury	---	---	---	---	Immune system	0.0002	---	---	0.0002
		C4S-EU2 Total		4E-09	---	7E-09	1E-08		0.002	---	0.003	0.004
		C4S-EU2 PCB Dioxin-like Congener TEQ		1E-09	---	2E-09	3E-09	Developmental	0.00009	---	0.0001	0.0002
		Surface Soil at C4S-EU3	Total PCBs	9E-09	---	2E-08	3E-08	Eyes, Immune system	0.003	---	0.006	0.009
			Mercury	---	---	---	---	Immune system	0.0002	---	---	0.0002
		C4S-EU3 Total		9E-09	---	2E-08	3E-08		0.003	---	0.006	0.009
		C4S-EU3 PCB Dioxin-like Congener TEQ		2E-09	---	4E-09	7E-09	Developmental	0.0002	---	0.0003	0.0005
		Surface Soil at C5N-EU1	Total PCBs	1E-08	---	2E-08	3E-08	Eyes, Immune system	0.004	---	0.006	0.01
			Mercury	---	---	---	---	Immune system	0.0002	---	---	0.0002
		C5N-EU1 Total		1E-08	---	2E-08	3E-08		0.004	---	0.006	0.01
		C5N-EU1 PCB Dioxin-like Congener TEQ		3E-09	---	5E-09	7E-09	Developmental	0.0002	---	0.0003	0.0006

TABLE B-24

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C5S-EU1	Total PCBs	2E-09	---	4E-09	6E-09	Eyes, Immune system	0.0008	---	0.001	0.002
			Mercury	---	---	---	---	Immune system	0.0001	---	---	0.0001
		C5S-EU1 Total		2E-09	---	4E-09	6E-09		0.0009	---	0.001	0.002
		C5S-EU1 PCB Dioxin-like Congener TEQ		6E-10	---	1E-09	2E-09	Developmental	0.00004	---	0.00008	0.0001
		Surface Soil at C6N-EU1	Total PCBs	4E-09	---	6E-09	1E-08	Eyes, Immune system	0.001	---	0.002	0.003
			Mercury	---	---	---	---	Immune system	0.0002	---	---	0.0002
		C6N-EU1 Total		4E-09	---	6E-09	1E-08		0.001	---	0.002	0.004
		C6N-EU1 PCB Dioxin-like Congener TEQ		9E-10	---	2E-09	2E-09	Developmental	0.00007	---	0.0001	0.0002
		Surface Soil at C6S-EU1	Total PCBs	5E-09	---	8E-09	1E-08	Eyes, Immune system	0.002	---	0.003	0.005
			Mercury	---	---	---	---	Immune system	0.0004	---	---	0.0004
		C6S-EU1 Total		5E-09	---	8E-09	1E-08		0.002	---	0.003	0.005
		C6S-EU1 PCB Dioxin-like Congener TEQ		1E-09	---	2E-09	3E-09	Developmental	0.0001	---	0.0002	0.0003
		Surface Soil at C7S-EU1	Total PCBs	2E-09	---	4E-09	6E-09	Eyes, Immune system	0.0008	---	0.001	0.002
			Mercury	---	---	---	---	Immune system	0.00009	---	---	0.00009
		C7S-EU1 Total		2E-09	---	4E-09	6E-09		0.0009	---	0.001	0.002
		C7S-EU1 PCB Dioxin-like Congener TEQ		6E-10	---	1E-09	2E-09	Developmental	0.00004	---	0.00008	0.0001
		Surface Soil at C8N-EU1	Total PCBs	5E-09	---	9E-09	1E-08	Eyes, Immune system	0.002	---	0.003	0.005
			Mercury	---	---	---	---	Immune system	0.0002	---	---	0.0002
		C8N-EU1 Total		5E-09	---	9E-09	1E-08		0.002	---	0.003	0.005
		C8N-EU1 PCB Dioxin-like Congener TEQ		2E-09	---	3E-09	4E-09	Developmental	0.0001	---	0.0002	0.0003

TABLE B-25

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU2	Total PCBs	8E-08	---	4E-08	1E-07	Eyes, Immune system	0.02	---	0.009	0.03
		C1-EU2 Total		8E-08	---	4E-08	1E-07		0.02	---	0.009	0.03
		C1-EU2 PCB Dioxin-like Congener TEQ		2E-08	---	1E-08	3E-08	Developmental	0.001	---	0.0005	0.002
		Surface Soil at C2N-EU1	Total PCBs	3E-08	---	1E-08	4E-08	Eyes, Immune system	0.006	---	0.003	0.01
			Mercury	---	---	---	---	Immune system	0.0001	---	---	0.0001
		C2N-EU1 Total		3E-08	---	1E-08	4E-08		0.006	---	0.003	0.01
		C2N-EU1 PCB Dioxin-like Congener TEQ		7E-09	---	4E-09	1E-08	Developmental	0.0004	---	0.0002	0.0005
		Surface Soil at C3N-EU1	Total PCBs	4E-08	---	2E-08	6E-08	Eyes, Immune system	0.009	---	0.005	0.01
			Mercury	---	---	---	---	Immune system	0.0003	---	---	0.0003
		C3N-EU1 Total		4E-08	---	2E-08	6E-08		0.009	---	0.005	0.01
		C3N-EU1 PCB Dioxin-like Congener TEQ		9E-09	---	5E-09	1E-08	Developmental	0.0005	---	0.0002	0.0007
		Surface Soil at C3N-EU2	Total PCBs	6E-08	---	3E-08	9E-08	Eyes, Immune system	0.01	---	0.007	0.02
			Mercury	---	---	---	---	Immune system	0.0004	---	---	0.0004
		C3N-EU2 Total		6E-08	---	3E-08	9E-08		0.01	---	0.007	0.02
		C3N-EU2 PCB Dioxin-like Congener TEQ		2E-08	---	1E-08	3E-08	Developmental	0.001	---	0.0006	0.002
		Surface Soil at C4N-EU1	Total PCBs	1E-08	---	7E-09	2E-08	Eyes, Immune system	0.003	---	0.002	0.005
			Mercury	---	---	---	---	Immune system	0.0002	---	---	0.0002
		C4N-EU1 Total		1E-08	---	7E-09	2E-08		0.003	---	0.002	0.005
		C4N-EU1 PCB Dioxin-like Congener TEQ		4E-09	---	2E-09	6E-09	Developmental	0.0002	---	0.0001	0.0003
		Surface Soil at C4N-EU2	Total PCBs	1E-08	---	7E-09	2E-08	Eyes, Immune system	0.003	---	0.002	0.005
			Mercury	---	---	---	---	Immune system	0.0002	---	---	0.0002
		C4N-EU2 Total		1E-08	---	7E-09	2E-08		0.003	---	0.002	0.005
		C4N-EU2 PCB Dioxin-like Congener TEQ		4E-09	---	2E-09	6E-09	Developmental	0.0002	---	0.0001	0.0003
		Surface Soil at C4S-EU1	Total PCBs	3E-08	---	1E-08	4E-08	Eyes, Immune system	0.006	---	0.003	0.01
			Mercury	---	---	---	---	Immune system	0.0003	---	---	0.0003
		C4S-EU1 Total		3E-08	---	1E-08	4E-08		0.007	---	0.003	0.01
		C4S-EU1 PCB Dioxin-like Congener TEQ		8E-09	---	4E-09	1E-08	Developmental	0.0004	---	0.0002	0.0007
		Surface Soil at C4S-EU2	Total PCBs	4E-09	---	2E-09	6E-09	Eyes, Immune system	0.001	---	0.0005	0.001
			Mercury	---	---	---	---	Immune system	0.0001	---	---	0.0001
		C4S-EU2 Total		4E-09	---	2E-09	6E-09		0.001	---	0.0005	0.002
		C4S-EU2 PCB Dioxin-like Congener TEQ		1E-09	---	6E-10	2E-09	Developmental	0.00006	---	0.00003	0.00009
		Surface Soil at C4S-EU3	Total PCBs	9E-09	---	5E-09	1E-08	Eyes, Immune system	0.002	---	0.001	0.003
			Mercury	---	---	---	---	Immune system	0.0001	---	---	0.0001
		C4S-EU3 Total		9E-09	---	5E-09	1E-08		0.002	---	0.001	0.003
		C4S-EU3 PCB Dioxin-like Congener TEQ		2E-09	---	1E-09	4E-09	Developmental	0.0001	---	0.00006	0.0002
		Surface Soil at C5N-EU1	Total PCBs	1E-08	---	5E-09	2E-08	Eyes, Immune system	0.002	---	0.001	0.004
			Mercury	---	---	---	---	Immune system	0.0001	---	---	0.0001
		C5N-EU1 Total		1E-08	---	5E-09	2E-08		0.002	---	0.001	0.004
		C5N-EU1 PCB Dioxin-like Congener TEQ		3E-09	---	1E-09	4E-09	Developmental	0.0001	---	0.00007	0.0002

TABLE B-25

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C5S-EU1	Total PCBs	2E-09	---	1E-09	3E-09	Eyes, Immune system	0.0005	---	0.0003	0.0008
			Mercury	---	---	---	---	Immune system	0.00008	---	---	0.00008
		C5S-EU1 Total		2E-09	---	1E-09	3E-09		0.0006	---	0.0003	0.0009
		C5S-EU1 PCB Dioxin-like Congener TEQ		6E-10	---	3E-10	9E-10	Developmental	0.00003	---	0.00002	0.00004
		Surface Soil at C6N-EU1	Total PCBs	3E-09	---	2E-09	5E-09	Eyes, Immune system	0.0008	---	0.0004	0.001
			Mercury	---	---	---	---	Immune system	0.0001	---	---	0.0001
		C6N-EU1 Total		3E-09	---	2E-09	5E-09		0.0009	---	0.0004	0.001
		C6N-EU1 PCB Dioxin-like Congener TEQ		9E-10	---	5E-10	1E-09	Developmental	0.00005	---	0.00002	0.00007
		Surface Soil at C6S-EU1	Total PCBs	5E-09	---	2E-09	7E-09	Eyes, Immune system	0.001	---	0.0006	0.002
			Mercury	---	---	---	---	Immune system	0.0002	---	---	0.0002
		C6S-EU1 Total		5E-09	---	2E-09	7E-09		0.001	---	0.0006	0.002
		C6S-EU1 PCB Dioxin-like Congener TEQ		1E-09	---	7E-10	2E-09	Developmental	0.00006	---	0.00003	0.0001
		Surface Soil at C7S-EU1	Total PCBs	2E-09	---	1E-09	3E-09	Eyes, Immune system	0.0005	---	0.0003	0.0008
			Mercury	---	---	---	---	Immune system	0.00006	---	---	0.00006
		C7S-EU1 Total		2E-09	---	1E-09	3E-09		0.0006	---	0.0003	0.0008
		C7S-EU1 PCB Dioxin-like Congener TEQ		6E-10	---	3E-10	8E-10	Developmental	0.00003	---	0.00002	0.00004
		Surface Soil at C8N-EU1	Total PCBs	5E-09	---	3E-09	8E-09	Eyes, Immune system	0.001	---	0.0006	0.002
			Mercury	---	---	---	---	Immune system	0.0001	---	---	0.0001
		C8N-EU1 Total		5E-09	---	3E-09	8E-09		0.001	---	0.0006	0.002
		C8N-EU1 PCB Dioxin-like Congener TEQ		2E-09	---	8E-10	2E-09	Developmental	0.00008	---	0.00004	0.0001

TABLE B-26

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU1	Total PCBs	1E-07	---	6E-08	2E-07	Eyes, Immune system	0.02	---	0.01	0.04
		C1-EU1 Total		1E-07	---	6E-08	2E-07		0.02	---	0.01	0.04
		C1-EU1 PCB Dioxin-like Congener TEQ		3E-08	---	2E-08	5E-08	Developmental	0.004	---	0.002	0.006
		Surface Soil at C3S-EU1	Total PCBs	2E-07	---	1E-07	3E-07	Eyes, Immune system	0.05	---	0.02	0.07
			Mercury	---	---	---	---	Immune system	0.001	---	---	0.001
		C3S-EU1 Total		2E-07	---	1E-07	3E-07		0.05	---	0.02	0.07
		C3S-EU1 PCB Dioxin-like Congener TEQ		6E-08	---	3E-08	9E-08	Developmental	0.008	---	0.004	0.01
		Surface Soil at C3S-EU2	Total PCBs	3E-07	---	1E-07	4E-07	Eyes, Immune system	0.06	---	0.03	0.08
			Mercury	---	---	---	---	Immune system	0.0006	---	---	0.0006
		C3S-EU2 Total		3E-07	---	1E-07	4E-07		0.06	---	0.03	0.08
		C3S-EU2 PCB Dioxin-like Congener TEQ		2E-07	---	8E-08	2E-07	Developmental	0.02	---	0.01	0.03

TABLE B-27

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU1	Total PCBs	4E-08	---	6E-08	1E-07	Eyes, Immune system	0.01	---	0.02	0.03
		C1-EU1 Total		4E-08	---	6E-08	1E-07		0.01	---	0.02	0.03
		C1-EU1 PCB Dioxin-like Congener TEQ		9E-09	---	2E-08	3E-08	Developmental	0.0007	---	0.001	0.002
		Surface Soil at C3S-EU1	Total PCBs	7E-08	---	1E-07	2E-07	Eyes, Immune system	0.02	---	0.04	0.06
			Mercury	---	---	---	---	Immune system	0.002	---	---	0.002
		C3S-EU1 Total		7E-08	---	1E-07	2E-07		0.03	---	0.04	0.06
		C3S-EU1 PCB Dioxin-like Congener TEQ		2E-08	---	3E-08	5E-08	Developmental	0.001	---	0.002	0.004
		Surface Soil at C3S-EU2	Total PCBs	8E-08	---	1E-07	2E-07	Eyes, Immune system	0.03	---	0.05	0.08
			Mercury	---	---	---	---	Immune system	0.001	---	---	0.001
		C3S-EU2 Total		8E-08	---	1E-07	2E-07		0.03	---	0.05	0.08
		C3S-EU2 PCB Dioxin-like Congener TEQ		5E-08	---	8E-08	1E-07	Developmental	0.004	---	0.006	0.01

TABLE B-28

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU1	Total PCBs	3E-08	---	2E-08	5E-08	Eyes, Immune system	0.008	---	0.004	0.01
		C1-EU1 Total		3E-08	---	2E-08	5E-08		0.008	---	0.004	0.01
		C1-EU1 PCB Dioxin-like Congener TEQ		9E-09	---	5E-09	1E-08	Developmental	0.0005	---	0.0002	0.0007
		Surface Soil at C3S-EU1	Total PCBs	6E-08	---	3E-08	1E-07	Eyes, Immune system	0.01	---	0.008	0.02
			Mercury	---	---	---	---	Immune system	0.002	---	---	0.002
		C3S-EU1 Total		6E-08	---	3E-08	1E-07		0.02	---	0.008	0.02
		C3S-EU1 PCB Dioxin-like Congener TEQ		2E-08	---	9E-09	3E-08	Developmental	0.0009	---	0.0005	0.001
		Surface Soil at C3S-EU2	Total PCBs	8E-08	---	4E-08	1E-07	Eyes, Immune system	0.02	---	0.010	0.03
			Mercury	---	---	---	---	Immune system	0.0007	---	---	0.0007
		C3S-EU2 Total		8E-08	---	4E-08	1E-07		0.02	---	0.01	0.03
		C3S-EU2 PCB Dioxin-like Congener TEQ		5E-08	---	2E-08	7E-08	Developmental	0.002	---	0.001	0.004

TABLE B-29

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU2	Total PCBs	7E-08	---	4E-08	1E-07	Eyes, Immune system	0.1	---	0.08	0.2
		C1-EU2 Total		7E-08	---	4E-08	1E-07		0.1	---	0.08	0.2
		C1-EU2 PCB Dioxin-like Congener TEQ		1E-08	---	6E-09	2E-08	Developmental	0.007	---	0.004	0.01
		Surface Soil at C2N-EU1	Total PCBs	4E-08	---	2E-08	6E-08	Eyes, Immune system	0.07	---	0.04	0.1
			Mercury	---	---	---	---	Immune system	0.0006	---	---	0.0006
		C2N-EU1 Total		4E-08	---	2E-08	6E-08		0.07	---	0.04	0.1
		C2N-EU1 PCB Dioxin-like Congener TEQ		5E-09	---	3E-09	8E-09	Developmental	0.004	---	0.002	0.006
		Surface Soil at C4N-EU1	Total PCBs	7E-09	---	4E-09	1E-08	Eyes, Immune system	0.01	---	0.007	0.02
			Mercury	---	---	---	---	Immune system	0.0009	---	---	0.0009
		C4N-EU1 Total		7E-09	---	4E-09	1E-08		0.01	---	0.007	0.02
		C4N-EU1 PCB Dioxin-like Congener TEQ		1E-09	---	6E-10	2E-09	Developmental	0.0007	---	0.0004	0.001
		Surface Soil at C5N-EU1	Total PCBs	1E-08	---	8E-09	2E-08	Eyes, Immune system	0.02	---	0.01	0.04
			Mercury	---	---	---	---	Immune system	0.0006	---	---	0.0006
		C5N-EU1 Total		1E-08	---	8E-09	2E-08		0.02	---	0.01	0.04
		C5N-EU1 PCB Dioxin-like Congener TEQ		2E-09	---	1E-09	3E-09	Developmental	0.001	---	0.0008	0.002

TABLE B-30

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU2	Total PCBs	3E-09	---	4E-09	7E-09	Eyes, Immune system	0.01	---	0.01	0.02
		C1-EU2 Total		3E-09	---	4E-09	7E-09		0.01	---	0.01	0.02
		C1-EU2 PCB Dioxin-like Congener TEQ		7E-10	---	1E-09	2E-09	Developmental	0.0006	---	0.0007	0.001
		Surface Soil at C2N-EU1	Total PCBs	2E-09	---	2E-09	4E-09	Eyes, Immune system	0.005	---	0.007	0.01
			Mercury	---	---	---	---	Immune system	0.00004	---	---	0.00004
		C2N-EU1 Total		2E-09	---	2E-09	4E-09		0.005	---	0.007	0.01
		C2N-EU1 PCB Dioxin-like Congener TEQ		4E-10	---	5E-10	9E-10	Developmental	0.0003	---	0.0004	0.0007
		Surface Soil at C4N-EU1	Total PCBs	3E-10	---	3E-10	6E-10	Eyes, Immune system	0.0009	---	0.001	0.002
			Mercury	---	---	---	---	Immune system	0.00007	---	---	0.00007
		C4N-EU1 Total		3E-10	---	3E-10	6E-10		0.001	---	0.001	0.002
		C4N-EU1 PCB Dioxin-like Congener TEQ		7E-11	---	1E-10	2E-10	Developmental	0.00006	---	0.00007	0.0001
		Surface Soil at C5N-EU1	Total PCBs	5E-10	---	7E-10	1E-09	Eyes, Immune system	0.002	---	0.002	0.004
			Mercury	---	---	---	---	Immune system	0.00005	---	---	0.00005
		C5N-EU1 Total		5E-10	---	7E-10	1E-09		0.002	---	0.002	0.004
		C5N-EU1 PCB Dioxin-like Congener TEQ		1E-10	---	2E-10	3E-10	Developmental	0.0001	---	0.0001	0.0002

TABLE B-31

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Farmer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at Ag-EU1	Total PCBs	1E-06	---	2E-06	3E-06	Eyes, Immune system	0.05	---	0.07	0.1
			Mercury	---	---	---	---	Immune system	0.004	---	---	0.004
		Ag-EU1 Total		1E-06	---	2E-06	3E-06		0.05	---	0.07	0.1
		Ag-EU1 PCB Dioxin-like Congener TEQ		1E-07	---	2E-07	3E-07	Developmental	0.003	---	0.004	0.007
		Surface Soil at Ag-EU2	Total PCBs	6E-07	---	8E-07	1E-06	Eyes, Immune system	0.03	---	0.03	0.06
			Mercury	---	---	---	---	Immune system	0.0008	---	---	0.0008
		Ag-EU2 Total		6E-07	---	8E-07	1E-06		0.03	---	0.03	0.06
		Ag-EU2 PCB Dioxin-like Congener TEQ		8E-08	---	1E-07	2E-07	Developmental	0.002	---	0.002	0.004
		Surface Soil at Ag-EU3	Total PCBs	8E-07	---	1E-06	2E-06	Eyes, Immune system	0.03	---	0.04	0.08
			Mercury	---	---	---	---	Immune system	0.001	---	---	0.001
		Ag-EU3 Total		8E-07	---	1E-06	2E-06		0.03	---	0.04	0.08
		Ag-EU3 PCB Dioxin-like Congener TEQ		1E-07	---	1E-07	2E-07	Developmental	0.002	---	0.003	0.005
		Surface Soil at Ag-EU4	Total PCBs	5E-08	---	6E-08	1E-07	Eyes, Immune system	0.002	---	0.003	0.005
			Mercury	---	---	---	---	Immune system	0.0004	---	---	0.0004
		Ag-EU4 Total		5E-08	---	6E-08	1E-07		0.002	---	0.003	0.005
		Ag-EU4 PCB Dioxin-like Congener TEQ		6E-09	---	8E-09	1E-08	Developmental	0.0001	---	0.0002	0.0003
		Surface Soil at Ag-EU5	Total PCBs	1E-07	---	2E-07	3E-07	Eyes, Immune system	0.006	---	0.008	0.01
			Mercury	---	---	---	---	Immune system	0.0004	---	---	0.0004
		Ag-EU5 Total		1E-07	---	2E-07	3E-07		0.007	---	0.008	0.01
		Ag-EU5 PCB Dioxin-like Congener TEQ		2E-08	---	2E-08	4E-08	Developmental	0.0004	---	0.0005	0.0008
		Surface Soil at Ag-EU6	Total PCBs	1E-09	---	1E-09	3E-09	Eyes, Immune system	0.00005	---	0.00006	0.0001
			Mercury	---	---	---	---	Immune system	0.00006	---	---	0.00006
		Ag-EU6 Total		1E-09	---	1E-09	3E-09		0.0001	---	0.00006	0.0002
		Ag-EU6 PCB Dioxin-like Congener TEQ		3E-11	---	4E-11	8E-11	Developmental	0.0000007	---	0.0000009	0.000002
		Surface Soil at Ag-EU7	Total PCBs	2E-08	---	3E-08	5E-08	Eyes, Immune system	0.0009	---	0.001	0.002
			Mercury	---	---	---	---	Immune system	0.0001	---	---	0.0001
		Ag-EU7 Total		2E-08	---	3E-08	5E-08		0.001	---	0.001	0.002
		Ag-EU7 PCB Dioxin-like Congener TEQ		3E-09	---	4E-09	6E-09	Developmental	0.00005	---	0.00007	0.0001
		Surface Soil at Ag-EU8	Total PCBs	1E-08	---	2E-08	3E-08	Eyes, Immune system	0.0005	---	0.0007	0.001
			Mercury	---	---	---	---	Immune system	0.0003	---	---	0.0003
		Ag-EU8 Total		1E-08	---	2E-08	3E-08		0.0008	---	0.0007	0.002
		Ag-EU8 PCB Dioxin-like Congener TEQ		1E-09	---	2E-09	3E-09	Developmental	0.00003	---	0.00004	0.00006

TABLE B-32

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Farmer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at Ag-EU1	Total PCBs	1E-07	---	2E-07	3E-07	Eyes, Immune system	0.006	---	0.008	0.01
			Mercury	---	---	---	---	Immune system	0.0004	---	---	0.0004
		Ag-EU1 Total		1E-07	---	2E-07	3E-07		0.007	---	0.008	0.01
		Ag-EU1 PCB Dioxin-like Congener TEQ		2E-08	---	2E-08	4E-08	Developmental	0.0004	---	0.0005	0.0008
		Surface Soil at Ag-EU2	Total PCBs	7E-08	---	1E-07	2E-07	Eyes, Immune system	0.003	---	0.004	0.008
			Mercury	---	---	---	---	Immune system	0.0001	---	---	0.0001
		Ag-EU2 Total		7E-08	---	1E-07	2E-07		0.003	---	0.004	0.008
		Ag-EU2 PCB Dioxin-like Congener TEQ		1E-08	---	1E-08	2E-08	Developmental	0.0002	---	0.0002	0.0004
		Surface Soil at Ag-EU3	Total PCBs	1E-07	---	1E-07	2E-07	Eyes, Immune system	0.004	---	0.006	0.01
			Mercury	---	---	---	---	Immune system	0.0002	---	---	0.0002
		Ag-EU3 Total		1E-07	---	1E-07	2E-07		0.004	---	0.006	0.01
		Ag-EU3 PCB Dioxin-like Congener TEQ		1E-08	---	2E-08	3E-08	Developmental	0.0002	---	0.0003	0.0006
		Surface Soil at Ag-EU4	Total PCBs	6E-09	---	8E-09	1E-08	Eyes, Immune system	0.0003	---	0.0003	0.0006
			Mercury	---	---	---	---	Immune system	0.00005	---	---	0.00005
		Ag-EU4 Total		6E-09	---	8E-09	1E-08		0.0003	---	0.0003	0.0006
		Ag-EU4 PCB Dioxin-like Congener TEQ		8E-10	---	1E-09	2E-09	Developmental	0.00001	---	0.00002	0.00003
		Surface Soil at Ag-EU5	Total PCBs	2E-08	---	2E-08	4E-08	Eyes, Immune system	0.0008	---	0.001	0.002
			Mercury	---	---	---	---	Immune system	0.00005	---	---	0.00005
		Ag-EU5 Total		2E-08	---	2E-08	4E-08		0.0008	---	0.001	0.002
		Ag-EU5 PCB Dioxin-like Congener TEQ		2E-09	---	3E-09	5E-09	Developmental	0.00004	---	0.00006	0.0001
		Surface Soil at Ag-EU6	Total PCBs	1E-10	---	2E-10	3E-10	Eyes, Immune system	0.000006	---	0.000008	0.00001
			Mercury	---	---	---	---	Immune system	0.000007	---	---	0.000007
		Ag-EU6 Total		1E-10	---	2E-10	3E-10		0.00001	---	0.000008	0.00002
		Ag-EU6 PCB Dioxin-like Congener TEQ		4E-12	---	6E-12	1E-11	Developmental	0.00000008	---	0.0000001	0.0000002
		Surface Soil at Ag-EU7	Total PCBs	3E-09	---	4E-09	6E-09	Eyes, Immune system	0.0001	---	0.0002	0.0003
			Mercury	---	---	---	---	Immune system	0.00002	---	---	0.00002
		Ag-EU7 Total		3E-09	---	4E-09	6E-09		0.0001	---	0.0002	0.0003
		Ag-EU7 PCB Dioxin-like Congener TEQ		3E-10	---	4E-10	8E-10	Developmental	0.000006	---	0.000009	0.00002
		Surface Soil at Ag-EU8	Total PCBs	1E-09	---	2E-09	3E-09	Eyes, Immune system	0.00007	---	0.00009	0.0002
			Mercury	---	---	---	---	Immune system	0.00004	---	---	0.00004
		Ag-EU8 Total		1E-09	---	2E-09	3E-09		0.0001	---	0.00009	0.0002
		Ag-EU8 PCB Dioxin-like Congener TEQ		2E-10	---	2E-10	4E-10	Developmental	0.000003	---	0.000005	0.000008

TABLE B-33

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU2	Total PCBs	1E-06	---	5E-06	7E-06	---	---	---	---	---
		C1-EU2 Total		1E-06	---	5E-06	7E-06		---	---	---	---
		Surface Soil at C2N-EU1	Total PCBs	---	---	2E-06	2E-06	---	---	---	---	---
		C2N-EU1 Total		---	---	2E-06	2E-06		---	---	---	---
		Surface Soil at C3N-EU1	Total PCBs	---	---	3E-06	3E-06	---	---	---	---	---
		C3N-EU1 Total		---	---	3E-06	3E-06		---	---	---	---
		Surface Soil at C3N-EU2	Total PCBs	---	---	4E-06	4E-06	---	---	---	---	---
		C3N-EU2 Total		---	---	4E-06	4E-06		---	---	---	---
		Surface Soil at C4S-EU1	Total PCBs	---	---	2E-06	2E-06	---	---	---	---	---
		C4S-EU1 Total		---	---	2E-06	2E-06		---	---	---	---

TABLE B-34

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (Low Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU2	Total PCBs	2E-06	---	2E-06	4E-06	---	---	---	---	---
		C1-EU2 Total		2E-06	---	2E-06	4E-06		---	---	---	---
		Surface Soil at C3N-EU1	Total PCBs	1E-06	---	---	1E-06	---	---	---	---	---
		C3N-EU1 Total		1E-06	---	---	1E-06		---	---	---	---
		Surface Soil at C3N-EU2	Total PCBs	2E-06	---	1E-06	3E-06	---	---	---	---	---
		C3N-EU2 Total		2E-06	---	1E-06	3E-06		---	---	---	---

TABLE B-35

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU1	Total PCBs	2E-06	---	2E-06	4E-06	---	---	---	---	---
		C1-EU1 Total		2E-06	---	2E-06	4E-06		---	---	---	---
		Surface Soil at C3S-EU1	Total PCBs	4E-06	---	3E-06	7E-06	---	---	---	---	---
		C3S-EU1 Total		4E-06	---	3E-06	7E-06		---	---	---	---
		Total PCB Dioxin-like Congener TEQ C3S-EU1 Total		---	---	---	---	---	---	---	---	---
		Surface Soil at C3S-EU2	Total PCBs	5E-06	---	4E-06	8E-06	---	---	---	---	---
		C3S-EU2 Total		5E-06	---	4E-06	8E-06		---	---	---	---

TABLE B-36

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU1	Total PCBs	---	---	2E-06	2E-06	---	---	---	---	---
		C1-EU1 Total		---	---	2E-06	2E-06		---	---	---	---
		Surface Soil at C3S-EU1	Total PCBs	1E-06	---	4E-06	6E-06	---	---	---	---	---
		C3S-EU1 Total		1E-06	---	4E-06	6E-06		---	---	---	---
		Surface Soil at C3S-EU2	Total PCBs	1E-06	---	5E-06	7E-06		---	---	---	---
		C3S-EU2 Total		1E-06	---	5E-06	7E-06		---	---	---	---
		Total PCB Dioxin-like Congener TEQ C3S-EU2 Total		---	---	2E-06	2E-06	---	---	---	---	---

TABLE B-37
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
ANNISTON PCB SITE
OU 4

Scenario Timeframe: Current/Future
Receptor Population: Recreational User (High Contact)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at C1-EU1	Total PCBs	1E-06	---	---	1E-06	---	---	---	---	---
		C1-EU1 Total		1E-06	---	---	1E-06		---	---	---	---
		Surface Soil at C3S-EU1	Total PCBs	2E-06	---	1E-06	3E-06	---	---	---	---	---
		C3S-EU1 Total		2E-06	---	1E-06	3E-06		---	---	---	---
		Surface Soil at C3S-EU2	Total PCBs	2E-06	---	2E-06	4E-06	---	---	---	---	---
		C3S-EU2 Total		2E-06	---	2E-06	4E-06		---	---	---	---

TABLE B-38

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

ANNISTON PCB SITE

OU 4

Scenario Timeframe: Current/Future
Receptor Population: Farmer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil at Ag-EU1	Total PCBs	1E-06	---	2E-06	3E-06	---	---	---	---	---
		Ag-EU1 Total		1E-06	---	2E-06	3E-06	---	---	---	---	---
		Surface Soil at Ag-EU3	Total PCBs	---	---	1E-06	1E-06	---	---	---	---	---
		Ag-EU3 Total		---	---	1E-06	1E-06	---	---	---	---	---

APPENDIX C

BASELINE ECOLOGICAL RISK ASSESSMENT TABLES

Table C-1 Summary Statistics for Polychlorinated Biphenyls in OU-4 Floodplain Soils
Anniston PCB Site, Anniston, Alabama

Reach or AA [1]	Description	Subgroup	Total Sample Size (n)	Number of Detects	Mean of Detected PCB Concentration (mg/kg)	Maximum of Detected PCB Concentration (mg/kg)	Standard Deviation of Detected PCB Concentration (mg/kg)	UCL[2,3] (mg/kg)	EPC[4] (mg/kg)	EPC Basis
C1	Oxford Lake Park	east	94	75	11.03	59.00	12.91	11.4	11.4	UCL
C1	Oxford Lake Park	west	6	6	52.90	206.50	80.30	NA	206.5	Maximum
C2	Backwater Area	central	35	4	0.59	1.76	0.81	NA	1.8	Maximum
C2	Backwater Area	south	22	3	0.26	0.38	0.10	NA	0.4	Maximum
C2	Backwater Area	riparian	17	4	8.58	32.00	15.63	NA	32.0	Maximum
C2	Backwater Area	north	38	29	3.56	32.00	6.56	5.5	5.5	UCL
C3	Friendship Road to Highway 21	north	82	78	11.06	75.00	13.72	13.6	13.6	UCL
C3	Friendship Road to Highway 21	riparian	22	21	13.14	79.40	18.23	24	24.0	UCL
C3	Friendship Road to Highway 21	south	70	45	12.97	79.40	19.41	28.3	28.3	UCL
C4	Highway 21 to Silver Run Road	north	147	115	4.36	38.00	7.21	9.4	9.4	UCL
C4	Highway 21 to Silver Run Road	south	145	118	6.18	51.50	7.93	6.3	6.3	UCL
C4	Highway 21 to Silver Run Road	riparian	52	49	8.01	31.30	7.97	9.8	9.8	UCL
UAA	Floodplain Soil and Riparian Soil	floodplain	539	392	7.10	79.40	11.30	9.5	9.5	UCL
UAA	Riparian Soil Only	riparian	91	74	9.49	79.40	12.17	10	10.2	UCL
C5	Silver Run Road to Mitchell Matson Road	south	101	52	1.95	15.50	2.47	1.5	1.5	UCL
C5	Silver Run Road to Mitchell Matson Road	north	127	68	1.38	9.39	1.95	1.0	1.0	UCL
C5	Silver Run Road to Mitchell Matson Road	riparian	57	51	2.37	15.50	2.76	2.9	2.9	UCL
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	north	23	16	1.75	5.20	1.75	1.8	1.8	UCL
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	south	24	15	1.87	9.95	2.65	2.7	2.7	UCL
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	riparian	29	24	1.84	9.95	2.24	2.6	2.6	UCL
MAA	Floodplain Soil and Riparian Soil	floodplain	275	151	1.66	15.50	2.19	1.4	1.4	UCL
MAA	Riparian Soil	riparian	86	75	2.20	15.50	2.60	2.5	2.5	UCL
C7	upstream of Curry Station Road to Eastaboga Creek	north	91	39	0.64	8.39	1.42	0.7	0.7	UCL
C7	upstream of Curry Station Road to Eastaboga Creek	south	103	40	1.57	9.90	2.37	1.3	1.3	UCL
C7	upstream of Curry Station Road to Eastaboga Creek	riparian	37	33	1.95	9.90	2.28	2.6	2.6	UCL
C8	Eastaboga Creek to Jackson Shoals Dam	south	20	10	0.72	3.08	1.22	1.3	1.3	UCL
C8	Eastaboga Creek to Jackson Shoals Dam	north	24	18	1.39	5.46	1.58	1.9	1.9	UCL
C8	Eastaboga Creek to Jackson Shoals Dam	riparian	19	18	1.72	5.46	1.58	2.3	2.3	UCL
C9	Jackson Shoals Dam to Highway 77	south	20	11	0.41	0.58	0.13	0.3	0.3	UCL
C9	Jackson Shoals Dam to Highway 77	north	21	8	1.22	5.10	1.75	1.6	1.6	UCL
C9	Jackson Shoals Dam to Highway 77	riparian	14	13	0.98	5.10	1.36	2.3	2.3	UCL
LAA	Floodplain Soil and Riparian Soil	floodplain	288	132	1.04	9.90	1.75	0.8	0.8	UCL
LAA	Riparian Soil	riparian	79	70	1.58	9.90	1.90	1.8	1.8	UCL

Table C-1. Summary Statistics for Polychlorinated Biphenyls in OU-4 Floodplain Soils Anniston PCB Site, Anniston, Alabama

Notes:

[1] See Figure 4-1 for locations of reaches.

[2] Datasets with "NA" for UCL did not have enough samples for ProUCL to calculate a UCL.

[3] ProUCL 5.1 (USEPA 2016) was used to calculate summary statistics and UCL values.

[4] EPC based on the UCL when available, otherwise based on the maximum detected concentration.

AA: assessment area

EPC: exposure point concentration

LAA: lower assessment area

MAA: middle assessment area

mg/kg: milligram per kilogram

n: sample size

OU-4: Operable Unit 4

PCB: polychlorinated biphenyl

UAA: upper assessment area

UCL: 95% upper confidence limit

USEPA: United States Environmental Protection Agency

Reference:

USEPA. 2016. ProUCL 5.1 A Statistical Software for Environmental Applications for Data Sets with and without non detect observations. National Exposure Research Lab, EPA, Las Vegas Nevada, May 2016. http://www.epa.gov/osp/hstl/tsc/softwaredocs.htm

Table C-2. Summary Statistics for Mercury in OU-4 Floodplain Soils
Anniston PCB Site, Anniston, Alabama

Reach or AA [1]	Description	Subgroup	Total Sample Size (n)	Number of Detects	Mean of Detected Mercury Concentration (mg/kg)	Maximum of Detected Mercury Concentration (mg/kg)	Standard Deviation of Detected Mercury Concentration (mg/kg)	UCL[2,3] (mg/kg)	EPC[4] (mg/kg)	EPC Basis
C2	Backwater Area	south	22	22	0.05	0.21	0.04	0.07	0.07	UCL
C2	Backwater Area	central	34	34	0.08	0.70	0.11	0.2	0.2	UCL
C2	Backwater Area	riparian	16	16	0.17	1.10	0.30	0.5	0.5	UCL
C2	Backwater Area	north	16	15	0.42	2.40	0.67	1.4	1.4	UCL
C3	Friendship Road to Highway 21	north	77	77	2.56	16.50	2.78	3.2	3.2	UCL
C3	Friendship Road to Highway 21	south	63	62	1.79	13.00	2.93	3.4	3.4	UCL
C3	Friendship Road to Highway 21	riparian	13	13	3.22	13.00	3.58	5.9	5.9	UCL
C4	Highway 21 to Silver Run Road	riparian	36	36	2.51	17.40	3.36	3.6	3.6	UCL
C4	Highway 21 to Silver Run Road	north	103	103	1.51	21.70	3.13	2.2	2.2	UCL
C4	Highway 21 to Silver Run Road	south	131	131	1.95	16.30	2.55	2.4	2.4	UCL
UAA	Floodplain Soil and Riparian Soil	floodplain	446	444	1.64	21.70	2.69	2.2	2.2	UCL
UAA	Riparian Soil	riparian	65	65	2.08	17.40	3.14	2.8	2.8	UCL
C5	Silver Run Road to Mitchell Matson Road	riparian	44	44	1.02	3.90	1.12	1.4	1.4	UCL
C5	Silver Run Road to Mitchell Matson Road	north	120	120	0.44	3.70	0.74	0.7	0.7	UCL
C5	Silver Run Road to Mitchell Matson Road	south	92	92	0.53	3.90	0.82	0.9	0.9	UCL
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	riparian	29	29	1.27	8.40	1.83	2.0	2.0	UCL
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	north	23	23	0.88	3.40	1.13	1.6	1.6	UCL
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	south	24	24	1.03	8.40	1.94	2.8	2.8	UCL
MAA	Floodplain Soil and Riparian Soil	floodplain	259	259	0.57	8.40	0.99	0.8	0.8	UCL
MAA	Riparian Soil	riparian	73	73	1.12	8.40	1.44	1.4	1.4	UCL
C7	Upstream of Curry Station Road to Eastaboga Creek	north	40	38	0.25	2.20	0.45	0.5	0.5	UCL
C7	Upstream of Curry Station Road to Eastaboga Creek	south	52	52	0.69	8.40	1.76	1.8	1.8	UCL
C7	Upstream of Curry Station Road to Eastaboga Creek	riparian	13	12	2.01	7.60	2.38	3.0	3.0	UCL
C8	Eastaboga Creek to Jackson Shoals Dam	south	2	2	0.70	0.75	0.07	NA	0.8	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	riparian	4	4	1.75	4.65	1.94	NA	4.7	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	north	6	6	0.95	4.65	1.85	NA	4.7	Maximum
C9	Jackson Shoals Dam to Highway 77	south	20	20	0.33	0.86	0.28	0.5	0.5	UCL
C9	Jackson Shoals Dam to Highway 77	riparian	13	13	0.88	5.10	1.30	1.7	1.7	UCL
C9	Jackson Shoals Dam to Highway 77	north	20	12	0.67	5.10	1.43	1.7	1.7	UCL
LAA	Floodplain Soil and Riparian Soil	floodplain	140	130	0.52	8.40	1.28	0.9	0.9	UCL
LAA	Riparian Soil	riparian	30	29	1.47	7.60	1.91	3.9	3.9	UCL

Table C-2. Summary Statistics for Mercury in OU-4 Floodplain Soils
Anniston PCB Site, Anniston, Alabama

Notes:

[1] See Figure 4-1 for locations of reaches.

[2] Datasets with "NA" for UCL did not have enough samples for ProUCL to calculate a UCL.

[3] ProUCL 5.1 (USEPA 2016) was used to calculate summary statistics and UCL values.

[4] EPC based on the UCL when available, otherwise based on the maximum detected concentration.

AA: assessment area

EPC: exposure point concentration

LAA: lower assessment area

MAA: middle assessment area

mg/kg: milligram per kilogram

n: sample size

NA: value not available; too few samples for UCL calculation

OU-4: Operable Unit 4

PCB: polychlorinated biphenyl

UAA: upper assessment area

UCL: 95% upper confidence limit

USEPA: United States Environmental Protection Agency

Reference:

USEPA. 2016. ProUCL 5.1 A Statistical Software for Environmental Applications for Data Sets with and without non detect observations. National Exposure Research Lab, EPA, Las Vegas Nevada, May 2016. http://www.epa.gov/osp/hstl/tsc/softwaredocs.htm

Table C-3. Summary Statistics for Chromium in OU-4 Floodplain Soils
Anniston PCB Site, Anniston, Alabama

Reach or AA [1]	Description	Subgroup	Total Sample Size (n)	Number of Detects	Mean of Detected Chromium Concentration (mg/kg)	Maximum of Detected Chromium Concentration (mg/kg)	Standard Deviation of Detected Chromium Concentration[1] (mg/kg)	UCL[2,3] (mg/kg)	EPC[4] (mg/kg)	EPC Basis
C2	Backwater Area	south	2	2	11.00	11.20	0.28	NA	11.2	Maximum
C2	Backwater Area	riparian	3	3	11.45	13.40	1.84	NA	13.4	Maximum
C2	Backwater Area	central	3	3	11.12	13.40	1.99	NA	13.4	Maximum
C2	Backwater Area	north	2	2	28.90	34.40	7.78	NA	34.4	Maximum
C3	Friendship Road to Highway 21	north	7	7	12.61	17.90	3.85	NA	17.9	Maximum
C3	Friendship Road to Highway 21	riparian	1	1	16.20	16.20	NA	NA	16.2	Maximum
C3	Friendship Road to Highway 21	south	6	6	24.52	55.20	18.49	NA	55.2	Maximum
C4	Highway 21 to Silver Run Road	south	11	11	18.80	35.30	9.49	26.2	26.2	UCL
C4	Highway 21 to Silver Run Road	north	9	9	24.34	53.10	17.18	43.8	43.8	UCL
C4	Highway 21 to Silver Run Road	riparian	4	4	26.43	46.00	14.00	NA	46.0	Maximum
UAA	Floodplain Soil and Riparian Soil	floodplain	40	40	19.36	55.20	12.77	28.2	28.2	UCL
UAA	Riparian Soil	riparian	8	8	19.53	46.00	11.90	27.5	27.5	UCL
C5	Silver Run Road to Mitchell Matson Road	north	10	10	14.47	35.80	9.35	19.9	19.9	UCL
C5	Silver Run Road to Mitchell Matson Road	south	8	8	16.68	41.90	12.44	25.0	25.0	UCL
C5	Silver Run Road to Mitchell Matson Road	riparian	2	2	24.50	41.90	24.61	NA	41.9	Maximum
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	south	2	2	8.80	10.00	1.70	NA	10.0	Maximum
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	north	2	2	15.85	18.40	3.61	NA	18.4	Maximum
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	riparian	1	1	18.40	18.40	NA	NA	18.4	Maximum
MAA	Floodplain Soil and Riparian Soil	floodplain	22	22	14.88	41.90	9.73	19.0	19.0	UCL
MAA	Riparian Soil	riparian	3	3	22.47	41.90	17.75	NA	41.9	Maximum
C7	Upstream of Curry Station Road to Eastaboga Creek	north	7	7	12.07	22.20	6.42	NA	22.2	Maximum
C7	Upstream of Curry Station Road to Eastaboga Creek	riparian	5	5	13.54	27.80	8.52	NA	27.8	Maximum
C7	Upstream of Curry Station Road to Eastaboga Creek	south	10	10	21.54	42.00	13.75	29.5	29.5	UCL
C8	Eastaboga Creek to Jackson Shoals Dam	south	2	2	17.63	18.75	1.59	NA	18.8	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	north	3	3	18.33	23.70	4.87	NA	23.7	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	riparian	4	4	19.01	23.70	3.27	NA	23.7	Maximum
C9	Jackson Shoals Dam to Highway 77	south	2	2	13.15	14.10	1.34	NA	14.1	Maximum
C9	Jackson Shoals Dam to Highway 77	riparian	1	1	14.40	14.40	NA	NA	14.4	Maximum
C9	Jackson Shoals Dam to Highway 77	north	2	2	11.00	14.40	4.81	NA	14.4	Maximum
LAA	Floodplain Soil and Riparian Soil	floodplain	26	26	16.86	42.00	10.01	20.2	20.2	UCL
LAA	Riparian Soil	riparian	10	10	15.82	27.80	6.59	19.6	19.6	UCL

Table C-3. Summary Statistics for Chromium in OU-4 Floodplain Soils
Anniston PCB Site, Anniston, Alabama

Notes:

[1] See Figure 4-1 for location of reaches.

[2] Datasets with "NA" for UCL did not have enough samples for ProUCL to calculate a UCL.

[3] ProUCL 5.1 (USEPA 2016) was used to calculate summary statistics and UCL values.

[4] EPC based on the UCL when available, otherwise based on the maximum detected concentration.

AA: assessment area
EPC: exposure point concentration
LAA: lower assessment area
MAA: middle assessment area
mg/kg: milligram per kilogram
n: sample size
NA: value not available; too few samples for UCL calculation
PCB: polychlorinated biphenyl
UAA: upper assessment area
UCL: 95% upper confidence limit
USEPA: United States Environmental Protection Agency

Reference:

USEPA. 2016. ProUCL 5.1 A Statistical Software for Environmental Applications for Data Sets with and without non detect observations. National Exposure Research Lab, EPA, Las Vegas Nevada, May 2016.
http://www.epa.gov/osp/hstl/tsc/softwaredocs.htm

Table C-4. Summary Statistics for Lead in OU-4 Floodplain Soils
Anniston PCB Site, Anniston, Alabama

Reach or AA [1]	Description	Subgroup	Total Sample Size (n)	Number of Detects	Mean of Detected Lead Concentration (mg/kg)	Maximum of Detected Lead Concentration (mg/kg)	Standard Deviation of Detected Lead Concentration[1] (mg/kg)	UCL[2,3] (mg/kg)	EPC[4] (mg/kg)	EPC Basis
C2	Backwater Area	south	2	2	20.15	22.80	3.75	NA	22.8	Maximum
C2	Backwater Area	north	2	2	20.65	30.00	13.22	NA	30.0	Maximum
C2	Backwater Area	central	3	3	32.82	44.80	13.03	NA	44.8	Maximum
C2	Backwater Area	riparian	3	3	27.08	44.80	15.36	NA	44.8	Maximum
C3	Friendship Road to Highway 21	riparian	1	1	35.90	35.90	NA	NA	35.9	Maximum
C3	Friendship Road to Highway 21	north	7	7	32.10	43.10	8.67	NA	43.1	Maximum
C3	Friendship Road to Highway 21	south	6	6	53.40	106.00	33.79	NA	106.0	Maximum
C4	Highway 21 to Silver Run Road	south	11	11	37.18	85.70	22.56	49.5	49.5	UCL
C4	Highway 21 to Silver Run Road	north	9	9	44.30	89.10	30.05	62.9	62.9	UCL
C4	Highway 21 to Silver Run Road	riparian	4	4	52.88	89.10	26.31	NA	89.1	Maximum
UAA	Floodplain Soil and Riparian Soil	floodplain	40	40	38.32	106.00	23.94	45.3	45.3	UCL
UAA	Riparian Soil	riparian	8	8	41.08	89.10	23.05	56.5	56.5	UCL
C5	Silver Run Road to Mitchell Matson Road	north	10	10	17.04	39.20	8.23	21.8	21.8	UCL
C5	Silver Run Road to Mitchell Matson Road	riparian	2	2	39.65	52.70	18.46	NA	52.7	Maximum
C5	Silver Run Road to Mitchell Matson Road	south	8	8	34.08	95.60	29.60	53.9	53.9	UCL
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	south	2	2	13.75	14.30	0.78	NA	14.3	Maximum
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	north	2	2	17.85	25.50	10.82	NA	25.5	Maximum
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	riparian	1	1	25.50	25.50	NA	NA	25.5	Maximum
MAA	Floodplain Soil and Riparian Soil	floodplain	22	22	23.01	95.60	20.03	41.6	41.6	UCL
MAA	Riparian Soil	riparian	3	3	34.93	52.70	15.40	NA	52.7	Maximum
C7	Upstream of Curry Station Road to Eastaboga Creek	south	10	10	20.22	32.10	7.92	24.8	24.8	UCL
C7	Upstream of Curry Station Road to Eastaboga Creek	riparian	5	5	18.94	32.10	8.87	NA	32.1	Maximum
C7	Upstream of Curry Station Road to Eastaboga Creek	north	7	7	21.39	39.40	9.86	NA	39.4	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	north	3	3	24.98	29.50	5.69	NA	29.5	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	riparian	4	4	25.15	30.45	4.97	NA	30.5	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	south	2	2	27.57	30.45	4.07	NA	30.5	Maximum
C9	Jackson Shoals Dam to Highway 77	north	2	2	14.25	15.50	1.77	NA	15.5	Maximum
C9	Jackson Shoals Dam to Highway 77	riparian	1	1	15.50	15.50	NA	NA	15.5	Maximum
C9	Jackson Shoals Dam to Highway 77	south	2	2	16.45	18.60	3.04	NA	18.6	Maximum
LAA	Floodplain Soil and Riparian Soil	floodplain	26	26	20.90	39.40	7.78	23.5	23.5	UCL
LAA	Riparian Soil	riparian	10	10	21.08	32.10	7.52	25.4	25.4	UCL

Table C-4. Summary Statistics for Lead in OU-4 Floodplain Soils
Anniston PCB Site, Anniston, Alabama

Notes:
[1] See Figure 4-1 for location of reaches.
[2] Datasets with "NA" for UCL did not have enough samples for ProUCL to calculate a UCL.
[3] ProUCL 5.1 (USEPA 2016) was used to calculate summary statistics and UCL values.
[4] EPC based on the UCL when available, otherwise based on the maximum detected concentration.
AA: assessment area
EPC: exposure point concentration
LAA: lower assessment area
MAA: middle assessment area
mg/kg: milligram per kilogram
n: sample size
NA: value not available; too few samples for UCL calculation
PCB: polychlorinated biphenyl
UAA: upper assessment area
UCL: 95% upper confidence limit
USEPA: United States Environmental Protection Agency

Reference:
USEPA. 2016. ProUCL 5.1 A Statistical Software for Environmental Applications for Data Sets with and without non detect observations. National Exposure Research Lab, EPA, Las Vegas Nevada, May 2016. http://www.epa.gov/osp/hstl/tsc/softwaredocs.htm

Table C-5. Summary Statistics for Vanadium in OU-4 Floodplain Soils
Anniston PCB Site, Anniston, Alabama

Reach or AA [1]	Description	Subgroup	Total Sample Size (n)	Number of Detects	Mean of Detected Vanadium Concentration (mg/kg)	Maximum of Detected Vanadium Concentration (mg/kg)	Standard Deviation of Detected Vanadium Concentration[1] (mg/kg)	UCL[2,3] (mg/kg)	EPC[4] (mg/kg)	EPC Basis
C2	Backwater Area	central	3	3	16.22	19.40	2.76	NA	19.4	Maximum
C2	Backwater Area	riparian	3	3	18.88	22.80	4.20	NA	22.8	Maximum
C2	Backwater Area	south	2	2	20.05	22.80	3.89	NA	22.8	Maximum
C2	Backwater Area	north	2	2	21.75	22.90	1.63	NA	22.9	Maximum
C3	Friendship Road to Highway 21	riparian	1	1	15.80	15.80	NA	NA	15.8	Maximum
C3	Friendship Road to Highway 21	north	7	7	16.63	19.60	2.74	NA	19.6	Maximum
C3	Friendship Road to Highway 21	south	6	6	17.98	24.80	4.83	NA	24.8	Maximum
C4	Highway 21 to Silver Run Road	riparian	4	4	17.75	22.20	3.58	NA	22.2	Maximum
C4	Highway 21 to Silver Run Road	south	11	11	20.16	25.50	4.44	22.6	22.6	UCL
C4	Highway 21 to Silver Run Road	north	9	9	20.78	27.20	4.05	23.3	23.3	UCL
UAA	Floodplain Soil and Riparian Soil	floodplain	40	40	19.13	27.20	4.09	20.2	20.2	UCL
UAA	Riparian Soil	riparian	8	8	17.93	22.80	3.40	20.2	20.2	UCL
C5	Silver Run Road to Mitchell Matson Road	riparian	2	2	13.35	15.70	3.32	NA	15.7	Maximum
C5	Silver Run Road to Mitchell Matson Road	north	10	10	21.16	42.80	11.95	28.1	28.1	UCL
C5	Silver Run Road to Mitchell Matson Road	south	8	8	22.66	44.90	14.02	32.1	32.1	UCL
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	south	2	2	12.60	12.90	0.42	NA	12.9	Maximum
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	riparian	1	1	13.30	13.30	NA	NA	13.3	Maximum
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	north	2	2	20.25	27.20	9.83	NA	27.2	Maximum
MAA	Floodplain Soil and Riparian Soil	floodplain	22	22	20.85	44.90	11.80	25.2	25.2	UCL
MAA	Riparian Soil	riparian	3	3	13.33	15.70	2.35	NA	15.7	Maximum
C7	Upstream of Curry Station Road to Eastaboga Creek	riparian	5	5	12.86	15.40	2.50	NA	15.4	Maximum
C7	Upstream of Curry Station Road to Eastaboga Creek	north	7	7	16.96	28.80	7.45	NA	28.8	Maximum
C7	Upstream of Curry Station Road to Eastaboga Creek	south	10	10	21.89	45.40	13.78	29.9	29.9	UCL
C8	Eastaboga Creek to Jackson Shoals Dam	north	3	3	15.72	22.80	6.33	NA	22.8	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	riparian	4	4	19.91	28.30	9.04	NA	28.3	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	south	2	2	27.65	28.30	0.92	NA	28.3	Maximum
C9	Jackson Shoals Dam to Highway 77	riparian	1	1	9.70	9.70	NA	NA	9.7	Maximum
C9	Jackson Shoals Dam to Highway 77	north	2	2	10.95	12.20	1.77	NA	12.2	Maximum
C9	Jackson Shoals Dam to Highway 77	south	2	2	24.25	27.00	3.89	NA	27.0	Maximum
LAA	Floodplain Soil and Riparian Soil	floodplain	26	26	19.63	45.40	10.22	23.7	23.7	UCL
LAA	Riparian Soil	riparian	10	10	15.37	28.30	6.80	20.7	20.7	UCL

Table C-5 Summary Statistics for Vanadium in OU-4 Floodplain Soils
Anniston PCB Site, Anniston, Alabama

Notes:
[1] See Figure 4-1 for location of reaches.
[2] Datasets with "NA" for UCL did not have enough samples for ProUCL to calculate a UCL.
[3] ProUCL 5.1 (USEPA 2016) was used to calculate summary statistics and UCL values.
[4] EPC based on the UCL when available, otherwise based on the maximum detected concentration.
AA: assessment area
EPC: exposure point concentration
LAA: lower assessment area
MAA: middle assessment area
mg/kg: milligram per kilogram
n: sample size
NA: value not available; too few samples for UCL calculation
PCB: polychlorinated biphenyl
UAA: upper assessment area
UCL: 95% upper confidence limit
USEPA: United States Environmental Protection Agency

Reference:
USEPA. 2016. ProUCL 5.1 A Statistical Software for Environmental Applications for Data Sets with and without non detect observations. National Exposure Research Lab, EPA, Las Vegas Nevada, May 2016. http://www.epa.gov/osp/hstl/tsc/softwaredocs.htm

Table C-6. Summary Statistics for Barium in Soil [5]
Anniston PCB Site, Anniston, Alabama

Reach or AA [1]	Description	Subgroup	Total Sample Size (n)	Number of Detects	Mean of Detected Barium Concentration (mg/kg)	Maximum of Detected Barium Concentration (mg/kg)	Standard Deviation of Detected Barium Concentration (mg/kg)	UCL[2,3] (mg/kg)	EPC[4] (mg/kg)	EPC Basis
C2	Backwater Area	central	3	3	124.00	138.00	15.72	NA	138	Maximum
C2	Backwater Area	north	2	2	77.80	86.10	11.74	NA	86.1	Maximum
C2	Backwater Area	riparian	3	3	114.50	138.00	20.75	NA	138	Maximum
C2	Backwater Area	south	2	2	117.30	136.00	26.45	NA	136	Maximum
C3	Friendship Road to Highway 21	north	7	7	101.50	137.00	32.64	NA	137	Maximum
C3	Friendship Road to Highway 21	riparian	1	1	117.00	117.00	NA	NA	117	Maximum
C3	Friendship Road to Highway 21	south	6	6	109.90	171.00	39.49	NA	171	Maximum
C4	Highway 21 to Silver Run Road	north	9	9	128.10	197.00	55.28	162.4	162.4	UCL
C4	Highway 21 to Silver Run Road	riparian	4	4	130.30	189.00	46.89	NA	189	Maximum
C4	Highway 21 to Silver Run Road	south	11	11	122.60	180.00	29.24	138.6	138.6	UCL
UAA	Floodplain Soil and Riparian Soil	floodplain	40	40	115.80	197.00	37.59	125.9	125.9	UCL
UAA	Riparian Soil Only	riparian	8	8	122.70	189.00	33.63	145.2	145.2	UCL
C5	Silver Run Road to Mitchell Matson Road	north	10	10	88.45	145.80	39.78	111.5	111.5	UCL
C5	Silver Run Road to Mitchell Matson Road	riparian	2	2	107.90	137.00	41.15	NA	137	Maximum
C5	Silver Run Road to Mitchell Matson Road	south	8	8	65.71	137.00	40.25	92.67	92.7	UCL
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	north	2	2	62.40	74.90	17.68	NA	74.9	Maximum
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	riparian	1	1	74.90	74.90	NA	NA	74.9	Maximum
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	south	2	2	66.25	85.40	27.08	NA	85.4	Maximum
MAA	Floodplain Soil and Riparian Soil	floodplain	22	22	75.79	145.80	37.54	89.56	89.6	UCL
MAA	Riparian Soil	riparian	3	3	96.90	137.00	34.78	NA	137	Maximum
C7	upstream of Curry Station Road to Eastaboga Creek	north	7	7	90.70	139.00	33.28	NA	139	Maximum
C7	upstream of Curry Station Road to Eastaboga Creek	riparian	5	5	77.84	107.00	19.99	NA	107	Maximum
C7	upstream of Curry Station Road to Eastaboga Creek	south	10	10	81.11	163.00	36.83	110.1	110.1	UCL
C8	Eastaboga Creek to Jackson Shoals Dam	north	3	3	92.02	130.00	35.72	NA	130	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	riparian	4	4	104.40	142.50	38.36	NA	142.5	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	south	2	2	135.80	142.50	9.55	NA	142.5	Maximum
C9	Jackson Shoals Dam to Highway 77	north	2	2	55.40	57.60	3.11	NA	57.6	Maximum
C9	Jackson Shoals Dam to Highway 77	riparian	1	1	57.60	57.60	NA	NA	57.6	Maximum
C9	Jackson Shoals Dam to Highway 77	south	2	2	91.80	116.00	34.22	NA	116	Maximum
LAA	Floodplain Soil and Riparian Soil	floodplain	26	26	88.00	163.00	34.62	101.6	101.6	UCL
LAA	Riparian Soil	riparian	10	10	86.44	142.50	30.74	104.3	104.3	UCL

Table C-6. Summary Statistics for Barium in Soil [5]
Anniston PCB Site, Anniston, Alabama

Notes:

[1] See Figure 4-1 for location of reaches.

[2] Datasets with "NA" for UCL did not have enough samples for ProUCL to calculate a UCL.

[3] ProUCL 5.1 (USEPA 2016) was used to calculate summary statistics and UCL values.

[4] EPC based on the UCL when available, otherwise based on the maximum detected concentration.

[5] Barium is not a COPC in soil. Data included for foodweb modeling for mixed-diet receptors.

AA: assessment area
EPC: exposure point concentration
LAA: lower assessment area
MAA: middle assessment area
mg/kg: milligram per kilogram
n: sample size
NA: value not available; too few samples for UCL calculation
PCB: polychlorinated biphenyl
UAA: upper assessment area
UCL: 95% upper confidence limit
USEPA: United States Environmental Protection Agency

Reference:

USEPA. 2016. ProUCL 5.1 A Statistical Software for Environmental Applications for Data Sets with and without non detect observations. National Exposure Research Lab, EPA, Las Vegas Nevada, May 2016. http://www.epa.gov/osp/hstl/tsc/softwaredocs.htm

Table C-7. Summary Statistics for Cobalt in Soil [5]
Anniston PCB Site, Anniston, Alabama

Reach or AA [1]	Description	Subgroup	Total Sample Size (n)	Number of Detects	Mean of Detected Cobalt Concentration (mg/kg)	Maximum of Detected Cobalt Concentration (mg/kg)	Standard Deviation of Detected Cobalt Concentration (mg/kg)	UCL[2,3] (mg/kg)	EPC[4] (mg/kg)	EPC Based on
C2	Backwater Area	central	3	3	10.22	11.40	1.20	NA	11.4	Maximum
C2	Backwater Area	north	2	2	5.80	6.50	0.99	NA	6.5	Maximum
C2	Backwater Area	riparian	3	3	9.95	11.40	1.62	NA	11.4	Maximum
C2	Backwater Area	south	2	2	9.10	10.00	1.27	NA	10	Maximum
C3	Friendship Road to Highway 21	north	7	7	7.79	10.60	2.32	NA	10.6	Maximum
C3	Friendship Road to Highway 21	riparian	1	1	8.50	8.50	NA	NA	8.5	Maximum
C3	Friendship Road to Highway 21	south	6	6	8.40	13.80	3.55	NA	13.8	Maximum
C4	Highway 21 to Silver Run Road	north	9	9	9.21	12.60	2.89	11.0	11.0	UCL
C4	Highway 21 to Silver Run Road	riparian	4	4	9.20	11.70	1.75	NA	11.7	Maximum
C4	Highway 21 to Silver Run Road	south	11	11	8.96	12.60	2.39	10.3	10.3	UCL
UAA	Floodplain Soil and Riparian Soil	floodplain	40	40	8.67	13.80	2.57	9.4	9.4	UCL
UAA	Riparian Soil Only	riparian	8	8	9.39	11.70	1.53	10.4	10.4	UCL
C5	Silver Run Road to Mitchell Matson Road	north	10	10	7.89	15.25	3.86	10.1	10.1	UCL
C5	Silver Run Road to Mitchell Matson Road	riparian	2	2	7.70	8.60	1.27	NA	8.6	Maximum
C5	Silver Run Road to Mitchell Matson Road	south	8	8	5.91	10.00	2.58	7.6	7.6	UCL
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	north	2	2	6.65	7.10	0.64	NA	7.1	Maximum
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	riparian	1	1	7.10	7.10	NA	NA	7.1	Maximum
C6	Mitchell Matson Road to 2,000 feet upstream of Curry Station Road	south	2	2	5.10	5.20	0.14	NA	5.2	Maximum
MAA	Floodplain Soil and Riparian Soil	floodplain	22	22	6.80	15.25	3.12	8.1	8.1	UCL
MAA	Riparian Soil	riparian	3	3	7.50	8.60	0.96	NA	8.6	Maximum
C7	upstream of Curry Station Road to Eastaboga Creek	north	7	7	10.14	25.20	6.91	NA	25.2	Maximum
C7	upstream of Curry Station Road to Eastaboga Creek	riparian	5	5	6.92	8.50	1.29	NA	8.5	Maximum
C7	upstream of Curry Station Road to Eastaboga Creek	south	10	10	8.68	15.40	3.59	10.8	10.8	UCL
C8	Eastaboga Creek to Jackson Shoals Dam	north	3	3	7.60	8.10	0.78	NA	8.1	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	riparian	4	4	10.30	13.60	3.46	NA	13.6	Maximum
C8	Eastaboga Creek to Jackson Shoals Dam	south	2	2	13.25	13.60	0.50	NA	13.6	Maximum
C9	Jackson Shoals Dam to Highway 77	north	2	2	5.40	5.50	0.14	NA	5.5	Maximum
C9	Jackson Shoals Dam to Highway 77	riparian	1	1	5.50	5.50	NA	NA	5.5	Maximum
C9	Jackson Shoals Dam to Highway 77	south	2	2	6.95	7.90	1.34	NA	7.9	Maximum
LAA	Floodplain Soil and Riparian Soil	floodplain	26	26	8.91	25.20	4.44	10.5	10.5	UCL
LAA	Riparian Soil	riparian	10	10	8.13	13.60	2.90	9.8	9.8	UCL

Table C-7. Summary Statistics for Cobalt in Soil [5]
Anniston PCB Site, Anniston, Alabama

Notes:

[1] See Figure 4-1 for location of reaches.

[2] Datasets with "NA" for UCL did not have enough samples for ProUCL to calculate a UCL.

[3] ProUCL 5.1 (USEPA 2016) was used to calculate summary statistics and UCL values.

[4] EPC based on the UCL when available, otherwise based on the maximum detected concentration.

[5] Cobalt is not a COPC in soil. Data included for foodweb modeling for mixed-diet receptors.

AA: assessment area
EPC: exposure point concentration
LAA: lower assessment area
MAA: middle assessment area
mg/kg: milligram per kilogram
n: sample size
NA: value not available; too few samples for UCL calculation
PCB: polychlorinated biphenyl
UAA: upper assessment area
UCL: 95% upper confidence limit
USEPA: United States Environmental Protection Agency

Reference:

USEPA. 2016. ProUCL 5.1 A Statistical Software for Environmental Applications for Data Sets with and without non detect observations. National Exposure Research Lab, EPA, Las Vegas Nevada, May 2016. http://www.epa.gov/osp/hstl/tsc/softwaredocs.htm

Table C-8. EPC Calculation Details Table for PCBs in Surface Sediments
Anniston PCB Site, Anniston, Alabama

Data Groups			Descriptive Statistics						MCA (Fine + Coarse + Gravel)				
Assessment Area	Reach	Sediment Texture	Core Locations (n)	Surface Area (ac)	PCB Samples (n)	Detected Samples (n)	Mean Surface PCB (mg/kg)	Max Surface PCB (mg/kg)	Reach Sample Weighting Factor	Reach Bootstrap Mean	Reach 95%tile of Bootstrap Means	Assessment Area Bootsrap Mean	Assessment Area 95%tile of Bootstrap Means
C1	C1[a]	Snow Creek[a]	16	NA	16	15	5.26	41.00	NA	NA	NA	NA	NA
Upper	C2	Coarse	14	2.5	15	3	0.37	3.08	0.01				
		Fine	24	6.5	22	13	8.83	95.00	0.03				
		Gravel	8	2.4	2	2	0.55	0.81	0.10	5.13	9.95		
		No Recovery	2	0.7	0	0	0.05	NA					
	C3	Coarse	14	6.0	5	5	0.75	1.96	0.09				
		Fine	5	2.2	9	9	1.29	2.83	0.02				
		Gravel[b]	9	5.3	0	0	**0.75**	NA	0.39	0.83	1.10	1.69	4.09
		No Recovery	4	1.7	0	0	0.05	NA					
	C4	Coarse	79	28.8	16	16	1.07	8.90	0.05				
		Fine	7	2.2	5	5	5.32	23.20	0.01				
		Gravel	18	6.8	4	4	0.58	1.45	0.05	1.24	2.42		
		No Recovery	8	3.1	0	0	0.05	NA					
Middle	C5	Coarse	75	47.2	31	26	0.52	5.15	0.03				
		Fine	6	3.6	14	14	1.62	3.90	0.005				
		Gravel	9	5.5	2	1	0.07	0.08	0.05	0.55	0.83		
		No Recovery	34	19.5	0	0	0.05	NA				0.49	0.76
	C6[c]	Coarse	37	28.4	3	2	0.10	0.14	0.29				
		Fine	1	0.7	1	1	1.20	1.20	0.02	< 8 Samples			
		Gravel[b]	6	4.0	0	0	**0.10**	NA	0.12				
		No Recovery	40	24.6	0	0	0.05	NA					
Lower	C7	Coarse	56	35.4	17	11	0.56	3.17	0.04				
		Fine	8	5.0	17	16	1.87	4.20	0.01				
		Gravel	14	8.3	1	1	0.09	0.09	0.17	0.61	0.90		
		No Recovery	22	12.7	0	0	0.05	NA					
	C8	Coarse	30	27.1	14	13	0.57	2.64	0.04				
		Fine	25	24.1	18	18	1.09	2.13	0.03				
		Gravel[b]	2	1.4	0	0	**0.57**	NA	0.03	0.81	1.02		
		No Recovery	35	30.4	0	0	0.05	NA				0.83	1.11
	C9	Coarse	7	7.9	7	6	0.18	0.49	0.04				
		Fine	9	11.2	8	5	0.23	0.84	0.05				
		Gravel	9	11.0	2	1	0.11	0.16	0.18	0.17	0.25		
		No Recovery	31	37.1	0	0	0.05	NA					
	C10	Coarse	13	27.6	6	6	0.37	0.64	0.01				
		Fine	95	347.1	31	25	0.57	2.72	0.03				
		Gravel[b]	0	0.0	0	0	**0.37**	NA	0	0.56	0.74		
		No Recovery	13	26.6	0	0	0.05	NA					

Table C-8 EPC Calculation Details Table for PCBs in Surface Sediments
Anniston PCB Site, Anniston, Alabama

Notes:

Areas of no sediment recovery were not included in the assessment or spatial weighting

a. Snow Creek values are representive of 16 samples collected from individual deposits and are not spatially weighted. A standard 95% UCL of 16.0 mg/kg was selected as the reach and AA EPC.

b. Gravel areas without samples in a given reach were assumed to have a gravel PCB concentration equal to mean Coarse Sediment for that reach.

c. Dataset is small; weighted maximum EPC of 0.17 mg/kg calculated for reach C6.

Blue shading indicates selected EPC value

AA: assessment area

ac: acres

EPC: exposure point concentration

MCA: Monte-Carlo analysis

mg/kg: milligrams per kilogram

NA: not applicable or not calculated

PCB: polychlorinated biphenyl

UCL: 95% upper confidence limit

Table C-9. EPC Calculation Details Table for Mercury in Surface Sediments by Reach
Anniston PCB Site, Anniston, Alabama

Data Groups		Descriptive Statistics						MCA (Fine and Coarse)			MCA (Fine + Coarse + Gravel)		
Hg Reach	**Sediment Texture**	**Core Locations (n)**	**Surface Area (ac)**	**Hg Samples (n)**	**Detected Samples (n)**	**Mean Surface Hg (mg/kg)**	**Max Surface Hg (mg/kg)**	**Sample Weighting Factor**	**Mean**	**95% of Bootstrap Means**	**Reach Sample Weighting Factor**	**Reach Bootstrap Mean**	**Reach 95%tile of Bootstrap Means**
C1[a]	Snow Creek[a]	16	NA	2	2	0.55	0.58				NA	NA	NA
C2	Coarse	14	2.5	4	3	0.87	2.60	0.0694			0.05		
	Fine	24	6.5	2	2	23.32	46.60	0.361	6.5	11.7	0.29	14.1	27.4
	Gravel	8	2.4	1	1	2.90	2.90				0.21		
	No Recovery	2	0.7	0	0	No samples	No samples						
C3 to C4	Coarse	93	34.7	5	5	0.94	1.30	0.178			0.14		
	Fine	12	4.4	9	9	0.54	1.00	0.0124	0.89	1.25	0.01	0.801	0.96
	Gravel	27	12.1	3	3	0.51	0.91				0.08		
	No Recovery	12	4.7	0	0	No samples	No samples						
C5 to C8	Coarse	coarse	138.1	22	22	0.57	1.40	0.0366			0.03		
	Fine	fine	33.5	25	25	0.97	6.30	0.00780			0.01	0.640	0.82
	Gravel**	gravel	19.2	0	0	**0.49**	No samples				0.10		
	No Recovery	NR	87.2	0	0	No samples	No samples						
C9 to C10	Coarse	coarse	35.4	1	1	0.57	0.57	0.0900			0.09		
	Fine	fine	358.3	15	15	0.64	1.70	0.0607			0.06	0.615	0.822
	Gravel[b]	gravel	11.0	0	0	**0.57**	No samples				0.03		
	No Recovery	NR	63.7	0	0	No samples	No samples						

Notes:

Non-weighted UCLs calculation used. No substitutions were made for gravel and no recovery samples

Areas of no sediment recovery were not included in the assessment or spatial weighting

a. Snow Creek values are representive of 16 samples collected from individual deposits and are not spatially weighted. A reach EPC of 0.58 mg/kg based on the maximum concentration was selected.

b. Gravel areas without samples in a given reach were assumed to have a gravel PCB concentration equal to mean Coarse Sediment for that reach

*** Dataset is small; UCL may be unreliable

Blue shading indicates selected EPC value

AA: assessment area

ac: acres

EPC: exposure point concentration

Hg: mercury

mg/kg: milligrams per kilogram

NA: not applicable or not calculated

NR: no recovery

PCB: polychlorinated biphenyl

UCL: Upper Confidence Limit

Table C-10. EPC Calculation Details Table for Mercury in Surface Sediments by Assessment Area Anniston PCB Site, Anniston, Alabama

Data Groups		Descriptive Statistics						MCA (Fine and Coarse)			MCA (Fine + Coarse + Gravel)		
Hg Reach	Sediment Texture	Core Locations (n)	Surface Area (ac)	Hg Samples (n)	Detected Samples (n)	Mean Surface Hg (mg/kg)	Max Surface Hg (mg/kg)	Sample Weighting Factor	Mean	95% of Bootstrap Means	Reach Sample Weighting Factor	Reach Bootstrap Mean	Reach 95%tile of Bootstrap Means
C1[a]	Snow Creek[a]	16	NA	2	2	0.55	0.58				NA	NA	NA
Upper	Coarse	107	37.2	9	9	0.91	2.60	0.0861	6.46	11.7	0.07	1.61	4.48
	Fine	36	10.8	11	11	4.68	46.60	0.0205			0.02		
	Gravel	35	14.5	4	4	1.11	2.90				0.06		
	No Recovery	14	5.5	0	0	No samples	No samples						
Middle	Coarse	112	75.6	13	13	0.74	1.40	0.0727	0.894	1.25	0.07	0.736	0.85
	Fine	7	4.4	11	11	0.70	1.20	0.0050			0.004		
	Gravel**	15	9.5	0	NA	**0.62**	No samples				0.11		
	No Recovery	74	44.1	0	NA	No samples	No samples						
Lower	Coarse	106	97.9	10	10	0.35	0.57	0.0202			0.02	0.769	1.07
	Fine	137	387.4	29	29	0.90	6.30	0.0275			0.03		
	Gravel[b]	25	20.7	0	0	**0.35**	No samples				0.04		
	No Recovery	101	106.8	0	0	No samples	No samples						

Notes:

Areas of no sediment recovery were not included in the assessment or spatial weighting

a. Snow Creek values are representative of 16 samples collected from individual deposits and are not spatially weighted. An AA EPC of 0.58 mg/kg based on the maximum concentration was selected.

b. Gravel areas without samples in a given reach were assumed to have a gravel PCB concentration equal to mean Coarse Sediment for that reac

Blue shading indicates selected EPC value

AA: assessment area

ac: acres

EPC: exposure point concentration

Hg: mercury

MCA: Monte-Carlo analysis

mg/kg: milligrams per kilogram

NA: not applicable or not calculated

PCB: polychlorinated bipheny

Table C-11 Summary Statistics for Non-Mercury Metals in OU-4 Sediments Anniston PCB Site, Anniston, Alabama

Reach or AA [1]	COPC	Total Sample Size (n)	Number of Detects	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	Median	SD	CV	UCL[2,3] (mg/kg)	EPC[4] (mg/kg)	EPC Basis
C1	barium	2	2	160.00	220.00	190.00	190.00	42.43	0.22	NA	220	Maximum
C1	chromium	2	2	42.00	46.00	44.00	44.00	2.83	0.06	NA	46	Maximum
C1	cobalt	2	2	16.00	21.00	18.50	18.50	3.54	0.19	NA	21	Maximum
C1	lead	2	2	57.00	110.00	83.50	83.50	37.48	0.45	NA	110	Maximum
C1	vanadium	2	2	52.00	53.00	52.50	52.50	0.71	0.01	NA	53	Maximum
C2	barium	4	4	15.90	172.00	86.23	78.50	68.43	0.79	NA	172	Maximum
C2	chromium	4	4	6.00	16.00	9.85	8.70	4.46	0.45	NA	16	Maximum
C2	cobalt	4	4	2.70	7.80	5.45	5.65	2.21	0.41	NA	7.8	Maximum
C2	lead	4	3	9.10	50.30	25.03	15.70	22.13	0.88	NA	50	Maximum
C2	vanadium	4	4	4.70	13.70	9.63	10.05	4.47	0.46	NA	14	Maximum
C3	barium	2	2	47.50	82.90	65.20	65.20	25.03	0.38	NA	83	Maximum
C3	chromium	2	2	16.90	20.80	18.85	18.85	2.76	0.15	NA	21	Maximum
C3	cobalt	2	2	7.00	10.50	8.75	8.75	2.48	0.28	NA	11	Maximum
C3	lead	2	2	10.20	13.90	12.05	12.05	2.62	0.22	NA	14	Maximum
C3	vanadium	2	2	9.40	17.20	13.30	13.30	5.52	0.42	NA	17	Maximum
C4	barium	2	2	35.10	47.50	41.30	41.30	8.77	0.21	NA	48	Maximum
C4	chromium	2	2	9.30	18.10	13.70	13.70	6.22	0.45	NA	18	Maximum
C4	cobalt	2	2	4.10	4.20	4.15	4.15	0.07	0.02	NA	4.2	Maximum
C4	lead	2	2	10.40	12.90	11.65	11.65	1.77	0.15	NA	13	Maximum
C4	vanadium	2	2	6.90	7.40	7.15	7.15	0.35	0.05	NA	7.4	Maximum
UAA	barium	8	8	15.90	172.00	69.74	48.75	49.99	0.72	103.2	103	UCL
UAA	chromium	8	8	6.00	20.80	13.06	13.10	5.55	0.42	16.78	17	UCL
UAA	cobalt	8	8	2.70	10.50	5.95	5.65	2.50	0.42	7.627	8	UCL
UAA	lead	8	7	9.10	50.30	17.50	12.90	14.65	0.84	30.28	30	UCL
UAA	vanadium	8	8	4.70	17.20	9.93	8.40	4.29	0.43	12.8	13	UCL
C5	barium	4	4	24.10	251.00	85.50	33.45	110.40	1.29	NA	251	Maximum
C5	chromium	4	4	6.30	54.70	19.05	7.60	23.77	1.25	NA	55	Maximum
C5	cobalt	4	4	2.30	34.30	10.66	3.03	15.77	1.48	NA	34	Maximum
C5	lead	4	4	4.30	71.00	22.31	6.98	32.49	1.46	NA	71	Maximum
C5	vanadium	4	4	3.15	43.10	13.66	4.20	19.64	1.44	NA	43	Maximum

Table C-11. Summary Statistics for Non-Mercury Metals in OU-4 Sediments Anniston PCB Site, Anniston, Alabama

Reach or AA [1]	COPC	Total Sample Size (n)	Number of Detects	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	Median	SD	CV	UCL[2,3] (mg/kg)	EPC[4] (mg/kg)	EPC Basis
C6	barium	4	4	24.10	251.00	85.50	33.45	110.40	1.29	NA	251	Maximum[5]
C6	chromium	4	4	6.30	54.70	19.05	7.60	23.77	1.25	NA	55	Maximum[5]
C6	cobalt	4	4	2.30	34.30	10.66	3.03	15.77	1.48	NA	34	Maximum[5]
C6	lead	4	4	4.30	71.00	22.31	6.98	32.49	1.46	NA	71	Maximum[5]
C6	vanadium	4	4	3.15	43.10	13.66	4.20	19.64	1.44	NA	43	Maximum[5]
MAA	barium	4	4	24.10	251.00	85.50	33.45	110.40	1.29	NA	251	Maximum
MAA	chromium	4	4	6.30	54.70	19.05	7.60	23.77	1.25	NA	55	Maximum
MAA	cobalt	4	4	2.30	34.30	10.66	3.03	15.77	1.48	NA	34	Maximum
MAA	lead	4	4	4.30	71.00	22.31	6.98	32.49	1.46	NA	71	Maximum
MAA	vanadium	4	4	3.15	43.10	13.66	4.20	19.64	1.44	NA	43	Maximum
C7	barium	3	3	14.30	26.90	20.05	18.95	6.37	0.32	NA	27	Maximum
C7	chromium	3	3	8.15	13.60	10.08	8.50	3.05	0.30	NA	14	Maximum
C7	cobalt	3	3	2.45	3.90	3.25	3.40	0.74	0.23	NA	4	Maximum
C7	lead	3	3	7.05	9.20	8.22	8.40	1.09	0.13	NA	9	Maximum
C7	vanadium	3	3	5.05	7.60	5.98	5.30	1.41	0.24	NA	8	Maximum
C8	barium	3	3	14.30	26.90	20.05	18.95	6.37	0.32	NA	27	Maximum[5]
C8	chromium	3	3	8.15	13.60	10.08	8.50	3.05	0.30	NA	14	Maximum[5]
C8	cobalt	3	3	2.45	3.90	3.25	3.40	0.74	0.23	NA	4	Maximum[5]
C8	lead	3	3	7.05	9.20	8.22	8.40	1.09	0.13	NA	9	Maximum[5]
C8	vanadium	3	3	5.05	7.60	5.98	5.30	1.41	0.24	NA	8	Maximum[5]
C9	barium	1	1	88.80	88.80	88.80	88.80	NA	NA	NA	89	Maximum
C9	chromium	1	1	23.10	23.10	23.10	23.10	NA	NA	NA	23	Maximum
C9	cobalt	1	1	9.30	9.30	9.30	9.30	NA	NA	NA	9.3	Maximum
C9	lead	1	1	23.90	23.90	23.90	23.90	NA	NA	NA	24	Maximum
C9	vanadium	1	1	16.20	16.20	16.20	16.20	NA	NA	NA	16	Maximum
C10	barium	10	10	39.20	134.00	89.46	100.30	35.03	0.39	110	110	UCL
C10	chromium	10	10	7.50	41.20	21.71	20.25	10.92	0.50	28	28	UCL
C10	cobalt	10	10	4.00	13.30	8.03	7.73	2.93	0.37	10	9.7	UCL
C10	lead	10	10	6.30	36.10	20.10	19.45	11.13	0.55	27	27	UCL
C10	vanadium	10	10	7.50	30.90	17.51	17.55	7.99	0.46	22	22	UCL

Table C-11. Summary Statistics for Non-Mercury Metals in OU-4 Sediments Anniston PCB Site, Anniston, Alabama

Reach or AA [1]	COPC	Total Sample Size (n)	Number of Detects	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	Median	SD	CV	UCL[2,3] (mg/kg)	EPC[4] (mg/kg)	EPC Basis
LAA	barium	14	14	14.30	134.00	74.54	82.15	41.57	0.56	94	94	UCL
LAA	chromium	14	14	7.50	41.20	19.32	16.80	10.45	0.54	24	24	UCL
LAA	cobalt	14	14	2.45	13.30	7.09	7.28	3.24	0.46	9	9	UCL
LAA	lead	14	14	6.30	36.10	17.82	13.43	10.68	0.60	23	23	UCL
LAA	vanadium	14	14	5.05	30.90	14.94	15.88	8.26	0.55	19	19	UCL

Notes:

[1] See Figure 4-1 for locations of reaches.

[2] Datasets with "NA" for UCL did not have enough samples for ProUCL to calculate a UCL.

[3] ProUCL 5.1 (USEPA 2016) was used to calculate summary statistics and UCL values.

[4] EPC based on the UCL when available, otherwise based on the maximum detected concentration.

[5] Data for the reach directly upstream was used as a surrogate for C6 and C8.

AA: assessment area

COPC: constituent of potential concern

CV: coefficient of variation

EPC: exposure point concentration

LAA: lower assessment area

MAA: middle assessment area

MAD: median absolute deviation

mg/kg: milligram per kilogram

n: sample size

NA: value not available; too few samples for UCL calculation

OU-4: Operable Unit 4

PCB: polychlorinated biphenyl

SD: standard deviation

UAA: upper assessment area

UCL: 95% upper confidence limit

USEPA: United States Environmental Protection Agency

Reference:

USEPA. 2016. ProUCL 5.1 A Statistical Software for Environmental Applications for Data Sets with and without non detect observations. National Exposure Research Lab, EPA, Las Vegas Nevada, May 2016. http://www.epa.gov/osp/hstl/tsc/softwaredocs.htm

Table C-12. Summary Statistics for COPCs in OU-4 Surface Water
Anniston PCB Site, Anniston, Alabama

Reach or AA [1]	COPC	Total Sample Size (n)	Detects	NumNDs	% FOD	Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Median	SD	CV	UCL[1,2] (mg/L)	EPC[3] (mg/L)	EPC Basis
C1	Barium	4	4	0	100%	0.0241	0.201	0.086	0.059	0.083	0.97	--	0.20	Maximum
C1	Chromium	4	4	0	100%	0.002	0.0329	0.012	0.0065	0.015	1.2	--	0.033	Maximum
C1	Cobalt	4	2	2	50%	0.005	0.0122	0.0086	0.0086	0.0051	0.59	--	0.012	Maximum
C1	Lead	4	4	0	100%	0.0042	0.0964	0.034	0.017	0.043	1.3	--	0.096	Maximum
C1	Vanadium	4	4	0	100%	0.0041	0.0339	0.015	0.011	0.014	0.94	--	0.034	Maximum
C1	Mercury	4	2	2	50%	0.00015	0.00043	0.00029	0.00029	0.00020	0.68	--	0.00043	Maximum
C1	Total Homolog PCBs	3	3	0	100%	0.000175	0.000498	0.00036	0.00040	0.00017	0.46	--	0.00050	Maximum
UAA	Barium	4	4	0	100%	0.0251	0.0319	0.030	0.031	0.0030	0.10	--	0.032	Maximum
UAA	Chromium	4	4	0	100%	0.000575	0.0017	0.0011	0.0011	0.00046	0.42	--	0.0017	Maximum
UAA	Cobalt	4	0	4	0%	NA	NA	NA	NA	NA	NA	--	--	ND
UAA	Lead	4	4	0	100%	0.00048	0.00084	0.00063	0.00060	0.00016	0.26	--	0.00084	Maximum
UAA	Vanadium	4	4	0	100%	0.000495	0.0013	0.0010	0.0012	0.00036	0.35	--	0.0013	Maximum
UAA	Mercury	15	0	15	0%	NA	NA	NA	NA	NA	NA	--	--	ND
UAA	Total Homolog PCBs	15	11	4	73%	0.000016	0.000132	0.000068	0.000064	0.000036	0.53	0.000083	0.000083	UCL
MAA	Barium	2	2	0	100%	0.0248	0.0428	0.034	0.034	0.013	0.38	--	0.043	Maximum
MAA	Chromium	2	1	1	50%	0.004	0.004	0.0040	0.0040	NA	NA	--	0.0040	Maximum
MAA	Cobalt	2	1	1	50%	0.0022	0.0022	0.0022	0.0022	NA	NA	--	0.0022	Maximum
MAA	Lead	2	2	0	100%	0.00058	0.0048	0.0027	0.0027	0.0030	1.1	--	0.0048	Maximum
MAA	Vanadium	2	2	0	100%	0.00057	0.0031	0.0018	0.0018	0.0018	0.98	--	0.0031	Maximum
MAA	Mercury	12	0	12	0%	NA	NA	NA	NA	NA	NA	--	--	ND
MAA	Total Homolog PCBs	12	12	0	100%	0.0000476	0.000172	0.000087	0.000085	0.000032	0.37	0.00011	0.00011	UCL
LAA	Barium	1	1	0	100%	0.0244	0.0244	0.024	0.024	NA	NA	--	0.024	Maximum
LAA	Chromium	1	1	0	100%	0.00067	0.00067	0.00067	0.00067	NA	NA	--	0.00067	Maximum
LAA	Cobalt	1	0	1	0%	NA	NA	NA	NA	NA	NA	--	--	ND
LAA	Lead	1	1	0	100%	0.00034	0.00034	0.00034	0.00034	NA	NA	--	0.00034	Maximum
LAA	Vanadium	1	1	0	100%	0.00039	0.00039	0.00039	0.00039	NA	NA	--	0.00039	Maximum
LAA	Mercury	13	1	12	8%	0.000069	0.000069	0.000069	0.000069	NA	NA	--	0.000069	Maximum
LAA	Total Homolog PCBs	13	13	0	100%	0.000024	0.000309	0.000073	0.000054	0.000072	1.0	0.00016	0.00016	UCL
Sitewide	Barium	11	11	0	100%	0.0241	0.201	0.050	0.030	0.054	1.1	0.12	0.12	UCL
Sitewide	Chromium	11	10	1	91%	0.000575	0.0329	0.0057	0.0019	0.010	1.8	0.018	0.018	UCL
Sitewide	Cobalt	11	3	8	27%	0.0022	0.0122	0.0065	0.0050	0.0052	0.80	--	0.012	Maximum
Sitewide	Lead	11	11	0	100%	0.00034	0.0964	0.013	0.00084	0.029	2.2	0.067	0.067	UCL
Sitewide	Vanadium	11	11	0	100%	0.00039	0.0339	0.0061	0.0013	0.010	1.7	0.017	0.017	UCL
Sitewide	Mercury	44	3	41	7%	0.000069	0.00043	0.00022	0.00015	0.00019	0.88	--	0.00043	Maximum
Sitewide	Total Homolog PCBs	43	39	4	91%	0.000016	0.000498	0.00010	0.000069	0.00010	1.0	0.00016	0.00016	UCL

Table C-13. Assessment and Measurement Endpoints Summary
Anniston PCB Site, Anniston, Alabama

Assessment Endpoint	Risk Questions	Measurement Endpoints
1) Survival, Growth, and Reproduction of Aquatic/Terrestrial Plant Communities	Are the levels of COPCs in soils (including floodplain soils), surface water, and sediments from OU-4 greater than toxicity benchmarks for the survival, growth, or reproduction of aquatic/terrestrial plants?	1a) Concentrations of COPCs in OU-4 soils (including floodplain soils), surface water, and sediments relative to benchmarks for survival, growth, or reproduction.
	Are the levels of COPCs in plant tissue from OU-4 greater than reference concentrations or CTCs protective of survival, growth, or reproduction of aquatic/terrestrial plants?	1b) Measured body burdens of COPCs in OU-4 plant tissue as compared to reference area(s) plant tissue and literature-derived CTCs, as available.
	Is the health of aquatic/terrestrial plant species collected in OU-4 outside the normal range for aquatic/terrestrial plant communities in the reference area(s)?	1c) Qualitative observations of plant condition and discoloration in OU-4 as compared to the reference area(s).
	Is the structure of aquatic/terrestrial plant communities in OU-4 outside the normal range for aquatic/terrestrial plant communities in the reference area(s)?	1d) Comparison of aquatic/terrestrial plant community structure metrics, including species diversity, total abundance, number of taxa, and taxa dominance, for each habitat type in OU-4 to the reference area(s) or among OU-4 assessment areas.
2) Survival, Growth, and Reproduction of Benthic Invertebrate Communities	Are the levels of COPCs in sediments (including pore water) from OU-4 greater than benchmarks or toxicity thresholds for survival, growth, or reproduction of benthic invertebrates?	2a) Concentration of COPCs in OU-4 sediments (including pore water) compared to literature-derived toxicity benchmarks and site-specific toxicity thresholds.
	Are the levels of COPCs in benthic invertebrate tissue from OU-4 greater than reference concentrations or CTCs for survival, growth, or reproduction of benthic invertebrates?	2b) Measured body burdens of COPCs in OU-4 benthic invertebrate tissue as compared to reference area(s) benthic invertebrate tissue and literature-derived CTCs, as available.
	Is the survival, growth, or reproduction of laboratory-cultured benthic invertebrates exposed to sediments (including pore water and overlying water) from OU-4 significantly lower than those exposed to reference area(s) sediments?	2c) Survival, growth, and reproduction of Hyalella azteca and Chironomus dilutus.
	Is the structure of benthic macroinvertebrate communities in OU-4 outside the normal range for benthic invertebrate communities in the reference area(s)?	2d) Comparison of benthic invertebrate community structure metrics, including species diversity, total abundance, number of taxa, and taxa dominance, from OU-4 to the reference area(s) or among OU-4 assessment areas.
3) Survival, Growth, and Reproduction of Terrestrial Invertebrate Communities	Are the levels of COPCs in soil (including floodplain soils) from OU-4 greater than toxicity benchmarks for survival, growth, or reproduction of terrestrial invertebrates?	3a) Concentrations of COPCs in OU-4 surface soils compared to literature-derived toxicity benchmarks.
	Are the levels of COPCs in terrestrial invertebrate tissue from OU-4 greater than CTCs for survival, growth, or reproduction of terrestrial invertebrates?	3b) Measured body burdens of COPCs in OU-4 terrestrial invertebrate tissue as compared to reference area(s) terrestrial invertebrate tissue and literature-derived tissue-based CTCs, as available.
	Is the structure of terrestrial invertebrate communities in OU-4 outside the normal range for terrestrial invertebrate communities in the reference area(s)?	3c) Comparison of terrestrial invertebrate community structure metrics, including species diversity, total abundance, number of taxa, and taxa dominance, from OU-4 to the reference area(s).

Table C-13. Assessment and Measurement Endpoints Summary
Anniston PCB Site, Anniston, Alabama

Assessment Endpoint	Risk Questions	Measurement Endpoints
4) Survival, Growth, and Reproduction of Fish Communities	Are the levels of COPCs in surface water and/or sediments from OU-4 greater than literature-derived toxicity benchmarks for survival, growth, or reproduction of fish?	4a) Concentration of COPCs in OU-4 surface water and sediment compared to literature-derived toxicity benchmarks.
	Are the levels of COPCs in fish tissue from OU-4 greater than CTCs for survival, growth, or reproduction of fish?	4b) Body burdens of COPCs in selected fish species from OU-4 as compared to those in the reference area(s) and CTCs, as available.
	Is the structure of fish communities in OU-4 outside the normal range for fish communities in the reference area(s)?	4c) Comparison of fish community structure metrics, including species diversity, total abundance, number of taxa, and taxa dominance, from OU-4 to the reference area(s).
	Are fish health assessment results (e.g., external parasites, fish erosion, lesions, sex ration, age structure) comparable between OU-4 and the reference area(s)?	4d) Fish health assessment using anomaly codes similar to those in the Rapid Bioassessment Protocol (Barbour et al. 1999). Observations may include disease, deformities, external parasites, fin erosion, lesions, tumors, sex ratio, and age structure.
5) Survival, Growth, and Reproduction of Birds	Do daily doses of COPCs received by aquatic-dependent and terrestrial birds (including piscivorous birds, sediment-probing birds, invertivorous birds, carnivorous birds, and omnivorous birds) from consumption of/exposure to food and other media from OU-4 exceed toxicity reference values (TRVs) for survival, growth, or reproduction?	5a) Compare an estimated dietary daily dose of COPCs in prey based in OU-4 to relevant literature-based dietary TRVs. Daily dose estimated using modeled and measured prey tissue concentrations.
	What is avian community structure and habitat use in OU-4 and the reference area(s)?	5b) Comparison of avian species community structure, including total abundance and number of taxa, and habitat use in OU-4 to reference area(s) or among OU-4 assessment areas.
	Do the predicted concentrations of COPCs in bird eggs exceed CTCs for bird eggs?	5c) Comparisons of predicted OU-4 egg COPC concentrations to literature-derived egg-based CTCs, as available.
6) Survival, Growth, and Reproduction of Mammals	Do daily doses of COPCs received by aquatic-dependent and terrestrial mammals (including carnivorous mammals, piscivorous mammals, invertivorous mammals [including shrews and bats], omnivorous mammals, and herbivorous mammals) from consumption of/exposure to food and other media from OU-4 exceed TRVs for survival, growth, or reproduction?	6a) Compare an estimated dietary daily dose of COPCs in prey based in OU-4 to relevant literature-based dietary TRVs. Daily dose estimated using modeled and measured prey tissue concentrations.
	Are levels of COPCs in tissues of small mammals from OU-4 greater than tissue-based TRVs protective of survival, growth, or reproduction or reference area(s) tissue concentrations?	6b) Measured body burdens of COPCs in selected mammal species in OU-4 as compared to those in mammals from the reference area(s) and CTCs, as available.
	What is the mammalian community structure and habitat use in OU-4 and the reference area(s)?	6c) Comparison of mammalian species community structure, including total abundance and number of taxa, and habitat use in OU-4 to the reference area(s) or among OU-4 assessment areas.
	What is the habitat suitability of OU-4 and the reference area(s) for mink and river otter?	6d) Evaluate habitat suitability for the mink and river otter using habitat suitability index models or other methods as available.

Table C-13. Assessment and Measurement Endpoints Summary
Anniston PCB Site, Anniston, Alabama

Assessment Endpoint	Risk Questions	Measurement Endpoints
7) Survival, Growth, and Reproduction of Amphibians or Reptiles	Are the levels of COPCs in surface water, sediment, and/or soil (including floodplain soil) from OU-4 greater than toxicity thresholds for survival, growth, or reproduction of amphibians and reptiles?	7a) Concentration of COPCs in surface water, sediment, and/or soil in OU-4 compared to literature-derived toxicity benchmarks, as available.
	Are the levels of COPCs in amphibian or reptile tissue from OU-4 greater than CTCs for survival, growth, or reproduction or reference area(s) tissue concentrations?	7b) Measured body burden of COPCs in selected herptile receptor tissue in OU-4 as compared to those in the reference area(s) and to tissue-based CTCs, as available.

Notes:

COPCs: constituents of potential concern

CTC: critical tissue concentration

OU-4: Operable Unit 4

PCB: polychlorinated biphenyl

TRV: toxicity reference value

USEPA: United States Environmental Protection Agency

References:

Barbour, MT, J Gerritsen, BD Snyder, and JB Stribling. 1999. Rapid bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish. Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C..

Table C-14. Prey items collected for the BERA.

Biological Tissue Type	Number of Samples	Common Name	Scientific Name
Aquatic plants	27	Alligator weed	Alternanthera philoxeroides
Emergent Insects	27	Mixture of Craneflies Damselflies Dragonflies	Tipulidae Odonata Epiprocta
Benthic Invertebrates	27	Damselfly larvae	Odonata
Crayfish	23	Crayfish	Cambarus sp
Mollusks	27	Asian clam	Corbicula fluminea
Frogs	16	Southern leopard frogs bullfrogs bronze or green frogs American toad northern cricket frogs	Thobates sphenocephalus Rana catesbeiana Rana clamitans (Anaxyrus americanus) (Acris crepitans)
Snakes	11	midland water snake queen snake cottonmouth yellow-bellied water snake	(Nerodia sipedon) (Regina septemvittata), (Agkistrodon piscivorus), (Nerodia erythrogaster)
Predator fish	27	Spotted bass	Micropterus puntulatus
Forage fish	81	Alabama hog sucker Large-scale stoneroller Southern studfish black spotted topminnow black redhorse	(Hypentelium etowanum), (Campostoma oligolepis), (Fundulus stellifer), (Fundulus olivaceus), (Moxostoma duquesnei)
Bottom fish	27	Blacktail redhorse Catfish	Moxostoma poecilurum Ictalurus spp.
Terrestrial plants	54	soy bean yellow foxtail crabgrass cotton pokeberry and prickly mallow	[Glycine max], [Setaria pumila], [Digitaria], [Gossypium], [Phytolacca], [Sida spinose])
Terrestrial insects	18	grasshoppers and crickets	NA
Soil invertebrates	16	Earthworms	Annelida
Small mammals	30	E. Harvest Mouse Hispid Cotton Rat Cotton Mouse Short-tail Shrew Woodland/Pine vole	Reithrodontomys humulis Sigmodon hispidus Peromyscus gossypinus Blarina carolinensis Microtus pinetorum

APPENDIX D

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENT TABLES

Table D-1. – Chemical-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Action/Media	**Requirements**	**Prerequisite**	**Citation**
Protection of surface water (Snow Creek and Choccolocco Creek)	State waters shall be free from substances attributable to sewage, industrial wastes or other wastes in concentrations or combinations which are toxic or harmful to human, animal or aquatic life to the extent commensurate with the designated usage of such waters.	Pollution of waters of the State of Alabama, as defined by ADEM Admin. Code r. 335-6-10-.02 – **Relevant and Appropriate**	ADEM Admin. Code r. 335-6-10-.06(c) *Minimum Conditions Applicable to All State Waters*
	Toxic substances attributable to sewage, industrial wastes, or other wastes shall be only in such amounts, whether alone or in combination with other substances, as will not exhibit acute toxicity or chronic toxicity, as demonstrated by effluent toxicity testing or by application of numeric criteria given in ADEM Admin. Code r. 335-6-10-.07, to fish and aquatic life, including shrimp and crabs in estuarine or salt waters or the propagation thereof.	Pollution of waters of the State of Alabama classified for *Fish and Wildlife* use per ADEM Admin. Code r. 335-6-11-.02 – **Relevant and Appropriate**	ADEM Admin. Code r. 335-6-10-.09(5)(e)(5) *Specific Water Quality Criteria*
Protection of surface water *con't*	There shall be no turbidity of other than natural origin that will cause substantial visible contrast with the natural appearance of waters or interfere with any beneficial uses which they serve. Furthermore, in no case shall turbidity exceed 50 [NTU] above background. Background will be interpreted as the natural condition of the receiving waters without the influence of man-made or man-induced causes. Turbidity levels caused by natural runoff will be included in establishing background levels.	Discharges to waters of the State of Alabama classified for *Fish and Wildlife* use per ADEM Admin. Code r. 335-6-11-.02 – **Relevant and Appropriate**	ADEM Admin. Code r. 335-6-10-.09(5)(e)(9) *Specific Water Quality Criteria*

Table D-1. – Chemical-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Action/Media	**Requirements**	**Prerequisite**	**Citation**
Restoration of surface water (Snow Creek and Choccolocco Creek)	Concentrations of toxic pollutants in State waters shall not exceed the *Freshwater Chronic Aquatic Life Criteria* indicated in Table 1 to the extent commensurate with the designated usage of such waters: • PCB: 0.014 µg/L[1]	Concentrations of toxic pollutants in waters of the State of Alabama as defined by ADEM Admin. Code r. 335-6-10-.02 – **Relevant and Appropriate**	ADEM Admin. Code r. 335-6-10-.07(1), Table 1 *Toxic Pollutant Criteria*
	Recommends the following *Criteria based on Protection Human Health from Consumption of Organisms Only* shall not be exceeded. • PCB: 0.000064 µg/L[2]	Presence of a toxic pollutant in waters of the State – **TBC**	EPA National Recommended Water Quality Criteria- Human Health Table[3]
Cleanup of PCB-contaminated soil at sites in *industrial areas*	Recommends cleanup levels should be established at 10 to 25 ppm PCB.[4] Recommends treatment, where practicable, for principal threat wastes that includes PCB ≥ 500 ppm.	CERCLA site with PCB contamination in soil requiring response action – **TBC**	*Guidance on Remedial Actions for Superfund Sites with PCB Contamination* [EPA/540/G-90/007] (USEPA 1990), page 30.

[1] The criteria for Polychlorinated Biphenyls (PCBs) apply to total PCBs, which is defined as the sum of the seven particular Aroclors (1016, 1221 1232, 1232, 1242, 1248, 1254, and 1260) listed in ADEM Admin. Code r. 335-6-10-.07(1), Table 1 *Toxic Pollutant Criteria.*

[2] This criterion applies to total PCBs (e.g., the sum of all congener or isomer or homolog or Aroclor analyses).

[3] National Recommended Water Quality Criteria - Human Health Criteria Table | US EPA

[4] The appropriate concentration within the range will depend on site-specific factors that affect the exposure assumptions. For example, at sites where exposures will be very limited or where soil is already covered with concrete, PCB concentrations near the high end of the 10-to-25 ppm range may be protective of human health and the environment. [Ref. *A Guide on Remedial Actions at Superfund Sites with PCB Contamination* [Publication No. 9355.4-01FS August 1990]

Table D-1. – Chemical-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Action/Media	**Requirements**	**Prerequisite**	**Citation**
Cleanup of PCB-contaminated soil at sites in *residential areas*	Recommends cleanup levels should be established at 1 ppm PCB.[5]	CERCLA site with PCB contamination in soil requiring response action – **TBC**	*Guidance on Remedial Actions for Superfund Sites with PCB Contamination* [EPA/540/G-90/007] (USEPA 1990), Page 28.

µg/L = micrograms per liter
ADEM = Alabama Department of Environmental Management
ARAR = Applicable or Relevant and Appropriate Requirement [Ref. 40 C.F.R. § 300.5 Definitions of 'Applicable requirements' and 'Relevant and appropriate requirements']
C.F.R. - Code of Federal Regulations
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
EPA = Environmental Protection Agency
PCB = polychlorinated biphenyl
ppm = parts per million
≥ = greater than or equal to
PRG = preliminary remediation goal
ROD = Record of Decision
TBC = to be considered [Ref. 40 C.F.R. § 300.405(g)(3) "The 'to be considered' (TBC) category consists of advisories, criteria, or guidance that were developed by EPA, other federal agencies, or states that may be useful in developing CERCLA remedies."]
USEPA = United States Environmental Protection Agency
U.S.C. = *United States Code*

[5] A concentration of 1 ppm PCBs equates to approximately a 10^{-5} excess cancer risk assuming no soil cover or management controls. [EPA/540/G-90/007] (USEPA 1990), Page 28.

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Floodplains			
Presence of 100-year floodplain or floodplain as defined by ADEM Admin. Code r. 335-13-1-.03(54)	Land-based disposal unit shall not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste, so as to pose a hazard to human health and the environment.	Construction of industrial landfill as defined by ADEM Admin. Code r. 335-13-1-.03(54) – **Relevant and Appropriate**	ADEM Admin. Code r. 335-13-4-.01(1)(a)
Presence of floodplain, designated as such on a map[1]	Shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.	Federal actions that involve potential impacts to, or take place within, floodplains – **TBC** *NOTE*: Federal agencies required to comply with E.O. 11988 requirements.	Executive Order 11988 – Section 1. *Floodplain Management*
	Shall consider alternatives to avoid, to the extent possible, adverse effects and incompatible development in the floodplain. Design or modify its action in order to minimize potential harm to or within the floodplain		Executive Order 11988 Section 2.(a)(2) *Floodplain Management*

[1] Under 44 C.F.R. § 9.7 *Determination of proposed action's location*, Paragraph (c) *Floodplain determination*. One should consult the FEMA Flood Insurance Rate Map (FIRM), the Flood Boundary Floodway Map (FBFM) and the Flood Insurance Study (FIS) to determine if the Agency proposed action is within the base floodplain. Per Executive Order 13690, "To determine whether an agency action is located in a floodplain, the agency shall use one of the approaches in Section 6(c) of this Order based on the best-available information and the Federal Emergency Management Agency's effective Flood Insurance Rate Map''.

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
	Section 2(a)(2) of EO 11988 is amended by inserting the following sentence after the first sentence: Where possible, an agency shall use natural systems, ecosystem processes, and nature-based approaches when developing alternatives for consideration.	*NOTE*: Federal agencies required to comply with E.O. 13690 requirements.	Executive Order 13690 Section 2 (c) *Establishing a Federal Flood Risk Management Standard and a Process*
Presence of floodplain designated as such on a map	*Step 4*. Identify the potential direct and indirect impacts associated with the occupancy or modification of floodplains and wetlands and the potential direct and indirect support of floodplain and wetland development that could result from the proposed action; *Step 5.* Minimize the potential adverse impacts and support to or within floodplains and wetlands to be identified under Step 4, restore and preserve the natural and beneficial values served by floodplains, and preserve and enhance the natural and beneficial values served by wetlands (see § 9.11);	Federal *actions affecting or affected by Floodplain* as defined in 44 C.F.R. § 9.4 – **Relevant and Appropriate**	44 C.F.R. § 9.6(b) *Decision-making Process*
	The Agency shall design or modify its actions so as to minimize[2] harm to or within the floodplain.		44 C.F.R. § 9.11(b)(1) *Mitigation*
	The Agency shall restore and preserve natural and beneficial floodplain values.		44 C.F.R. § 9.11(b)(3) *Mitigation*

[2] *Minimize* means to reduce to smallest amount or degree possible. 44 C.F.R. § 9.4 Definitions.

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
	The Agency shall minimize: • Potential harm to lives and the investment at risk from base flood, or in the case of critical actions[3], from the 500-year flood; • Potential adverse impacts that action may have on floodplain values	Federal *actions affecting or affected by Floodplain* as defined in 44 C.F.R. § 9.4 – **Relevant and Appropriate**	44 C.F.R. § 9.11(c)(1) and (3) *Minimization provisions*
	Endangered and/or Threatened Species		
Presence of federally Endangered or Threatened wildlife as designated in 50 C.F.R. § 17.11 -**or**- critical habitat of such species listed in 50 C.F.R. § 17.95	Except as provided in sections 1535(g)(2) and 1539 of this title, with respect to any endangered species of fish or wildlife listed pursuant to section 1533 of this title it is unlawful for any person subject to the jurisdiction of the United States to - (B) take any such species within the United States or the territorial sea of the United States; (G) violate any regulation pertaining to such species or to any threatened species of fish or wildlife listed pursuant to section 1533 of this title and promulgated by the Secretary pursuant to authority provided by this chapter. *NOTE*: The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. [16 U.S.C. 1532 Definitions]	Action that is likely to jeopardize endangered fish or wildlife or destroy or adversely modify critical habitat – **Applicable**	16 U.S.C. § 1538(a)(1) Endangered Species Act of 1973, as amended

[3] See 44 C.F.R. § 9.4 Definitions, *Critical action* means an action for which even a slight chance of flooding is too great. The minimum floodplain of concern for critical actions is the 500-year floodplain, i.e., critical action floodplain. Critical actions include, but are not limited to, those which create or extend the useful life of structures or facilities: Such as those that produce, use or store highly volatile, flammable, explosive, toxic or water-reactive materials.

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Presence of federally Endangered or Threatened *plants* designated in 50 C.F.R. § 17.12 **or**- critical habitat of such species listed in 50 C.F.R. § 17.96	Except as provided in sections 1535(g)(2) and 1539 of this title, with respect to any endangered species of plants listed pursuant to section 1533 of this title, it is unlawful for any person subject to the jurisdiction of the United States to - (B) remove and reduce to possession any such species from areas under Federal jurisdiction; maliciously damage or destroy any such species on any such area; or remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any law or regulation of any State or in the course of any violation of a State criminal trespass law;	Action that is likely to jeopardize endangered plant species or destroy or adversely modify critical habitat – **Applicable**	16 U.S.C. § 1538(a)(2) Endangered Species Act of 1973, as amended
Presence of federally Endangered or Threatened wildlife species as designated in 50 C.F.R. § 17.11 or- Endangered or Threatened plant species listed in 50 C.F.R. § 17.12	Each Federal agency shall, in consultation with and with the assistance of the Secretary [of DOI], insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available.	Actions authorized, funded, or carried out by any Federal agency, pursuant to 16 U.S.C. § 1536 – **Relevant and Appropriate**	16 U.S.C. § 1536(a)(2); - or Section 7(a)(2) Endangered Species Act of 1973, as amended 50 C.F.R. §§ 402.13(a), 402.14

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Presence of Endangered and Threatened Wildlife listed in 50 C.F.R. 17.11(h) (e.g., American alligator)	It is unlawful to take threatened or endangered wildlife in the United States, within the territorial sea of the United States, or upon the high seas. *NOTE:* Under 50 C.F.R. 10.12 Definitions, the term "take" means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.	Action that may jeopardize listed wildlife species – **Applicable**	50 C.F.R. § 17.21(c) Prohibitions Endangered Wildlife 50 C.F.R. § 17.31(a) Prohibitions Threatened Wildlife 50 C.F.R. § 17.42(a)(2) Species-specific rules - reptiles
Migratory Birds			
Presence of any migratory bird, as defined by 50 C.F.R. § 10.13	It shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird.	Actions that have, or are likely to have, a measurable negative effect on migratory bird populations **– Applicable**	16 U.S.C. § 703(a) *Taking, killing, or possessing migratory birds unlawful* Migratory Bird Treaty Act[4]

[4] Migratory Bird Treaty Reform Act of 2004 - (Sec. 102) Amends the Migratory Bird Treaty Act (MBTA) to clarify that the MBTA's prohibition on taking, killing, or possessing migratory birds applies only to native migratory bird species whose occurrence in the United States results from natural biological or ecological conditions.

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Presence of any migratory bird, as defined by 50 C.F.R. § 10.13	No person may take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such bird except as may be permitted under the terms of a valid permit issued pursuant to the provisions of this part and part 13 of this chapter, or as permitted by regulations in this part, or part 20 of this subchapter (the hunting regulations), or part 92 of subchapter G of this chapter (the Alaska subsistence harvest regulations). Birds taken or possessed under this part in "included areas" of Alaska as defined in § 92.5(a) are subject to this part and not to part 92 of subchapter G of this chapter.	Actions that have, or are likely to have, a measurable negative effect on migratory bird populations – **Applicable**	50 C.F.R. § 21.10 *General Permit Requirements*
Presence of a Bald Eagle or Golden Eagle – or – nest or egg of such eagles	No person shall knowingly, or with wanton disregard for the consequences of his act take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or in any manner any bald eagle commonly known as the American eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof of the foregoing eagles.	Determination of the presence of bald eagle or golden eagle – **Applicable**	16 U.S.C. §668 (a) *Prohibited Acts* Protection of Bald and Golden Eagles
Wetlands			
Presence of wetlands, as defined by ADEM Admin. Code r. 335-8-1-.02(nnn)	Impacts to wetlands shall be mitigated through the creation of wetlands or the restoration and enhancement of existing degraded wetlands.	Actions in wetlands – **Relevant and Appropriate**	ADEM Admin. Code r. 335-8-2-.02(4), 335-8-2-.03(1)

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Presence of wetlands (as defined in 44 C.F.R. § 9.4)	Shall take action to minimize the destruction, loss or degradation of wetlands and to preserve and enhance beneficial values of wetlands.	Federal actions that involve potential impacts to, or take place within, wetlands – **TBC** *NOTE*: Federal agencies required to comply with E.O. 11990 requirements.	Executive Order 11990 – *Protection of Wetlands* Section 1.(a)
	Shall avoid undertaking construction located in wetlands unless: (1) there is no practicable alternative to such construction, and (2) that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.		Executive Order 11990, Section 2.(a) *Protection of Wetlands*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Presence of Wetlands (as defined in 44 C.F.R. § 9.4)	*Step 4*. Identify the potential direct and indirect impacts associated with the occupancy or modification of floodplains and wetlands and the potential direct and indirect support of floodplain and wetland development that could result from the proposed action; *Step 5.* Minimize the potential adverse impacts and support to or within floodplains and wetlands to be identified under Step 4, restore and preserve the natural and beneficial values served by floodplains, and preserve and enhance the natural and beneficial values served by wetlands (see § 9.11); NOTE: Identification of potential direct and indirect impacts associated with occupancy or modification of wetlands can be performed in a FS when evaluating remedial alternatives against criteria in the NCP at 40 CFR 300.430(e)(9) including *Long-term effectiveness and permanence*.	Federal *actions affecting or affected by Wetlands* including the destruction and modification of wetlands and the direct or indirect support of new construction in wetlands as defined in 44 C.F.R. § 9.4 – **Relevant and Appropriate**	44 C.F.R. § 9.6(b) *Decision-making Process*
	The Agency shall minimize[5] the destruction, loss or degradation of wetlands.		44 C.F.R. § 9.11(b)(2) *Mitigation*

[5] *Minimize* means to reduce to smallest amount or degree possible. 44 C.F.R. § 9.4 Definitions.

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Presence of Wetlands (as defined in 44 C.F.R. § 9.4)	The Agency shall preserve and enhance the natural and beneficial wetlands values. *Natural Values of Flood Plains and Wetlands* means the qualities of or functions served by floodplains and wetlands which include but are not limited to: (a) Water resource values (natural moderation of floods, water quality maintenance, groundwater recharge); (b) living resource values (fish, wildlife, plant resources and habitats); (c) cultural resource values (open space, natural beauty, scientific study, outdoor education, archeological and historic sites, recreation); and (d) cultivated resource values (agriculture, aquaculture, forestry).	Federal *actions affecting or affected by Wetlands* including the destruction and modification of wetlands and the direct or indirect support of new construction in wetlands as defined in 44 C.F.R. § 9.4 – **Relevant and Appropriate**	44 C.F.R. § 9.11(b)(4) *Mitigation*
	The Agency shall minimize: • Potential adverse impacts the action may have on others; and • Potential adverse impact the action may have on wetland values.		44 C.F.R. § 9.11(c)(2) and (3) *Minimization provisions*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Compensatory Mitigation for Losses of Aquatic Resources			
Compensatory Mitigation[6] for Losses of Aquatic Resources	Compensatory mitigation required to offset unavoidable impacts to waters of the United States. Consultation with the USACE District Engineer recommended. • Amount of required compensatory mitigation must be, to the extent practicable, sufficient to replace lost aquatic resource functions. • Compensatory mitigation may be provided through mitigation banks or in-lieu fee programs • Implementation of the compensatory mitigation project shall be, to the maximum extent practicable, in advance of or concurrent with the impact-causing activity.	Unavoidable impacts to waters of the U. S. requiring compensatory mitigation to offset environmental losses to aquatic resources including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.93(a)(1) *General compensatory mitigation requirements*
	Compensatory mitigation may be performed using the methods of restoration, enhancement, establishment, and in certain circumstances preservation. Restoration should generally be the first option considered because the likelihood of success is greater and the impacts to potentially ecologically important uplands are reduced compared to establishment, and the potential gains in terms of aquatic resource functions are greater, compared to enhancement and preservation.		40 C.F.R. § 230.93(a)(2) *General compensatory mitigation requirements*

[6] 40 C.F.R. § 230.92 "*Compensatory mitigation* means the restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved." For impacts authorized under section 404, compensatory mitigation is not considered until after all appropriate and practicable steps have been taken to first avoid and then minimize adverse impacts to the aquatic ecosystem pursuant to 40 CFR part 230 (i.e., the CWA Section 404(b)(1) Guidelines).

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
	Required compensatory mitigation should be located within the same watershed as the impact site and should be located where it is most likely to successfully replace lost functions and services, taking into account such watershed scale features as aquatic habitat diversity, habitat connectivity, relationships to hydrologic sources (including the availability of water rights), trends in land use, ecological benefits, and compatibility with adjacent land uses.	Unavoidable impacts to waters of the U. S. requiring compensatory mitigation to offset environmental losses to aquatic resources including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.93(b) *Type and location of mitigation*
Compensatory Mitigation for Losses of Aquatic Resources (cont.)	Project site must be ecologically suitable for providing the desired aquatic resource functions. In determining the ecological suitability of the compensatory mitigation project site, the district engineer must consider, to the extent practicable, the factors in subsections (i) thru (vi). Should propose compensation sites adjacent to existing aquatic resources or where aquatic resources previously existed.	Unavoidable impacts to waters of the U. S. requiring compensatory mitigation to offset environmental losses to aquatic resources including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.93(d)(1) & (3) *Site selection*
	In general, in-kind mitigation is preferable to out-of-kind mitigation because it is most likely to compensate for the functions and services lost at the impact site. Except as provided in paragraph (e)(2) of this section, the required compensatory mitigation shall be of a similar type to the affected aquatic resource.		40 C.F.R. § 230.93(e)(1) *Mitigation Type*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
	The amount of required compensatory mitigation must be, to the extent practicable, sufficient to replace lost aquatic resource functions. Where appropriate functional or condition assessment methods or other suitable metrics are available, these methods should be used where practicable to determine how much compensatory mitigation is required. If a functional or condition assessment or other suitable metric is not used, a minimum one-to-one acreage or linear foot compensation ratio must be used.		40 C.F.R. § 230.93(f)(1) *Mitigation Type*
Compensatory Mitigation Planning	Prepare a mitigation plan addressing objectives, site selection, site protection, baseline information, determination of credits, mitigation work plan, maintenance plan, performance standards, monitoring requirements, long-term management, and adaptive management. *NOTE:* Plan would be part of CERCLA document, such as a Remedial Design or Remedial Action Work Plan. Plan to include items described in 40 C.F.R. § 230.94(c)(2) through (c)(14).[7]	Unavoidable impacts to waters of the U. S. requiring compensatory mitigation to offset environmental losses to aquatic resources including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.94(c) *Mitigation Plan*
	Shall obtain ecological performance standards based on best available science.		40 C.F.R. § 230.95 *Ecological Performance Standards*

[7] If mitigation obligations will be met by securing credits from approved mitigation banks or in-lieu fee programs, mitigation plan need include only items described in Section 230.94(c)(5) and (c)(6), and name of mitigation bank or in-lieu fee program. 40 C.F.R. § 230.94(c)(1).

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Compensatory Mitigation Project Monitoring	Monitoring the compensatory mitigation project site is necessary to determine if the project is meeting its performance standards, and to determine if measures are necessary to ensure that the compensatory mitigation project is accomplishing its objectives. The mitigation plan must address the monitoring requirements for the compensatory mitigation project, including the parameters to be monitored, the length of the monitoring period, the party responsible for conducting the monitoring, the frequency for submitting monitoring reports to the district engineer, and the party responsible for submitting those monitoring reports to the district engineer. *NOTE:* Mitigation Plan would be part of CERCLA document, such as a Remedial Design or Remedial Action Work Plan.	Unavoidable impacts to waters of the U. S. requiring compensatory mitigation to offset environmental losses to aquatic resources including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.96(a)(1) *Mitigation Plan - Monitoring*
Compensatory Mitigation Project Monitoring	Compensatory mitigation project monitoring period shall be sufficient to demonstrate that project has met performance standards, but not less than five (5) years. A longer monitoring period must be required for aquatic resources with slow development rates (e.g., forested wetlands, bogs). *NOTE:* Monitoring Plan would be part of CERCLA document, such as a Remedial Action Work Plan and/or Operations & Maintenance Plan.	Unavoidable impacts to waters of the U. S. requiring compensatory mitigation to offset environmental losses to aquatic resources including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.96(b) *Monitoring period*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Compensatory Mitigation Project Management	The aquatic habitats, riparian areas, buffers, and uplands that comprise the overall compensatory mitigation project must be provided long-term protection through real estate instruments or other available mechanisms, as appropriate. Long-term protection may be provided through real estate instruments such as conservation easements held by entities such as federal, tribal, state, or local resource agencies, non-profit conservation organizations, or private land managers; the transfer of title to such entities; or by restrictive covenants. *NOTE*: Plan would be part of CERCLA document, such as a Remedial Action Work Plan and/or Operations and Maintenance Plan.	Unavoidable impacts to waters of the U. S. requiring compensatory mitigation to offset environmental losses to aquatic resources including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.97(b) *Sustainability*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
CWA Section 404(b)(1) Guidelines – Specification of Disposal Sites for Dredged or Fill Material into Waters of the United States and/or State of Alabama			
Location encompassing aquatic ecosystem[8]	Except as provided under section 404(b)(2) [of the Clean Water Act] no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.10(a) *Restrictions on Discharge*
	For the purpose of this requirement, practicable alternatives include, but are not limited to: (i) Activities which do not involve a discharge of dredged or fill material into the waters of the United States or ocean waters; (ii) (ii) Discharges of dredged or fill material at other locations in waters of the United States or ocean waters;		40 C.F.R. § 230.10(a)(1) *Restrictions on Discharge*
	An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered.		40 C.F.R. § 230.10(a)(2) *Restrictions on Discharge*

[8] 40 C.F.R. § 230.3(b) The terms *aquatic environment* and *aquatic ecosystem* mean waters of the United States, including wetlands, that serve as habitat for interrelated and interacting communities and populations of plants and animals.

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Location encompassing aquatic ecosystem *con't*	No discharge of dredged or fill material shall be permitted if it: • Causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable State water quality standard; • Violates any applicable toxic effluent standard or prohibition under Section 307 of the Clean Water Act; • Jeopardizes the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, or results in the likelihood of the destruction or adverse modification of critical habitat; • Violates any requirement imposed by the Secretary of Commerce to protect any marine sanctuary designated under title III of the Marine Protection, Research, and Sanctuaries Act of 1972.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.10(b) *Restrictions on Discharge*
	Except as provided under CWA section 404(b)(2), no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the United States. Findings of significant degradation related to the proposed discharge shall be based upon appropriate factual determinations, evaluations, and tests required by subparts B and G, after consideration of subparts C through F, with special emphasis on the persistence and permanence of the effects outlined in those subparts.		40 C.F.R. § 230.10(c) *Restrictions on Discharge*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Location encompassing aquatic ecosystem *con't*	Under these Guidelines, effects contributing to significant degradation considered individually or collectively, include: (1) Significantly adverse effects of the discharge of pollutants on human health or welfare, including but not limited to effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites. (2) Significantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration, and spread of pollutants or their by-products outside of the disposal site through biological, physical, and chemical processes; (3) Significantly adverse effects of the discharge of pollutants on aquatic ecosystem diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy; or (4) Significantly adverse effects of discharge of pollutants on recreational, aesthetic, and economic values.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.10(c)(1)-(4) *Restrictions on Discharge*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Location encompassing aquatic ecosystem con't	No discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem. *NOTE*: There are many actions which can be undertaken in response to § 230.10(d) to minimize the adverse effects of discharges of dredged or fill material. Some of these, grouped by type of activity, are listed in this subpart H *Actions To Minimize Adverse Effects*. Additional criteria for compensation measures are provided in subpart J of this part.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.10(d) *Restrictions on Discharge*
Determination of effects from discharge of dredged or fill material into an aquatic ecosystem	The permitting authority shall determine in writing the potential short-term or long-term effects of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the aquatic environment in light of subparts C through F. Such factual determinations shall be used in § 230.12 in making findings of compliance or non-compliance with the restrictions on discharge in § 230.10. The evaluation and testing procedures described in § 230.60 and § 230.61 of subpart G shall be used as necessary to make, and shall be described in, such determination. *NOTE*: Written evaluation of potential short-term and long-term effects of proposed discharge of dredged or fill material on the aquatic environment will be provided in CERCLA documents including but not limited to a Remedial Design or Remedial Action Work Plan.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.11 *Factual Determinations*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
	The determinations of effects of each proposed discharge shall include the following: (a) *Physical substrate determinations.* (b) *Water circulation, fluctuation, and salinity determinations.* (c) *Suspended particulate/turbidity determinations.* (d) *Contaminant determinations.* (e) *Aquatic ecosystem and organism determinations.* (f) *Proposed disposal site determinations.* (g) *Determination of cumulative effects on the aquatic ecosystem* (h) *Determination of secondary effects on the aquatic ecosystem.* *NOTE:* Refer to the regulatory requirements in each of the above subparagraphs of 40 C.F.R. § 230.11. Any documentation of factual determinations will be provided in CERCLA documents including but not limited to a Remedial Design or Remedial Action Work Plan.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.11(a) through (h) *Factual Determinations*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Determining compliance with the CWA 404(b) Guidelines for discharge of dredged or fill material into an aquatic ecosystem	On the basis of these Guidelines (subparts C through G) the proposed disposal sites for the discharge of dredged or fill material must be: (1) Specified as complying with the requirements of these Guidelines; or (2) Specified as complying with the requirements of these Guidelines with the inclusion of appropriate and practicable discharge conditions (see subparts H and J) to minimize pollution or adverse effects to the affected aquatic ecosystems; or (3) Specified as failing to comply with the requirements of these Guidelines where: (i) There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences; or (ii) The proposed discharge will result in significant degradation of the aquatic ecosystem under § 230.10(b) or (c); or (iii) The proposed discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem; or (iv) There does not exist sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with these Guidelines.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.12(a) *Findings of compliance or non-compliance with the restrictions on discharge*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Determining compliance with the CWA 404(b) Guidelines for discharge of dredged or fill material into an aquatic ecosystem *con't*	Findings under this section shall be set forth in writing by the permitting authority for each proposed discharge and made available to the permit applicant. These findings shall include the factual determinations required by § 230.11, and a brief explanation of any adaptation of these Guidelines to the activity under consideration. In the case of a General permit, such findings shall be prepared at the time of issuance of that permit rather than for each subsequent discharge under the authority of that permit. *NOTE*: Findings of compliance with the CWA 404(b) Guidelines will be documented in a CERCLA document including but limited to a Remedial Design or Remedial Action Work Plan.		40 C.F.R. § 230.12(b) *Findings of compliance or non-compliance with the restrictions on discharge*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Evaluation of dredged or fill material for contamination and placement	To reach the determinations in § 230.11 involving potential effects of the discharge on the characteristics of the disposal site, the narrative guidance in subparts C through F shall be used along with the general evaluation procedure in § 230.60 and, if necessary, the chemical and biological testing sequence in § 230.61. Where the discharge site is adjacent to the extraction site and subject to the same sources of contaminants, and materials at the two sites are substantially similar, the fact that the material to be discharged may be a carrier of contaminants is not likely to result in degradation of the disposal site. In such circumstances, when dissolved material and suspended particulates can be controlled to prevent carrying pollutants to less contaminated areas, testing will not be required. *NOTE*: Previous sampling and analysis performed as part of the RI, a post-ROD Design Investigation, a Treatability or Pilot Study can be used to demonstrate the chemical or other properties of the sediment and/or soil (dredged or fill material).	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **Relevant and Appropriate**	40 C.F.R. § 230.60(c) *General evaluation of dredged or fill material*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Evaluation of chemical and biological effects from discharge of dredged or fill material into an aquatic ecosystem	Dredged or fill material may be excluded from the evaluation procedures specified in paragraphs (b) (2) and (3) of this section if it is determined, on the basis of the evaluation in § 230.60, that the likelihood of contamination by contaminants is acceptably low, unless the permitting authority, after evaluating and considering any comments received from the EPA, determines that these procedures are necessary. The EPA may require, on a case-by-case basis, testing approaches and procedures by stating what additional information is needed through further analyses and how the results of the analyses will be of value in evaluating potential environmental effects. *NOTE*: Determination of testing procedures will be made as part of EPA review and approval of CERCLA documents including but not limited to a Treatability or a Pilot Study.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **TBC**	40 C.F.R. § 230.61(b)(1) *Chemical, biological, and physical evaluation and testing*
	Sediments normally contain constituents that exist in various chemical forms and in various concentrations in several locations within the sediment. An elutriate test may be used to predict the effect on water quality due to release of contaminants from the sediment to the water column. However, in the case of fill material originating on land which may be a carrier of contaminants, a water leachate test is appropriate. *NOTE*: Determination of testing procedures will be made as part of EPA review and approval of CERCLA documents including but not limited to a Treatability or a Pilot Study.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **TBC**	40 C.F.R. § 230.61(b)(2)(i) *Water column effects*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Evaluation of water column effects from discharge of dredged or fill material into an aquatic ecosystem	Major constituents to be analyzed in the elutriate are those deemed critical after evaluating and considering any comments received from the EPA, and considering results of the evaluation in § 230.60. Elutriate concentrations should be compared to concentrations of the same constituents in water from the disposal site. Results should be evaluated in light of the volume and rate of the intended discharge, the type of discharge, the hydrodynamic regime at the disposal site, and other information relevant to the impact on water quality. The permitting authority should consider the mixing zone in evaluating water column effects. The permitting authority may specify bioassays when such procedures will be of value. *NOTE*: Per CERCLA 121(e)(1) permits are not required for on-site response actions. For purposes of this section EPA is the permitting authority. Determination of testing procedures will be made as part of EPA review and approval of CERCLA documents including but not limited to a Treatability or a Pilot Study.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **TBC**	40 C.F.R. § 230.61(b)(2)(ii) *Water column effects*
Evaluation of effects on benthic community from discharge of dredged or fill material into an aquatic ecosystem	The permitting authority may use an appropriate benthic bioassay (including bioaccumulation tests) when such procedures will be of value in assessing ecological effects and in establishing discharge conditions. *NOTE*: Per CERCLA 121(e)(1) permits are not required for on-site response actions. For purposes of this section EPA is the permitting authority. Determination of testing procedures will be made as part of EPA review and approval of CERCLA documents, including but not limited to a Treatability or a Pilot Study.		40 C.F.R. § 230.61(b)(3) *Effects on benthos*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Procedure for comparison of contaminants in sediments at excavation and disposal sites	When an inventory of the total concentration of contaminants would be of value in comparing sediment at the dredging site with sediment at the disposal site, the permitting authority may require a sediment chemical analysis. Markedly different concentrations of contaminants between the excavation and disposal sites may aid in making an environmental assessment of the proposed disposal operation. Such differences should be interpreted in terms of the potential for harm as supported by any pertinent scientific literature. *NOTE*: Per CERCLA 121(e)(1) permits are not required for on-site response actions. For purposes of this section EPA is the permitting authority. Determination of testing procedures will be made as part of EPA review and approval of CERCLA documents, including but not limited a Treatability or a Pilot Study.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **TBC**	40 C.F.R. § 230.61(c)

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Evaluation of effects on physical substrate and water quality from discharge of dredged or fill material into an aquatic ecosystem	The effect of a discharge of dredged or fill material on physical substrate characteristics at the disposal site, as well as on the water circulation, fluctuation, salinity, and suspended particulates content there, is important in making factual determinations in § 230.11. Where information on such effects is not otherwise available to make these factual determinations, the permitting authority shall require appropriate physical tests and evaluations as are justified and deemed necessary. Such tests may include sieve tests, settleability tests, compaction tests, mixing zone and suspended particulate plume determinations, and site assessments of water flow, circulation, and salinity characteristics. *NOTE*: Per CERCLA 121(e)(1) permits are not required for on-site response actions. For purposes of this section EPA is the permitting authority. Determination of testing/evaluation procedures will be made as part of EPA review and approval of CERCLA documents, including but not limited to a Treatability or a Pilot Study.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **TBC**	40 C.F.R. § 230.61(d) *Physical tests and evaluation*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Actions to minimize effects of discharge of dredged or fill material into an aquatic ecosystem	The effects of the discharge can be minimized by the choice of the disposal site. Some of the ways to accomplish this are by: (a) Locating and confining the discharge to minimize smothering of organisms; (b) Designing the discharge to avoid a disruption of periodic water inundation patterns; (c) Selecting a disposal site that has been used previously for dredged material discharge; (d) Selecting a disposal site at which the substrate is composed of material similar to that being discharged, such as discharging sand on sand or mud on mud; (e) Selecting the disposal site, the discharge point, and the method of discharge to minimize the extent of any plume; (f) Designing the discharge of dredged or fill material to minimize or prevent the creation of standing bodies of water in areas of normally fluctuating water levels, and minimize or prevent the drainage of areas subject to such fluctuations.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **TBC**	40 C.F.R. § 230.70 *Actions concerning the location of the discharge*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
	The effects of a discharge can be minimized by treatment of, or limitations on the material itself, such as: (a) Disposal of dredged material in such a manner that physiochemical conditions are maintained and the potency and availability of pollutants are reduced. (b) Limiting the solid, liquid, and gaseous components of material to be discharged at a particular site; (c) Adding treatment substances to the discharge material; (d) Utilizing chemical flocculants to enhance the deposition of suspended particulates in diked disposal areas.		40 C.F.R. § 230.71 *Actions concerning the material to be discharged*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Actions to minimize effects of discharge of dredged or fill material into an aquatic ecosystem	The effects of the dredged or fill material after discharge may be controlled by: (a) Selecting discharge methods and disposal sites where the potential for erosion, slumping or leaching of materials into the surrounding aquatic ecosystem will be reduced. These sites or methods include, but are not limited to: (1) Using containment levees, sediment basins, and cover crops to reduce erosion; (2) Using lined containment areas to reduce leaching where leaching of chemical constituents from the discharged material is expected to be a problem; (b) Capping in-place contaminated material with clean material or selectively discharging the most contaminated material first to be capped with the remaining material; (c) Maintaining and containing discharged material properly to prevent point and nonpoint sources of pollution; (d) Timing the discharge to minimize impact, for instance during periods of unusual high wat r flows, wind, wave, and tidal actions.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **TBC**	40 C.F.R. § 230.72 *Actions controlling the material after discharge*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Actions to minimize effects of discharge of dredged or fill material into an aquatic ecosystem	The effects of a discharge can be minimized by the manner in which it is dispersed, such as: (a) Where environmentally desirable, distributing the dredged material widely in a thin layer at the disposal site to maintain natural substrate contours and elevation; (b) Orienting a dredged or fill mate- rial mound to minimize undesirable obstruction to the water current or circulation pattern, and utilizing natural bottom contours to minimize the size of the mound; (c) Using silt screens or other appropriate methods to confine suspended particulate/turbidity to a small area where settling or removal can occur; (d) Making use of currents and circulation patterns to mix, disperse and dilute the discharge; (e) Minimizing water column turbidity by using a submerged diffuser system. A similar effect can be accomplished by submerging pipeline dis- charges or otherwise releasing materials near the bottom; (f) Selecting sites or managing dis- charges to confine and minimize the release of suspended particulates to give decreased turbidity levels and to maintain light penetration for organisms; (g) Setting limitations on the amount of material to be discharged per unit of time or volume of receiving water.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **TBC**	40 C.F.R. § 230.73 *Actions affecting the method of dispersion*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Actions to minimize effects of discharge of dredged or fill material into an aquatic ecosystem	Discharge technology should be adapted to the needs of each site. In determining whether the discharge operation sufficiently minimizes adverse environmental impacts, the applicant should consider: (a) Using appropriate equipment or machinery, including protective devices, and the use of such equipment or machinery in activities related to the discharge of dredged or fill material; (b) Employing appropriate maintenance and operation on equipment or machinery, including adequate training, staffing, and working procedures; (c) Using machinery and techniques that are especially designed to reduce damage to wetlands. This may include machines equipped with devices that scatter rather than mound excavated materials, machines with specially designed wheels or tracks, and the use of mats under heavy machines to reduce wetland surface compaction and rutting; (d) Designing access roads and channel spanning structures using culverts, open channels, and diversions that will pass both low and highwater flows, accommodate fluctuating water levels, and maintain circulation and faunal movement; (e) Employing appropriate machinery and methods of transport of the material for discharge.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **TBC**	40 C.F.R. § 230.74 *Actions related to technology*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Actions to minimize effects of discharge of dredged or fill material into an aquatic ecosystem	Minimization of adverse effects on populations of plants and animals can be achieved by: (a) Avoiding changes in water current and circulation patterns which would interfere with the movement of animals; (b) Selecting sites or managing discharges to prevent or avoid creating habitat conducive to the development of undesirable predators or species which have a competitive edge ecologically over indigenous plants or animals; (c) Avoiding sites having unique habitat or other value, including habitat of threatened or endangered species; (d) Using planning and construction practices to institute habitat development and restoration to produce a new or modified environmental state of higher ecological value by displacement of some or all of the existing environmental characteristics. Habitat development and restoration techniques can be used to minimize adverse impacts and to compensate for destroyed habitat. (e) Timing discharge to avoid spawning or migration seasons and other biologically critical time periods; (f) Avoiding the destruction of remnant natural sites within areas already affected by development.	Action that involves discharge of dredged or fill material into waters of the U. S., including wetlands – **TBC**	40 C.F.R. § 230.75 *Actions affecting plant and animal populations*

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Dredging and/or Filling State of Alabama Water Bottoms or Adjacent Wetlands			
Presence of State water bottoms or adjacent wetlands, as defined by ADEM Admin. Code r. 335-8-1-.02(a)	Dredging and/or filling of State waterbottoms or adjacent wetlands may be permitted provided that: • There will be no dredging or filling in close proximity to existing submersed grassbeds; • Dredging, filling or trenching methods and techniques are such that reasonable assurance is provided that applicable water quality standards will be met; and no alternative project site or design is feasible and the adverse impacts to coastal resources have been reduced to the greatest extent practicable.	Dredging and/or filling of a State waterbottom or adjacent wetland – **Relevant and Appropriate**	ADEM Admin. Code r. 335-8-2-.02(1)(c) & (d)
	Dredging, filling, or trenching resulting in a temporary disturbance may be permitted provided that all areas are returned to pre-project elevations and all wetland areas are revegetated and the requirements of ADEM Admin. Code r. 335-8-2-.02(1)(b) thru (d) are met.		ADEM Admin. Code r. 335-8-2-.02(2)
	Any fill material placed on State waterbottoms or in wetlands shall be free to toxic pollutants in toxic amounts and shall be devoid of sludge and/or solid waste.		ADEM Admin. Code r. 335-8-2-.02(5)
	The salinity of return waters from dredge disposal sites shall be similar to that of the receiving waters and reasonable assurance provided that applicable water quality standards met.		ADEM Admin. Code r. 335-8-2-.02(8)

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Presence of non-adjacent wetlands, as defined by ADEM Admin. Code r. 335-8-1-.02(nnn)	Dredging or filling of non-adjacent wetlands may be permitted provided that: • No alternative project sites or designs which avoid the dredging or filling are feasible and the adverse impacts have been reduced to the greatest extent possible; and • The non-adjacent wetlands to be dredged or filled have a limited functional value.	Dredging and/or filling of non-adjacent wetland – **Relevant and Appropriate**	ADEM Admin. Code r. 335-8—2-.02(3)
Alteration, Drainage or Obstruction of Waterbodies			
Presence of any stream or other body of water proposed to be impounded, diverted, controlled, or modified for drainage	Whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the United States, or by any public or private agency under Federal permit or license, such department or agency first shall consult with the United States Fish and Wildlife Service, Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular State wherein the impoundment, diversion, or other control facility is to be constructed, with a view to the conservation of wildlife resources by preventing loss of and damage to such resources as well as providing for the development and improvement thereof in connection with such water-resource development. *NOTE*: Consultation with USFWS is recommended in order to determine actions as part of project in view of conservation of wildlife resources.	Federal actions that propose to impound, divert, control, or modify waters of any stream or body of water – **Relevant and Appropriate**	16 U.S.C. § 662(a) *Impounding, diverting, or controlling of waters* Fish and Wildlife Coordination Act

Table D-2. – Location-Specific ARARs and To Be Considered Guidance (TBC) for Anniston PCB Site OU-4 ROD			
Location	**Requirements**	**Prerequisite**	**Citation**
Presence of navigable water (e.g., river) or harbor proposed to be obstructed with any structure	The creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any of the waters of the United States is prohibited; and it shall not be lawful to build or commence the building of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in any port, roadstead, haven, harbor, canal, navigable river, or other water of the United States, outside established harbor lines, or where no harbor lines have been established, except on plans recommended by the Chief of Engineers and authorized by the Secretary of the Army. *NOTE*: Consultation with USACE is recommended in order to determine actions as part of project in view of authorization or exemption.	Federal actions that propose to build of or construct structures in navigable waters or harbors – **Relevant and Appropriate**	33 U.S.C. § 403 *Obstruction of navigable waters generally* Rivers and Harbors Act of 1899, Section 10

ADEM = Alabama Department of Environmental Management
ADPH = Alabama Department of Public Health
ARAR = Applicable or Relevant and Appropriate Requirement [Ref. 40 C.F.R. § 300.5 Definitions of 'Applicable requirements' and 'Relevant and appropriate requirements']
AWPCA = Alabama Water Pollution Control Act
C.F.R. = *Code of Federal Regulations*
CWA = Clean Water Act
DOI = U.S. Department of the Interior
EPA = Environmental Protection Agency
E.O. = Executive Order
FS = Feasibility Study
> = greater than
< = less than
≥ = greater than or equal to
≤ = less than or equal to
RI = Remedial Investigation
ROD =Record of Decision
TBC = To Be Considered [Ref. 40 C.F.R. § 300.405(g)(3) "The 'to be considered' (TBC) category consists of advisories, criteria, or guidance that were developed by EPA, other federal agencies, or states that may be useful in developing CERCLA remedies."]

U.S. = United States
USACE = U.S. Army Corps of Engineers
USFWS = United States Fish and Wildlife Service
U.S.C. = U.S. Code

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
General Construction Standards – All Land Disturbing Activities			
Activities causing stormwater runoff (*e.g.*, clearing, grading, excavation)	Shall fully implement and regularly maintain effective best management practices (BMPs) to the maximum extent practicable, and in accordance with the operator's Construction Best Management Practices Plan (CBMPP). Appropriate, effective pollution abatement/prevention facilities, structural and nonstructural BMPs, and management strategies shall be fully implemented prior to and concurrent with commencement of the regulated activities and regularly maintained during construction as needed at the site to meet or exceed the requirements of this chapter until construction is complete, effective reclamation and/or stormwater quality remediation is achieved. *NOTE*: CBMPP will be included as part of a CERCLA document such as the Remedial Design or Remedial Action Work Plan.	All new and existing construction activities as defined in ADEM Admin. Code r. 335-6-12-.02(e) disturbing one (1) acre or more in size – **Applicable**	ADEM Admin. Code r. 335-6-12-.05(2)
	The operator shall take all reasonable steps to prevent and/or minimize, to the maximum extent practicable, any discharge in violation of this chapter or which has a reasonable likelihood of adversely affecting the quality of groundwater or surface water receiving the discharge(s).		ADEM Admin. Code r. 335-6-12-.06(4)
	Implement a comprehensive CBMPP appropriate for site conditions consistent with the substantive requirements of ADEM Admin. Code r. 335-6-12-.21 that has been prepared and certified by a Qualified Credentialed Professional (QCP). The CBMPP shall include a description of appropriate, effective water quality BMPs to be implemented at the site as needed to ensure compliance with this chapter and include		ADEM Admin. Code r. 335-6-12-.21(2)(a) & (b)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	but not limited to the measures provided in subsections 1. thru 14.		
	BMPs shall be designed, implemented, and regularly maintained to provide effective treatment of discharges of pollutants in stormwater resulting from runoff generated by probable storm events expected/predicted during construction disturbance based on historic precipitation information, and during extended periods of adverse weather and seasonal conditions		ADEM Admin. Code r. 335-6-12-.21(4)
Activities causing fugitive dust emissions	Shall not cause, suffer, allow or permit any materials to be handled, transported, or stored; or a building, its appurtenances, or a road to be used . . . without taking reasonable precautions to prevent particulate matter from becoming airborne. Shall not cause or permit the discharge of visible fugitive dust emissions beyond the lot line of the property on which the emissions originate.	Fugitive emissions from construction operations, grading, or the clearing of land – **TBC**	ADEM Admin. Code r. 335-3-4-.02(1) & (2)[1]
	In-Situ Capping of Contaminated Sediments		
Design of in-situ subaqueous cap of contaminated sediments	Provides guidance for planning and design of in-situ, subaqueous capping projects, including cap design, equipment and placement techniques, and monitoring and management considerations. NOTE: Relevant provisions of the guidance will be considered in the Remedial Design and Remedial Action Work Plan.	In-situ, subaqueous capping of contaminated sediments – **TBC**	U.S. Army Corps of Engineers, Tech. Report DOER-1, *Guidance for Subaqueous Dredged Material Capping* (1998).

[1] ADEM Admin. Code r. 335-3-4-.02(1) and (2) were held unconstitutional for being unduly vague (335-3-4-.02(1)) and too restrictive (335-3-4-.02(2)). See Ross Neeley Express, Inc. v. Ala. Dep't of Envtl. Mgmt., 437 So.2d 82 (Ala. 1983).

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
Waste Characterization — Primary Wastes (e.g., contaminated sediments and soil) and Secondary Wastes (e.g., contaminated equipment/PPE and wastewaters)			
Characterization of solid waste	Must make an accurate determination as to whether that waste is a hazardous waste in order to ensure wastes are properly managed according to Applicable RCRA regulations. A hazardous waste determination is made using the following steps: (a) Must be made at the point of waste generation, before any dilution, mixing, or other alteration of the waste occurs, and at any time in the course of its management that it has, or may have, changed its properties as a result of exposure to the environment or other factors that may change the properties of the waste such that the RCRA classification of the waste may change (b) Must determine whether the waste is excluded from regulation under 40 C.F.R. § 261.4 (c) Must use the knowledge of the waste to determine whether waste meets any of the listing descriptions under subpart D of 40 C.F.R. Part 261. Acceptable knowledge that may be used in making an accurate determination as to whether the waste is listed may include waste origin, composition, the process producing the waste, feedstock, and other reliable and relevant information	Generation of solid waste as defined in 40 C.F.R. § 261.2 – **Applicable**	40 C.F.R. § 262.11(a), (b) and (c) ADEM Admin. Code r. 335-14-3-.01(2)
	The person then must also determine whether the waste exhibits one or more hazardous characteristics as identified in subpart C of 40 C.F.R. part 261 by following the procedures in paragraph (d)(1) or (2) of this section, or a combination of both.	Generation of solid waste which is not excluded under 40 C.F.R. § 261.4(a) – **Applicable**	40 C.F.R. § 262.11(d) ADEM Admin. Code r. 335-14-3-.01(2)(d)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
Determination of characteristic hazardous waste through knowledge	The person must apply knowledge of the hazard characteristic of the waste in light of the materials or the processes used to generate the waste. Acceptable knowledge may include process knowledge (e.g., information about chemical feedstocks and other inputs to the production process); knowledge of products, by-products, and intermediates produced by the manufacturing process; chemical or physical characterization of wastes; information on the chemical and physical properties of the chemicals used or produced by the process or otherwise contained in the waste; testing that illustrates the properties of the waste; or other reliable and relevant information about the properties of the waste or its constituents. A test other than a test method set forth in subpart C of 40 C.F.R. part 261, or an equivalent test method approved by the Administrator under 40 C.F.R. 260.21, may be used as part of a person's knowledge to determine whether a solid waste exhibits a characteristic of hazardous waste. However, such tests do not, by themselves, provide definitive results. Persons testing their waste must obtain a representative sample of the waste for the testing, as defined at 40 C.F.R. 260.10.	Generation of solid waste which is not excluded under 40 C.F.R. § 261.4(a) – **Applicable**	40 C.F.R. § 262.11(d)(1) ADEM Admin. Code r. 335-14-3-.01(2)(d)(1)
Determination of characteristic hazardous waste through testing	When available knowledge is inadequate to make an accurate determination, the person must test the waste according to the Applicable methods set forth in subpart C of 40 C.F.R. part 261 or according to an equivalent method approved by the Administrator under 40 C.F.R. § 260.21; or and in accordance with the following: (i) Persons testing their waste must obtain a representative sample of the waste for the testing, as defined at 40 C.F.R. § 260.10.	Generation of solid waste which is not excluded under 40 C.F.R. § 261.4(a) – **Applicable**	40 C.F.R. § 262.11(d)(2) ADEM Admin. Code r. 335-14-3-.01(2)(d)(2)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	(ii) Where a test method is specified in subpart C of 40 C.F.R. part 261, the results of the regulatory test, when properly performed, are definitive for determining the regulatory status of the waste.		
	Must refer to Parts 261, 262, 264, 265, 266, 268, and 273 of Chapter 40 for possible exclusions or restrictions pertaining to management of the specific waste.	Generation of solid waste which is determined to be hazardous – **Applicable**	40 C.F.R. § 262.11(e)
Identifying hazardous waste numbers for small and large quantity generators	If the waste is determined to be hazardous, small quantity generators and large quantity generators must identify all Applicable EPA hazardous waste numbers (EPA hazardous waste codes) in 335-14-2-.03 and .04. Prior to shipping the waste off site, the generator also must mark its containers with all Applicable EPA hazardous waste numbers (EPA hazardous waste codes) according to 335-14-3-.03(3).		40 C.F.R. § 262.11(g) ADEM Admin. Code r. 335-14-3-.01(2)(g)
Characterization of hazardous waste	Must obtain a detailed chemical and physical analysis on a representative sample of the waste(s), which at a minimum contains all the information that must be known to treat, store, or dispose of the waste in accordance with pertinent sections of 40 C.F.R. Parts 264 and 268.	Generation of RCRA-hazardous waste for storage, treatment or disposal – **Applicable**	40 C.F.R. § 264.13(a)(1) ADEM 335-14-5-.01(1)(j)(2)
Determinations for management of hazardous waste	Must determine each EPA Hazardous Waste Number (waste code) Applicable to the waste in order to determine the Applicable treatment standards under subpart D of this part. This determination may be made concurrently with the hazardous waste determination required in § 262.11 of this chapter. For purposes of part 268, the waste will carry the waste code for any Applicable listed waste (40 C.F.R. part 261, subpart D). In addition, where the waste exhibits a characteristic, the waste will carry one or more of the characteristic waste codes	Generation of hazardous waste for storage, treatment, or disposal – **Applicable**	40 C.F.R. § 268.9(a) ADEM Admin. Code r. 33-14-9-.01

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	(40 C.F.R. part 261, subpart C), except when the treatment standard for the listed waste operates in lieu of the treatment standard for the characteristic waste, as specified in paragraph (b) of this section.		
Determinations for management of characteristic hazardous waste	Must determine the underlying hazardous constituents [as defined in 40 C.F.R. § 268.2(i)] in the characteristic waste.	Generation of RCRA characteristic hazardous waste (and is not D001 non-wastewaters treated by CMBST, RORGS, or POLYM of Section 268.42 Table 1) for storage, treatment, or disposal **– Applicable**	40 C.F.R. § 268.9(a) ADEM Admin. Code r. 33-14-9-.01
Determinations for land disposal of hazardous waste	Must determine if the waste has to be treated before it can be land disposed. This is done by determining if the hazardous waste meets the treatment standards in §268.40, 268.45, or §268.49. This determination can be made concurrently with the hazardous waste determination required in §262.11 of this chapter, in either of two ways: testing the waste or using knowledge of the waste. If the generator tests the waste, testing would normally determine the total concentration of hazardous constituents, or the concentration of hazardous constituents in an extract of the waste obtained using test method 1311 in ''Test Methods of Evaluating Solid Waste, Physical/Chemical Methods,'' EPA Publication SW–846, (incorporated by reference, see §260.11 of this chapter), depending on whether the treatment standard for the waste is expressed as a total concentration or concentration of hazardous constituent in the waste's extract. (Alternatively, the generator must send the waste to a RCRA-permitted hazardous waste treatment facility, where the waste treatment facility must comply with the requirements of §264.13 of this chapter and paragraph (b) of this section.)	Generation of hazardous waste for storage, treatment, or disposal – **Applicable**	40 C.F.R. § 268.7(a) ADEM Admin. Code r. 33-14-9-.01

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
Waste Storage — Primary Wastes (e.g., contaminated sediments and soil) and Secondary Wastes (e.g., wastewaters and contaminated equipment/PPE)			
Temporary on–site accumulation of hazardous waste in containers	A large quantity generator may accumulate hazardous waste on site without a permit or interim status, and without complying with the requirements of parts 124, 264 through 267, and 270 of this chapter, or the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, provided that all of the following conditions for exemption are met:	Accumulation of RCRA hazardous waste on site as defined in 40 C.F.R. § 260.10 **– Applicable**	40 C.F.R. § 262.17(a) ADEM Admin. Code r. 335-14-3-.01(7)
Condition of containers	If a container holding hazardous waste is not in good condition, or if it begins to leak, the large quantity generator must immediately transfer the hazardous waste from this container to a container that is in good condition, or immediately manage the waste in some other way that complies with the conditions for exemption of this section.	Accumulation of RCRA hazardous waste in containers on site as defined in 40 C.F.R. § 260.10 **– Applicable**	40 C.F.R. § 262.17(a)(1)(ii) ADEM Admin. Code r. 335-14-3-.01(7)(a)(1)(ii)
Compatibility of waste with container	Must use a container made of or lined with materials that will not react with, and are otherwise compatible with, the hazardous waste to be accumulated, so that the ability of the container to contain the waste is not impaired.		40 C.F.R. § 262.17(a)(1)(iii) ADEM Admin. Code r. 335-14-3-.01(7)(a)(1)(iii)
Management of containers	(A) A container holding hazardous waste must always be closed during accumulation, except when it is necessary to add or remove waste. (B) A container holding hazardous waste must not be opened, handled, or accumulated in a manner that may rupture the container or cause it to leak.		40 C.F.R. § 262.17(a)(1)(iv) ADEM Admin. Code r. 335-14-3-.01(7)(a)(1)(iv)
Labeling and marking of containers	A large quantity generator must mark or label its containers with the following: (a) The words "Hazardous Waste";	Accumulation of RCRA hazardous waste on site as defined in 40 C.F.R. §260.10 **– Applicable**	40 C.F.R. § 262.17(a)(5)(i)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	(b) An indication of the hazards of the contents (examples include, but are not limited to, the applicable hazardous waste characteristic(s) (*i.e.,* ignitable, corrosive, reactive, toxic); hazard communication consistent with the Department of Transportation requirements at 49 C.F.R. part 172 subpart E (labeling) or subpart F (placarding); a hazard statement or pictogram consistent with the Occupational Safety and Health Administration Hazard Communication Standard at 29 C.F.R. § 1910.1200; or a chemical hazard label consistent with the National Fire Protection Association code 704); and (c) The date upon which each period of accumulation begins clearly visible for inspection on each container.		ADEM Admin. Code r. 335-14-3-.01(7)(a)(5)(i)(a)-(c)
	A large quantity generator must mark or label its containers with the following: (d) All appropriate EPA hazardous waste numbers associated with the hazardous waste as specified in 335-14-2-.03 and 335-14-2-.04.	Accumulation of RCRA hazardous waste on site as defined in 40 C.F.R. §260.10 **– Applicable**	ADEM Admin. Code r. 335-14-3-.01(7)(a)(5)(i)(d)
Use and management of hazardous waste in containers	If container is not in good condition (e.g. severe rusting, structural defects) or if it begins to leak, must transfer waste into container in good condition.	Storage of RCRA hazardous waste in containers **– Applicable**	40 C.F.R. § 265.171 ADEM Admin. Code r. 335-14-5-.09(2)
	Use container made or lined with materials compatible with waste to be stored so that the ability of the container is not impaired.		40 C.F.R. § 265.172 ADEM Admin. Code r. 335-14-5-.09(3)
	Keep containers closed during storage, except to add/remove waste. Open, handle and store containers in a manner that will not cause containers to rupture or leak.	Storage of RCRA hazardous waste in containers**– Applicable**	40 C.F.R. § 265.173 ADEM Admin. Code r. 335-14-5-.09(4)(a)&(b)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	Containers having capacity greater than 30 gallons must not be stacked over two containers high		ADEM Admin. Code r. 335-14-5-.09(4)(c)
Storage of hazardous waste in container area	Area must have a containment system designed and operated in accordance with 40 C.F.R. 264.175(b)(1)-(5).	Storage of RCRA hazardous waste in containers *with free liquids* **– Applicable**	40 C.F.R. § 264.175(a) ADEM Admin. Code r. 335-14-5-.09(6)(a)
	Area must be sloped or otherwise designed and operated to drain liquid resulting from precipitation, or Containers must be elevated or otherwise protected from contact with accumulated liquid.	Storage of RCRA hazardous waste in containers that *do not contain free liquids* (other than F020, F021, F022, F023, F026 and F027) **– Applicable**	40 C.F.R. § 264.175(c)(1) and (2) ADEM Admin. Code r. 335-14-5-.09(6)(c)(1) and (2)
Closure of hazardous waste container storage with containment system	At closure, all hazardous waste and hazardous waste residues must be removed from the containment system. Remaining containers, liners, bases, and soils containing or contaminated with hazardous waste and hazardous waste residues must be decontaminated or removed. [Comment: At closure, as throughout the operating period, unless the owner or operator can demonstrate in accordance with40 C.F.R. 261.3(d) of this chapter that the solid waste removed from the containment system is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with all applicable requirements of parts 262 through 266 of this chapter].	Storage of RCRA hazardous waste in containers in a unit *with a containment system* **– Applicable**	40 C.F.R. § 264.178 ADEM Admin. Code r. 335-14-5-.09(9)(a)
Exemption from RCRA Subpart CC Air Emission Standards for containers	The requirements of this subpart do not apply to the following waste management units at the facility: (5) A waste management unit that is used solely for on-site treatment or storage of hazardous waste that is placed in the unit as a result of implementing remedial activities required under the corrective action authorities of RCRA	Storage of RCRA hazardous waste in containers **– Applicable**	40 C.F.R. § 1080(b)(5) *Applicability*

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	sections 3004(u), 3004(v), or 3008(h); CERCLA authorities; or similar Federal or State authorities.		
PCB Remediation Waste Generation, Management and Storage			
Management of PCB waste (e.g., contaminated sediment and soil)	Any person storing or disposing of PCB waste must do so in accordance with 40 C.F.R. § 761, Subpart D.	Generation of waste containing PCBs at concentrations ≥ 50 ppm – **Applicable**	40 C.F.R. § 761.50(a)
Management of PCB remediation waste	Any person cleaning up and disposing of PCBs shall do so based on the concentration at which the PCBs are found.	Generation of PCB remediation waste as defined in 40 C.F.R. § 761.3 – **Applicable**	40 C.F.R. § 761.61
Storage of PCB waste in a RCRA-regulated container storage area	Does not have to meet storage unit requirements in 40 C.F.R. 761.65(b)(1) provided unit: • is permitted by EPA under RCRA §3004, or • qualifies for interim status under RCRA §3005; or • is permitted by an authorized state under RCRA §3006 and, • PCB spills cleaned up in accordance with Subpart G of 40 C.F.R. 761. *NOTE:* Under CERCLA section 121(e)(1) on-site remedial actions are not required to obtain permits provided action complies with ARARs. RCRA container storage requirements are identified as ARARs in this table and any PCB waste generated may be managed in accordance with those requirements.	Storage of PCBs and PCB Items designated for disposal – **Applicable**	40 C.F.R. § 761.65(b)(2)(i)-(iv)
Temporary storage of Bulk PCB remediation waste in a TSCA waste pile (e.g., sediment and soil)	May be stored at the cleanup site or site of generation for 180 days subject to the following conditions: • Waste must be placed in a pile designed and operated to control dispersal by wind, where necessary, by means other than wetting;	Storage of PCB remediation waste or PCB bulk product waste in a waste pile at a cleanup site or site of generation for up to 180 days – **Applicable**	40 C.F.R. § 761.65(c)(9)(i) and (ii)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	• Waste must not generate leachate through decomposition or other reactions.		
Waste pile liner performance	The storage site must have a liner designed, constructed, and installed to prevent any migration of wastes off or through liner into adjacent subsurface soil, groundwater or surface water at any time during active life (including closure period) of the storage site.	Storage of PCB remediation waste or PCB bulk product waste at cleanup site or site of generation for up to 180 days **– Applicable**	40 C.F.R. § 761.65(c)(9)(iii)(A)
Construction of TSCA storage pile liner	Liner must be: • Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure because of pressure gradients, physical contact with waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation; • Placed on foundation or base capable of providing support to liner and resistance to pressure gradients above and below the liner to present failure because of settlement compression or uplift; and • Installed to cover all surrounding earth likely to be in contact with waste.		40 C.F.R. § 761.65(c)(9)(iii)(A)(1)-(3)
Construction of a TSCA storage pile cover	The storage site must have a cover that meets the above requirements and is installed to cover all of the stored waste likely to be contacted by precipitation, and is secured so as not to be functionally disabled by winds expected under normal weather conditions at the storage site.		40 C.F.R. § 761.65(c)(9)(iii)(B)
Construction of TSCA storage pile run-on control system	The storage site must have a run-on control system designed, constructed, operated and maintained such that it: • prevents flow on the stored waste during peak discharge from at least a 25-year storm;	Storage of PCB remediation waste or PCB bulk product waste at cleanup site or site of generation for up to 180 days **– Applicable**	40 C.F.R. § 761.65(c)(9)(iii)(C)(1) and (2)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	• collects and controls at least the water volume resulting from a 24-hour, 25-year storm. • Collection and holding facilities (e.g., tanks or basins) must be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.		
Modification of TSCA waste pile requirements	Requirements of 40 C.F.R. § 761.65(c)(9) may be modified under the risk-based disposal option of 40 C.F.R.§ 761.61(c). *NOTE*: See ARAR entry below for requirements associated with use of 40 C.F.R. § 761.61(c).		40 C.F.R. § 761.65(c)(9)(iv)
Waste Disposal — Primary Wastes (e.g., contaminated sediments and soil) and Secondary Wastes (e.g., wastewaters and contaminated equipment/PPE)			
Disposal of RCRA hazardous waste in an off-site land-based unit	May be land disposed if it meets the requirements in the table "Treatment Standards for Hazardous Waste" at 40 C.F.R. 268.40 before land disposal.	Land disposal, as defined in 40 C.F.R. 268.2, of restricted RCRA waste – **Applicable**	40 C.F.R. § 268.40(a) ADEM Admin. Code r. 33-14-9-.04
	All underlying hazardous constituents [as defined in 40 C.F.R. 268.2(i)] must meet the Universal Treatment Standards, found in 40 C.F.R. 268.48 Table UTS prior to land disposal	Land disposal of restricted RCRA characteristic wastes (D001 –D043) that are not managed in a wastewater treatment system that is regulated under the CWA, that is CWA equivalent, or that is injected into a Class I nonhazardous injection well – **Applicable**	40 C.F.R. § 268.40(e) ADEM Admin. Code r. 33-14-9-.04
Disposal of RCRA – *hazardous waste soil* in an off-site land–based unit	Must be treated according to the alternative treatment standards of 40 C.F.R. 268.49(c) <u>or</u>	Land disposal, as defined in 40 C.F.R. 268.2, of restricted hazardous soils – **Applicable**	40 C.F.R. § 268.49(b)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	Must be treated according to the UTSs specified in 40 C.F.R. 268.48 applicable to the listed and/or characteristic waste contaminating the soil prior to land disposal.		ADEM Admin. Code r. 33-14-9-.04(9)
Treatment of RCRA *hazardous waste soil*	Prior to land disposal, all "constituents subject to treatment" as defined in 40 C.F.R. § 268.49(d) must be treated as follows: • **For non–metals** (except carbon disulfide, cyclohexanone, and methanol), treatment must achieve a 90 percent reduction in total constituent concentrations, except as provided in 40 C.F.R. § 268.49(c)(1)(C) • **For metals** and carbon disulfide, cyclohexanone, and methanol, treatment must achieve a 90 percent reduction in total constituent concentrations as measured in leachate from the treated media (tested according to TCLP) or 90 percent reduction in total constituent concentrations (when a metal removal technology is used), except as provided in 40 C.F.R. § 268.49(c)(1)(C) • When treatment of any constituent subject to treatment to a 90 percent reduction standard would result in a concentration less than 10 times the Universal Treatment Standard for that constituent, treatment to achieve constituent concentrations less than 10 times the universal treatment standard is not required. Universal Treatment Standards (UTS) are identified in 40 C.F.R. § 268.48 Table UTS.	Treatment of restricted hazardous waste soils – **Applicable**	40 C.F.R. § 268.49(c)(1)(A)-(C)
	In addition to the treatment requirement required by paragraph (c)(1) of this section, prior to land disposal, soils must be treated to eliminate these characteristics.	Soils that exhibit the characteristic of ignitability, corrosivity or reactivity intended for land disposal – **Applicable**	40 C.F.R. § 268.49(c)(2)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
Treatment of RCRA *hazardous waste soil*	Provides methods on how to demonstrate compliance with the alternative treatment standards for contaminated soils that will be land disposed.	On-site treatment of restricted hazardous waste soils following alternative soil treatment of 40 C.F.R. § 268.49(c) – **TBC**	*Guidance on Demonstrating Compliance with the LDR Alternative Soil Treatment Standards* [EPA 530 –R –02 –003, July 2002]
Constituents subject to treatment	When applying the soil treatment standards in paragraph (c) of this section, constituents subject to treatment are any constituents listed in § 268.48 Table UTS-Universal Treatment Standards that are reasonably expected to be present in any given volume of contaminated soil, except fluoride, selenium, sulfides, vanadium, zinc, and that are *present at concentrations greater than 10 times the universal treatment standard*. PCBs are not constituents subject to treatment in any given volume of soil that exhibits the toxicity characteristic solely because of presence of metals.	Treatment of restricted hazardous waste soils – **Applicable**	40 C.F.R. § 268.49(d)
Disposal of RCRA characteristic wastewaters in an NPDES permitted WWTU	Are not prohibited, if the wastes are managed in a treatment system which subsequently discharges to waters of the U.S. pursuant to a permit issued under 402 the CWA (i.e., NPDES permitted), unless the wastes are subject to a specified method of treatment other than DEACT in 40 C.F.R. § 268.40, or are D003 reactive cyanide.	Land disposal of RCRA restricted hazardous wastewaters that hazardous only because they exhibit a characteristic and are not otherwise prohibited under 40 C.F.R. § 268 – **Applicable**	40 C.F.R. § 268.1(c)(4)(i) ADEM Admin. Code r. 335-14-9-.01
Disposal of RCRA characteristic wastewaters in a POTW	Are not prohibited, if the wastes are treated for purposes of the pretreatment requirements of Section 307 of the CWA, unless the wastes are subject to a specified method of treatment other than DEACT in 40 C.F.R. § 268.40, or are D003 reactive cyanide.	Land disposal of hazardous wastewaters that hazardous only because they exhibit a characteristic and are not otherwise prohibited under 40 C.F.R. 268 – **Applicable**	40 C.F.R. §268.1(c)(4)(ii) ADEM Admin. Code r. 335-14-9-.01
Transport and conveyance of	Any dedicated tank systems, conveyance systems, and ancillary equipment used to treat, store or convey wastewater	On-site wastewater treatment unit (as defined in 40 C.F.R. § 260.10)	40 C.F.R. §264.1(g)(6)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
collected RCRA wastewater to WWTU located on the facility	to an on–site NPDES–permitted wastewater treatment facility are exempt from the requirements of RCRA Subtitle C standards.	subject to regulation under § 402 or § 307(b) of the CWA (i.e., NPDES–permitted) that manages hazardous wastewaters – **Applicable**	
Liquids in landfills prohibition	The placement of bulk or noncontainerized liquid hazardous waste or hazardous waste containing free liquids (whether or not sorbents have been added) in any landfill is prohibited. Prior to disposal in a hazardous waste landfill, liquids must meet additional requirements as specified in 335-14-5-.14 and 335-14-6-.14.	Land disposal, as defined in 40 C.F.R. § 268.2, of restricted hazardous soils – **Applicable**	ADEM Admin. Code r. 335-14-3-.04(5)
Disposal of PCB Remediation Waste (e.g., soil and sediment) and Secondary Waste (e.g., decontamination water, contaminated equipment)			
Disposal of bulk PCB remediation waste off-site *(self-implementing option)*	May be sent off-site for decontamination or disposal provided the waste is either dewatered on-site or transported off-site in containers meeting the requirements of DOT HMR at 49 C.F.R. parts 171-180.	Generation of bulk PCB remediation waste (as defined in 40 C.F.R. 761.3) for disposal **– Relevant and Appropriate**	40 C.F.R. § 761.61(a)(5)(i)(B)
	Must provide written notice including the quantity to be shipped and highest concentration of PCBs [using extraction EPA Method 3500B/3540C or Method 3500B/3550B followed by chemical analysis using Method 8082 in SW-846 or methods validated under 40 C.F.R. 761.320-26 (Subpart Q)] at least 15 days before the first shipment of waste to each off-site facility.	Generation of bulk PCB remediation waste (as defined in 40 C.F.R. § 761.3) for disposal at an off-site facility where the waste is destined for an area not subject to a TSCA PCB Disposal Approval **– Relevant and Appropriate**	40 C.F.R. § 761.61(a)(5)(i)(B)(2)*(iv)*
	Shall be disposed of in accordance with the provisions for Cleanup wastes at 40 C.F.R. § 761.61(a)(5)(v)(A).	Bulk PCB remediation waste which has been de-watered and with a PCB concentration < 50 ppm – **Relevant and Appropriate**	40 C.F.R. § 761.61(a)(5)(i)(B)(2)*(ii*

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
Disposal of bulk PCB remediation waste off-site *(self-implementing option)*	Shall be disposed of: • in a hazardous waste landfill permitted by EPA under §3004 of RCRA; • in a hazardous waste landfill permitted by a State authorized under §3006 of RCRA; or • in a PCB disposal facility approved under 40 C.F.R. § 761.60.	Bulk PCB remediation waste which has been de-watered and with a PCB concentration ≥ 50 ppm – **Relevant and Appropriate**	40 C.F.R. § 761.61(a)(5)(i)(B)(2)*(iii)*
Performance-based disposal of *PCB remediation waste*	Shall dispose by one of the following methods: • in a high-temperature incinerator approved under 40 C.F.R. § 761.70(b); • by an alternate disposal method approved under 40 C.F.R. § 761.60(e); • in a chemical waste landfill approved under 40 C.F.R. § 761.75; • in a facility with a coordinated approval issued under 40 C.F.R. § 761.77; or • through decontamination in accordance with 40 C.F.R. § 761.79.	Disposal of non-liquid *PCB remediation waste* (as defined in 40 C.F.R. §.761.3) **– Applicable**	40 C.F.R. § 761.61(b)(2) 40 C.F.R. § 761.61(b)(2)(i) 40 C.F.R. § 761.61(b)(2)(ii)
	Shall be disposed according to 40 C.F.R. § 761.60(a) or (e), or decontaminate in accordance with 40 C.F.R. § 761.79.	Disposal of liquid PCB remediation waste – **Applicable**	40 C.F.R. § 761.61(b)(1)
Performance-based disposal of *PCB bulk product waste*	Any person disposing of PCB bulk product waste may do so as follows: (1) In an incinerator approved under § 761.70. (2) In a chemical waste landfill approved under § 761.75. (3) In a hazardous waste landfill permitted by EPA under section 3004 of RCRA, or by a State authorized under section 3006 of RCRA.	Disposal of *PCB bulk product waste* listed in 40 C.F.R. § 761.62(b)(1)(i) including non-liquid building debris **– Applicable**	40 C.F.R. § 761.61(a) *Performance-based disposal*

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	(4) Under an alternate disposal approval under § 761.60(e). (5) In accordance with the decontamination provisions of § 761.79. (6) For metal surfaces in contact with PCBs, in accordance with the thermal decontamination provisions of § 761.79(c)(6). (7) In accordance with a TSCA PCB Coordinated Approval issued under § 761.77.		
Disposal of *PCB bulk product waste* in an off-site solid waste landfill	Any person may dispose of the following bulk product waste in a facility permitted, licensed, or registered by a State as a municipal solid waste or non-municipal non-hazardous waste landfill. (i) Plastics (such as plastic insulation from wire or cable; radio, television and computer casings; vehicle parts; or furniture laminates); preformed or molded rubber parts and components; applied dried paints, varnishes, waxes or other similar coatings or sealants; caulking; Galbestos; non-liquid building demolition debris; or non-liquid PCB bulk product waste from the shredding of automobiles or household appliances from which PCB small capacitors have been removed (shredder fluff). (ii) Other PCB bulk product waste, sampled in accordance with the protocols set out in subpart R of this part, that leaches PCBs at <10 µg/L of water measured using a procedure used to simulate leachate generation.	*PCB bulk product waste* listed in 40 C.F.R. § 761.62(b)(1)(i) including non-liquid building debris **– Applicable**	40 C.F.R. § 761.62(b)(1)(i) and (ii) *Disposal in solid waste landfills*
Disposal of PCB bulk product waste in an	Must provide written notice to the facility 15 days in advance of the first shipment from the same disposal waste stream.	Disposal of *PCB bulk product waste* regulated under 40 C.F.R. §	40 C.F.R. § 761.62(b)(4)(i)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
off-site solid waste landfill *con't*	The notice shall state that the PCB bulk product waste may include components containing PCBs at ≥ 50 ppm based on analysis of the waste in the shipment or application of a general knowledge of the waste stream (or similar material) which is known to contain PCBs at those levels, and that the PCB bulk product waste is known or presumed to leach <10 µg/L PCBs.	761.62(b)(1) at a facility without PCB approval **– Applicable**	
Risk-based cleanup, storage and/or disposal of *PCB remediation waste*	Any person wishing to sample, cleanup or dispose of PCB remediation waste in a manner other than prescribed in 40 C.F.R. §§761.61(a) or (b) or store remediation waste in a manner other than prescribed in 40 C.F.R. § 761.65 must apply in writing to the Regional Administrator in the Region where the sampling, cleanup, disposal, or storage site is located. Each application must include information described in 40 C.F.R. § 761.61(a)(3). EPA may request other information that it believes necessary to evaluate the application. *NOTE*: Appropriate information required in an application can be provided in a CERCLA document (e.g. FS, PP, or ROD) that is approved or issued by EPA.	Cleanup, storage, or disposal of *PCB remediation waste* (as defined in 40 C.F.R. § 761.3) **– Relevant and Appropriate**	40 C.F.R. § 761.61(c)(1) *Risk-based disposal approval*
	EPA will issue a written decision on each application for a risk-based method for PCB remediation wastes. EPA will approve such an application if it finds that the method will not pose an unreasonable risk of injury to human health or the environment.		40 C.F.R. § 761.61(c)(2) *Risk-based disposal approval*
Disposal of decontamination waste and residues	Such waste shall be disposed of at their existing PCB concentration unless otherwise specified in 40 C.F.R. § 761.79(g)(1 - 6).	Decontamination waste and residues **– Applicable**	40 C.F.R. 761.79(g)
	Are regulated for disposal as PCB remediation waste.	Distillation bottoms or residues	40 C.F.R. § 761.79(g)(1)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
		and filter media – **Applicable**	
	Are regulated for disposal at their original concentration.	PCBs physically separated from regulated waste during decontamination, other than distillation bottoms and filter media – **Applicable**	40 C.F.R. § 761.79(g)(2)
	Shall be disposed of in accordance with provisions for wastes from cleanup of PCB remediation waste at 40 C.F.R. § 761.61(a)(5)(v).	Nonliquid cleaning materials and PPE at any concentration of PCBs, including nonporous surfaces and other nonliquid materials (e.g., rags, gloves, booties) resulting from decontamination – **Applicable**	40 C.F.R. § 761.79(g)(6)
Disposal of PCB contaminated porous surfaces *(self-implementing option)*	Shall be disposed on-site or off-site as bulk PCB remediation waste according to 40 C.F.R. § 761.61(a)(5)(i) <u>or</u> decontaminated for use according to 40 C.F.R. § 761.79(b)(4).	PCB remediation waste porous surfaces (as defined in 40 C.F.R. § 761.3) – **Relevant and Appropriate**	40 C.F.R. § 761.61(a)(5)(iii)
Disposal of PCB contaminated nonporous surfaces *(self-implementing option)*	Shall be cleaned on-site or off-site to levels in 40 C.F.R. § 761.61(a)(4)(ii) using: • decontamination procedures under 40 C.F.R. § 761.79; • technologies approved under 40 C.F.R. § 761.60(e); or • risk-based procedures/technologies under 40 C.F.R. § 761.61(c).	PCB remediation waste nonporous surfaces (as defined in 40 C.F.R. 761.3) – **Relevant and Appropriate**	40 C.F.R. § 761.61(a)(5)(ii)(A)(*1*)-(*3*)
Disposal liquid PCB remediation waste	Shall either: • Decontaminate the waste to the levels specified in 40 C.F.R. § 761.79(b)(1) or (2); or • Dispose of the waste in accordance with 40 C.F.R. § 761.61(b) or a risk-based approval under 40 C.F.R. §	Liquid PCB remediation waste (as defined in 40 C.F.R. § 761.3) – **Relevant and Appropriate**	40 C.F.R. § 761.61(a)(5)(iv)(A) and (B)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	761.61(c).		
Disposal of PCB cleanup wastes (e.g., PPE, rags, nonliquid cleaning materials) *(self-implementing option)*	Shall be disposed of either: • in a facility permitted, licensed, or registered by a State to manage municipal solid waste under 40 C.F.R § 258 or nonmunicipal, nonhazardous waste subject to 40 C.R.R.§§ 257.5 through 257.30; or • in an RCRA Subtitle C landfill permitted by a State to accept PCB waste; or • in an approved PCB disposal facility; or • through decontamination under 40 C.F.R. § 761.79(b) or (c).	Generation of nonliquid PCBs at any concentration during and from the cleanup of PCB remediation waste – **Relevant and Appropriate**	40 C.F.R. § 761.61(a)(5)(v)(A)(1)-(4)
Disposal of PCB cleaning solvents, abrasives, and equipment *(self-implementing option)*	May be reused after decontamination in accordance with 40 C.F.R. §761.79; or For liquids, disposed in accordance with 40 C.F.R. § 761.60(a).	Generation of PCB wastes from the cleanup of PCB remediation waste – **Relevant and Appropriate**	40 C.F.R. § 761.61(a)(5)(v)(B) 40 C.F.R. § 761.60(b)(1)(i)(B)
Discharge of Wastewater (e.g., from equipment decontamination and de-watering of sediments/soil) into Surface Water[2]			
Protection of surface water	The quality of any waters receiving sewage, industrial wastes or other wastes, regardless of their use, shall be such as will not cause the best usage of any other waters to be adversely affected by such sewage, industrial wastes or other wastes.	Point source discharge of pollutants to surface waters – **Applicable**	ADEM Admin. Code r. 335-6-10-.05
Protection of surface water	The following minimum conditions are applicable to all State waters, at all places and at all times, regardless of their uses:	Point source discharge of pollutants to surface waters – **Applicable**	ADEM Admin. Code r. 335-6-10-.06(a)-(c)

[2] *NOTE*: A responsible party is not required to obtain a discharge permit for any part of a remedial action conducted entirely onsite, per CERCLA §121(e). Use of the terms "permit" and "permittee" reflect regulatory language; in this remedial action, "permit" can generally be taken to mean the Record of Decision, and "permittee" to mean the responsible party. Limitations that otherwise would be included in a permit will be identified in a CERCLA ROD or post-ROD document approved by EPA and ADEM.

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	a. State waters shall be free from substances attributable to sewage, industrial wastes or other wastes that will settle to form bottom deposits which are unsightly, putrescent or interfere directly or indirectly with any classified water use. b. State waters shall be free from floating debris, oil, scum, and other floating materials attributable to sewage, industrial wastes or other wastes in amounts sufficient to be unsightly or interfere directly or indirectly with any classified water use. c. State waters shall be free from substances attributable to sewage, industrial wastes or other wastes in concentrations or combinations which are toxic or harmful to human, animal or aquatic life to the extent commensurate with the designated usage of such waters.		
Toxic Pollutant Criteria Applicable to State Waters	The U.S. EPA has listed the chemical constituents given in Table 1 of ADEM Admin. Code r. 335-6-10 as toxic pollutants pursuant to Section 307(a)(1) of the Federal Water Pollution Control Act (FWPCA). Concentrations of these toxic pollutants in State waters shall not exceed the criteria indicated in Table 1 to the extent commensurate with the designated usage of such waters.	Point source discharge of *toxic pollutants* to surface waters – **Applicable**	ADEM Admin. Code r. 335-6-10-.07
Discharge of PCB contaminated water	For water discharged to a treatment works (as defined in 40 C.F.R. § 503.9 (aa), or to navigable waters, meet standard of < 3 ppb PCBs; <u>or</u> Meet a PCB discharge limit included in a permit issued under section 307(b) or section 402 of the CWA.	Water containing PCBs regulated for disposal – **Applicable**	40 C.F.R. §761.79(b)(1)(ii) 40 C.F.R. § 761.450(a)(3)
General duty to mitigate for discharge	Take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of effluent	Point source discharge of pollutants to surface waters – **Applicable**	40 C.F.R. §122.41(d)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
of wastewater treatment unit	standards which has a reasonable likelihood of adversely affecting human health or the environment.		
Operation and maintenance of treatment unit	Properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used to achieve compliance with the effluent standards. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures.	Discharge of pollutants to surface waters – **Applicable**	40 C.F.R. §122.41(e)
Technology-based effluent limits (TBELs) for wastewater discharge	To the extent that EPA promulgated effluent limitations are inapplicable, shall develop on a case-by-case Best Professional Judgment (BPJ) basis under § 402(a)(1)(B) of the CWA, technology based effluent limitations by applying the factors listed in 40 *C.F.R.* §125.3(d) and shall consider: • The appropriate technology for this category or class of point sources, based upon all available information; and • Any unique factors relating to the discharger.	Discharge of pollutants to surface waters from other than a POTW – **Applicable**	40 C.F.R. §125.3(c)(2)
	Technology-based treatment requirements are applied prior to or at the point of discharge.		40 C.F.R. § 125.3(e)
	Technology-based treatment requirements cannot be satisfied through the use of “non-treatment” techniques such as flow augmentation and in-stream mechanical aerators.		40 C.F.R. § 125.3(f)
Water quality standards and State requirements	Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.	Discharge that causes or has the reasonable potential to cause, or contributes to an excursion above any State water quality standard, including State narrative criteria for water quality – **Applicable**	40 C.F.R. § 122.44(d)(1)(i)
Establishing water quality-based effluent	Permitting authority must establish effluent limits using a calculated numeric water quality criterion for	Determination of effluent limits where a State has not established a	40 C.F.R. §122.44(d)(1)(vi)(A)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
limits using a calculated numeric water quality criterion	the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and will fully protect the designated use. Such criterion may be derived using an explicit State policy or regulation interpreting its narrative water quality criterion, supplemented with other relevant information which may include EPA's Water Quality Standards Handbook, October 1983, risk assessment data, exposure data … and current EPA criteria documents.	water quality criterion for a specific pollutant – **Applicable**	
Water quality-based effluent limits for wastewater discharge	When developing water quality-based effluent limits under this paragraph the permitting authority shall ensure that: (A) The level of water quality to be achieved by limits on point source(s) established under this paragraph is derived from, and complies with all applicable water quality standards; and (B) Effluent limits developed to protect narrative or numeric water quality criteria are consistent with the assumptions and any available waste load allocation for the discharge prepared by the State and approved by EPA pursuant to 40 C.F.R. §130.7.	Point source discharge of pollutants to surface waters **– Applicable**	40 C.F.R. §122.44(d)(1)(vii)
	Attain or maintain a specified water quality through water quality related effluent limits established under section 302 of CWA.		40 C.F.R. §122.44(d)(2)
Minimum monitoring requirements for discharges from on-site CERCLA wastewater treatment unit	In addition to § 122.48, and to assure compliance with permit limitations, the following monitoring requirements shall be followed: (i) The mass (or other measurement specified in the permit) for each pollutant limited in the permit; (ii) The volume of effluent discharged from each outfall;	Point source discharge of pollutants as defined in 40 C.F.R. § 122.2 into surface water – **Applicable**	40 C.F.R. § 122.44(i)(1) *Monitoring requirements*

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	(iii) Other measurements as appropriate including pollutants in internal waste streams under § 122.45(i); pollutants in intake water for net limitations under § 122.45(f); frequency, rate of discharge, etc., for non-continuous discharges under § 122.45(e); pollutants subject to notification requirements under § 122.42(a); and pollutants in sewage sludge or other monitoring as specified in 40 C.F.R. part 503; or as determined to be necessary on a case-by-case basis pursuant to section 405(d)(4) of the CWA.		
	All effluent limitations, standards and prohibitions shall be established for each outfall or discharge point, except as provided under § 122.44(k).		40 C.F.R. § 122.45(a)
Continuous wastewater discharge	All effluent limitations, standards and prohibitions, including those necessary to achieve water quality standards, shall unless impracticable be stated as: Maximum daily and average monthly discharge limitations for all discharges.	Continuous discharge of pollutants to surface waters – A**pplicable**	40 C.F.R. § 122.45(d)(1) ADEM Admin. Code r. 335-6-6-.15(4)(a)
Non-continuous wastewater discharge	Discharges which are not continuous, as defined in rule 335-6-6-.02, shall be particularly described and limited, considering the following factors, as appropriate: • Frequency (for example, a batch discharge shall not occur more than once every three weeks); • Total mass (for example, not to exceed 100 kilograms of zinc and 200 kilograms of chromium per batch discharge); • Maximum rate of discharge of pollutants during the discharge (for example, not to exceed two kilograms	Non-continuous discharge of pollutants to surface waters – **Applicable**	ADEM Admin. Code r. 335-6-6-.15(5)(a)-(d)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	of zinc per minute or not to exceed a specified discharge rate); and • Prohibition or limitation of specified pollutants by mass, concentration, or other appropriate measure (for example, shall not contain at any time more than 0.1 milligrams per liter zinc or more than 250 grams of zinc in any discharge).		
Internal waste streams	Limitations on internal waste streams may be imposed: 1) When permit limitations or standards imposed at the point of discharge are impractical or infeasible; 2) Prior to mixing with other waste streams or cooling water streams; 3) When the wastes at the final point of discharge are so diluted that monitoring would be impracticable; 4) When interferences among pollutants at the point of discharge would make detection or analysis infeasible.	Mixing wastewater into another waste stream prior discharge into surface waters – **Applicable**	ADEM Admin. Code r. 335-6-6-.15(8)(a)
	When monitoring of internal waste streams is required, the monitoring requirements of subparagraph 335-6-6-.14(3)(i) shall be applicable.		ADEM Admin. Code r. 335-6-6-.15(8)(b)
Discharge of treated wastewater to a POTW	Shall not introduce into publicly or privately owned treatment works any pollutant(s) which, alone or in conjunction with a discharge or discharges from other sources, cause pass through or interference or in any other manner adversely impact the operation or performance of the treatment works, to include the method of sludge disposal in use by the publicly or privately owned treatment works.	Discharge pollutants into POTW or privately owned treatment facility operated by a person other than the indirect discharger – **Applicable**	ADEM Admin. Code r. 335-6-5-.03(1)
Discharge of treated wastewater to a POTW *con't*	The following pollutants may not be introduced into a POTW: • Pollutants which create a fire or explosion hazard in the POTW, including, but not limited to, waste	Discharge pollutants into POTW or privately owned treatment facility	ADEM Admin. Code r. 335-6-5-.03(2)(a)-(h)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	streams with a closed cup flashpoint of less than 140 degrees Fahrenheit (°F) or 60 degrees Centigrade (°C) using the test methods specified in 40 C.F.R. § 261.21; • Pollutants which will cause corrosive structural damage to the treatment works, but in no case discharges with pH lower than 5.0, unless the treatment works are specifically designed to accommodate such discharges; • Solid or viscous pollutants in amounts which will cause obstruction to the flow in sewers, or other interference with the operation of the treatment works; • Any pollutant, including oxygen demanding pollutants released in a discharge of such volume or strength as to cause interference in the treatment works; • Heat in amounts which will inhibit biological activity in the treatment plant resulting in interference but in no case in such quantities that the temperature of the influent, at the treatment plant, exceeds 40 °C (104 °F) unless the treatment plant is designed to accommodate such heat; • Pollutants which result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; • Any trucked or hauled pollutants, except at discharge points designated by the treatment works; and • Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through.	operated by a person other than the indirect discharger – **Applicable**	

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
Decontamination of PCB-contaminated water	For discharge to a treatment works as defined in 40 C.F.R. § 503.9 (aa), or discharge to navigable waters, meet standard of < 3 parts per billion PCBs.	Water containing PCBs regulated for disposal – A**pplicable**	40 C.F.R. § 761.79(b)(1)(ii)
	For unrestricted use, meet standard of 0.5 parts per billion PCBs.		40 C.F.R. § 761.79(b)(1)(iii)
Cleanup and Containment of Bulk PCB Remediation Waste			
Bulk PCB remediation waste left-in-place *(self-implementing option)*	The cleanup level for bulk PCB remediation waste in high occupancy areas is ≤1 ppm without further conditions.	Bulk PCB remediation waste[3] remaining in a *high occupancy area* (as defined in 40 C.F.R. § 761.3) at concentrations ≤1 ppm – **Relevant and Appropriate**	40 C.F.R. § 761.61(a)(4)(i)(A)
	High occupancy areas where bulk PCB remediation waste remains at concentrations >1 ppm and ≤10 ppm shall be covered with a cap meeting the requirements of 40 C.F.R. § 761.61(a)(7) and 40 C.F.R. § 761.61(a)(8) [*See below*].	Bulk PCB remediation waste remaining in a *high occupancy area* (as defined in 40 C.F.R. § 761.3) at concentrations > 1 ppm and ≤10 ppm – **Relevant and Appropriate**	40 C.F.R. § 761.61(a)(4)(i)(A)
	The cleanup level for bulk PCB remediation waste in *low occupancy areas* is ≤25 ppm unless otherwise specified in this paragraph.	Bulk PCB remediation waste remaining in a *low occupancy area* (as defined in 40 C.F.R. § 761.3) at concentrations ≤ 25 – **Relevant and Appropriate**	40 C.F.R. § 761.61(a)(4)(i)(B)(*1*)
	Bulk PCB remediation wastes may remain at a cleanup site at concentrations >25 ppm and ≤50 ppm if the site is secured by a fence and marked with a sign including the ML mark.	Bulk PCB remediation waste remaining in a *low occupancy area* (as defined in 40 C.F.R. §.761.3) at	40 C.F.R. § 761.61(a)(4)(i)(B)(*2*)

[3] Bulk PCB remediation waste includes, but is not limited to, the following non-liquid PCB remediation waste: soil, sediments, dredged materials, muds, PCB sewage sludge, and industrial sludge. [40 C.F.R. § 761.61(a)(4)(i)]

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
		concentrations > 25 ppm and ≤ 50 ppm – **Relevant and Appropriate**	
Bulk PCB remediation waste left in place *con't* *(self-implementing option)*	Bulk PCB remediation wastes may remain at a cleanup site at concentrations >25 ppm and ≤100 ppm if the site is covered with a cap meeting the requirements of 40 C.F.R. §761.61(a)(7) and (8). [*See below*]	Bulk PCB remediation waste remaining in a *low occupancy area* (as defined in 40 C.F.R. §.761.3) at concentrations > 50 ppm and ≤ 100 ppm – **Relevant and Appropriate**	40 C.F.R. § 761.61(a)(4)(i)(B)(*3*)
Cap requirements for Bulk PCB remediation waste left-in-place *(self-implementing option)*	Any person designing and constructing a cap must do so in accordance with 40 C.F.R. § 264.310(a) [*See below*], and ensure that it complies with the permeability, sieve, liquid limit, and plasticity index parameters in § 761.75(b)(1)(ii) through (b)(1)(v).	Designing and constructing a cap[4] for on-site disposal of PCB remediation waste **– Relevant and Appropriate**	40 C.F.R. § 761.61(a)(7) *Cap requirements*
	A cap of compacted soil shall have a minimum thickness of 25 cm (10 inches). A concrete or asphalt cap shall have a minimum thickness of 15 cm (6 inches).		
	A cap must be of sufficient strength to maintain its effectiveness and integrity during the use of the cap surface which is exposed to the environment. A cap shall not be contaminated at a level ≥1 ppm PCB per Aroclor*TM* (or equivalent) or per congener. Repairs shall begin within 72 hours of discovery for any breaches which would impair the integrity of the cap.		
Cap requirements for Bulk PCB remediation	Must cover the landfill or cell with a final cover designed and constructed to:	Closure of a RCRA hazardous waste landfill – **Relevant and Appropriate**	40 C.F.R. § 264.310(a)(1)-(5)

[4] A cap means, when referring to on-site cleanup and disposal of PCB remediation waste, a uniform placement of concrete, asphalt, or similar material of minimum thickness spread over the area where remediation waste was removed or left in place in order to prevent or minimize human exposure, infiltration of water, and erosion. [40 C.F.R. § 761.61(a)(7)]

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
waste left-in-place under 40 C.F.R. § 761.61(a)(7)	• provide long-term minimization of migration of liquids through the closed landfill; • function with minimum maintenance; • promote drainage and minimize erosion or abrasion of the cover; • accommodate settling and subsidence so that the cover's integrity is maintained; • and have a permeability less than or equal to the permeability of any bottom-liner system or natural subsoils present.		*Closure and post-closure care*
Maintenance of cap and/or fence for bulk PCB remediation waste left-in-place *(self-implementing option)*	When a cleanup activity conducted under this section includes the use of a fence or a cap, the owner of the site must maintain the fence or cap, in perpetuity.	Use of a cap or fence at PCB remediation waste cleanup site **– Relevant and Appropriate**	40 C.F.R. § 761.61(a)(8) *Deed restrictions for caps, fences and low occupancy areas.*
Deed Notice for cap or fences used in low occupancy areas *(self-implementing option)*	Shall record, in accordance with State law, a notation on the deed to the property, or on some other instrument which is normally examined during a title search, that will in perpetuity notify any potential purchaser of the property: • that land has been used for PCB remediation waste disposal and is restricted to use as a low occupancy area as defined in 40 C.F.R. § 761.3. • of existence of the fence or cap and the requirements to maintain the fence or cap. • the applicable cleanup levels left at the site, inside the fence, and/or under the cap. *NOTE*: Planned and existing recorded environmental restrictive covenants may be considered to satisfy this	Use of a cap or fence for cleanup of PCB remediation waste at a *low occupancy area* **– Relevant and Appropriate**	40 C.F.R. § 761.61(a)(8)(i)(A)(1)-(3)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	notice requirement for capped areas addressed under TSCA, RCRA and/or CERCLA.		
Modification of fence or cap *(self-implementing option)*	May remove a fence or cap after conducting additional cleanup activities and achieving levels specified in 40 CFR 761.61(a)(4) which do not require a cap or fence and remove the notice on the deed no earlier than 30 days after achieving these levels.	Use of a cap or fence at PCB remediation waste cleanup site **– Relevant and Appropriate**	40 C.F.R. § 761.61(a)(8)(i)(B)
Transportation of Wastes			
Transportation of hazardous materials	Shall be subject to and must comply with all applicable provisions of the HMTA and HMR at 49 C.F.R. §§ 171–180 related to marking, labeling, placarding, packaging, emergency response, etc.	Any person who, under contract with a department or agency of the federal government, transports "in commerce," or causes to be transported or shipped, a hazardous material – **Applicable**	49 C.F.R. § 171.1(c)
Pre-Transportation of hazardous waste *off–site*	Must comply with the generator standards of Part 262 including 40 C.F.R. §§ 262.20–23 for manifesting, Sect. 262.30 for packaging, Sect. 262.31 for labeling, Sect. 262.32 for marking, Sect. 262.33 for placarding,	Preparation and initiation of shipment of hazardous waste off–site – **Applicable**	40 C.F.R. § 262.10(h);
	A generator who transports, or offers for transportation, hazardous waste for off-site treatment, storage, or disposal, or a treatment, storage, and disposal facility who offers for transportation a rejected hazardous waste load, must prepare a Manifest (OMB control number 2050-0039) on EPA Form 8700-22, and, if necessary, EPA Form 8700-22A, according to the instructions in 335-14-3-Appendix I.		ADEM Admin. Code r. 335-14-3-.02(1)(a)
Packaging	Before transporting hazardous waste or offering hazardous waste for transportation off-site, a generator must package the waste in accordance with the applicable United States Department of Transportation regulations on packaging under	Preparation and initiation of shipment of hazardous waste off–site – **Applicable**	ADEM Admin. Code r. 335-14-3-.03(1)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	49 C.F.R. Parts 173, 178, and 179. Failure to properly package the waste in accordance with the applicable United States Department of Transportation regulations is a violation of 335-14-3-.03(1).		
Labeling	Before transporting hazardous waste or offering hazardous waste for transportation off-site, a generator must label each package in accordance with the applicable United States Department of Transportation regulations on hazardous materials under 49 C.F.R. Part 172. Failure to properly label the waste in accordance with the applicable United States Department of Transportation regulations is a violation of 335-14-3-.03(2).	Preparation and initiation of shipment of hazardous waste off–site – **Applicable**	ADEM Admin. Code r. 335-14-3-.03(2)
Marking	Before transporting hazardous waste or offering hazardous waste for transportation off-site, a generator must mark each package of hazardous waste in accordance with the applicable United States Department of Transportation regulations on hazardous materials under 49 C.F.R. Part 172;		ADEM Admin. Code r. 335-14-3-.03(3)
Transportation of hazardous waste *on–site*	The generator manifesting requirements of 40 C.F.R. §§ 262.20–262.32(b) do not apply. Generator or transporter must comply with the requirements set forth in 40 C.F.R. § 263.30 and § 263.31 in the event of a discharge of hazardous waste on a private or public right–of–way.	Transportation of hazardous wastes on a public or private right–of–way within or along the border of contiguous property under the control of the same person, even if such contiguous property is divided by a public or private right–of–way – **Applicable**	40 C.F.R. § 262.20(f)
Transportation of samples (*i.e.* soil, sediments and wastewaters)	Are not subject to any requirements of 40 C.F.R. Parts 261 through 268 or 270 when: • the sample is being transported to a laboratory for the purpose of testing; or	Samples of solid waste <u>or</u> a sample of water, soil for purpose of conducting testing to determine its characteristics or composition – **Applicable**	40 C.F.R. § 261.4(d)(1)(i)–(iii)

Table D-3. – Action-specific ARARs and To Be Considered (TBC) Guidance for Anniston PCB Site OU-4 ROD			
Action	**Requirements**	**Prerequisite**	**Citation**
	• the sample is being transported back to the sample collector after testing. • the sample is being stored by sample collector before transport to a lab for testing		
	In order to qualify for the exemption in paragraphs (d)(1)(i) and (ii), a sample collector shipping samples to a laboratory must: • Comply with U.S. DOT, U.S. Postal Service, or any other applicable shipping requirements. • Assure that the information provided in (1) thru (5) of this section accompanies the sample. • Package the sample so that it does not leak, spill, or vaporize from its packaging.	Samples of solid waste <u>or</u> a sample of water, soil for purpose of conducting testing to determine its characteristics or composition – **Applicable**	40 C.F.R. § 261.4(d)(2)(i)(A) and (B)

ADEM = Alabama Department of Environmental Management
ADPH = Alabama Department of Public Health
ARAR = Applicable or Relevant and Appropriate Requirement [Ref. 40 C.F.R. § 300.5 Definitions of 'Applicable requirements' and 'Relevant and appropriate requirements']
AWPCA = Alabama Water Pollution Control Act
C.F.R. = *Code of Federal Regulations*
CWA = Clean Water Act
DOI = U.S. Department of the Interior
DOT = U.S. Department of Transportation
EPA = Environmental Protection Agency
FS = Feasibility Study
HMR: Hazardous Materials Regulations
HMTA: Hazardous Materials Transportation Act
NPDES = National Pollution Discharge Elimination System
PCB = polychlorinated biphenyl
POTW = Publicly Owned Treatment Works
PP = Proposed Plan
PPE = personal protection equipment

ppm = parts per million
> = greater than
< = less than
≥ = greater than or equal to
≤ = less than or equal to
RAWP = Remedial Action Work Plan
RCRA: Resource Conservation and Recovery Act of 1976
RD = Remedial Design
TBC = To Be Considered
TSCA = Toxic Substances Control Act of 1976 US: United States
U.S.C. = U.S. Code
UTS: Universal Treatment Standard
WWTU = waste water treatment unit

APPENDIX E

ADEM ROD REVIEW COMMENTS

LANCE R. LEFLEUR
DIRECTOR

ADEM

Alabama Department of Environmental Management
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KAY IVEY
GOVERNOR

October 23, 2024

TRANSMITTED ELECTRONICALLY

Pamela Langston Scully, P.E.
Remedial Project Manager
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW
Atlanta, Georgia 30303

Re: Record of Decision – Review Comments
Anniston PCB Site
Anniston, Calhoun County, Alabama
USEPA I.D. Number 093 179 315

Dear Ms. Scully:

The Department has completed the review of the U.S Environmental Protection Agency's (EPA) request for concurrence on the draft *Record of Decision (ROD)*, dated September 2024, for the Anniston PCB Superfund Site, Operable Unit 4 (OU-4). Based on review, the Department requests that environmental covenants be required for properties that are not returned to unrestricted use in accordance with State Applicable or Relevant and Appropriate Requirements (ARARs).

If questions should arise concerning this matter, please contact Ricky Minor of the Engineering Services Section at (334) 274-4198.

Sincerely,

Sonja B. Favors, Chief
Industrial Hazardous Waste Branch
Land Division

SBF/RM

cc/via email: ADEM: Austin Pierce, Marwa Sabeeh

APPENDIX F

PUBLIC MEETING TRANSCRIPTS

BEFORE THE UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

ANNISTON PCB SITE
OPERABLE UNIT 4
PROPOSED CLEANUP PLAN

Anniston, Alabama

PUBLIC MEETING

WHEREUPON, the following proceedings were transcribed by Suzanne Lee, Certified Court Reporter No. 476 and Notary Public for the State of Alabama at Large, at the Oxford Civic Center, 401 McCullars Lane, Oxford, Alabama, on June 18, 2024, commencing at approximately 6:06 p.m.

* * * * * * * * * * * * *

APPEARANCES

FOR THE EPA:

Angela Miller . . Community Involvement Coordinator

Pam Scully. . . . . Project Manager

SUPPORT PERSONNEL:

Gayle Macolly . . . . Project Manager
PRP Group

Alan Fowler . . . . Consultant for
PRP Group

TABLE OF CONTENTS

MS. MILLER: Good evening. I know y'all can hear me because somebody said they heard me outside.

(LAUGHTER)

MS. MILLER: For those that don't know me, my name is Angela Miller. I'm Community Involvement Coordinator with the EPA. I actually started this site back in 2000, so I've been here a while. And then I left, got married, divorced, and now I'm back, so.

(LAUGHTER)

MS. MILLER: Anyway, thank you so much for taking time to come out tonight. We're here to talk about the Anniston PCB, Operable Unit 4, and the proposed plan that we have. We have a comment period that opened June the 1st, and it closes July the 30th, so that means all comments submitted by then. If you do snail mail, it just needs to be postmarked by July the 30th.

All the contact information and how to submit comments are in the fact sheet sitting on the back. We have a website that has the fact sheet, the summarized version. If you're technical and want to read the 100-page version that Pam produced, we have that on the link as well.

We also have a prerecorded presentation where Pam narrates that. That's also on the website, because it never fails, you get home and you forget something or you want to hear something else. You can go back to the website and hear all about it all over again.

We have a court reporter that's going to transcribe the meeting and the question and answer period. So, if you want to state your name, you may do that. If you don't, then don't, because all we want is your question and comments that we're going to be collecting. You'll see recorders on each table. Don't talk about us because it's going to be on the tape.

AUDIENCE MEMBER: We already did.

MS. MILLER: Did you say we were nice or something?

AUDIENCE MEMBER: Well, no, I was just telling you how to get in touch with me.

MS. MILLER: Thank you.

Anyway, we're doing that because we don't have mics and everyone is not as loud as Pam and I, and the court reporter would like to make sure that she gets your comments and questions.

The restroom, for those that don't know, is out, take a left, you go to the very end, and you'll see it over by the water fountain at the end.

Feel free to grab some water, get you a fact sheet, sit back, relax, and let's talk about Anniston OU-4.

And I'll turn it over to Pam.

MS. SCULLY: All right. I think a lot of you probably have heard me before. I'm Pam Scully. I'm the remedial project manager for EPA at this site. And I haven't been on it as long as Angela was. I started in 2002, so. Some people here have been on this project a lot longer than me.

So the Anniston PCB site is made up of four operable units. Operable Unit 3 -- and I don't have a pointer -- is up here (indicating), and it is the facility of the two adjacent landfills. Choccolocco -- Snow Creek runs through Anniston down through Oxford, and that is Operable Unit 1 and 2. And then Operable Unit 4 is Choccolocco Creek from the backwater area and a small portion of Snow Creek. It runs all the way down to the embayment of Lake Logan Martin.

So Operable Unit 4 is what we're going to talk about. We've -- we also have a watershed of 320,000 acres that drains into Choccolocco Creek. And that's shown by the gold outline.

Okay. So, the boring part. I'll try to go fast. Superfund process. If you don't know the Superfund process, sites are typically discovered by the State. We have two representatives of ADEM here tonight over at this table, Austin and Ricky. And typically the State will find a site that they think will qualify as a Superfund site, and they'll refer it to EPA.

In most instances, the State does the initial assessment of the site, the preliminary assessment and the site investigation. Once that is done, we go through a scoring system called the "Hazard Ranking System" for Superfund sites. And if a site has enough risk associated with it and ranks high enough, then it can become a Superfund site, and it goes on the National Priority List, the NPL.

Once it's on the NPL, we would do a remedial investigation where we would go out and do the nature and extent of contamination. We would use that data to assess the risk that's posed to both human health and to ecological receptors. Once we have all that information, then we look at a feasibility study of how can we fix the risks that are present at the site.

Now, this site is not on the NPL. The responsible party has agreed to perform this work without being listed on the NPL. We call that the "Superfund Alternative Approach." It's done -- executed the same way as you would a Superfund site, it's just not on the NPL. What you get from being on the NPL is that the government can spend its own money. So, since the responsible party has signed up to do all this investigation, it's their money that we're spending.

So, once you have all the data and have a feasibility study, we come out with a proposed plan, which is what this meeting is about. And we use that proposed plan to come to you and request your comments.

Once we get your comments, we will finalize that proposed plan in a Record of Decision. We've already done that twice at this site. We did that for Operable Unit 3 in 2011, and we did that for Operable Unit 1 and 2 along Snow Creek in 2017.

So, once we have a Record of Decision, we then have to negotiate with the responsible parties to implement that Record of Decision and another consent decree. And when that consent decree is in place, we will do a remedial design, do all the engineering of how do we actually implement the cleanup we said we wanted to do.

You've got to go back.

MS. MILLER: It's changing by itself.

MS. SCULLY: Is it?

MS. MILLER: Yes.

MS. SCULLY: It's got a line?

Okay. So we do the remedial design, and then we do what we call the "remedial action," where we go and implement the work. And because a lot of times we can't get every speck of contamination out, especially in a large -- a large operable unit like OU-4, we do do follow-up reviews where we come back every five years to make sure that the remedy we put in place is still in place. And we have done a five-year review already at the Anniston PCB site. We'll do another one -- I think we start in September.

Okay. So the site -- the primary source of this site, I think most of you know, is a former PCB manufacturing facility in Anniston. And production began there in 1929 under Swann Chemical. Monsanto Company purchased the production rights and the facility in 1935, and they manufactured PCBs here until 1971.

The facility is no long- -- the PCB portion of the facility has been dismantled and disposed of in a landfill after that 1971 date. The facility itself, though, is still operating, and it's -- Solutia Inc. is a wholly owned subsidiary of Eastman Chemical.

Okay. So this diagram is just supposed to show you that the way that OU-4 was primarily contaminated was through the surface water pathway. So, surface water started at the facility, it ran to what we call the "11th Street ditch" right next to the facility, and that ditch dumped into Snow Creek at 11th Street. And then it came down from 11th Street all the way to Choccolocco Creek.

This area on Choccolocco Creek tends to -- water -- well, water backs up, so we call this the "backwater area," and that's shown in that highlight. And then it goes down Choccolocco Creek, down to the embayment at Lake Logan Martin. So it's a surface water issue.

Okay. There were a bunch of actions that were taken at this site before EPA got involved. And so we looked at all of those actions. There were two final corrective measures that were conducted under the Alabama Department of Environmental Management, ADEM, and -- under their oversight, and those were this Highway 21 bridge closure and this Choccolocco Creek Wastewater Treatment Plant soil cover that was placed close to I-20.

Then there were some interim corrective measures that were taken when it was discovered that the Oxford Lake Park -- right here -- had some potential exposures. So, there was -- the tennis court complex was constructed, the ball fields, the softball fields. As you come in on Recreation Drive, those softball fields were excavated and a clean soil cap was placed over that area. The soil from those softball fields was put under a pavement area that became a parking lot, and then that Miracle Field area is also over an area of contamination.

The -- then as we've been -- it's taken a long time to get here. Right? So it's taken us a lot of years to get here, and, as we've been doing the investigation, we wanted developers and the City and utilities to keep providing services to their customers. So we have a number of infrastructure improvement projects that we've worked with. The gas company, the electric company, any kind of improvement that took place in the OU-4 area, we've assisted in those projects. And our assistance is primarily in handling soil that they might excavate that's contaminated.

Okay. We've also done some residential cleanup. Now, most of the residential cleanup that was done under the Anniston PCB site was done up in

OU-1 and OU-2 around the facility and along Snow Creek. It's a lot less populated next to the creek in the flood areas on Choccolocco Creek.

So we have found 59 properties that we thought were -- could be contaminated. We went and sampled those properties. Twenty of those properties were identified for cleanup, and we've completed cleanup on 19 of those properties. One property is just slightly above one, but -- and the owner has not given us access to clean that up.

Okay. So, those are some of the preliminary things. Now, let's get into the meat of OU-4.

In OU-4, we went out and sampled soil, we sampled groundwater, we sampled sediment, we sampled surface water, we sampled fish, and we sampled a bunch of other organisms that we could -- in the lower end of the food chain that we could sample.

What do we do with this information? Well, basically what we do is conduct risk assessments. We have a human health risk assessment, and we have an ecological risk assessment. The human health risk assessment, we assess both cancer risk and noncancer risk.

The cancer risk is a probability. We -- you have, currently in the United States, a one-in-three chance of getting cancer in your lifetime. So what the Superfund program does is, we have a range that if -- we don't want there to be one in -- an increase greater than one in a hundred -- one in 10,000 cancers. I'm trying to come up with this probability. So one times ten to the minus four is one in 10,000. So we don't want there to be more cancer risk than that.

So our one times ten to the minus four, if we have excess cancer greater than that, then we require a cleanup of some sort to lower that cancer risk. We -- so we operate within this range of one in a million and one in 10,000 for cancer -- excess cancer risk.

If -- we also look at noncancer effects -- reproduction, other diseases, heart disease, other diseases that people might get -- and we assess whether or not there's a risk from those. What we use to determine that is a hazard index, and if the hazard index is greater than one, then we have to take an action to lower that risk for human health.

Okay. I think I explained it better on the video, but -- but I don't have my notes, so.

Okay. So what did we find out? What we found out was PCBs are the primary contaminant driving risk at this site. That's not a surprise. The highest risks for human health were associated with consumption of fish. We had a cancer risk of one times ten to the minus three, and we had a hazard index of 71.

Now, we did look at soil and exposures that might occur in the floodplain. Granted, we cleaned up the residential risks, so the exposures we looked at were workers, farmers, recreators, people that might stand and fish on the bank or play in one of these fields for recreation.

And for the ecological risk, it becomes a lot more complicated. For human health risk, we have a lot of -- we have a lot of information. We have specific numbers that we can use for each contaminant.

When you get to ecological risk, there's a whole lot more receptors. There's not just one species; there's lots of species. Some were exposed on land or terrestrial floodplain soil, and some were exposed to the water and riparian area.

So what we found in the ecological risk assessment, again, is that the communities at risk are both in the water and on the land. The PCBs are the primary driver. The receptors that eat fish are the most at risk. You know, we have some risk to terrestrial birds and mammals, but, by and far, anything that eats the fish that's contaminated is more at risk.

So, we took all that information, and we said we need to look at four different sets of alternatives. We need to consider residential soil, because we still have one property that we haven't cleaned up. And we have the interim measures in Oxford Lake Park, are we satisfied with what's been done in Oxford Lake Park.

We need to look at nonresidential soil that exists in the floodplain, and we need to look at the creek banks and the sediment.

I need a drink of water before I start this one.

So, how do we make our decision? The Superfund program is required by law to consider nine evaluation criteria. So all of our alternatives, we have to -- we have to look at does it meet the threshold criteria, which means is it going to be protective within our risk -- you know, risk range, and is it going to comply with all the requirements, legal requirements, that are -- that are required for environmental cleanups. Those are threshold criteria. If a cleanup -- if an alternative can't meet those threshold criteria, we don't consider it any farther.

The balancing criteria is that we then look at long-term effectiveness and permanence. Will it -- will it last through the years? Will we be able to reduce the toxicity, mobility, and volume of the contaminant through treatment? Is it short-term? The short-term effect in this. How many trucks are going to run through your neighborhood while we're doing this cleanup? That's kind of a short-term effect. Is it easy to implement or not? Is it cost effective? Do we have a cost effective alternative?

The modifying criteria are considered after the proposed plan, and that's because we need to know the State -- if the State has any comments and agrees with the remedy, and we need to know whether the community has comments and agrees with the remedy. So that's when we consider those two criteria in the Record of Decision.

So, for residential cleanup, this map is just showing you an area where we did some sampling for residential. It shows you where we sampled for PCBs, and they were less than one milligram per kilogram, which was the cleanup goal we used for residential. It shows you where we didn't have a sample. It shows you any areas where we had a sample that was high that we haven't cleaned up.

We have figures all along the creek in the feasibility study, which is available online on our website. If you wanted to look at what was found in the area where you live on Choccolocco Creek or where someone you know might live, you can get those in the feasibility study. They're all available.

But what we have as far as residential goes is, we know that there's one property that we haven't cleaned up in the surface. We know that there are five yards where PCBs in the subsurface are less than one and greater than ten. That was our original cleanup standard when we did the residential cleanup, that we needed less than one in the surface soil, the top 12 inches, and less than ten in the subsurface soils.

We also have 14 structures that were located next to an area where we did excavation, and we would want to check under those structures if they're ever removed to make sure we don't have PCBs above one because we want this remedy to remain protective.

So, based on our -- all of that information, we came up with a Remedial Action Objective, which is basically to protect the residents where we have PCBs located. It's a lot of words. A lot of people spent a lot of time developing all those words, but basically we're trying to protect residents from exposure.

And our goals are the same as we had for previous residential removal actions, is that in the top zero to 12 inches, we should have PCBs less than one and subsurface PCBs less than ten.

Okay. But we looked at three different alternatives. The first alternative that we always consider when we're comparing alternatives is no action. If we did no action, what would happen? Well, the people that had their cleanup would be protected. If a structure was removed, there might be some PCBs in the surface. If a structure was placed in that same area and created a new cover, then there might not be an exposure. So there would -- there's a potential that it wouldn't be protective, but there is some protection provided even for the no-action remedy.

RS-2 is where we would go in and clean up the property that we've cleaned up, and we continue to monitor properties where we know we still have PCBs in the subsurface and potentially under structures.

RS-3 would be where we would go in and remove any PCBs greater than one that we could get access to and then just monitor the structures. The difference, you can see that this table shows you how we compare the threshold criteria and the --

MS. MILLER: It's on a timer.

MS. SCULLY: -- and the balancing criteria. The range of cost for these alternatives is, you know, from zero dollars to 1.4 million dollars to do these alternatives.

RS-2 is what we have recommended. RS-2 is what we've selected in OU-1 and OU-2 for our residential properties, and we have been monitoring those every year. If you have a residential property where we did cleanup, you probably get a letter from us every year that says -- or from Solutia every year, that says you still have PCBs that might be in these areas and let us know if you're going to dig in this area.

Okay. So, again, this is -- RS-2 is what we've proposed. We have executed this already in OU-1 and OU-2, even though we still have to approve the soil management plan, but we've been actively doing it in an interim capacity for years, and we think it'll be effective.

Okay. So the next area we wanted to look was at the interim measures here in Oxford Lake Park. As -- you couldn't really tell on the previous diagram, but these are the four areas where we had interim measures placed in the park. What you're seeing on this page is the data for what's underneath the protective cover. So this is what's under the cover. We wanted to know what did we leave in place out there when we did some covers out here.

Now, the covers that are in the southwest part where the Miracle Field now is, the parking lot, the tennis courts, those are substantial structures that are over that contamination. We would consider those protective.

We wanted to look at the softball park a little bit closer to see whether we thought it would be protective. So what we did was, we pulled the data that was underneath those areas, and we tried to calculate what would the exposure point concentration, which we look at as a 95 percent upper confidence limit. That means it's just weighted more conservatively than just an average. It's an average, but it's an average that's on the more conservative end.

So what we found was we had concentrations in these fields, in the surface, in the subsurface, and what we did was look at those compared to a recreational exposure. And we found that these are all protective at the concentrations that are out there, even though we know there are PCBs greater than one on those fields.

Okay. So, you know, our Remedial Action Objective with the interim measures is to ensure that the long-term effectiveness of these previously implemented actions remain protective. We did not set a goal because we knew we already had reached a protective level for recreational exposure.

We only have two alternatives. We either do nothing, or we can continue to maintain these fields. We -- and if you look at the feasibility study, we have three additional alternatives. Because we -- we looked at what if we tried to make the whole first 12 inches have zero PCBs. We looked at different options. And when we got to headquarters, they said, no, it doesn't have a risk, so you can't do it under CERCLA.

So, but, you know, we looked at do we want to provide fields that have no PCBs on them for people to play on. We weren't able to do that under CERCLA. Our only option, because it is protective of risk, is to do operation and maintenance. Basically monitor the fields, make sure people don't dig it up, unless we bring in clean soil.

So obviously we are proposing IM-2, which is long-term monitoring and maintenance and soil management. The park is deed restricted -- deed restricted, and the PRPs coordinate with the Oxford Lake Park workers to make sure that, if there's a project that needs to be implemented, that we're informed, and we can come out and manage any soil that might be contaminated.

So the next area is the nonresidential soil alternatives. And this figure really just shows you what the land use is along Choccolocco Creek. And you can see from this figure that yellow is agricultural use and green is forested. And those are the primary uses along the floodplain in Choccolocco Creek. There are other uses obviously. We've sampled some residential, but that's a minor part of the floodplain of Choccolocco Creek.

So what we -- this is the soil results

from -- this is the Snow Creek area, and, if you go down the floodplain, all the way to where Lake Logan Martin is, this is what the floodplain concentrations look like.

For the most part, when you get down into --

MS. MILLER: It's on a timer.

MS. SCULLY: Okay.

MS. MILLER: It's not me, I promise.

MS. SCULLY: Okay. When you get down into the Lake Logan Martin embayment area, the concentrations are generally less than one. For a large part of the area, they're less than ten, and then they go really high up in the backwater area along and close to Snow Creek. They're in the hundreds.

So, for the soil, we -- the point is, we want to reduce exposure to terrestrial ecological receptors. Remember when we looked at the risk assessment for human health, we didn't have a risk to human health from the soil. We do have a risk to ecological receptors from the soil. So the ecological receptor risk assessment was conducted for the top six inches of soil. So that's the relevant zone that we're looking at for the ecological receptors. So what we've looked at is a PCB goal of less than six milligrams per kilogram to protect ecological receptors in the floodplain soil.

Okay. So this figure is intended to show you all of Choccolocco Creek. The top part of the figure is from right to left. On the right is the area where we are, up at the -- at the top end of -- the east end of Choccolocco Creek where contamination is. And then it goes down and continues on the bottom, until it gets to the embayment area in Lake Logan Martin.

So what this is showing you is that most of the contamination that we would be concerned about, where we would have greater than six milligrams per kilogram, is in the top ten miles of the creek. It's not in the lower area, but it is in the upper area.

And you'll notice that we don't show any floodplain down here because, once you start getting an embayment area, you lose your floodplain. So we don't really have a floodplain contamination in this area; it's just what we would find in the creek.

Okay. So, again, we have five alternatives in the feasibility study. One of the goals was to try to -- let's try to get some of the higher concentrations of PCBs that might be in the subsurface out, with some of our alternatives. They all included excavating six inches of soil to protect ecological receptors, but we had some higher concentrations in the subsurface.

So we looked at some alternatives to excavate some of the high contamination, and headquarters said, no, you can't do that. You can only clean up what's at risk. So we have two alternatives again, and RS-2 is what we're proposing.

And alternative 2 is -- would be that we would excavate zero to six inches below ground. It's to protect the ecological receptors. There's also a conservation corridor and deed restrictions that might be used to prevent people from excavating without us knowing about it.

There's -- of the 6,000 acres in Choccolocco Creek floodplain, 1,500 of those acres are under a conservation easement, or a conservation corridor, with the land trust, so we have some control. You know, some of you may have been impacted by that. I don't know where your properties are, but we do have a conservation corridor. We're trying to at least be able to know when someone wants to develop in those areas, so that we can remove contamination if the land use changes. So -- go ahead. So that's nonresidential soil.

Then we have to look at the creek banks and the sediment alternatives. This diagram just shows you how we divided up the creek into ten reaches for the ecological risk assessment. For the human health risk assessment, we grouped some of those reaches together, and, for the ecological risk assessment, we used -- had ten separate reaches that we evaluated risk in.

This is just intended to show you how that division was done.

Go ahead.

So we have a lot of Remedial Action Objectives that were developed for the creek. They are -- they are established to protect, you know -- reduce the concentrations in fish for humans and for ecological receptors. To do that, we have to clean up sediment, and, when we clean up sediment, we hope the concentrations in surface water are reduced. So all of these objectives are really just intended to restore fish to a concentra- -- the concentrations in fish, so that both ecological receptors and human receptors can eat those fish without incurring any additional risk.

And we have a number of cleanup goals that go along with that. We have goals for the creek bank, we have goals for sediment, and we have goals for surface water and for fish. Both fish tissue, which is what humans would eat, and then whole body fish, which is what ecological receptors would eat, all of these are based on the ecological and human health risk assessments.

I'll let you go ahead, Angela.

So what areas are impacted? The -- this is where we are. We are right up here, next to this ball field. So this is the Oxford Lake Park. All of Snow Creek and a lot of this backwater area are impacted. This is also in the backwater area. The area that's shaded pink is where we have high water flow -- high-velocity water flowing. And we -- those are the high-energy areas. The areas that are in green, in the backwater area, are lower-energy areas. The reason we distinguish those two is because we can look at different alternatives to correct the PCB concentrations in those areas.

So this -- the cleanup goal that a lot of this is based on, the not-to-exceed goal that we had in the previous table, is 2.6 milligrams per kilogram PCBs in sediment. And this whole area would be impacted, as well as 13 areas downstream.

Okay, Angela.

And this figure just shows you where those 13 areas where we would exceed that goal are as you go downstream. It's not a continuous area; it's just areas where we have deposits of PCBs that would be at higher concentrations. This is difficult to see, I know, but we wanted to show you that we're looking at the whole creek as far as that not-to-exceed number.

We also had to look at the creek banks, so an evaluation was done to look at the creek banks and see whether they were eroding. Are they eroding severely, moderately, or is there minor erosion? Those -- the stream banks were classified. It was done years ago, so when we go to remedial design, we will have to go back out and look at the erosion that's happening in the creek.

We're not worried about erosion if we don't have PCBs. But, if we have PCBs in that creek bank, we are worried about erosion, because we -- once we clean up the creek, we don't want it to be recontaminated. So we have to address any eroding creek banks where we have contamination.

We did look at moderate and severe erosion. That was 17,000 linear feet. And we looked at minor, moderate, and severe erosion. That was 39,800 linear feet of creek bank.

Go ahead.

In Snow Creek, we're looking at a more severe type of erosion, and the fix in Snow Creek, which is from Highway 78 down past the water treatment plant, is going to look more like a mechanical engineering remedy of riprap and geotextile, whatever it takes to stabilize those creeks.

When you get into Choccolocco Creek, we will try to use more natural stabilization methods, using trees and root wads and things that are more natural in nature, so that we don't disrupt a lot of the ecosystem. But in the areas where we have severe erosion, we expect to have to cut the banks back in some areas and replace some soil in order to protect the creek.

We will, during design, also consider climate change. If we think there's going to be an increase in rainfall in the future that could impact these remedies, we'll try to look at that. There's a lot of predictive models out there that we can consider that information.

Go back.

Okay. So we do have a lot of alternatives that we looked at for the creeks and the creek banks. And this table is not intended to give you all the information; it's just sort of to compare the alternatives. You can see in -- we have a no-action alternative, SED-1. SED-2 is we are looking at just the severe and moderate erosion of the creek banks, stabilizing those. We're looking at dredging the high-energy areas in Choccolocco Creek and using an in-place treatment in the low-energy areas.

Can you go back to -- a few slides? Back, back, back. Okay, right there.

So, again, this is the high-energy area where we'd want to do dredging, and this is the low-energy area where we can look at other things.

So now you can go back to that table.

AUDIENCE MEMBER: Can we ask questions already?

MS. SCULLY: Sure.

AUDIENCE MEMBER: So no dredging past that high-energy area?

MS. SCULLY: In those 13 areas -- go back.

AUDIENCE MEMBER: Okay.

MS. SCULLY: There, there. In these areas, we had -- we had data that showed that it exceeded our not-to-exceed number. I want to point out that our data has some age on it, so we will -- when we go to design, we'll have to go back out and sample to make sure we really -- these really are those areas. Right? So we'll do a lot of data analysis, but right now, based on the data we have, we think we would have to also go to these locations to remove -- to remove the sediment.

AUDIENCE MEMBER: So the answer is "yes," dredging.

MS. SCULLY: Dre- -- well, there's dredging in every alternative. But there's other things.

Can you go to the table now?

MS. MILLER: Sure.

MS. SCULLY: So the difference between these as far as creek bank stabilization, you can see sometimes we're doing minor creek bank stabilization as well as severe and moderate. They all include severe and moderate.

As far as dredging goes, we're always going to be dredging the high-energy areas because we can't cap in those areas. It would wash away the cap.

In the low-energy areas, sometimes we're dredging, sometimes we're installing a cap, and sometimes we're putting in-place treatment, which is a carbon treatment that we would put in place.

AUDIENCE MEMBER: So what -- so what does dredging look like? What does it -- I mean, you've got a -- something run out there with a big platform, put a big scoop on it, and scoop stuff out? Is that what dredging looks like?

MS. SCULLY: Well, Choccolocco Creek is -- in some areas you might be able to do that, but in the upstream areas, it's -- it's -- we're going to be able to reach it, I think, with equipment from the --

AUDIENCE MEMBER: From the bank.

MS. SCULLY: -- from the bank.

AUDIENCE MEMBER: You reach out in the middle of the creek and scoop it out.

MS. SCULLY: And, you know, where's my sediment guy?

MS. MACOLLY: Alan.

MS. SCULLY: Alan can tell you.

AUDIENCE MEMBER: What does it look like? What does it sound like? How long is it going to take?

MS. SCULLY: It's going to take some time.

AUDIENCE MEMBER: Well, that's what I'm asking.

MS. SCULLY: Alan, I'll let you --

AUDIENCE MEMBER: And how much of that will disturb down the creek if you're --

AUDIENCE MEMBER: Yeah.

AUDIENCE MEMBER: -- if you're dredging up creek?

MS. SCULLY: Well, what we do is, if we have areas -- like the low-energy areas, it will be pretty easily isolated with walls. We can use sheet pile walling or something like that because we have a low-energy area. In other areas, we would use curtains to keep --

AUDIENCE MEMBER: What's a curtain?

MS. SCULLY: It's just a --

MR. FOWLER: I'm Alan Fowler. I'm a consultant with Solutia and developed a lot of the engineering behind the feasibility study document that EPA would use and uses.

So, I can answer your questions, if you want me to do this, in terms of what does the dredge look like.

AUDIENCE MEMBER: Sure.

MR. FOWLER: And I have been through --

AUDIENCE MEMBER: And sound like.

MR. FOWLER: And sound like. It sounds like an excavator, because it is an excavator.

AUDIENCE MEMBER: That's a big scooper.

MR. FOWLER: Big scoop on it. Chances are for a lot of Choccolocco Creek, we'd actually have to build ramps down into the creek.

AUDIENCE MEMBER: Oh, okay.

MR. FOWLER: We'd position an off-road sort of -- I'd call it a dump truck, but it'd be an off-road dump truck that would be on the top of the bank. You'd bring the excavator down onto this -- I'll call it a walkway, right on the edge of the --

AUDIENCE MEMBER: Walkway is going to be made out of cement?

MR. FOWLER: No, no, you'd use, you know, wooden, wooden-type mats, things like that.

AUDIENCE MEMBER: Okay.

MR. FOWLER: Sometimes we use gravel, sometimes we'll use wooden mats.

AUDIENCE MEMBER: And it'll all get pulled up when you get through dredging?

MR. FOWLER: Yeah, when we're done.

AUDIENCE MEMBER: Okay.

MR. FOWLER: So they'd operate down there. They'd be digging it out of the creek and putting it up into a truck. The truck would bring it to a temporary holding area.

AUDIENCE MEMBER: Are you going to dam it before you do that?

MR. FOWLER: Excuse me?

AUDIENCE MEMBER: Do you dam it above it before you start dredging?

MR. FOWLER: A lot of the area is -- as Pam mentioned, some of the low-energy areas we can dam off. The free-flowing, high-energy areas, difficult to dam off. Sometimes you can isolate them. A lot of the creek is underlined by bedrock, which makes it difficult. You know, there are some places we work where we can actually physically use sheeting to isolate the area that we're working.

AUDIENCE MEMBER: Use what?

MR. FOWLER: Sheet piling.

MS. SCULLY: Sheet pile.

AUDIENCE MEMBER: Sheet piling, okay.

MR. FOWLER: But because of the bedrock in this creek, it makes it difficult to do that.

Other things that you can do is you schedule the work in a dry time of the year, so the flow is at its minimum. You set up criteria such that, if it's going to start raining, then you stop work, so you give an opportunity for the materials to settle, so they don't get transported downstream in an accelerated manner.

So there's a number of engineering controls, as well as operational controls, to minimize that. The reality is, is, as you've said and your questions are, you know, bringing up, dredging is not, you know, a perfect -- it's heavy civil construction. There will be materials that are released and do go downstream.

AUDIENCE MEMBER: Yeah.

MR. FOWLER: The design is, you know, designed to minimize that and -- but it's not perfect. And what EPA is looking for here, and they recognize there's a balance between short-term strain and long-term gain. One of the things you'll notice is the amount of dredging that's here is about 25 acres are what are anticipated, and that the remedy itself involves targeting concentrations, and Pam throws out a number of 2.6. The long-term goal for the system is more than 100 times lower than that. It's going to get there by natural recovery.

So, by taking the creek banks off, which are a current source, as well as the upstream areas that are being -- you know, have been remediated or will be remediated, such as Snow Creek, and addressing the creek banks, we're shutting off the sources. And so then you go in and deal with the higher concentration areas in the creek, the criteria of 2.6, and over time -- you know, she'll put time frames up there, the 20 to 30 years, whether it's 30 years or whether it's 40 years or whether it's 26 years, there's a lot of uncertainty, but you first have to shut off the sources. Then you're going to take out the high points, and you're going to let the system recover.

AUDIENCE MEMBER: So -- so -- so can you

tell me how many miles we are from here down to the mouth of --

AUDIENCE MEMBER: West of 77.

AUDIENCE MEMBER: -- west of 77 and the mouth of Logan Martin where --

MR. FOWLER: The mouth of Logan Martin is about 35 miles, 37 miles, depends on where you want to choose your starting point from.

AUDIENCE MEMBER: So how long -- how long does the muddy water flow for when you start dredging 35 miles away till -- you know, 35 miles, you dig a mile or two, right, a day, or I don't know how many, and then --

MR. FOWLER: It's slower than that.

MS. SCULLY: Yeah.

AUDIENCE MEMBER: More than that?

MR. FOWLER: Slower.

MS. SCULLY: Slow.

AUDIENCE MEMBER: Slower. Okay.

MR. FOWLER: It's slow. It's -- it's slow production for the reasons for your concerns.

AUDIENCE MEMBER: So the water stays muddy longer because you're going slower. Right? So you start dredging up high, and it stays muddy all the way down to the mouth of Logan Martin?

MR. FOWLER: I wouldn't --

AUDIENCE MEMBER: Is that -- is that what -- is that what's going to happen?

MR. FOWLER: A couple -- a couple of things. I wouldn't -- we go slow because you -- what you want to do is minimize disturbance.

AUDIENCE MEMBER: Well --

MR. FOWLER: And so -- and, again --

AUDIENCE MEMBER: -- for the folks down low, that's for sure.

MR. FOWLER: Right. And trust me that it's designed to minimize disturbance, recognizing there will be some movement downstream.

AUDIENCE MEMBER: "Some" is a relative term.

AUDIENCE MEMBER: Yeah, I --

MR. FOWLER: It is.

AUDIENCE MEMBER: Yeah.

MR. FOWLER: It is.

AUDIENCE MEMBER: It is relevant, yeah.

AUDIENCE MEMBER: So it's going to look

like a rainy day, you know, when the water levels go up and it rains and all of a sudden you see a lot of brown water coming down through there, and, oh, it'll clear up in two or three days, and it clears up in two or three days.

MR. FOWLER: Not -- not necessarily --

AUDIENCE MEMBER: But for 35 years, it's going to be running muddy water down through there. Correct?

MS. SCULLY: No.

MR. FOWLER: No.

MS. SCULLY: No.

AUDIENCE MEMBER: Okay.

MS. SCULLY: No.

AUDIENCE MEMBER: How many feet back --

MS. SCULLY: If you get -- if you get muddy water every time it rains, then you're probably going to get muddy water every time it rains, but it won't be contaminated water, we hope. That's what we're trying to do is remove the contamination.

AUDIENCE MEMBER: Except while you're digging it up and moving it out, it's going to be contaminated then. Right? And coming downstream.

MS. SCULLY: But it --

AUDIENCE MEMBER: Yeah.

AUDIENCE MEMBER: Yeah.

AUDIENCE MEMBER: Yeah.

MS. SCULLY: -- but what's going to happen is that the --

AUDIENCE MEMBER: Yeah, so then it ends up on our property.

AUDIENCE MEMBER: Yeah. Is there also heavy metals in these PCB sites?

MS. SCULLY: There are some metals.

AUDIENCE MEMBER: Yes.

MS. SCULLY: There -- the metal concentrations are essentially the same as what we would have background. We didn't designate any metals to clean up in Choccolocco Creek, except for mercury. Mercury is the -- is an issue. Mercury also is an atmospheric contaminant, and everything in Choccolocco Creek -- not all sections. A lot of Choccolocco Creek has a mercury fish advisory also.

AUDIENCE MEMBER: Yes.

MS. SCULLY: So -- but we have -- most of the high levels of mercury are located in the same area as the high levels of PCBs. So by cleaning those up, we will also reduce the mercury concentrations. Mercury is not the biggest contaminant problem we have; it's PCBs, so we hope to alleviate any concerns that are related to the site.

Now, if you have atmospheric mercury that's coming from other sources, this won't fix that. But we will get high concentrations that are located in the backwater area.

AUDIENCE MEMBER: So the dredging up at the high point is going to -- like this young lady over here says -- is going to stir up whatever is laying down now. It's going to stir it up, and it's going to eventually float it down, and then the more you dredge, the more concentration you're going to have of whatever you're trying to get rid of, because you're not going to contain the contaminants in the dredging. Right? I mean, this kind of stuff is going to stay in the water, and it's going to float down and settle down into the lower levels.

MS. SCULLY: Well, our intent is to

contain it as much as we can, but --

AUDIENCE MEMBER: Umm. That sounds scary.

AUDIENCE MEMBER: And send it downstream --

MS. SCULLY: -- the fish will never --

AUDIENCE MEMBER: -- to dilute it? Is that what it is?

MS. SCULLY: -- the fish are not going to recover if we don't.

AUDIENCE MEMBER: (Indiscernible) the mechanisms that you're going to be using to try to control that?

MS. SCULLY: I'm sorry?

AUDIENCE MEMBER: Can y'all speak more to what mechanisms you're going to be using to try to control that drift down the creek? Because that's going to be a big concern for all the property owners --

AUDIENCE MEMBER: Yes.

AUDIENCE MEMBER: -- and all the people on the lake said, hey, you know, yes, they're going to be dredging and they're going to be -- they're going to be digging out contaminated soil and stuff like that, but what's to keep those high PCB levels from drifting further down the creek and further down the creek and further down the creek?

AUDIENCE MEMBER: That's why --

AUDIENCE MEMBER: So it's contained -- it's contained now, but if you start dredging, is your containment going to be a larger area?

MS. SCULLY: Well, it's not contained now because you have high levels of PCBs that continue to flow downstream.

AUDIENCE MEMBER: So when he -- so when you say "short" -- what did you say? "Short-term strain, long-term gain"? What did you say?

AUDIENCE MEMBER: But these --

MR. FOWLER: That's --

AUDIENCE MEMBER: -- but these have been flowing for what, 70 years? They've flowed for 70 years, and now we're going to fix it? I don't -- I don't get that. Stirring it up?

AUDIENCE MEMBER: So what -- so my question, though --

MS. SCULLY: The reason we need to take the action is because fish are contaminated, and we need to make that resource -- reestablish a resource that people can use.

AUDIENCE MEMBER: So when you say "short-term strain," that means 20-, 30-year strain, long-term 100-year gain. So we're all dead when this water is cleared up. Correct? At our age --

AUDIENCE MEMBER: What's the def- -- what's the definition of short and long-term?

AUDIENCE MEMBER: Yeah.

AUDIENCE MEMBER: Yeah.

AUDIENCE MEMBER: How many -- how many feet back is EPA and ADEM going to clean up off of Choccolocco Creek back? Also, a second question I have, any possible river walk areas that possibly can be created for future uses anywhere -- because Choccolocco Creek is 49 miles long. And when we was on the PCB health study from 2001 to 2005, I was a volunteer on the PCB health study with 15 other volunteers, and that's where we found out the Choccolocco Creek was 49 miles long. If it had been one more mile or more, it would be considered a river and not a creek. So you've got up in Gadsden and other places where there's beautiful river walk areas, and I'm sure that there's a lot of places on Choccolocco Creek this can be done.

So, Alan, I want you to address, and Pam too, both of y'all, if y'all've got on my questions here, how far back --

MS. SCULLY: As far as the river walk --

AUDIENCE MEMBER: -- and river walk.

MS. SCULLY: -- goes, this is all private property.

AUDIENCE MEMBER: Well, I'm talking about people that's going to have property because when you get down to my place, this is one point, and it's on a map that I got from the Monsanto/Solutia years ago.

AUDIENCE MEMBER: Where do you live? Where do you live?

AUDIENCE MEMBER: One thousand parts per billion is on Alabama Power land a thousand feet from Coldwater Creek where it deads into Choccolocco Creek on the other side, going south. How are you going to clean up one thousand parts per billion PCBs and how did it get there?

AUDIENCE MEMBER: And how about properties that border on that creek? Is that going to take away from the property that we have? Are you going to replace it? What . . .

MS. SCULLY: Our intent is to restore as much as we can. Obviously if there are large trees, we're not going to -- we're not trying to take out large trees. We're trying to preserve your property as much as we can, but we need to get the contamination out to an acceptable level, so that the ecosystem and people who want to eat fish from Choccolocco Creek can do so without it impacting their health.

AUDIENCE MEMBER: So short-term and long- --

AUDIENCE MEMBER: Excuse me. I asked --

AUDIENCE MEMBER: -- let's just -- short-term and long-term --

AUDIENCE MEMBER: -- two questions and nobody ain't answered my question yet, please.

MS. SCULLY: Okay.

AUDIENCE MEMBER: Short-term and long-term. You can start --

AUDIENCE MEMBER: Answer the two questions

I asked.

AUDIENCE MEMBER: -- with that one first, if you don't mind.

AUDIENCE MEMBER: Alan?

AUDIENCE MEMBER: Short-term, long-term, and then an- -- and then y'all can answer her questions. I'm first.

MR. FOWLER: All right. Short-term. And those are relative terms, so --

AUDIENCE MEMBER: Yeah, that's what he said.

MR. FOWLER: -- you know, the best -- yeah, and I think probably the best way to look at it is to -- to give you time frames. So when we see these things, these actions, right, it will take several years to implement a construction project like this. Right? So that's --

AUDIENCE MEMBER: Several years.

MR. FOWLER: Several years, probably three to five years to implement a construction project like this. By the time you start it, mobilize to the field, do -- three to five years to do --

AUDIENCE MEMBER: To get started.

MS. SCULLY: To do it, to do the work --

MR. FOWLER: To do the physical construction work, to dig the materials out of the creek and the floodplain.

After that, you are going to see -- for probably a five-year period, you're going to see an increase in fish concen- -- in PCB concentrations in fish.

AUDIENCE MEMBER: Yeah, because we stirred it up. Right?

MR. FOWLER: Yeah. Yeah, I mean --

AUDIENCE MEMBER: Okay. Fair enough.

MR. FOWLER: Okay.

AUDIENCE MEMBER: I see. We're just asking the question.

MR. FOWLER: Yeah, and I'm -- and I'm telling you --

AUDIENCE MEMBER: Thank you.

MR. FOWLER: -- what I see on sites I do all over the country.

AUDIENCE MEMBER: All right.

MR. FOWLER: So we'll see that for probably five years, and then the concentrations will go down, and now we're into the multiple decades of system recovery.

AUDIENCE MEMBER: Can I ask a question? So -- so --

MS. MILLER: Can we -- we have -- we have like six more slides. Can we get through the presentation, and then the rest of the time is Q&A. Can we do that? Okay, good.

AUDIENCE MEMBER: Sure.

MS. MILLER: All right. Thank you.

MS. SCULLY: Okay. Go to the next.

AUDIENCE MEMBER: Sure.

AUDIENCE MEMBER: Alan, you --

AUDIENCE MEMBER: Don't sit down, though.

AUDIENCE MEMBER: -- Alan, you're free to go sit down now.

AUDIENCE MEMBER: Just don't go anywhere.

MS. SCULLY: Okay. So you've seen these tables before. There are tables where we compare the threshold criteria and the balancing criteria for each of these alternatives. The alternatives range from 43 million to, on the next page it continues, to 54 million dollars.

So we've compared all of the alternatives. There's only one alternative that we would consider that doesn't treat anything, and that was the one alternative, SED-5, that has a capping of the low-energy area. So all of these tables are available in the feasibility study if you want to look at them in more detail.

And we're proposing alternative SED-6. That is to dredge even the low-energy areas and the high-energy areas. It stabilizes the principal threat waste with cement when it's being shipped off-site to a landfill. SED-7 was the next comparable alternative, and it required shipment of the principal threat waste to be incinerated, which we didn't think was worth doing at this point. So what we proposed was SED-6. In total, the estimated cost of the OU-4 remedy is 85.2 million dollars.

And -- okay. So that's the gist of what we're talking about. Again, this whole presentation is available for you on our website if you want to look at it. This is our website. If you just Google Anniston PCB site, our website will pop up first, and you can see the 100-page proposed plan, the four-page proposed plan fact sheet, and you can see the recording of this meeting. Not this meeting, but a prerecorded meeting.

You can send any of your comments to me at scully.pam@epa.gov. I also have an address in the building, and it's on this. It's also on the fact sheet, if you have that. The comment period ends July 30th.

And so we are meeting here tonight. We are offering an availability session at the Anniston Meeting Center this Saturday from 2:00 to 10:00, if you just want to come in and talk to us.

MS. MILLER: Ten to 2:00.

MS. SCULLY: I'm sorry.

AUDIENCE MEMBER: Ten to 2:00. Ten to 2:00.

MS. SCULLY: Ten to 2:00.

MS. MILLER: She can come 2:00 to 10:00; I'm coming 10:00 to 2:00.

MS. SCULLY: Okay. Ten to 2:00, in the middle of the day. If you want to come talk to us one on one, I think ADEM will be there also.

Is this the meeting you're coming to?

ADEM REPRESENTATIVE: I think it's the next one.

MS. SCULLY: It's the next one.

Okay. They'll be at the next meeting, but --

AUDIENCE MEMBER: So are these going to be the same type of meetings --

MS. SCULLY: Yes, they are exactly the same.

AUDIENCE MEMBER: Okay. All right.

MS. SCULLY: I'm just offering two times for this public forum meeting. One is today, and then again on July 23rd there'll be another one here at the Oxford Civic Center. The availability meetings or open houses will be this coming Saturday at the Anniston Meeting Center --

MS. MILLER: Drop-in.

MS. SCULLY: -- and then Saturday, July 20th at the Lincoln City Center. So --

AUDIENCE MEMBER: The July 23rd here will be just like this. Right? Same, it's a repeat.

MS. SCULLY: Yes.

MS. MILLER: Yes.

MS. SCULLY: It'll be the same thing, repeat.

AUDIENCE MEMBER: Okay. So I don't need to come to that.

MS. SCULLY: If you want to come and talk to me again, you can.

AUDIENCE MEMBER: Well, if I get to missing you a lot -- if I get to missing you, I'll come back.

MS. SCULLY: Okay. You come on.

AUDIENCE MEMBER: You need to come, but . . .

AUDIENCE MEMBER: I know it, to see my friend.

MS. SCULLY: Okay. So Angela -- any questions you have, our contact information is all over everything, I hope. So we have our telephone numbers, our email addresses. I think on the fact sheet we listed everybody's email address, so there's a lot of people you can contact and get more information. And we hope you will comment, because it can change the course of -- the course of what we do.

I'll let you go, Angela.

AUDIENCE MEMBER: Can I ask a question --

AUDIENCE MEMBER: Now my questions?

AUDIENCE MEMBER: -- can I ask a question --

MS. MILLER: All right. Let's hold up one -- let's hold up one second because Ms. Wanda has been very, very patient.

MS. SCULLY: Okay.

MS. MILLER: So let's -- let's let her speak.

And if you could, because there's a lot of people, and we want to respect time, if you could ask a question and then let somebody else ask and we'll go through it that way, okay? And let -- instead of one person having like ten.

Okay, Ms. Wanda.

AUDIENCE MEMBER: Okay. One question that I've got -- okay, that's your phone -- is the fact that -- the two questions I already asked, but the other one, a lot of y'all probably are not aware and I happened to attend the meeting at Cane Creek, and it would be great if we had some Fish and Wildlife people here, because they were out there and they discussed -- and this would be great for children and stuff -- about the mussels that was reintroduced into Choccolocco Creek and tributaries of Choccolocco Creek back in 2010. I just pulled it up a little while ago and Googled it. And so those mussels, when I sat there and listened to the gentleman talking from Fish and Wildlife, I said, can you answer me a question towards, you know, the latter part of the conversation, are those mussels going to be used when the PCB of Choccolocco Creek gets started to clean up?

He said, yes, ma'am, they are.

So what -- what it is, the mussels, a lot of them had gone, but they re-put mussels back in Choccolocco Creek tributaries, like all those creeks. And so what they're going to do when they start the PCB cleanup is to take some of those mussels out and go test them to see what the amount of PCBs that they're taking in from the PCB cleanup as it goes through the different stages and steps.

So that's very interesting for children and teenagers and young people, college career, to have on, and so you can address something on that that people are not aware of.

And I would love to see river walk areas, because a lot of places are beautiful and a lot of people come to my place just to go fishing because it's out there -- it's not big -- because it's peaceful and quiet, and you see Mother Nature, you hear hoot owls. I even seen a freaking monkey back last year, a cream-colored monkey, and he was just standing at my front door when I throwed some scraps out with my two kittens. He was the size of a kitten, cream-colored monkey.

MS. SCULLY: Well, let me answer your question. I think that bivalves sometimes are used in order to monitor whether concentrations are going down. I don't know that we have a plan to do that, but Fish and Wildlife does a lot of those things also where they do that evaluation.

And as far as a river walk, all I can tell you is, this is all privately owned property. There would have to be some sort of effort to -- people to donate property to some sort of river walk, and I don't -- that's really outside my lane right now. I mean, mostly I just want to get it cleaned up, and if that becomes a development potential, then, you know, we will certainly cooperate with anything that happens like that.

MS. MILLER: Okay. The lady right in the -- yes, you right there.

And then the gentleman in the white shirt.

She's had her hand up for a long time; I've watched.

MS. OVERTON: Sorry. Not that sorry, though.

Thank you so much for hosting this tonight. I appreciate it.

I have lots of concerns about this. I'm Justinn Overton with Coosa Riverkeeper.

I wanted to ask a couple of logistical questions about the dredging in particular and what that will look like in terms of public access. For the many people that paddle this creek, that boat up this creek, that want to fish this creek, can you talk to us a little bit about what public notice will be like when y'all start this work, as well as what access to the river will look like for the many people that look to this creek for respite, and the downstream folks?

MS. SCULLY: Well, I think that you can see that -- in the figures that we showed, that a lot of the work is going to be done in the upstream end.

MS. OVERTON: Um-hum.

MS. SCULLY: I don't know where people paddle, but I don't think there's a lot of paddling up near the water treatment plants, which is kind of the area.

MS. OVERTON: Um-hum. A lot of people actually put in right there at Friendship Road.

MS. SCULLY: Right, so --

MS. OVERTON: Um-hum.

MS. SCULLY: -- you know, we may impact people being able to use that access point when we're doing our cleanup, but, you know, what we're trying to do is to restore it, so --

MS. OVERTON: Sure.

MS. SCULLY: -- we're going to have to have some impacts on the community. We try to lessen them as much as possible.

I don't know if there's any notification that goes on?

MS. MACOLLY: Well, typically whenever we do the remediation, we -- EPA requires that we notify people of that. But one of the things that Alan had mentioned too is that we will try to do a lot of the intrusive work when the water level is lower, and then that should -- and when the water level is lower, that -- less people are kayaking then and things like that.

You know, we're very cognizant of when we do the work, and we try to work around even -- we even look at school schedules and school routing and things like that. All this is done as part of the plan that my engineers put together for us. We even -- I mean, we even look at truck routes and when they're going to be on the road and when -- you know, high traffic times.

So there's a lot of aspects. It's a very complicated site. There's going to be a lot of aspects that we have to deal with, and then we're going to have to change at a moment's notice when the weather changes.

MS. OVERTON: Um-hum.

MS. MACOLLY: And that's another thing that affects us. So that's one reason why it takes two to five, six years --

MS. OVERTON: Um-hum.

MS. MACOLLY: -- to actually do the remediation. You know, if we could just blow and go, we could get it done in a year, but by doing that, we would create more damage, not just to the ecosystem, but also to people's lives. So it's a -- it's a costly process.

MS. SCULLY: Balance.

MS. MILLER: And typically too, once we have all of that information for the remedial action, EPA comes back --

MS. SCULLY: Right.

MS. MILLER: -- and does a public meeting or an open house and we can say, this many trucks, this is --

MS. OVERTON: Okay.

MS. MILLER: -- going to be a scoop and, you know, things like that. When we have all of that detail, we come back --

MS. OVERTON: Great, thank you.

MS. MILLER: -- to the community. Yes, ma'am.

MS. MACOLLY: And --

MS. MILLER: And we'll create, if you sign in -- I'm sorry -- if you sign in on our sign-in sheet, we'll have an email list. You'll get a fact sheet, all of that information, so you'll be in touch, the website --

MS. SCULLY: She's on it.

MS. MILLER: Yeah. The website, we'll have stuff on the website, things like that --

MS. MACOLLY: And the CAG.

MS. MILLER: -- so you'll -- you'll be notified.

MS. MACOLLY: The CAG --

MS. SCULLY: The community advisory group.

MS. MILLER: Yes, yes, absolutely. Yes.

MS. MACOLLY: And the only other thing, Wanda, I do want to let you know that the trustees, Wildlife and Fisheries, they do review all of our documents.

MS. SCULLY: Yes.

AUDIENCE MEMBER: Right.

MS. MACOLLY: They are submitted to them, so there's nothing that we have submitted to the EPA or to ADEM that they don't review and comment on. So they do have their voice in all of this too.

MS. MILLER: Okay. Yes, sir, white shirt.

AUDIENCE MEMBER: So I get long-term benefit, short-term pain, to kind of get through it. Totally cool. We're looking at a five- to six-year -- two- to five- to six-year window where the PCB levels in the fish will be elevated, I assume because of all the work being done, the sediments being stirred up, yaddady, yaddady.

So I'm down below Highway 77, kind of at the mouth of the lake. Can our kids swim? I mean, how does this impact that corner of the world down there that we live on the water all the time?

AUDIENCE MEMBER: Yeah, our kids swim in that water.

MS. SCULLY: Well --

AUDIENCE MEMBER: So what's the interaction of 25 miles downstream?

MS. SCULLY: There's less impact

downstream than there is upstream. So the downstream areas are closer to cleanup right now, but there will be some disturbance that'll happen.

Now, we don't have a risk -- we don't -- we haven't calculated any risk from the water, being in the water swimming or being in contact with the sediment. The issue is eating the fish. So that was the risk we found when we did the risk assessment. It's the risk to ecological receptors and it's the risk to humans is eating the fish.

So there's a no-fish advisory for the whole length of Choccolocco Creek from Snow Creek down. We hope people will abide by it. And so --

AUDIENCE MEMBER: So then it's back into what she said. The communication --

MS. SCULLY: Right.

AUDIENCE MEMBER: -- I think, will be very important for that five- or six-year window.

MS. SCULLY: Okay.

AUDIENCE MEMBER: So when -- we all -- we all know PCB levels will be elevated.

MS. SCULLY: Right.

AUDIENCE MEMBER: He's saying "five to

six," and you're shaking your head "yes."

MS. SCULLY: I'm just trying -- I'm trying to be affirmative; I'm sorry. I'm just --

AUDIENCE MEMBER: Okay.

MS. SCULLY: I'm not trying to --

MR. FOWLER: Yeah, I -- this -- the construction project --

MS. SCULLY: Construction is two to five years, is what he said.

MR. FOWLER: It's going to be probably three to five years for construction. You will see elevated concentrations in fish for up to a decade or so.

MS. SCULLY: And then the fish --

AUDIENCE MEMBER: What's the current life expectancy?

MS. SCULLY: -- concentrations go down.

MS. MILLER: Hang on one second. This lady has been waiting patiently too.

Yes, ma'am, go ahead.

AUDIENCE MEMBER: So my question is regarding the bar graph with the levels, and, with Snow Creek being the highest, wouldn't it make sense to, like, concentrate on that area first --

MS. SCULLY: Yes.

AUDIENCE MEMBER: -- to keep it from getting downstream?

MS. SCULLY: Yes. What we've been doing -- and that's why we started at the facility and we're working our way down Snow Creek, and then we'll work on Snow Creek and then Choccolocco Creek. So, yes, we have a sequence we want to go in because we don't want -- we don't want to do an activity in the middle of Choccolocco Creek and then go upstream and do something. We want to be able to clean as we go down.

AUDIENCE MEMBER: Are the Corps of Engineers going to do the job --

MS. MILLER: Ms. Wanda, Ms. Wanda, hold on just a second. We've got people back here that's waiting patiently too. Okay?

Yes, sir, striped shirt.

AUDIENCE MEMBER: I might have missed it. Do you know how many total acres you're planning on dredging from Snow and Choccolocco both?

MS. SCULLY: It's 25 acres is what's in

the current plan. Right?

MR. FOWLER: It's 25 acres in the current plan.

AUDIENCE MEMBER: And that's going to be the majority right up at kind of the mouth, but also a few areas --

MS. SCULLY: Downstream.

AUDIENCE MEMBER: -- all the way down --

MS. SCULLY: Yeah.

AUDIENCE MEMBER: -- where the concentrations are higher.

MR. FOWLER: It's about fifty-fifty.

AUDIENCE MEMBER: What's that?

MR. FOWLER: From an acreage perspective, it's about fifty-fifty, that portion of Snow Creek, the backwater area, and a little piece just underneath Friendship Road is about 50 percent of the dredge area footprint. The other 50 percent is 13 spots that have been identified downstream.

And, again, Pam mentioned that -- you know, that those data are old, so we're going to have to go back -- because the creek moves down there.

AUDIENCE MEMBER: Right.

MR. FOWLER: We're going to have to go back and make sure those are the right spots.

MS. MILLER: Yes, ma'am, in the back.

AUDIENCE MEMBER: Yeah, it's somewhat related to that. You mentioned in determining which areas met certain criteria, that some of the data was older --

MS. MILLER: Um-hum.

AUDIENCE MEMBER: -- and those areas would need to be re-evaluated. How old is that data?

MR. FOWLER: Twenty years.

AUDIENCE MEMBER: Wow. So those areas --

MS. SCULLY: Well, but --

AUDIENCE MEMBER: -- haven't been sampled --

MS. SCULLY: -- the creek bank --

AUDIENCE MEMBER: -- since?

MS. SCULLY: -- the creek bank assessment was done, I think, in 2014.

MR. FOWLER: Yeah, a lot of the soil data from that was collected in 2008.

MS. SCULLY: The soil data is older.

MR. FOWLER: The sediment data is the oldest, which was collected in -- a lot of it collected in '99. The floodplain soil data, most of it was collected in the 2007/2008 --

MS. SCULLY: Right.

MR. FOWLER: -- time frame. And what's really important to recognize is, for the most part, soil in the floodplain, even though the data is, you know, close to 20 years old, those soils, with the exception of right on the creek bank, those aren't going anywhere. So those concentrations, those data were valid. The design will still probably involve more sampling in some of those upstream areas to refine where excavation would occur. But, for the sediment, especially downstream of Friendship Road, between there and Jackson Shoals, it's high energy, it's transitional, and so we don't believe the data are representative. They could be, but it's been almost 25 years. Downstream of Jackson Shoals, when you get into the embayment area, it's a depositional area. The sediments are stable; they're not moving. Those data are probably pretty accurate from 25 years ago. There may actually be lower concentrations today. But that area will still get sampled during the design to confirm what the conditions are.

AUDIENCE MEMBER: Okay. Follow-up to that. Science has changed a lot in the last 25 years. How different are the sampling and analysis technologies that are used now than they were 20 or 25 years ago?

MS. SCULLY: Well, we'll use current --

AUDIENCE MEMBER: I mean, y'all are the PCB experts.

MS. SCULLY: -- when we go do the remedial design, we'll be using the most up-to-date sampling. Obviously, a lot of the data is Aroclor data for PCBs. And we'll collect additional data. A lot -- we look at a lot of homologs now. But Aroclor data is still pretty valid for us.

MS. MACOLLY: But -- and the -- and the laboratory procedure hasn't changed that much at all. It's still the same methods that are required today as we used back then.

MS. SCULLY: The real question is --

MS. MACOLLY: (Indiscernible) --

MS. SCULLY: -- where are the sediments?

MS. MACOLLY: -- or something like that?

MR. FOWLER: Eight forty-six is the overall.

MS. MACOLLY: So it's -- it's the same methodology, and all the sampling we did and all the analytical work, it has -- it had to be approved by EPA that it's EPA methodology.

MR. FOWLER: The fundamental changes to analytical chemistry from the mid seventies to the late '90s are where those evolutions occurred. Even in the sampling and analysis we did in the 2008 time frame, we actually did split sample comparisons. So if we did it with an older Aroclor method and we also did it with what's known as a "homolog method," which is a more current method, even though they're both still used, the results were very comparable. And so it gives us confidence that, if it was X concentration in 1999, if that material hasn't moved, it's still going to be concentration X using samples collected today.

MS. MILLER: Okay. Hold on, ma'am; I'm sorry.

Sir, you right here, and then you.

AUDIENCE MEMBER: Yeah, two questions. One, does FEMA have to approve the plan? And, two, what would you expect the impact to be on the boundaries of the floodway once the work is completed?

MS. SCULLY: Well, I think we would try not to change the available flood zone. I think those are sort of the laws we work with.

MR. FOWLER: One of the reasons, when you look at the feasibility study -- and, again, we look at different options -- and for the floodplain soils, we didn't look at a capping option. We didn't look -- many times on most --

MS. SCULLY: Right.

MR. FOWLER: -- sites I work on, you look at less intrusive things like capping. Because of floodways and FEMA and the regulations surrounding that, we couldn't look at capping because we'd be building the elevations up and changing the distribution of the flooding. And so that's why it was only removal of that six inches of soil and replacement with clean backfill.

Relative to the creek itself, there's nothing there that's going to change the bathymetry. If at all, if there's any flattening out of the banks that happens as part of the bank remediation process, that won't -- that will actually relieve things a bit, but won't fundamentally change the location of the floodplain.

So it's really building up. If you place things in there, that's when you change the footprint of the floodplain. So this remedy doesn't involve that.

Even the alternative that looks at capping in the backwater area, so the low-energy portion, there's -- as Pam mentioned, there's different treatments that were looked at. One was actually treating it in place. Another was putting a cap in. That cap involves removal of material to be able to put the cap in, so the bathymetry is not being altered above, you know, current conditions.

Good question.

MS. MILLER: Sir, another one?

AUDIENCE MEMBER: Yeah, I --

MS. MILLER: And then you, ma'am.

AUDIENCE MEMBER: -- I've still got the same question from before, is that, you know, dredging is being discussed as being used on both the high-energy and low-energy areas. Okay? And the big concern would be, you know, dredging in and of itself can't capture everything, so stuff is naturally going to drift down-creek. So what kind of mechanisms are you going to have in place to try to minimize that drift going down-creek, especially when you're talking about high-energy areas where your flow is going to be wanting to carry it downstream?

MS. SCULLY: I think we'll use sheet piling where we can.

MR. FOWLER: Yeah.

MS. SCULLY: We'll use silt screens. We'll --

MR. FOWLER: Yeah.

MS. SCULLY: -- we'll do it in the time of year when we have better access and less material flows downstream. Those are --

MR. FOWLER: I wish maybe for the next meeting, if you want, I can bring pictures of --

MS. SCULLY: Yeah.

MR. FOWLER: -- of things to show you what we do. Again, that excavator we'll be using, we will try to use as much of -- it's an enclosed bucket. So it wouldn't be just a scoop like this that's open. It would have a scoop that closes on both sides. It won't be watertight, but it'll close on both sides, so you're not having like your typical excavator you see with an open scoop on it. So it'll be a bucket that would close on both sides. So that would be one thing, would be a choice of a bucket.

The second thing would be positioning equipment. So we know exactly where that bucket goes. So I can tell you -- I could look at a blueprint afterwards, and it'll show me the bucket went here, went here. The operator sitting in the cab sees that same picture. He knows where those bucket bites need to go.

And that's important, because what you want to do is minimize how much material you're taking. You're not trying to dig the same areas twice. And so the equipment includes those features.

Again, operational controls would be, you know, operating in low-flow conditions, time of year, nonprecipitation. We'd also look at -- Pam mentioned silt curtains. And basically what they are, they're a screen that's going to allow the water to flow through and catch some of the particles that are in suspension. You can't have the silt curtain size so tight that it captures all the particles because then it becomes plugged, and it just goes like a sail and you lose everything.

I can tell you that silt curtains are a challenge to work with from a construction perspective. Many dredging jobs that I work on, we don't specify them because they actually make more of a mess. Those tend to be like the tidal, mucky environments that I'm working in. I've got a mucky site in New Jersey that's right next to the Meadow- -- it's in the -- it is the Meadowlands. And there, I'm trying to avoid silt curtains at all cost because they make a mess.

Downstream -- the portion downstream of the backwater area where the dredging would be slated, right, so it's between Jackson Shoals and Friendship Road, most of the materials there are more granular. There's a small amount of fine particles there. Most of them are granular because it's high energy. The fines wash downstream. So there's not a lot of fines there.

So the good news from that perspective is those things settle out relatively close to the point of dredging, and you would actually have the silt curtain downstream to try to capture as much as you can, the fine particles that get resuspended during that removal process.

So other things that we can put in, sometimes we put in diversions. Here, again, we've got limits in terms of being able to put sheeting in there. Might we put a -- I'll call it a "log-type structure" that would be upstream of where dredging is, and so the sense that it would take the water and divert the water flow around the dredging area.

Will it divert all of it? No. Will it increase water velocities on the other half of the creek when we're not working? Sure. But if it can act to sort of still water velocities where you're actually dredging, that will help minimize, again, what goes downstream.

AUDIENCE MEMBER: Will you be -- will you be surface water sampling downstream of your dredging area to say, hey, you know, if your surface water numbers go up too high, oh, we're dredging too fast, we need to hold up?

MR. FOWLER: Absolutely.

AUDIENCE MEMBER: Okay.

MR. FOWLER: So the way we'll typically do that, and, you know, in today's world, this is where advances in technology have been great. I can put a series of monitors out there, and I'll actually be able to look at my phone and see what's going on.

And the way we'll do it is, we'll have a shutdown criteria, but we'll also have criteria that if, say, 50 percent is shut down, that sends a yellow light up. So, in other words, hey, folks, I know what you're doing, but let's go take a look at it because it's trending in the wrong direction.

And, again, we can still keep operating under those conditions, but, if we get to an upset level, then everything shuts down, and we sit down and figure out, okay, what's going on here? You know, in many cases, do we need a different piece of equipment? Is it one operator? Like, hey, I begin to look at the stats, and it's always -- you know, it's always Bobby. I'm like, wait a minute, he needs either retraining or he's off the job. I mean, these are the things that we look at in terms of operations with the monitoring.

But that was a great question, and that's how we do it.

MS. MILLER: Ma'am, did you have --

AUDIENCE MEMBER: It was the same question --

MS. MILLER: Did you -- okay.

AUDIENCE MEMBER: -- he had.

MS. MILLER: Okay. Okay, let me get him, her, Ms. Wanda one, you, and then we'll come to you. Okay?

AUDIENCE MEMBER: The testing, that was my question, but the -- you have the visibility on the testing, and it's real-time analysis, so --

MR. FOWLER: Yeah. What it is, it measures turbidity. So it's not the actual concentrations of the solids that you see in water, which are typically measured in milligrams, mass per liter, so volume. It's not that. It'll be the nephelometric units. So it'll be turbidity, which is the ability of light to pass through water. So --

AUDIENCE MEMBER: So it has nothing to do with PCBs; it's just the --

MS. SCULLY: It's the muddier the water that's --

MR. FOWLER: You're right. So if -- if we -- if we know what the background is -- so if I have a monitor that's upstream of the dredge. All right?

AUDIENCE MEMBER: Right.

MR. FOWLER: So that'll tell me what background conditions is. It'll tell me what's normally going on. So downstream of the dredge, I'm going to have, if that number is exceeding background, I will know it, and then I know it's a disturbance of -- it's an indication of disturbance by the dredge and --

AUDIENCE MEMBER: Okay.

MR. FOWLER: -- resuspended solids.

AUDIENCE MEMBER: So you mentioned that the -- the effects on the fish and eating the fish and the testing has been done for that. What about the human contact, the -- in skin, you know, kids swimming around in the water? And during the -- and during the remediation, how frequent will the testing be done for the PCBs down all -- you know, all the way down the stream, and will we be able to see that?

MS. SCULLY: I don't know that we'll have real-time, other than turbidity.

MR. FOWLER: We won't have real-time data on PCBs. It's certainly something that in a monitoring plan, we could put that out there. It does take several days to get PCB results back in. I would tell you that, when you look at EPA's human health risk assessment, the risks are not associated with PCBs and contact with the water.

I want to give a shout-out to Justinn and her crew that are out there in the summer months monitoring the water for things that really would affect you.

AUDIENCE MEMBER: Right, yeah.
MR. FOWLER: And I think --
AUDIENCE MEMBER: Yeah, they do -- they do a great job, and I was hoping to have the same thing for the PCBs --
MR. FOWLER: Yeah.
AUDIENCE MEMBER: -- that affect us.
MR. FOWLER: Right. If my kids were in the water, I'd be looking -- every Friday I'd be looking at the email I get.
MS. MACOLLY: They're not absorbed -- they don't absorb through the skin.
AUDIENCE MEMBER: Yeah, they're not in the water very well.
MS. MACOLLY: PCBs adhere --
MS. SCULLY: They're primarily on the --
MS. MACOLLY: Yeah.
MR. FOWLER: -- on the particles.
MS. SCULLY: -- the particles.
MS. MACOLLY: PCBs, the way they move in the environment, they adhere to the soil, and then they move through the soil.
Now, if the kids, I guess, are eating lots

of dirt, at least the --

AUDIENCE MEMBER: Or drinking the water.

MS. MACOLLY: That -- that's highly im- -- that's impacted, then that would be --

AUDIENCE MEMBER: We'd be drinking muddy water.

MS. MACOLLY: Yeah, it would have to be muddy water.

AUDIENCE MEMBER: If you're swimming, you're going to ingest water.

AUDIENCE MEMBER: You're standing on a soil surface in your slough.

MS. MACOLLY: And I have -- I have a property on the water.

AUDIENCE MEMBER: Yeah.

MS. MACOLLY: And my son swims in it.

AUDIENCE MEMBER: Yeah. What if you're not swimming? What if you're just standing in it?

MS. MACOLLY: It's not going to absorb, unless you have a lot of mud on your feet and you lick and eat that mud. That would be the way you would get PCBs --

AUDIENCE MEMBER: Okay.

MS. MACOLLY: -- in your body.

AUDIENCE MEMBER: So ingestion.

MS. MACOLLY: Yes.

AUDIENCE MEMBER: That's how you do it.

MS. SCULLY: Yeah. So I'll take this question back to my human health risk assessor, and we'll answer it as part of the responsiveness summary --

AUDIENCE MEMBER: I appreciate it.

MS. SCULLY: -- and make sure we get you a good answer.

AUDIENCE MEMBER: Thank you.

MS. SCULLY: Okay.

MS. MILLER: Yes, ma'am.

AUDIENCE MEMBER: I have a question. So are there any other sites where these particular remedies have been used, and have they been successful?

MS. SCULLY: They're used at -- dredging and capping and monitoring natural recovery are used at virtually every sediment site in the country. I think the most famous one is the Hudson River. And Alan has probably worked on more of them than anybody I know, so.

MR. FOWLER: Yeah, I mean, it -- these are common, but I think what you're seeing is that the success takes decades. I think that's what you're seeing --

MS. SCULLY: Yeah.

MR. FOWLER: -- is that you -- if you haven't done source control -- and we've seen this on -- you know, I'll get called in on a case, and they'll say, hey, look, we did a remedy five years ago; we have a problem. And chances are it'll be, well, yeah, you didn't fix this outfall, or, you know, you haven't dealt with a source that you didn't identify.

And so source control is paramount for any successful sediment site cleanup. And, again, the other thing we've learned is it takes time. But you'll never get to the lowest low levels by trying to dredge it out of there. You'll just -- that's one thing that we've known. And so what you'll do is, you'll take a look at trying to give, you know, monitored natural recovery a good head start. And in a system like this where we can't go out and cap it, then what you find is removing those areas with the highest contamination and eliminating the sources and let the system heal itself.

There's a lot of really valuable habitat out there. Someone -- you know, Wanda mentioned mollusks. There's a lot of great mollusk habitat out there. And, you know, the cleanup level, targeting concentrations, the higher concentrations, you know, is a way to avoid digging up all that valuable habitat and letting monitored natural recovery, you know, heal those areas.

MS. MILLER: Ms. Wanda and then the gentleman here.

AUDIENCE MEMBER: Okay. I got probably maybe three things, but one I want to kind of hit on really good. I don't remember, but some of y'all here probably remember the group that got the work done down around where Tape Craft is and where H.J. Bentley Parkway dead-ends over there at that 100-acre industrial park from off of Airport Road at the five-way stop. And it's got the beautiful rocks there just like when they done the Highway 21 South, and they've got the beautiful rocks there to maintain, you know, from the PCBs and stuff like that.

So how are y'all going to address that area down there? And plus the fact that in this area there, that -- where it dead-ends, there's going to be a roadway there, because 24 years ago when I first went out there in 2000 and 2001 and started living and working on the land that is family inherited -- anyway, I ran into a guy doing a survey, and he was with ALDOT. And what he was doing was the -- how far that they was going to build a road through on the other side of Silver Run, so the wooden flat bridge won't be used anymore, and there will be a big road coming through that's going to go probably somewhere and connect with the Priebes Mill Road that's completed to 21, or either it's going to cut through in front of the Plantation Pipeline on Silver Run going straight out to Highway 21. So that's for y'all that did not know, but it's been on the books longer than 24 years.

Plus, that's one thing of the group on those rocks that I think is areas that's already cleaned up of PCBs, except the creek. And then the other part is the Corps of Engineers on the trees, the dead trees that have fallen, because there's a bunch down there close to my place. But when you look at the creek within 300 feet from where I live, and the floodwaters, when they rain, and the creek comes up and there's this big log, a limb out there done come down, parked itself right out in front of the main area where you're going to throw a fishing line. Next thing you know, when it floods again, maybe six to nine months to a year later, finally that log lifts up and moves on further out of the way, just like a lot of these dead trees.

So I went out there, took pictures, but a lot of them I lost because my mobile home burnt down, but you find floating down the creek, lodged in the creek, pieces of plywood. The creek will be totally dead except for an area where it's going around another way. There'd be a piece of a railroad tie, whole railroad tie out there in the flat bottom of Choccolocco Creek, about 2015 when we had that dry spell.

So, anyway, those are some things that

I've seen where half of the creek is blocked up. And yet, here's the Corps of Engineers supposed to come and get this kind of stuff out, but we don't see or hear nothing out of the Corps of Engineers. You see what I'm saying?

MS. SCULLY: I don't think anybody has been doing a lot of work in Choccolocco Creek, mainly because we have a PCB --

AUDIENCE MEMBER: So can --

MS. SCULLY: -- issue that we need to address. And we expect that there will be some debris in areas where we have to dig that we'll have to dispose of. We're not going to look for debris; we're going to look for contamination. We're going to look for creek banks that need to be stabilized because they're contaminated and eroding, and those are the areas we're going to try to fix. But, yeah, we fully expect that there's going to be debris that we have to deal with --

AUDIENCE MEMBER: Right, so that's --

MS. SCULLY: -- when we're doing it.

AUDIENCE MEMBER: -- my question. So, honey child, I'm going to tell you right now, Pam

Scully, you're in for a treat when you get out on Choccolocco Creek.

MS. SCULLY: Thank you.

MS. MILLER: Yes, sir?

AUDIENCE MEMBER: Three -- three comments. One, semantics. So you used the word "dredging," but then we switched over to "excavation." So we're using those interchangeably? Okay. Excavation scares me --

MS. SCULLY: Well, typically --

AUDIENCE MEMBER: -- more than dredging, but.

MS. SCULLY: Well, typically in big river systems, dredging would be you were floating a barge out and --

AUDIENCE MEMBER: Yeah.

MS. SCULLY: -- and that's dredging from the side. We talk a lot about excavation. It's the same --

AUDIENCE MEMBER: That's not possible here? And -- and I'm sure it must not be, because you didn't choose that. How deep will you go down from -- from the bottom of the creek? How -- when you -- when you're excavating, typical depth that you're going to dig up?

MR. FOWLER: So when we're in the creek, we'll use an excavator to do the dredging. So -- and we should be clear on the terms, because I think words matter. For me, we'll use an excavator both in the floodplain and that's excavation. We'll use an excavator in the creek, and we'll call that "dredging" because we're in the -- we're in the wet.

MS. MACOLLY: We'll use a specialized excavator.

MR. FOWLER: And we'll use a specialized excavator bucket.

AUDIENCE MEMBER: How deep will you typically go?

MR. FOWLER: It varies. In the low-energy areas, we'll probably go three or four feet, because that's how deep the contamination is in the backwater area. So we'll take it down to the bottom. In the higher-energy areas of the creek, it varies between typically six inches and maybe two feet.

AUDIENCE MEMBER: Okay.

MR. FOWLER: There's two feet of material, like when I drive by Snow Creek on the way out, I'll look in the middle of the creek and there's two feet of, you know, stuff piled up in the middle of the creek. So there's a couple of feet there. Generally speaking, there's six inches to a foot. In Choccolocco Creek, that main stem that runs from Friendship Road to Jackson Shoals, is it variable? Yes. But we've assumed for -- you know, when we came up with the volume. Right? We came up with a little over 50,000 cubic yards. We made the assumption that on average in that reach of the creek, they were -- sediment deposits were about a foot thick.

AUDIENCE MEMBER: Second point, and this is repeating a couple of other comments, is you presented us with a plan. The plan is based on data that you have today. So really it's -- you don't really know what the scope of the plan is. You have an estimate of what the scope is, but until you have updated data, you don't really know what the scope is.

MS. SCULLY: When we do the sampling

during remedial design, we'll update our estimates, and, if we have to, we'll, you know, tell -- come out with a new estimate of what it's going to take to do that.

But what we're trying to do in the feasibility study is compare what our -- see what our options are and try to determine which one we think is the best option, and then we'll spend a lot of money sampling when we're almost ready to do the work.

AUDIENCE MEMBER: Yeah. See, my fear is based on your scope.

MS. SCULLY: Um-hum.

AUDIENCE MEMBER: And so I don't really know what my fear level is until you exact your scope. So.

And then the other question is more of a comment. So, I'm a resident of Logan Martin Lake. It's "Logan Martin Lake," not "Lake Logan Martin."

MS. SCULLY: Okay.

AUDIENCE MEMBER: And, you know, all of the concerns of all of those people is the same, and they've been stated a couple of times. You know, how much silt -- how far is it going to go, how much is it going to be, how long is it going to stay there? And your answer is qualitative; it's not quantitative, and people are just going to freak out. That wasn't a question.

MS. SCULLY: Okay. Thank you.

MS. MILLER: One second. There was a gentleman back here that had -- yes, sir.

AUDIENCE MEMBER: Yeah. So I'm just --

MS. MILLER: And then I'll come to you.

AUDIENCE MEMBER: -- curious. Do you-all have examples where other projects use some of these same remedies where you've had some measure of success that you can demonstrate and share with people?

MS. SCULLY: I don't have a specific example, but . . .

MR. FOWLER: Yeah, I mean, I -- I think what -- again, what I explained earlier was that the success -- I mean, you can demonstrate success in a couple of ways. Right? The first way is immediately, did we change the concentration from X to Y? Right? So we went out there before we did something, the concentration was X; we did a physical action, lowered it to Y. I -- plenty of those examples.

I think we'll find the other examples are, show me the concentrations of fish tissue over time following implementation of that. And the curves will all look like, okay, here's where we were before remediation, here's where we were after remediation, and now we're into that decline that will take several decades to achieve. That's -- that's what you'll find. And . . .

AUDIENCE MEMBER: So I think it -- or I was hoping you'd share at least that we've seen in Choccolocco Creek and Logan Martin Lake, we've actually seen a decrease --

MS. SCULLY: We have.

AUDIENCE MEMBER: -- in PCB concentrations already with the re- -- with the remedies that have been implemented upstream from here. Correct? So we've seen reductions and --

MR. FOWLER: Com- -- combination of things, and I -- I don't know what Pam has with her for slides.

MS. SCULLY: I don't have that slide, so.

MR. FOWLER: Yeah.

AUDIENCE MEMBER: So that is a success. Since the --

MR. FOWLER: Yep, absolutely.

AUDIENCE MEMBER: -- project started concentrations in fish have decreased. We're going to see a bump in OU-4 remediation, but we know in time it will go back down.

MR. FOWLER: Because where we are right now -- and I guess I'll draw my hypothetical curve here. Right? So, if you go back to the, you know, the '90s, there was actually -- concentrations were coming down. Right? The plant stopped making PCBs in '71. Cleanup actions were started. I mean, even the environmental laws were forming, but things were being done. Concentrations were declining.

They bumped up. Right? There were things that happened in the creek, whether it was NRCS doing dredging, whether it was somebody placing PCB-containing soils in the creek as a part of their construction. And we saw a bump in concentrations. And now what you've seen are the concentrations coming back down --

AUDIENCE MEMBER: Um-hum.

MR. FOWLER: -- and they're leveled off. But they're leveled off to the point, unless additional source control measures are done, you won't see them take that next step down.

So that's what the data show. It's great that the system has recovered quite a bit, but to get it to the next stage of recovery, you --

MS. SCULLY: You have to take some action.

MR. FOWLER: -- you've got to do the source control action.

MS. MILLER: Yes, sir, right here.

AUDIENCE MEMBER: Yes. What input did Alabama Power Shoreline Management have on this study as far as the low-energy levels past Highway 77? Because they control the shoreline management, and their advice is do not disturb.

MS. SCULLY: Right. And the primary reason we don't want them to disturb without con- -- we require people to drive in posts and try not to excavate, because we don't want to stir up contamination that might be buried, because the contamination has been flowing down to that embayment area since the plant operated and since the lake was impounded in 1964. So it's been building up in those areas. And we know that deeper contamination, there is higher contamination than there is at the surface.

MS. MACOLLY: And we're part of the Alabama Power Permit System.

MS. SCULLY: Right.

MS. MACOLLY: She -- they send it to Pam and us --

AUDIENCE MEMBER: Okay.

MS. MACOLLY: -- so we evaluate every project, and, on a couple of occasions, my -- I'll send my guys out there --

MS. SCULLY: Right.

MS. MACOLLY: -- to help out in case there are any kind of indications that there is PCB impact in the material that needs to be worked with. So --

MS. SCULLY: Right.

MS. MACOLLY: -- we are -- we've been integrated into that system, so that people aren't freewheeling, going out there and just --

MS. SCULLY: And one of our big concerns is that someone will, you know, excavate some sediment and put it in their yard.

MS. MACOLLY: Yes.

MS. SCULLY: Because then we would be worried about your yard. So we try to make sure people don't pull that sediment out and put it in their yard and don't disturb it enough that it causes an increase in concentrations in the water.

AUDIENCE MEMBER: But you're going to disturb it upstream?

MS. SCULLY: We're going to have to do some disturbance upstream. The concentrations down at the lake are lower and they -- they may increase a little bit, but our long-term goal is for it to get down to 0.1 milligram per kilogram, which is lower than it is right now, so.

MS. MACOLLY: And the fine -- and like Alan has described earlier, the fine material is going to be most of the stuff at the front end of it. And as we do work at -- downstream, the material is closer to the lake, it's less fine, thicker, and it will fall out into the -- and settle out before going down there, the likelihood. So there's a -- there's a 36-mile reach, so the majority of the work is being done in that first few miles, and it'll settle out more than likely before it gets down to the lake area.

AUDIENCE MEMBER: The Superfund ends at 84 million dollars, what you quoted. What if you run out of money before you finish your project?

MS. MACOLLY: She won't run out of money; I'm paying for it.

MS. SCULLY: Solutia is paying for it, and we're not going to run out of money, so.

MS. MACOLLY: That's why it's a Superfund-like site.

MS. SCULLY: Right.

MS. MACOLLY: If it was a Superfund site, they would have to pay for it.

MS. SCULLY: Then I'd have to use tax money --

MS. MACOLLY: But we --

MS. SCULLY: -- to clean it up.

MS. MACOLLY: -- agreed to do this.

AUDIENCE MEMBER: Then you run out of

money.

MS. SCULLY: Yeah.

MS. MACOLLY: So we're -- we're funding it.

MS. MILLER: Yeah, for sure.

MS. SCULLY: Yeah, it's not being paid for by the government or by your tax money. It's being paid for by the responsible party.

AUDIENCE MEMBER: Yeah, I knew Solutia was supposed to pay for it.

MS. SCULLY: Right.

AUDIENCE MEMBER: But that's the only amount I've seen, so.

MS. SCULLY: Right.

MS. MACOLLY: It's not a -- that amount, that's an estimation. It's not --

MS. SCULLY: That's an estimate.

MS. MACOLLY: -- it's not set. We agree -- we will go into an agreement with them as to what we will do, not the cost of what it is.

MS. SCULLY: Right.

MS. MACOLLY: So we're -- we have to perform what it is that we agree upon doing.

MS. SCULLY: Yeah, the agreement is basically, if the ROD says you'll do this, this, and this, then we would look to Solutia to sign a consent decree, which would be lodged in the court, which becomes a contract between us that they will do those activities. It really doesn't talk about costs in the consent decree.

AUDIENCE MEMBER: They're paying for it, but who's performing the work and who's --

AUDIENCE MEMBER: Yeah.

AUDIENCE MEMBER: -- overseeing the work?

MS. SCULLY: The EPA oversees all the work.

AUDIENCE MEMBER: And who's doing the work?

MS. SCULLY: And Solutia hires contractors to do the work -- and I have a contractor here somewhere --

MS. MILLER: He's right there.

MS. SCULLY: -- who I also get support from to do the work, because I can't be out there every day. So EPA has people overseeing the work, Solutia has people performing the work, and we all try to make sure it meets the requirements in the consent decree and the ROD.

MS. MACOLLY: And EPA has to -- I just can't go out there and do whatever I want. I have to write a plan --

MS. MILLER: The plan.

MS. MACOLLY: -- and submit it --

MS. MILLER: That's what I was going to say.

MS. MACOLLY: -- to EPA, and then they either comment on it, approve it, we go back and forth, and then revise it.

MS. SCULLY: Right.

MS. MACOLLY: But nothing I do doesn't go -- can be done without the oversight and the approval of EPA.

MS. SCULLY: Right.

MS. MACOLLY: And then EPA typically has an oversight person. On a project this scale, though, they're probably going to have multiple people.

MS. MILLER: Okay. Yes, ma'am.

AUDIENCE MEMBER: So, I have some

questions about institutional controls, particularly around the fish con- -- the issue of fish consumption advisories.

MS. SCULLY: Um-hum.

AUDIENCE MEMBER: So, is there going to be any coordination between the fish tissue data that y'all are collecting from OU-4, and will that be submitted to ADEM to be considered for the stretch of Logan Martin Lake downstream from here and how that could potentially change the fish consumption, like the amount of PCBs in them? Because normal people don't look at fish and go --

MS. SCULLY: Right.

AUDIENCE MEMBER: -- I think there might be some PCBs in this today.

MS. SCULLY: Well, right now there's a no- -- no-consumption advisory for the whole --

AUDIENCE MEMBER: Right. I'm talking about --

MS. SCULLY: -- of Choccolocco Creek.

AUDIENCE MEMBER: -- downstream. No, I'm super-aware --

MS. SCULLY: Right.

AUDIENCE MEMBER: -- of that. I'm talking about downstream of OU-4, because there is going to be sediment. I mean, that's going to happen. And there could be -- I'm assuming there will be some fish tissue sampling that will take place throughout this process.

So will the data be shared to ADEM, and will ADEM accept it?

MS. SCULLY: ADEM gets all of our data.

AUDIENCE MEMBER: Okay, cool.

MS. SCULLY: I don't know whether it would replace their data, because they have their own process for --

AUDIENCE MEMBER: Right.

MS. SCULLY: -- collecting data for fish advisories. Right? There are --

AUDIENCE MEMBER: Yes -- I mean, yeah.

MS. SCULLY: -- they do their own thing.

AUDIENCE MEMBER: Right. I'm aware.

MS. SCULLY: But we will certainly report all of our data. All of our data will be available to anyone who wants it. And, as I mentioned before, we do a five-year review of the remedy where all the data will be summarized, and we'd kind of take a picture of how is it looking every five years to see whether -- you know, we can look at trends of what's happening in the sediment, what's happening in the surface water, what's happening in the fish, to know where we stand relative to our final goals. So every five years there is a five-year review report that will come out.

I know we've had a community advisory group that we give all this information to, and we're happy to share all this information on our website.

MS. MILLER: Ms. Wanda -- and then I'll come to you.

AUDIENCE MEMBER: Back years ago, in the early stages of all this stuff, and down through a few -- number of years, I've forgot how many number of years -- there's information at the library in Anniston, I know, and I remember something brought up at the PCB health study meeting. But the fact is, when you say no consumption of fish out of the Choccolocco Creek, so like somebody was fishing the other day, and they caught a fish about maybe six to eight inches long. No more bigger around -- about like that (demonstrating). You know, it was smaller. Those size fish was said in the paperwork and stuff up there, that you can eat those younger fish because they have not had the capability of getting the PCBs like the bigger fish. So those are really safer that you can eat, even though Pam is saying that you should not eat none.

But the fact of the matter is, is that people that are knowledgeable and know that you can eat the smaller fish that you catch, like bass, bream, catfish, and so forth, which we know catfish eat off the bottom. But the thing about it is is the fact that some people -- like one guy I know, that's the only way he could put a meal on the table. And there's a lot of people that go fishing just for that single purpose, because they don't have hardly any money or whatever the case may be, and they're hungry.

And some other people was fishing, and they caught a pretty good size fish. And I went down there and talked to them. I said, "Josh, if you" -- "you're going to throw that back?"

And he said, "Yeah."

I said, "Would you please give it to Josh, because he would take it and he would actually have him a campfire there, and he'd clean and he'd cook the fish."

You don't know how many people are out here fishing off of Choccolocco Creek and other places. But hopefully, one of these years and days -- this PCB issue will never be gone, just like the homeless issue will never be gone. God says the homeless you will have with you always. That's to keep us humble, and many, many other things in our lives when we deal about getting rid of homelessness.

But the fish, the small fish, you can eat the smaller, pan-frying size. They don't have the PCBs in them, because they're not out there that long. They're young. So --

MS. SCULLY: I don't know whether that's true, but there are ways to prepare your fish so that it has less concentration. At least get rid of the skin, get rid of the fat. You know, if you're going to eat it, at least do some measure of trying to control how many PCBs you take into your body. But the advisory is not to eat any fish, big or small, out of Choccolocco Creek, until we can confirm that it's not a risk to human health.

AUDIENCE MEMBER: Now, when you start stirring the creek up, yeah, I can agree with you, Pam, but you're not stirring the creek up yet. So when you start stirring the creek up, that's when I would say back off on probably eating fish out of Choccolocco Creek.

MS. SCULLY: Well, I think there's a risk right now or we wouldn't be proposing an alternative to --

AUDIENCE MEMBER: Well, y'all have it --

MS. SCULLY: -- to fix it.

AUDIENCE MEMBER: -- in your paperwork at the library; I read it.

MS. SCULLY: The -- and just so you know, we used to have hard copies of the administrative record at the library. Now what we have is, we advise the librarians to point people toward the computer and to help them get access to our webpage. All of the administrative record is now electronic.

The federal government has gone electronic. So to access the data, you'll have to look at it on a computer, and most of the libraries have a computer that's available for people to access.

MS. MILLER: But if there's something that you're looking for --

MS. SCULLY: Right.

MS. MILLER: -- just call us, and we can -- we can help you find it.

AUDIENCE MEMBER: I've got one other question.

MS. MILLER: Sir -- hang on. Let's go to somebody else. You're so full of knowledge, we have to give you little bits at a time.

Yes, sir.

AUDIENCE MEMBER: Your statement here says the EPA, in consulting with the Alabama EPA, will make the final decision on what's taking place. Since Alabama owns the creek and so much of the thing down to there, I understand everybody telling what's going to happen, but I don't understand standing here talking about something that you don't own. The State owns the water.

MS. SCULLY: I -- I can't speak for the State, but I believe the State wants to be protective of its citizens.

AUDIENCE MEMBER: I -- no, I -- I -- yes.

MS. SCULLY: Okay.

AUDIENCE MEMBER: I say inform people, but it --

MS. SCULLY: Right.

AUDIENCE MEMBER: -- already states right here that those two agencies are going to make the decision on what takes place.

MS. SCULLY: Right. But we're also going to consider the comments we get, and that's why we have a comment period.

AUDIENCE MEMBER: I know. I -- that's what I said. I can understand informing the people of what's --

MS. SCULLY: Right.

AUDIENCE MEMBER: -- going to do and how it's going to affect them, but it's like breathing the air. You're going to breathe the air that you get. Okay. Never mind.

MS. SCULLY: Okay.

MS. MILLER: Yes, sir.

AUDIENCE MEMBER: I just have kind of an operational question and comment. One of the things I do is monitor conservation easement compliance, and I've believe we've got 23 properties that I do that for. A lot of work has gone into reestablishing the riparian zone. Would you be controlling your contractors very carefully to minimize the damage? I know of at least three of the properties that I -- that I've been to site -- actual site visits on, will be touched.

MS. SCULLY: Well, we -- we may --

AUDIENCE MEMBER: And I'm concerned about the riparian zone.

MS. SCULLY: Right. We may be disturbing riparian areas. I'm sure we will, and we will have to try to reestablish vegetation in those areas or whatever habitat exists in those areas; we will try to restore as much as we can.

AUDIENCE MEMBER: Um-hum.

MS. SCULLY: I don't know what else . . .

MR. FOWLER: No, your concern is a good one. When you -- when you think about it, I mean, the riparian zone plays an important component of the -- of the system, whether it's, you know, biological species that inhabit the terrestrial area, the riparian zone, the water; I mean, that's the interface point. And there's been a lot done that's been positive that I've seen over the last 20 years to, you know, stop cutting vegetation along the edge of the creek and allowing, you know, vegetation to stabilize the creek.

So there will be certain things -- and, again, you know, we're at the beginning here, but things that we would recommend, with my design engineer hat on, I would say, look, don't take -- if you're going out to clean up the floodplain soil and you're in that understory area adjacent to the creek and the riparian buffer zone, don't take out a tree that's larger than six inches, you know, at this height here, and the diameter at breast height, which is typically where you measure tree diameter, don't take that out.

You might want to take the soil out around it, but leave those trees, those large trees. I mean, there's old growth trees along the edge of the creek there. Those roots run actually parallel to the creek itself and hold the bank together. So it's going to be critical as a part of the design.

And, again, I'm just an engineer, but, if it were me, I'd be commenting, look, please don't take the big trees out, because that is so important to try to have that area restored. If you took out the big trees, it would be much harder to restore those areas.

But, again, that's, you know, for you guys to look at and comment on, but, from an engineering perspective, that would be something that, you know, would be prudent practice.

AUDIENCE MEMBER: I'm more concerned about monitoring the contractors. I think you've got the design engineers, which I call them into respect, but I've employed lots of contractors over the years, and sometimes they need very close monitoring. And I didn't know in your operational, even in your estimates, not just restoring the damage, but preventing the damage.

MS. SCULLY: Right.

AUDIENCE MEMBER: And will you be

coordinating very closely, not with just the property owner, but with the conservation hold- -- easement holder, which -- and the easements vary of what's allowed to be done on that property.

MR. FOWLER: The short answer now --

AUDIENCE MEMBER: And I don't know will your -- will your engineer guy look at that easement to say?

MS. SCULLY: Right.

MR. FOWLER: I think two things. Right? When you think about from a design perspective, the landowner owns that land, so when we think about how we want to approach -- say it's an area that needs some creek bank work. The design for that really has to incorporate input from the landowner. It's his land. So whether it's a soft technique, whether it's hardened with riprap, I mean, that's going to happen during the design process.

And I will tell you, I've watched Gayle for two decades now. Right? She's the client, she controls the resources, and she adequately funds both her construction oversight team and the engineer of record to make sure that the work is done right. I mean, the best way to describe -- you know, when I'm working with my younger engineering staff, so the best way to describe working with a contractor is like working with a two-year-old boy. Right? You have to keep telling them what to do because they're going to do what they want to do.

And the fortunate thing for this project is Gayle provides those resources and funding to make sure that both construction oversight is done well, but also that the engineer is involved in that construction oversight process. And there is an additional layer of oversight from the regulatory perspective. But it's really the day-to-day oversight that's out there that Solutia funds that make sure that the contractor is, you know, staying the course.

MS. MACOLLY: And we work with the property owners. We did it during residential. We treat each property as a project unto itself. So they have input. There's an agreement. There's an access. So there is a -- there's dialogue throughout the whole process.

MS. MILLER: Okay. We've got just a

couple of minutes left. We have to be out of here at a certain time, so I'll take you, you, and one more, Ms. Wanda.

AUDIENCE MEMBER: Just a quick suggestion. I was at one of the listed libraries this morning, and the director had no idea about this.

MS. MILLER: Okay.

AUDIENCE MEMBER: So, to ensure equitable access to this information, maybe doing an additional training for these librarians or just making sure that they're aware.

MS. MILLER: Okay. Noted. Thank you.

Yes, sir?

AUDIENCE MEMBER: I guess as a suggestion, everybody has seen what's occurred with Boeing recently with oversight and their -- and their quality control. I came from the IG world investigating stuff like this, and I'm not getting a warm fuzzy that -- that EPA has a COTR or a sufficient for oversight of the pro- -- the program itself.

MS. SCULLY: Well --

AUDIENCE MEMBER: At least it wasn't

briefed.

MS. SCULLY: Okay. Well, what I have is, we have contractors that we have contracted. And the gentleman back here, Todd, is -- works for HGL. He's my current contractor. He has experts that are the same as Alan, and we bring in those experts to do oversight. They review all the doc- -- all the documents that are provided. They tell us -- they advise EPA on whether we're using the right procedures and doing the right activities.

So, you know, I personally haven't done what Alan has done. No. I haven't designed all these river remedies.

AUDIENCE MEMBER: Um-hum.

MS. SCULLY: I haven't seen them in action. I just finished construction down on the Gu- -- the coast of Georgia in Brunswick for the LCP Chemicals site, and, you know, I learned a lot from that dredging activity, but I don't have nearly his knowledge or the knowledge that HGL is going to be able to provide in doing oversight.

MS. MACOLLY: And I'd like to say too, Pam has multiple different contractors that she pulls from --

MS. SCULLY: Right.

MS. MACOLLY: -- for -- you know, they have residential contractors. She has human health contractors. She has engineering contractors that she pulls from. But on top of that, I'm required -- on a monthly basis, I submit a monthly report to the EPA that reports any kind of data, any kind of access, all the progress, and any kind of issues that have occurred. And I've been submitting those back till since before I had to dye my hair.

(LAUGHTER)

AUDIENCE MEMBER: So is anybody from Alabama Power in this room? Is that -- is that -- they don't need to be here because you're here, and you're -- and it's like coordinated?

MS. MACOLLY: We've taken on the responsibility of it, and that's a big bear to fight.

AUDIENCE MEMBER: Yeah. Well, because they -- because they called me up, sent me letters and stuff that said, "Hey, you know, you might want to" -- "if you're putting more dirt out here, you might want to put a silt fence down." No, they didn't say "might"; it said, "You will put a silt fence down." I'm like --

MS. MACOLLY: But that's more water quality, as opposed --

MS. SCULLY: Right.

MS. MACOLLY: -- to PCB impact.

AUDIENCE MEMBER: Yeah, I know.

MS. MACOLLY: But we have a relationship with Alabama Power. We're going to have to work with them because they own Jackson Shoals Dam and some of the work, and they own --

AUDIENCE MEMBER: Yeah.

MS. MACOLLY: -- some of the other property. But we've had a pretty good relationship with them in working with them and --

AUDIENCE MEMBER: Yeah.

MS. MACOLLY: -- and doing this. And, like I said, they put us as part of their permitting process, so that we could make sure. Because a lot of times the permits have come through, we -- our people, you know, we look at the data that's around that area, and 95 percent of the time, we don't have to be involved because there's not PCB impacted material that has to be dealt with.

AUDIENCE MEMBER: One thing I'd like to mention to finish --

MS. MILLER: We have 30 seconds.

AUDIENCE MEMBER: Okay.

AUDIENCE MEMBER: Oh, Lord.

AUDIENCE MEMBER: -- is when this work begins, we should be -- or, if you want to, you can go ahead and start watching it anyway -- is that, since I've been out there where I've been for 24 years, and some years it does not flood. But, then, some years it's got up to one foot, two foot, three foot, four foot. In 2003, it got up to six foot deep. Okay. I was not there; I was in Talladega.

And when you go and you watch and see -- you see how fast the water is running in Choccolocco Creek when the floodwaters do get up. You come home at 12:00 o'clock at night, go to bed, and get up at 9:00 the next morning; the rain has quit. A gully washer all night long. I get up three feet of water. I go get my Bible out of my car, get my photo album on top of clothes, my Bible is soaked.

The floodwaters come up another foot, four foot, okay, because I didn't have my vehicle up on a hill.

But then when you've got lightning that strikes and it goes off like a bomb, and these big, humongous white oak trees down there around where I'm at on the creek, and they're right there on the creek. Well, two of them are totally gone. One, because I watched the split that was so small for years. And that split kept going, kept going, kept going.

So back at that time, the dogs started barking at 4:00 o'clock in the morning. I wasn't awake, but I heard the dogs barking. Pop, pop, crack, crack, kaboom. I said, "Oh, well, there goes that tree." And it was about -- probably about this big around (demonstrating), about 50 foot tall or long- -- or taller.

Thankfully, Melvin Watts, that lived across the property from where I'm at -- he passed away early this year or last year -- he'd come and walked down at some point in time, and he got the Corps of Engineers to -- Corps of Engineers to come out there at some point and meet with me, and they cut that one big white oak out of the Choccolocco Creek.

And then another time -- this was in one spot, and down here was another spot. And then eventually, at another time, one of those big white oaks the same size, fell in the Choccolocco Creek again. That one had to be cut out by the Corps of Engineers also.

So, see, that's why I say the Corps of Engineers are so well needed when you need to get the creek freed up, because as long as these trees are out there in the creek, you're going to have floodwaters in areas like where I'm at.

But yet, I'm country, and I'm a tomboy on top of that. So God made me that way. He made me an advocate, and he made me -- gave me boldness to speak. But start watching the creek when the rains come up and the floodwaters come up, and you will see things and you will -- like, you know, we see it on the flooding and stuff and everything.

But when you watch it yourself, especially when you live right there, it has got -- it's violent, and it has a mind of its own, and trees, like we know -- I walked back out on the Coldwater Creek side because I was down there at the camper. I had it close to the creek. I didn't know it'd flood like it did. And finally I walked out there years ago, back in early 2000, 2001, 2002, and somewhere in there a creek -- a tree had fell. I could hear it way back in the woods.

And I walked way back there, and it was right on the edge of the bank. What happened, the dirt had finally eroded underneath it and finally that big tree -- not as big as those white oaks, but it fell into the creek. So you see what I'm saying?

MS. SCULLY: Right.

AUDIENCE MEMBER: That's what happens on the creek bank when you live on a creek bank.

MS. SCULLY: Right. And the areas that are contaminated on the creek banks are the ones we're going to be most concerned about, and we're going to try to stabilize those creek banks. That's part of our source control remedy.

So thank you guys all for coming tonight. If you have any questions, feel free to email or call me. You can submit comments. We will address them as part of the responsiveness summary and the record of decision.

MS. MILLER: Or you can see us next Saturday.

MS. SCULLY: Come see us Saturday.

MS. MACOLLY: Wait -- and the next 6:00 o'clock meeting, if Pam is okay with it, I can have Alan bring the dredging --

MS. SCULLY: Right, we'll bring some dredging photos --

MS. MACOLLY: -- photos --

MS. SCULLY: -- if they'll help.

MS. MACOLLY: -- and talk to that.

AUDIENCE MEMBER: Bring the volume control, so we can hear how loud it is.

MS. SCULLY: Bring the volume control so you can hear what?

AUDIENCE MEMBER: How loud -- how loud it is.

MS. MILLER: How loud it's going to be.

MS. SCULLY: Oh.

AUDIENCE MEMBER: Thanks for putting it on, guys.

MS. SCULLY: Okay. Same to you. Thank you for coming.

MS. MILLER: Thank you-all for coming. Thank you.

(THE PROCEEDINGS CONCLUDED AT 8:10 P.M.)

C E R T I F I C A T E

STATE OF ALABAMA)
WALKER COUNTY)

I hereby certify that the above and foregoing proceeding was taken down by me by stenographic means, and that the questions and answers therein were produced in transcript form by computer aid, and that the foregoing represents a true and correct transcript of the proceedings occurring on said date.

I further certify that I am not of counsel, nor related to any of the parties to this action; nor am I in anywise interested in the result of said cause.

Witness my signature and seal this the 29th day of June 2024.

SUZANNE LEE, CCR
Certified Court Reporter
ACCR No.: 476
Expires: 09/30/24

Notary Public, State of Alabama at Large
My commission expires January 5, 2025

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BEFORE THE UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

ANNISTON PCB SITE
OPERABLE UNIT 4
PROPOSED CLEANUP PLAN

Anniston, Alabama

PUBLIC MEETING

WHEREUPON, the following proceedings were transcribed by Suzanne Lee, Certified Court Reporter No. 476 and Notary Public for the State of Alabama at Large, at the Oxford Civic Center, 401 McCullars Lane, Oxford, Alabama, on July 23, 2024, commencing at approximately 6:04 p.m.

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APPEARANCES

FOR THE EPA:

Angela Miller . . Community Involvement Coordinator

Pam Scully. . . . . Project Manager

SUPPORT PERSONNEL:

Gayle Macolly . . . . Project Manager
PRP Group

Alan Fowler . . . . Consultant for
PRP Group

TABLE OF CONTENTS

MS. MILLER: Okay. We'll go ahead and get started. If other people come in, they can join us.

Thank you so much for coming out in this beautiful weather to join us. Tonight is our farewell tour, so I'm sorry. It's our last night. My name is Angela Miller. I'm the community involvement coordinator for EPA, and we're here tonight to talk about a proposed plan to remedy the Operable Unit 4 of the Anniston PCB site.

We're in a comment period. The last day of the comment period is July the 30th. And we'll talk about several ways that you can submit your comments. Tonight is one of those. I have a court reporter that is transcribing the entire meeting. And since most of y'all look Baptist because you're in the back, when we do get to the Q&A, if you would come up, and there's a mic right here, so if you would just at least walk up here.

If you don't want to walk up here, let me know; I'll bring the mic to you. But at the last meeting, those that were here, we had a lot of people, and we had microphones just spread out, and that was really hard for her to get the transcript, and the transcript is very important for our final document, which is the Record of Decision.

So, if you would help us out and come here and -- during the Q&A and ask your question up here. I think put one right here.

MS. SCULLY: Or you could move to the front.

MS. MILLER: Yeah. I could put one right here, and they can just walk up in the middle.

THE COURT REPORTER: That's fine.

MS. MILLER: Let's do that. Let's do that.

Okay. So we've got a presentation. We're going to get through the entire presentation before we ask anything, because we tried to be kind last time, and y'all took it away. So --

AUDIENCE MEMBER: You're in Anniston, Angela.

MS. MILLER: I know. We said, "We're in Anniston." I know; I remember. I remember those days. I'm just joking with y'all; you've got to have fun. Right? If you're going to be out in the rain having a meeting, you've got to have a good time.

So we'll get through the entire presentation, and then we'll open it up for Q&A. The presentation is about 30 minutes, and then y'all can have the rest of the night to ask your questions. Again, it's all going to be transcribed, part of our final document.

The restrooms, in case you don't know, if you go out and take a left and go straight to the end, the restrooms are down there.

And, with that, I'll go ahead and turn it over to Pam, and we'll get started. Thank you, guys, for coming out.

MS. SCULLY: All right. Thank you for being here. My name is Pam Scully. I'm the EPA remedial project manager for the Anniston PCB site. This -- tonight we're going to talk about the proposed plan for Operable Unit 4, which is Choccolocco Creek and its floodplain.

I'm thinking I could click here, but --

MS. MILLER: No, you can't. That's just a pointer.

MS. SCULLY: Okay. So what we've done is

divided the site into chunks that we can look at based on their geographic location or their complexity. So, the first operable unit, Operable Unit 1, we started a residential cleanup under a non-time-critical removal agreement, so that was Operable Unit 1.

We also had to conduct an RI/FS for -- a remedial investigation and feasibility study to make sure we didn't have to do additional work or institutional controls for the residential area. So we combined Operable Unit 1 and Operable Unit 2, which was residential and nonresidential properties that are around the Solutia facility and run along the floodplain for Snow Creek.

The facility itself was investigated as Operable Unit 3. It was the facility and two adjacent landfills.

And then Operable Unit 4 starts at Highway 78, right up the road here in Oxford, and runs down to where Snow Creek and Choccolocco Creek join together. And it also runs the length of Choccolocco Creek from that point down to Lake Logan Martin -- or Logan Martin Lake; sorry.

Also outlined here in this -- I want to say it's a brown color. I'm not sure what it looks like out there, but this is the watershed, so all the water that impacts land in this area drains through this watershed of Choccolocco Creek down to the Coosa River.

Now, before we start talking about the remedy itself, let me tell you a little bit about the Superfund process. We -- Superfund is what's created really to handle hazardous waste sites that are not currently operational. This facility is operating, but PCBs haven't been manufactured since 1971, so it -- PCB impacts sort of fit into the Superfund process.

So sites are discovered typically by the State, or citizens can report sites, but typically it's the State that goes out and investigates areas where they think they might have impacts and they don't have a way to get that site cleaned up. And what happens is, EPA then takes that site. The State usually does a preliminary assessment or a site inspection to determine whether or not there's a hazard to human health and the environment based on the contaminants at that site, and, if there is, then the site gets -- and the site scores high enough on a hazard ranking system, then it gets placed on the NPL, the National Priority List, as a Superfund site.

This site is a little bit different. It's not on the National Priority List. It's considered a Superfund Alternative Approach site because the responsible party stepped up and agreed to go ahead and do the investigation and feasibility study without having the site listed on the NPL. So it saves time and money to do it that way. So we -- this site is being done as a Superfund Alternative Approach site, but it follows the same process as a site on the National Priority List.

So after the site, we get an agreement to implement the investigation. We do a remedial investigation. Lots of times you'll hear us say we're doing an RI. It's just our shorthand for "remedial investigation." I'll try not to use too many acronyms, but it's part of our process. We use a lot of acronyms.

We do the remedial investigation and the risk assessments together just to figure out whether or not we have impacts at the site. And then, based on that information, we do a feasibility study to see how can we clean up the site.

Once we have the feasibility study, we can come out with a proposed plan, which is the point we're at right now. We come out to you and say, you know, these are the alternatives we've looked at in the feasibility study, this is what we think is the best remedy, and we come to you and get your comments on that feasibility study.

We have done this twice already at this site. We had -- in 2011, we came out with a proposed plan and signed a Record of Decision for Operable Unit 3, which is the facility and the two adjacent landfills. In 2017, we came out with a proposed plan and Record of Decision for the OU-1 and OU-2, which is the residential/nonresidential area around the facility and downstream along Snow Creek.

So this is our third proposed plan. After we have this last meeting and the comment period ends, EPA will take the information from you that you've submitted in your comments and look at our proposed plan, we'll make adjustments as we need to, and we will come out with a Record of Decision, which is the basis for us taking action.

Once we have the Record of Decision, we will then negotiate with the responsible parties how to -- for them to clean up the site. As I said before, we have negotiated for them to investigate the site. We have to do a further negotiation for them to clean up the site, and that gets lodged and entered by the court. The Northern District Court in Birmingham is where we go for that.

Once we have that agreement, we will have to conduct a remedial design. I know a lot of people asked at the last meeting lots of detailed questions about where you're going to dewater your sediment, where are your trucks going to be running. All of that information is really determined during the remedial design. We have to know what the remedy is before we can design it. So the feasibility study is us presenting options to you and telling you what we prefer, and the Record of Decision sets that option that we're going to design firmly, so that we can negotiate an agreement.

So we do the remedial design, then we perform the cleanup and what we call a "remedial action," and then we follow up if any waste is left in place through the remedy, whether it's in subsurface or under a cap or any way that we have to be able to maintain that remedy, we will do five-year reviews. So the law requires that every five years EPA comes back and makes sure that the remedy we put in place is still effective.

So a lot of you already are familiar with this site, but the primary source for PCBs at this site was a production facility in Anniston at 702 Clydesdale Avenue. They began producing PCBs there in 1929 under the Swann Chemical Company. Monsanto purchased the facility and that process in 1935 and produced PCBs until 1971. The facility is still active, but the PCB facility has been demolished and has been placed in one of the on-site landfills, so it no longer exists at the site and they don't -- they don't manufacture PCBs anymore.

So how did the PCBs get down to Choccolocco Creek? Primarily the way PCBs got to

Choccolocco Creek and to the floodplain of Choccolocco Creek is through the surface water pathway. So at the facility itself, water discharges to the 11th Street ditch, which then discharges into Snow Creek, Snow Creek flows down all the way to Quintard Mall and goes under the mall and then comes out past the water treatment plant in Anniston into Choccolocco Creek.

Because there's a lot of places where the water gets retained in this area when there's a large flow, Choccolocco Creek is coming in and Snow Creek is coming in, so there's a huge area where water pools back here. That's what we call the "backwater area." So we'll -- a lot of times we'll talk about what we're doing in the backwater area. And that's just water can't get through fast enough, so it kind of pools in this area, and we get a lot of contamination that settles out, it slows down, and then it goes on for Choc- -- the rest of Choccolocco Creek down to the lake.

So, before EPA got involved, there were a number of different actions that had started to be taking place under the State program. And the State had approved two final corrective measures. One of them was the bridge at Highway 21. Another one was a large waste disposal area near the Choccolocco Creek Wastewater Treatment Plant for soil that was taken out of the ground and out of the creek at that time when they were expanding the plant.

So those two actions had been finalized. Then there were a series of four interim measures that took place in Oxford Lake Park. When you drove in, if you drove in on Recreation Drive, you passed these areas. The tennis court area is one of the areas. The Miracle Field is built on an area that had impacts that we installed an interim measure on. The parking lot for the softball field is a cap over some low-level PCBs, and the ball field itself had to be remediated because of PCB concentrations in the ball field.

AUDIENCE MEMBER: Pam Scully, can you back up when you were saying about the Tull C. Allen Wastewater Treatment Plant, when it was built?

MS. SCULLY: I'm sorry?

AUDIENCE MEMBER: You were saying dirt or stuff was taken into the Tull C. Allen Wastewater

Treatment Plant when it was being built?

MS. SCULLY: No. The wastewater treatment plant, they were doing an expansion and they dug up some contaminated soil that had to be addressed. And it's in an area across Snow Creek from the wastewater treatment plant and it's been capped.

AUDIENCE MEMBER: Do you know what year that was?

MS. SCULLY: Two thousand two or '3?

Gayle? I don't know. It's around that time.

AUDIENCE MEMBER: I've been out there since 2000 and I don't --

(SEVERAL AUDIENCE MEMBERS SPEAKING SIMULTANEOUSLY)

MS. MACOLLY: Yeah, it was '98 -- I want to say '98, '97/'98 time period.

MS. SCULLY: The capping took place in 2007.

MS. MACOLLY: Seven, yes.

AUDIENCE MEMBER: The activity took place before that.

AUDIENCE MEMBER: That's when they built

the incinerator.

AUDIENCE MEMBER: No, it's not.

AUDIENCE MEMBER: Uh-oh.

AUDIENCE MEMBER: Go ahead and finish your program.

MS. MILLER: Okay, yeah.

MS. SCULLY: In addition -- in addition to those interim measures, we have a number of infrastructure support projects in order to make sure that we didn't stop development and progress from taking place. Utilities needed access, developers needed access, so there are a number of projects that are identified in the proposed plan.

This just shows you some of those locations where we did these projects to help. Like Colonial Pipeline wanted to replace some piping, or the developer wanted to develop over where Bojangles is constructed on Highway 78. So a lot of those projects we oversaw, but they're really just to help support developers and people that needed to maintain facilities.

So we also -- as I mentioned before, we did a large residential cleanup in all of Anniston.

Most of the residential cleanup took place up in OU-1, as I talked about before, but there were some properties in OU-4 that we investigated and had to clean up due to -- because they were residential properties and they were above our cleanup goal.

So we identified 59 properties to sample. Twenty of those properties had contamination above our cleanup goal, which was one milligram per kilogram, or one part per million, PCBs. And 19 of those properties have been cleaned up. One property is still remaining to be cleaned up, and when we get access to do that, we'll finish that property.

So, aside from those things that have already occurred in the flood plain with the residential and the interim measures and infrastructure improvement projects, we went out and looked at the floodplain and we sampled soil. We sampled groundwater. We sampled sediment along the creek. We sampled surface water. We had fish concentrations, and there was also sampling done for the ecological risk assessment that involved a lot of different organisms, both on land and in the water.

Risk terminology, what do we do with all that data? Once we get all that data, we then have to figure out, okay, is it a risk at this concentration for the exposures that are going to occur in this location? So for risk, for human health, we look at cancer risk and noncancer risk. For cancer risk, we have a range of risk that EPA finds acceptable.

So if you have a one in three chance of getting cancer in your lifetime by just living here, we will not allow that cancer risk to increase more than an additional one in 10,000. So we have a risk range. If the increase in cancer, it has a probability of one in a million, less than one in a million chance of increase, then we can't take an action. If it has an increased probability of occurring greater than one in 10,000, then we can take an action, and we have to take an action under Superfund regulations.

So a lot of times you'll hear us say one times ten to the minus six, one times ten to the minus four, that's the cancer risk range. I know that's difficult to understand; it's just a probability of increasing the amount of cancer that occurs in a community. Those are extremely low levels compared to the one in three chance you already have of getting cancer, but that's written into the Superfund law, that that's the risk range we operate in.

We also, though, look at noncancer risk. Is there something that's going to affect reproduction, growth? Is it going to create tumors or any other type of effect? Then that's a noncancer risk. And what we use for that is, we call it a "hazard index." It's used to measure that, and we require that the hazard index be less than one to take no action, and if it's greater than one, then we need to take an action to improve -- to reduce that risk.

So, from the human health risk assessment, what we found was PCBs are the primary contaminant-driving risk. The highest risk that we found was associated with consumption of fish with contamination.

No unacceptable risk was found for any direct contact on the floodplain. And we've looked at recreation, farmer, utility. We looked at both juvenile and adult recreation. So we looked at different activities, and we evaluated those and did not find a direct contact risk to human health.

But when we get to ecological risk, that's a different story. So we looked at both terrestrial receptors, such as birds and mammals or worms that might live on -- in a land-based environment. We also looked at aquatic and riparian areas where you would have an organism that might eat fish. The same as the risk for you to eat fish, it's a risk for them to eat fish. So there's a lot more -- there's a lot more receptors when you look at the ecological community.

So we found that there were risks to both the aquatic, or water-based, and land-based receptors. PCBs were the -- were the primary driver to those receptors also, and the fish-eating receptors were most at risk.

So we looked at all of this data together, and we said we know we have ecological risk to land and water, and we have human health risk primarily to water, so -- to fish. So we developed alternatives to look at for the residential soil that we still have remaining out there, that one property that hasn't been completely cleaned. We wanted to look at the interim measures that were -- that were approved under the State program because they were never finalized. So we want to either finalize them or take another action in order to ensure that they stay protective. We want to look at nonresidential soil, which is just the floodplain soil that's not being used by a resident. And then we had to look at the creek banks and the sediment of Choccolocco Creek and that small portion, the lower portion, of Snow Creek.

So when we -- when E- -- when CERCLA -- or when Superfund looks at alternatives, we're required to evaluate them against each other using nine criteria. The nine criteria -- there are two threshold criteria that, if we carry an alternative forward, it has to meet these two threshold criteria, which are overall protection of human health and the environment, and it has to comply with environmental laws.

So after -- if the remedies -- if the

alternatives meet those two criteria, then we look at primary balancing criteria. What's the long-term effectiveness and permanence of the alternative? Does it reduce toxicity, mobility, and volume? What's the short-term protectiveness? Is it easy to implement? And is it cost-effective?

And then the final two criteria are the ones that are modifying criteria, and they're the ones that we can't look at until after we have this public comment period. And that's the State acceptance of the remedy and the community acceptance of the remedy.

Okay. So for residential soil, you can see -- you may not be able to see it on this map, but if you move closer, you can see that there are -- we've color-coded on maps in the feasibility study -- and the feasibility study is available on our website for all of you to look at if you want to.

We looked at areas where we found contamination. We have -- we know we have one property that remains to be cleaned up becau- -- and we haven't been able to do that because of access issues. We also have five yards of the ones we've cleaned up where PCBs are in the subsurface between one and ten milligrams per kilogram, and we have 14 structures that may have PCBs under them.

MS. MILLER: I'm sorry; your phone was going off.

MS. SCULLY: So what we want to do is, in looking at our remedial alternatives, we say, what is the objective of looking at residential? Our primary objective is to reduce exposure of residents in direct contact with PCBs on their residential property above levels that are protective.

So the -- what we approve -- what we propose is to carry forward the non-time-critical removal action goals, which were surface soil between zero and 12 inches needs to be less than -- have PCBs less than one milligram per kilogram, and subsurface soil greater than 12 inches below ground surface needs to have PCBs less than 10 milligrams per kilogram.

And when we looked at this, we thought, well, let's -- we looked at three different alternatives. The first alternative that's required for all -- all the alternatives we evaluate, we have to compare to a no-action alternative. And, in this case, the no-action alternative would not be protective in areas where we have not conducted a removal, and we don't have any long-term protections to make sure those subsurface PCBs are not going to come back to the surface of someone's yard.

So RS-2, the second alternative, was to go in and clean up the last property and to have a soil management plan and -- or ICs or -- institutional controls or some way to make sure that people don't bring contaminated soil to the surface and cause an exposure again on residential properties.

The third alternative is to go in and excavate the soil that we can get to in the subsurface that's greater than one, so that we don't have to worry about that exposure occurring if someone digs soil up and it becomes surface soil and causes an exposure.

So these alternatives range from zero dollars to 0.4 million dollars or 400,000 dollars to 1.4 million dollars.

So what we've proposed is to do RS-2.

That's our preferred alternative. It includes cleaning up the remaining property and then monitoring the properties that still have PCBs greater than one in subsurface or potentially beneath structures. It's the same alternative that we have already approved in Operable Unit 1 and 2 for the properties in that area. We have been implementing an interim plan to manage that soil and have been successful so far.

Okay. The next set of alternatives we looked at were the interim measures. And there were three interim measures that were very effective at preventing exposure, and those are the softball field parking lot is a paved area with multiple layers of engineered layers that protect -- or prevent contact with the PCB-contaminated soil. We have the tennis court complex, which is a paved area. There's no contact with soil in that area. And we have the southwest portion of the park.

So the concentrations you see on this map are what's beneath those covers. So there are some high concentrations beneath these covers, but the covers themselves are very substantial, and we didn't feel like we needed to look at those.

In the softball field, the cover is a soil cover. In the infield, it's a 12-inch cover. In the outfield, it's a 6-inch cover primarily, and in some areas, in these walkways, it might only be a 3-inch cover. But these are the concentrations that are beneath that cover. So what we looked at, we decided that we needed to look at the effectiveness of the softball field cover, and that's what we evaluated.

So what we did was, we took all the sample results and looked at to see what would a very conservative exposure be if the -- to that material that exists out there. And in human health we always look at zero to 12 inches as an exposure area. For -- below that is typically what we would look at for a utility worker or something like that.

But we found -- we calculated what that exposure concentration would be. And that exposure concentration -- oh, go ahead.

What we found out is that we need to ensure that this remedy stays effective and prevents people from coming in contact. We didn't set a specific goal because what we found in these areas is that they're already lower than what a recreation exposure would create an issue.

So -- so the concentrations in the ball fields in -- for the top 12 inches do not create a risk, and, because of that, we only have two alternatives. In the feasibility study, if you've read the feasibility study -- it's a very long document, but, if you look at it, we -- we considered five different alternatives.

But, because the second alternative, just long-term monitoring and maintenance of the soil caps that already exist, was protective, it wasn't ef- -- we didn't have additional risk to do the additional -- look at the additional alternatives, so we dropped those alternatives.

So we only have two alternatives, either do nothing or maintain what's out there. And we are proposing to maintain what's out there at a cost of 400,000 dollars.

Yeah, so -- so Item 2, the long-term monitoring, maintenance, and soil management is our proposed alternative. The par- -- the softball field is very well maintained. It's fenced off. It's not an area where people can just go and dig up soil. So we feel like this is a good alternative, and that the park is deed restricted.

And we work closely with -- or Solutia works closely with the PRPs. We've had several projects where we've come out and assisted in putting the lighting in at the park, doing soil management of any activities. They built a garage, and we came out and managed soil for that activity. So, so far we've been able to manage any kind of projects they've had in the park to deal with contaminated soil.

So, the rest of the floodplain, though, is very large. As you can see from this, we've looked at land use, and the primary land use in OU-4, outside of residential or the interim measure areas, is agricultural, which is in yellow, and forest areas, which are in green. That accounts for about 87 percent of the land use activity in OU-4.

There is some commercial and industrial, which is this purple color. There's some scrub areas, and there's very little residential that's in this area.

So we looked at the soil results as you are at the upstream end of Snow Creek of the OU, which is where Snow Creek is, as you go down toward Lake Logan Martin, the concentrations in soil are much higher closer to this area, and, as you go down toward Lake Logan Martin, the concentrations are much lower.

So what this diagram shows you is, we created -- we looked at exposure areas along the creek. There were twenty- -- I want to say 25, but it's probably 27. I can't remember the number, but there's a lot -- a lot of different exposure areas that we looked at. We looked at the soil in each area, and what we found was, and what this shows you is, the areas where we have bright colors are primarily in the first 10 miles of Snow Creek.

And then downstream the -- and this diagram is Choccolocco Creek, and it's split in two. So this is the eastern end, and then this is the western end. It's just split on this diagram, so we could get it all in.

But primarily the PCB contamination is in the first 10 miles of the floodplain.

So we -- and, again, we looked at five different alternatives in the feasibility study. However, because nonresidential soil is an ecological -- it's only a risk to ecological receptors and not to human receptors. We looked at protecting the ecological receptors in the top 10 in- -- the top 6 inches of soil along the floodplain, which is the primary exposure area.

And we looked at some alternatives that considered subsurface soil, but, since we didn't show a risk to the subsurface soil, taking more material out of the subsurface, we're not really allowed under Superfund to consider those alternatives. So we have proposed to excavate the top 6 inches to meet our cleanup goal for ecological receptors.

Of course, there's a no-action alternative. The alternative that we've looked at is 30 million dollars, and so that's the preferred alternative. Soil from the zero-to-6-inch below ground surface, which is a risk to ecological receptors, will be excavated and backfilled with clean fill to reach a PCB goal of 6 milligrams per kilogram in the floodplain.

There's also a conservation corridor that, if you own property in this area, you may be familiar with, in order to help protect the riparian area. There's a conservation corridor, and there are deed restrictions on land. And we'll use whatever process is -- seems most appropriate as we go along the floodplain to protect the areas that have subsurface soil greater than one.

So then the next set of alternatives we looked at were the creek banks and the sediment alternatives. And the creek was really divided into ten reaches. And one of the reaches is -- let me get this. Okay. One of the reaches is Snow Creek, the area on Snow Creek before it reaches Choccolocco Creek, and then there are nine reaches further downstream. All of the areas that we looked at had a floodplain except for reach C-10 at the end where it becomes more of an embayment area and the lake controls the water level and we don't have really a floodplain in that area. But the floodplain area is in reaches C-1 to C-9.

We also looked at grouping some of these areas into assessment areas in our risk assessment, so we have a lower assessment area, a middle assessment area, and an upper assessment area.

When we get to the creek, there are a lot of different things we're trying, objectives that we're trying to reach. We're trying to restore fish for ecological receptors. We're trying to restore fish for human receptors. We're trying to make the sediment protective for the bugs and critters that live in the sediment. We're trying to prevent PCBs from washing downstream. So all of these different objectives are outlined in the feasibility study.

And we looked at different cleanup goals. For the creek banks, we set the cleanup goal as not to exceed 2.6 milligrams per kilogram. That's really based on the sediment not to exceed cleanup goal of 2.6 because the soil from the banks erodes into the sediment. We want to make sure we're not causing additional contamination when that happens.

Our overall goal for sediment is to reach a 95 percent upper-confidence limit, which is just a very conservative average. And it is 0.1 milligrams per kilogram in each reach.

For surface water, there are a number of water quality standards that are available for PCBs, and we're trying to reach those goals. There's one goal to protect wildlife, and there's another goal that's extremely conservative to protect human health.

For fish, we also are studying standards for fish tissue, fish tissue upstream of Jackson Shoals and fish tissue downstream of Jackson Shoals. And then we have whole body fish that we want to reach a certain number to protect ecological receptors, because they don't fillet their fish.

Okay. So the target remedial areas that we're looking at based on those goals are the -- so, you can see that this is the Oxford Lake Park area, and we're somewhere over here (indicating). So from Highway 78 down to Choccolocco Creek where the water backs up into Choccolocco Creek and then past Friendship Road for a -- a little ways down past Friendship Road, we know all of that area is contaminated, needs to be excavated, and these areas, the water moves very fast. The area that backs up into this slower moving area is -- it's just a slower area and the sediment tends to settle out in that area, and that's where we have some of our highest concentrations of PCBs.

Downstream there are approximately 13 acres that we also need to look at. And, you know, we've identified where those are. There are different areas along this map, and I know you can't tell where those are. These -- this diagram points to where the concentrations are greater than 2.6 milligrams per kilogram. Obviously this data is not from just yesterday, so, before we can do any of this work, as part of the remedial design, we'll have to go back out and sample and make sure we know where these concentrations really are, because sediment tends to move.

So this is where we know they were when the samples were collected, but we have to sample to find out where they are today and if they're still in those locations. In the backwater area, we expect them to be still there. They don't really -- it's sort of a sediment trap area in that location and the sediment tends to stay there.

So for the -- because we know that creek banks also erode, we looked at where we have major, severe erosion, where we have minor erosion, where we have moderate erosion of the creek banks. If those areas coincide with areas where we have concentrations of PCBs greater than 2.6 milligrams per kilogram, then we're going to need to do something to stabilize those areas, so that we don't get a recontamination of the sediment.

So we did look at two different conditions. We looked at what if we just did moderate and severe erosion. We estimate that there's 17,100 linear feet of creek bank that will have to be stabilized. If we looked at minor, moderate, and severe erosion, it's about 39,800 linear feet.

So we looked at -- also considered how would we stabilize these creeks, creek banks. For anything that's not severe, we hope to use more natural methods to stabilize the creek with logs or root wads and different ways to make it more natural. But in the severe erosion cases, we expect, at least in Snow Creek, that we're going to have to cut the banks back and use riprap to stabilize Snow Creek parts.

And then the rest of the banks, you know, where we have -- in Choccolocco Creek where we have severe erosion, we expect to have to modify the creek bank in order to make it more stable. These are just conceptual drawings. I think that when we get in the field, every property is going to be a little bit different. We're going to have to do a lot of engineering to figure out what we're actually going to do.

If you're a property owner, we're going to work with you on how we stabilize. And obviously we can't do it without your permission, so we will work with you if you're a property owner in this area to figure out how we'll stabilize your creek banks if you have PCBs and severe erosion or any of the other erosion activities.

So we looked at seven different alternatives for sediment. And this table is really just kind of to give you an overall glimpse of how those alternatives look against each other. So we have the no-action alternative, which is SED-1, and we're not doing anything. So SED-2, we considered, let's just stabilize severe and moderate erosion on creek banks that have PCB contamination above 2.6. Let's dredge the areas that have high energy.

On that map, I showed you the pink line coming down where the energy was very high. That's the area we're talking about. Let's dredge that area, and then let's place something in the low-energy area to capture any contamination in that area. It's a material -- a material you would put over the top of the sediment to try to keep that contamination in place, so it's in-place treatment.

All of our alternatives consider monitored natural recovery. So we'll -- we can remove the highest concentrations of 2.6 milligram per kilogram, and then we would use monitored natural recovery, which is incoming sediment covering up areas and high concentrations of sediment being replaced with clean sediment. And that would take approximately 30 to 35 years in SED-2. It also involves off-site disposal of all the contaminated sediment and soil from the banks. And it involves mixing the high concentration areas in the backwater area -- or no, it involves in-place treatment of principal threat waste, which would be in that backwater area.

Principal threat waste is concentrations that are really, really high. And at this site, we've always used 500 milligrams per kilogram. In the backwater area, there's at least one concentration, I think, that's 930 milligrams per kilogram. It's at a depth of 2 to 3 feet, so it's not right at the surface, but it's considered principal threat waste. So principal threat waste is one of the criteria we always look at at all of our alternatives.

So SED-3, what did we change in SED-3? In SED-3 we added minor erosion for creek bank stabilization. It reduced the monitored natural recovery to 20 to 30 years. And other than that, it's essentially the same as SED-2.

For SED-4 we went back to let's just do severe and moderate, but let's excavate or dredge the high-energy and the low-energy areas. It still brings us back to a larger -- a longer monitored natural recovery time, and disposal is off-site, and principal threat waste is being treated because the excavated soil is being stabilized with cement before it's shipped off-site.

For SED- -- which one am I on? SED-4 -- SED-5, we went back to, okay, let's do the severe, moderate, and minor erosion. Let's dredge, but let's install a soil cap in the -- in the low-energy areas. And that, again, would -- it was off-site disposal for what we -- for the sediment and soil we take out, but it doesn't have any impact on principal threat waste.

Then SED-6 we looked at just dredging everything out and taking it off-site.

For SED-7 we looked at dredging everything out, and it involved taking the principal threat waste and shipping it off-site to an incinerator for treatment, rather than disposing of it in a landfill after it's been mixed with cement.

So, again, we had to consider the seven criteria, other than community acceptance and State acceptance. We compared these alternatives. The no-action alternative doesn't comply with RAOs and it's not protective. But these alternatives range from 43 million to -- on the next page -- up to 54 million. So -- and they're arranged in order of the dollar amounts. So SED-7 is the most expensive and SED-2 is the least expensive. But we compared all of these alternatives. This table is available in the feasibility study.

So SED-6 is what EPA prefers to do. It requires excavation of sediment in the high- and low-energy areas of OU-4. It stabilizes more creek banks and helps ensure that recontamination doesn't take place. We didn't feel that shipping material off-site would gain anything. It doesn't reduce the risk any, so we didn't go with SED-7, which was the next alternative that was similar to this one. So the total cost of what we've proposed in the preferred remedial alternatives is 85.2 million dollars.

And, again, the community -- the public comment period began on June 1st. It will end on July 30th. We hope that you will all comment or tell us how you feel about this remedy. The community advisory group really is to be commended for giving you an extra 30 days. Normally our comment periods are 30 days. The community advisory group requested an extension to that, so we started out with a 60-day comment period. You can submit your comments to me at either my email address, scully.pam@epa.gov. Or if you have one of the handouts or received one in the mail of our little fact sheet about this site, you have my mailing address.

We also have a large administrative record. You can read some of the background documents for this site. What we mailed out to people in the little fact sheet was about four pages long. The actual proposed plan is 102 pages long. There's a copy of it back on the desk in the back if you just wanted to see what it looked like, but it is available online.

We also if -- I went through this rather fast, but I do a really slow presentation of it on our website. I walk through all the slides. So if you missed something or want to see it again and you have 45 minutes of your life you want to give up, you can watch it again on our website. We have that presentation available. But all of the documents used for the basis for this proposed plan are also available on our website.

So we did two public meetings. This is our second public meeting. We also held two availability sessions. Those are complete. If you have any questions, though -- go ahead, Angela -- please don't hesitate to contact me on that fact sheet or my card is also in the back, and Angela's card is in the back. If you want to contact us through email or telephones, please don't hesitate. This is the time when we can answer your questions.

AUDIENCE MEMBER: I got a question.

MS. MILLER: Okay. Hold on, Ms. Wanda. We've got a lot of new faces and you were here last time.

AUDIENCE MEMBER: Okay.

MS. MILLER: So let's start with somebody else. Okay?

AUDIENCE MEMBER: All right.

MS. MILLER: So, remember this is being transcribed, so, in order for us to hear you, if you could either walk up to the mic or I can walk it to you; I don't care. And we've got one right here too, so.

With that, we'll open it up for questions. Don't be shy, or Ms. Wanda is going to get it.

AUDIENCE MEMBER: I have a couple of questions. Number one, when will this be done?

MS. SCULLY: Okay. Well, the Superfund process, after we write a Record of Decision -- we're going to negotiate, and we hope to get a Record of Decision this year. And then we will have to negotiate an agreement with the responsible parties to do the cleanup. That takes about a year.

The remedial design itself could take anywhere from two to five years, depending on access, because we don't own any of that property. You own to the -- if you own property along Choccolocco Creek, you own to the middle of the creek. So for us to even sample your sediment, we have to get access from you. And that's what really takes a long time, is for us to talk to every property owner, get access, and then get out and do the sampling.

Once the design is done, it will probably take three to five years to implement it, because we will start up in Oxford, and we will work our way down the creek. So I would say it's probably ten years away from being complete.

And after that, it will take an additional 20 to 30 years before monitored natural recovery restores the sediment enough to protect fish, so that the fish can recover and people can fish to their heart's desire and eat those fish.

Right now there is an advisory, a no-consumption fish advisory on all fish from Choccolocco Creek. It's for PCBs as well as mercury. We are cleaning up some mercury with this alternative. There's a -- there's mercury up in the backwater area, as well as PCBs, and we'll be cleaning up that mercury. And everywhere we remove PCBs, we expect there to be some mercury that comes along with it, so we're cleaning up mercury as we go.

We think the downstream end of Choccolocco Creek is probably impacted from mercury from deposition from the atmosphere, from coal-fired plants, so we'll try to clean up the mercury as we go. If it's coming from another source, this won't completely clean up that mercury, but we're dealing with the mercury that came from this site to try to get that remediated as we clean up the PCBs.

AUDIENCE MEMBER: Okay. Second question. Downstream, down at Logan Martin Lake.

MS. SCULLY: Yes.

AUDIENCE MEMBER: Any danger after you do your work to recreational use of the lake?

MS. SCULLY: We don't expect to have any danger to recreational users. There may be an uptake -- the fish concentrations that are there right now are above what we want them to be. Those may increase slightly after we take our action because there will be some sediment released, but they will go down after we eliminate the sources.

AUDIENCE MEMBER: Okay. But humans --

MS. SCULLY: But humans, no, we don't have -- expect any restrictions at all based on this.

AUDIENCE MEMBER: So just one quick question basically, because I know you have a long-term plan that you're wanting to implement with the soil and whatnot, and I just wanted to get an idea of what kind of thing- -- or are there going to be any kind of regulatory things that get applied to us that affects, you know, whether we're trying to build a building or working on the garden or something like that? Is any of that going to be affected in any shape, form, or fashion?

MS. SCULLY: No. There are some conservation easements already --

AUDIENCE MEMBER: Okay.

MS. SCULLY: -- that restrict that activity. I understand that the owners can work with the conservation easement to change some of that. And the responsible parties will work with you if you want to do something on your property and there might be PCB impacts.

AUDIENCE MEMBER: Right.

MS. SCULLY: That's why we have a soil management plan --

AUDIENCE MEMBER: Right.

MS. SCULLY: -- so that we can work with any kind of development.

You know, I don't expect there to be big residential developments or anything because it is a floodplain and it's difficult to get insurance, so -- so that kind of limits the development. But, no, we're not trying to restrict your property, from that standpoint.

AUDIENCE MEMBER: Right.

MS. MILLER: Okay, Ms. Wanda. I know you've got a list. Let's do one. Okay?

AUDIENCE MEMBER: Okay. I'm going to try to take some of this here and put it all in almost one. But I -- I can't never do that.

But the thing about it is, a lot of people here are not aware that, me living on Choccolocco Creek for 24 years now, okay, when they done the PCB cleanup in 2012 and part of 2013, they put you up in a hotel. So I don't know how far back on the creek bank y'all are going to go with the PCB cleanup with the contractors that y'all get, but they also paid for your out-of-expense pockets [sic] while you are put away, if you live on your land where this impact would be because you cannot be around where they're stirring up the dirt. That's one thing that I've got -- something I wanted to put out there just as a whole for people to be aware of.

And how far back -- because I don't see a map on there showing the tributaries. Okay? You talk about Choccolocco Creek as a whole, but you don't bring in these tributaries that go back, like they cleaned up back on Choc- -- Coldwater Creek where it dead-ends into Choccolocco at my place.

MS. SCULLY: When we investigated the floodplain, we followed the PCBs out to one milligram per kilogram. So we investigated everywhere the PCBs were. So if it extended beyond the area and may have been in one of those areas where it backs up along another creek, we would have investigated it. We followed wherever the contamination was.

AUDIENCE MEMBER: But my question is, a map of these tributaries. Is -- we're not seeing a good map of the tributaries and --

MS. SCULLY: I'm sorry. There --

AUDIENCE MEMBER: -- how far y'all are going to go back.

MS. SCULLY: There are a lot of maps in the feasibility study that show all the tributaries. We did -- we know the tributaries that come into

Choccolocco Creek. I just -- they just weren't relevant to this presentation, so I didn't put the map in, but it is in the feasibility study.

AUDIENCE MEMBER: Okay. What about the young lady here that's got the thing with the map that shows -- when you talk about this big old, long 36 miles there, a lot of people here tonight have not heard Forever Wild mentioned, because Forever Wild that goes and buys up land on Choccolocco Creek and places like that and other places to keep it just that way. Forever Wild has been after me for over 24 years, give or take, to want to buy our family inherited property. Well, if I had have done that, everything has to stay just like it is. So we don't know how many of these properties along Choccolocco Creek falls in Forever Wild. So they won't be touched to be cleaned up --

MS. SCULLY: No, if --

AUDIENCE MEMBER: -- or will they?

MS. SCULLY: -- if we have contamination greater than our cleanup value and we need to access a property, we will get access to the property. You know, there -- we haven't really had a lot of people that will deny us access, and, you know, we just work with each property owner to do it. And there are a lot of conservation corridors, but part of that conservation corridor allows us to come in and do that clean up, I believe, so.

AUDIENCE MEMBER: Okay.

MS. MILLER: Okay. I have to go --

AUDIENCE MEMBER: Let somebody else up.

MS. MILLER: -- I have to go to somebody else.

AUDIENCE MEMBER: Let somebody else up.

MS. MILLER: Yes, ma'am.

AUDIENCE MEMBER: I'm getting them stirred up.

MS. MILLER: We have to spread the love, Ms. Wanda.

AUDIENCE MEMBER: That's what I'm going to do, get them stirred up.

MS. MILLER: We have to spread it.

AUDIENCE MEMBER: I've got a question for you.

MS. SCULLY: Okay.

AUDIENCE MEMBER: I've got a home on Logan

Martin, and I've got a home on Choccolocco. In the creek itself, grandkids swimming or kayaking or anything like that, is there a danger in that? Are we talking only on the sides of consumption?

MS. SCULLY: We're talking about mainly consumption and then ecological receptors and their consumption mainly are the biggest impacts. We don't expect to have any issues for people swimming or being in the creek. It's mainly an issue for consumption of fish for human health, and then ecological receptors are exposed to both the land and the water and the sediments, so they also have exposure.

AUDIENCE MEMBER: Okay. So speaking on all of those lines as well, pulling water out of Choccolocco Creek to water land, is that moving the PCBs out from the creek and putting it on the land?

MS. SCULLY: Well, if there's -- if there's sediment that's in that water, it could have PCB contamination, but you'd have to pump a lot of water to get concentrations of PCBs just from the water.

AUDIENCE MEMBER: What's the definition of "a lot of water"?

MS. SCULLY: Huh?

AUDIENCE MEMBER: What's the definition of "a lot of water"? Make me feel comfortable.

MS. SCULLY: Well, I think the water concentrations are in the hundreds of parts per billion or -- they're very low. So, I mean, I'd have to run a calculator to tell you how many years it would take you to get a concentration above one.

AUDIENCE MEMBER: So watering cattle out of the creek and things like that?

MS. SCULLY: Now, cattle shouldn't be in the creek.

AUDIENCE MEMBER: Out of the creek, pumping water out of the creek --

MS. SCULLY: Um-hum.

AUDIENCE MEMBER: -- to the fields, cattle, et cetera, is there a danger in that?

MS. SCULLY: We looked at cattle as part of our human health risk assessment. And we looked at cattle; we looked at vegetables; we looked at eggs. We didn't have an- -- and we looked at really conservative numbers, and the only possible risk we found was if someone raised cattle and only ate cattle for dinner for 70 years --

AUDIENCE MEMBER: Hell, we don't live that long.

MS. MACOLLY: And the floodplain soil --

MS. SCULLY: -- they could have a risk.

MS. MACOLLY: And the floodplain soil --

AUDIENCE MEMBER: Um-hum.

MS. MACOLLY: -- was extensively sampled too. So if water was pumped out onto the field, you know, next to the creek, that was also part of this investigation. So not only the creek beds, but also the floodplain areas and the surrounding areas. And the -- and if there were a residential home even further out of the floodplain, the residential property was extensively sampled also.

AUDIENCE MEMBER: Then all good.

MS. MACOLLY: So all that data is in that feasibility study.

AUDIENCE MEMBER: So really what we're just looking at is the settlement in the creek itself being disturbed in certain areas basically.

MS. MACOLLY: No, there's going to be some floodplain work.

MS. SCULLY: There will be some floodplain work. If you're interested in the concentrations that were found on the properties you own, Solutia can provide you that information. The gentleman right behind you is actually the guy you want to talk to. So if you have a property that was sampled, you probably gave us access. If you're not sure, you can ask us and we'll tell you whether your property was sampled.

AUDIENCE MEMBER: In the '70s, I ate dirt in Mechanicsville right behind Monsanto, is where I grew up at.

MS. SCULLY: Why?

(LAUGHTER)

AUDIENCE MEMBER: In the '70s, that's what you did.

MS. SCULLY: Oh, really?

AUDIENCE MEMBER: You know, we all played in the ball fields. We were all right there in that area. So that's what concerned me about Choccolocco.

MS. SCULLY: Right. Well --

AUDIENCE MEMBER: Was it going to be like it was in that area.

MS. SCULLY: You know, we did look at -- we're doing a cleanup up in the floodplain for Snow Creek and around the facility for PCBs, so I don't know if any of those areas are where you played or ate dirt, but we have those documents also. If you want to see what the sample results were to know what you might have been exposed to, we can give you that information also.

AUDIENCE MEMBER: Well, I was exposed; I already know that. I just didn't do anything about it.

MS. SCULLY: Well, our goal is to -- I mean, I know it's bad if you were exposed and you've lived in this area, but we're trying to clean it up and make it protective for future generations and for you in the future, and that's the whole point of the cleanup.

MS. MILLER: Ms. Shirley, I've got you. One second.

She had her hand up, and then I'll come to you. Okay?

AUDIENCE MEMBER: Okay.

AUDIENCE MEMBER: Hi.

MS. MILLER: Hey.

AUDIENCE MEMBER: I have a bunch of questions, so I'm going to synthesize it into one very vague, but hopefully you'll catch my drift.

Can you explain to me in detail what the five-year review looks like, if there's public comment process; if there are issues, when they will be addressed; within what time might they be addressed? Do you mind just talking in great detail about what the public can expect during these five-year reviews and what our participation looks like? Thank you.

MS. SCULLY: Okay. So in a five-year review, in a year -- at the beginning of the fiscal year, EPA publishes a notice of all the five-year reviews that are going to take place that year. And it really is based on, from the start of remedial action, so we started a remedial action in OU-3, Operable Unit 3, the facility, and we did our first five-year review already at this site in 2020.

What we look at in a five-year review is the actions that have been taken and whether or not they're still protective. Now, I'm sad to say that the only actions we've taken so far are still OU-3. We're trying to get the design done for Operable Unit 2. And when that's complete in the nex- -- that next five-year review -- we're doing a five-year review. We'll start this September on our second five-year review, and we hope to have it complete by September of 2025.

So in a five-year review, what we do is, we look at what was the remedy, have any of the laws changed that would change -- make us go back and reevaluate the protectiveness of the remedy. Are the cleanup goals different? Should they be different based on different toxicity values that have been developed during this last five years? And sometimes that happens, and we have to go back out and do additional work.

So what happens is, we'll look at what work has taken place, and we'll determine whether or not it's still protective, based on our regulations and risk assessments and things like that. And then, if we have issues, we make a list of the issues, and we set up a plan for when those issues are going to be resolved. We always try to resolve any issues before the next five-year review because you don't want to have an issue that's repeated in the next five-year review.

Typically five-year reviews are not open for public comment. I do know of some sites, I think, that have public comments, but typically we don't offer public comment periods with five-year reviews. It's just an opportunity to go out and make sure the site is protective. And when the five-year review is done, it gets loaded onto our website, and it's available for anybody to look at. It's not real interactive for a five-year review.

Does that answer your question?

AUDIENCE MEMBER: Yeah.

MS. SCULLY: Okay.

AUDIENCE MEMBER: Thank you.

MS. MILLER: All right, Ms. Shirley.

MS. SHIRLEY CARTER: I've been in this business since it started. My name is Shirley Carter, by the way, and I've been here since it started. But I was thinking about you when they were talking about the risk. Aren't those risks determined by a certain amount of time versus how -- you know, how long you are exposed to certain -- and most of the risks, I know, in Operable Unit 1 and 2 have been remediated.

MS. SCULLY: Yes.

MS. SHIRLEY CARTER: So this -- and all of this is in that 365-page consent decree in the statement of work. And also I am the president, chair of the Commun- -- Anniston Community Advisory Group. So if you guys have any questions regarding what has gone on, I have all of these documents in our office. They're on our website. We also have a Facebook page. So the Anniston Community -- I'm on two things -- Advisory Group is the one. So all of this information that she's speaking about is there for you guys to see if you go and visit our site.

MS. MILLER: Thank you.

Hold on one second.

MS. MACOLLY: You want to tell them about your -- the CAG meetings?

MS. SHIRLEY CARTER: Oh, our CAG meetings? We have CAG meetings quarterly now because of COVID and stuff. So the next one, I think, is going to be in --

AUDIENCE MEMBER: September 10th, isn't it?

MS. MILLER: September 10th.

MS. SHIRLEY CARTER: -- in September -- it's in Pell City. And it usually starts around 4:00 or 5:00. So if you guys want to attend that -- but we normally have them here in Anniston, so, I mean, you can -- and the dates are on our website as well. So if you guys would like to, you know, attend any of those meetings, there's a lot of information there. And if you've got any questions for me, I'll be glad to answer them, if I can. Because I'm getting kind of old, you know, and I don't remember everything. And this process has been going on for 20-something years.

MS. SCULLY: Yes.

MS. MACOLLY: She's sharp as a tack; don't let her fool you.

MS. SHIRLEY CARTER: Unh-unh, I'm old.

MS. JENNIFER HUDSON: I have a question.

Jennifer Hudson with our Choccolocco Creek

Watershed. And I just -- so to look at the numbers, I'm looking at your proposed remediation measures. Even with those remediation measures, you're looking at a 20- to 35-year recovery period time on this.

MS. SCULLY: Yes.

MS. JENNIFER HUDSON: You know, so -- and then you're saying that the fish consumption -- I mean the levels of the PCBs will elevate for a period of time.

MS. SCULLY: Yes.

MS. JENNIFER HUDSON: For how long, and then, I mean, for how long of a period of time will that be elevated before you see them coming back down? And then what do you have from all of the samples, from the fish sampling, I mean, are they recovering now? From what you -- what is that based on?

MS. SCULLY: Okay. Well, fish have been sampled for a long time at this site --

MS. JENNIFER HUDSON: Exact- -- yeah, yeah.

MS. SCULLY: -- at this site. So we've had periods where fish have come down, and then someone has done an activity in the creek because there were still PCBs in it and they've gone back up. So they've come up and down several times.

It -- you know, whether it takes five to ten years for that to settle out before they come back down, I can't really predict that. What we plan to do is to take a lot of measures to reduce the sediment that continues to go downstream that would cause that fish impact.

So, you know, what we would try to do is work when the water levels are low, when it's dry. We'll, you know, use engineering devices, such as like a sheet pile wall to keep the sediment in the area that we're working, or silt screens in order to prevent sediment from going downstream and causing more contamination.

But inevitably, there will be some leakage of sediment that gets into the surface water and may cause the fish tissue to increase. How far down that'll be impacted, we'll know when we do the monitoring, but --

MS. JENNIFER HUDSON: Um-hum. And what's the anticipated outcome on that? So if you say the levels are going up, and you come in and you do this remediation, and you want those levels to come down and that -- what's that anticipated that it's -- you're getting rid of the PCBs but we're still going to have a mercury problem? I mean, or what --

MS. SCULLY: No, I --

MS. JENNIFER HUDSON: -- what is the anticipated outcome?

MS. SCULLY: The anticipated outcome is that fish will be below -- I forgot what the numbers are; they're on that screen -- below the required level for --

MS. JENNIFER HUDSON: Right.

MS. SCULLY: -- people to be able to consume those fish. Our goal is that you can eat fish all day long if you want to from Choccolocco Creek and not have an advisory.

MS. JENNIFER HUDSON: After another 20 to 35 years, though. Right?

MS. SCULLY: We want to get to where there's no fish advisories. That's our goal.

MS. MILLER: Okay, Ms. Wanda, can you give us one?

AUDIENCE MEMBER: The question I have that you made a while ago talking when you were showing the displays of the creek banks and how that they would be used to be certain areas and Alan here explained it and stuff last month and talked about how certain kind of dry piling will be used on certain creek banks and stuff to shore it up and stuff.

But you used something here a while ago that I find very, very disturbing when it comes to the fact when you say logs can be used to shore up a creek bank. Well, I'm here to tell you, I've been out yonder for 24 years, and I have seen so many logs and dead trees float away, rotten and stuff on the creek bank and float away. I don't see how you could ever think, with the way and the creek and the water and the pressure of flooding of Choccolocco Creek that I've seen in 24 years out there and how it can destruct and take stuff away and bring trees down on top that are green trees standing there on the creek bank because they undergird it and have got the soil down and the roots. So how do you explain the logic of using logs to build up and shore up a creek bank?

MS. SCULLY: I don't know exactly what we're going to do yet, Wanda. When we get out there, we will do an engineering design and evaluation to determine what we can do on each creek bank. Our intention is not to make it worse, but to make it better and to pre- -- and stabilize the creek bank, so that we don't get erosion. So we're not going to do anything that we think is going to make it worse. And, you know, that will be determined during remedial design. There just are -- there's a lot of interest in using more natural methods than riprap. People don't want riprap along the whole creek. They want a more natural-looking creek, so we'll have to find ways to do that.

AUDIENCE MEMBER: What about the big rocks like they used down here underneath of the bridge going underneath Highway 21, and what about the big rocks down below H.J. -- not H.J. -- yeah, H.J. Benton Parkway, where they're going to build a bridge across there at some point to further on into Highway 21 from Silver Run through Jenifer, whichever way to Priebes Mill Road; I don't know.

MS. SCULLY: Well, we expect that --

AUDIENCE MEMBER: What about those rocks?

MS. SCULLY: -- most -- we expect that most of Snow Creek from Highway 78 down to Choccolocco Creek, we'll have to use riprap because that's a high-flow area. And so we expect to use riprap in that area, but downstream, we don't want to use riprap everywhere that we have erosion, so we'll try to use some more natural techniques.

AUDIENCE MEMBER: Okay. Explain what riprap is, because I don't know what riprap is.

MS. SCULLY: It's rocks. I'm sorry. Rocks that are used to stabilize the bank.

AUDIENCE MEMBER: The big ones that I'm talking about?

MS. SCULLY: I don't know how big they are.

AUDIENCE MEMBER: It's like -- you could see like a washout area and it just has a bunch of like --

MS. SCULLY: -- rocks.

AUDIENCE MEMBER: -- just regular rocks

stacked up. There are probably some right here.

AUDIENCE MEMBER: Right. So, in other words, when y'all refer to that riprap --

MS. SCULLY: Yeah, we're talking about --

AUDIENCE MEMBER: -- is there not a better --

MS. SCULLY: -- we're talking about --

AUDIENCE MEMBER: -- terminology for it?

MS. SCULLY: -- rocks. Like you see that goes under the I-20 bridge, there's a lot of riprap along that creek bank.

MS. MILLER: Okay, we've got one back here.

MS. SCULLY: Okay.

AUDIENCE MEMBER: Hey. I remember in the last meeting that we had, it was mentioned that there would be passive turbidity samplers downstream from where the remediation is actually happening. I was curious about the rationale behind using turbidity samplers rather than PCB samplers.

MS. SCULLY: Well, because the PCBs attach to sediment particles, so the turbidity is -- we would just assume that there's PCBs in -- along with that sediment, so we would monitor turbidity. There will be some sediment sampling that oc- -- or some PCB sampling that occurs, but we -- when you're in the middle of dredging contaminated sediment, you can't wait to see if -- you can't stop work based on a PCB sample because it takes time. So you have to find another way to control what you're doing and make sure you're not having too many releases. So we use turbidity because that -- we know that PCBs attach to soil particles.

MS. MACOLLY: It's a much more conservative indicator. It doesn't mean there's PCBs attached to all sediment --

MS. SCULLY: Right.

MS. MACOLLY: -- but -- because there's not a real-time PCB sampler. We have to collect the sample, send it to the laboratory. It'll take two, three weeks before getting the results back. So this is just a conservative way that -- to monitor what is being released or potential releases downstream. And if there's like a big blip of high turbidity, we may stop work or alter what's being done to minimize that.

AUDIENCE MEMBER: One more. So you're -- are you starting -- you're starting in the backwater area and then moving your way down? And are you going to hit high -- I mean properties that have tested as high in PCB -- I don't know --

MS. SCULLY: In the floodplain soil?

AUDIENCE MEMBER: Yes.

MS. SCULLY: Yes. We're cleaning up floodplain soil as well as the creek. So we're cleaning up floodplain soil to be protective for ecological receptors, and we're also cleaning up sediment in the creek and stabilizing the creek banks, so that we can prevent future contamination from those areas. So, yes, we will start -- you know, we will actually start up in Anniston and work on Snow Creek all the way down before we start -- before we're able to start on Snow Creek south of Highway 78. We'll do Snow Creek first, and then we'll do the backwater areas of Choccolocco Creek, and we'll go downstream.

AUDIENCE MEMBER: So maybe we have to pray for no rains during that time, because that creek gets wicked.

MS. SCULLY: Yes.

AUDIENCE MEMBER: One day it will be low, you get rain, and it comes from all the creek -- I don't know how you're going to keep everything from just washing on down into Logan Martin? I really don't understand that one. I -- it's beyond my comprehension.

MS. SCULLY: Well, I think we'll -- we'll just have to take a lot of engineering measures to try to make sure we work during dry seasons. And, you know, we're not going to come out and dredge in the rain, pouring down rain where it's flooding. So we'll just have to work around those activities, those types of weather events.

AUDIENCE MEMBER: All right. And I'm going to say good luck and God bless you, because on Choccolocco, it don't matter. You can be low one day, not expecting no rain. It rain over to the west of us; everything comes down. I'll go from calm to out of the banks that quick.

MS. SCULLY: Well, in order to restore fishing in Choccolocco Creek, we have to take an action. I mean, PCBs haven't been manufactured for 54 years, something like that, so -- and it hasn't fixed itself yet. So the only way for us to do this is to take some of the PCBs out of the creek, so that we can hope that we can restore fish concentration, so that people can eat fish without having to worry about whether or not their health is impacted.

AUDIENCE MEMBER: So there's obviously going to be a lot of physical activity along Choccolocco Creek and along the stream banks. How will the public be notified of when that activity is occurring and what risks might be associated with it?

MS. SCULLY: Well, we'll have to develop a communication strategy obviously. The CAG has always been, you know, sort of our partner in getting information out to the community. You know, we've done mail; we can send mail outs. And when we worked up in -- doing the residential cleanup, we notified everybody around the area where we were going to be digging.

So we'll use either notices we'll provide to people at their doors, or we'll send mailers, or -- you know, those are the type of things we do when we're --

AUDIENCE MEMBER: But there are people who come to the area for kayaking, for instance, or fishing, who don't live in the area and may not even be aware of the proposed plans, much less of when the activity is going to occur. So I'm concerned that there's no notification method that's been established or even discussed yet about all of this activity that's going on, and that people should have an opportunity to make those decisions and understand the risks.

MS. SCULLY: Well, we haven't selected a remedy yet, but, when we do, we have to come up with a communication strategy. And, you know, if you have any input you want to provide on that, you're welcome to submit it as part of the comment period.

MS. MILLER: And we can be creative and --

MS. SCULLY: Yeah.

MS. MILLER: -- do QR -- post QR codes out there where people put in the water. We can --

MS. SCULLY: Right.

MS. MILLER: We just have to be creative

with something like that in getting the word out for sure.

AUDIENCE MEMBER: Okay.

MS. MILLER: Okay, Ms. Wanda, can you give me one?

AUDIENCE MEMBER: Well, the thing is, I want to say something to the young man back there, talking about Logan Martin Lake and all and everything, is the fact that -- and some of this stuff with areas where you can go. I go back to my childhood growing up and as a teenager and how when you come off of the Priebes Mill Road where Interstate 20 -- Munford/Coldwater you get off at, come down to Bobwhite Drive. You come back and go all the way down to the dead end off Choccolocco Creek, down to the property my grandpa owned. That's where we would take the road and drive a tractor across or a 2-ton truck across to the other side on property that my grandpa owned and farmed.

This area down there, if you've ever canoed and kayaked Choccolocco Creek, has a rock bed all the way across that the people built way back in the day, real wide, like from right yonder to about over here (indicating), wide enough that you can drive a tractor across. And when the water is down, these are some areas there that you can look at. How far down can we go to a certain area, where there's another area, where there's another area?

Clean up the logs that's floating down the creek. Get them out of the creek, have somebody already ahead on this aspect of cleanup. That's one way that can be done to get stuff out of the way. But you're not going to be able to get the PCBs out of the water like what he was asking there and she was asking there.

So the other thing is the fact that, when you get to a lot of this stuff and the questions is that what perturbs me a little bit and upsets me a little bit, watching -- going down Airport Road and seeing the -- Jackie Stovall's daddy's ballpark down there being restored down there where Miller -- the milk company used to be --

AUDIENCE MEMBER: Barber's.

AUDIENCE MEMBER: -- Barber's Dairy used to be. And so I have to ask the question, when you see a lot of the green dots up there on the thing about the round oval ball field out here, okay, and y'all stay on top of that to make sure, well, they come back in and they take that grass off and they redo that area and stuff like that. That's one thing that has me a little perturbed on that.

So, you know, softball fields covered and the possibility of whether the PCBs are being disturbed, supposedly they don't pose a risk. The round softball fields, okay, 400 [sic] dollars to maintain is what you said. So that's one area of concern there I've got there. Okay?

And so the other area -- and I'm getting lost in my notes here -- is this one here -- Gayle Macolly, I want you to answer this one big time.

Okay. Y'all said that dirt was taken from somewhere with PCB cleanup and was taken and put out yonder close to where I live, one-eighth mile back above me when they built the incinerator behind the Tull C. Allen Wastewater Treatment Plant, which was built in 2007, they did not cap that dirt that they brought in there and put on them big old rocks that they brought in there and piled up, because when I would go in and out my driveway, I would watch them as they brought dirt in, brought dirt in, brought dirt in, and packed it and stamped it, packed it and stamped it, packed it and stamped it. They didn't put nothing around there to keep that dirt from washing off and going out through them fields all the way down there back where I'm at.

MS. MACOLLY: I'm not aware of soil being brought to that treatment plant.

MS. SCULLY: All of the soil that --

AUDIENCE MEMBER: Well, y'all said 2007. That's when it was built. That's when the incinerator was built.

MS. SCULLY: All of the soil that's part of this site, when it goes for disposal, it goes to a facility that's approved by EPA. Solutia is required to contact the off-site -- the off-site rule people in the record division of EPA, the Resource Conservation and Recovery, to make sure every facility is in compliance with laws. So anything with PCBs greater than 50 has been taken to Emelle, Alabama, to a hazardous waste landfill, and everything less than 50 has been taken to Three Corners.

MS. MACOLLY: Yeah, I think she's talking about the Anniston soil -- the ADEM cap soil --

MS. SCULLY: Oh.

MS. MACOLLY: -- at the Anniston Wastewater Treatment Facility.

MS. SCULLY: Yes.

MS. MACOLLY: The treatment facility by your house is --

AUDIENCE MEMBER: Tull C. Allen.

MS. MACOLLY: -- the Oxford one, and no soil was brought there. We're -- the soil that she was talking about had an interim measure put on it was the Anniston.

MS. SCULLY: The Anniston Wastewater Treatment --

AUDIENCE MEMBER: Out here?

MS. MACOLLY: Out here, yes.

AUDIENCE MEMBER: See, that's where the confusion comes in. And, see, when you take these things, and I've already spotted it in the subdivision back over here off of Highway 78 by Fred's, which is Farmers Home Furniture now back in there. The City owns the piece of land there.

That's where they're dumping dirt and the stuff off the waterworks, I should say, and pipe, just like they've dumped all the way out to the edge of Coldwater Creek up there to where they really don't have nowhere else to go.

And so ADEM is supposed to stay on top of this and not supposed to let them continue, continue, continue to where it winds up washing off down the creek bank and into Coldwater Creek and then eventually making it down Coldwater Creek into Choccolocco Creek, because there's busted up PVC pipe that comes off the streets of Oxford whenever they do work. So this is another thing y'all should be aware of.

MS. SCULLY: Well, that may be a construction debris area. I'm not aware of what it is, but --

AUDIENCE MEMBER: Yeah, but in the back of a subdivision, a nice subdivision? If them people knew.

MS. SCULLY: I don't know. I don't know what -- what that area is. It's not part of the area we looked at, though.

AUDIENCE MEMBER: Hey, I'm going to take me some pictures one day because I know the people that live right there.

MS. SCULLY: Okay.

MS. MILLER: All right. We're going to move on. I gave you five minutes, Ms. Wanda.

AUDIENCE MEMBER: Huh?

MS. MILLER: Yes, sir, in the orange. Didn't you have a question? Yes, sir.

AUDIENCE MEMBER: She's answered my question. I was just wondering where they were going to take the soil that they dug up. I'm assuming Chem Waste Management in Emelle is what y'all are planning on?

MS. SCULLY: If the concentration is greater than 50 milligrams per kilogram, it's required to go to a hazardous waste landfill, so yes. It all depends on the concentrations we find.

MS. MILLER: Anybody else? Do we have any other questions?

AUDIENCE MEMBER: Well, is anybody going to get paid compensation for their property if they lose money while the PCBs are being done? Because I have people sometimes come out there and pay to park and fish off of Choccolocco Creek and Coldwater Creek at my place, which I got tired of the bullies coming out there. So, if you're going to come out to my place, you're going to either pay to park and fish, park your vehicle to camp, park your vehicle to go canoe and kayaking.

I ain't putting up with no bullcrap and no people -- nobody running over me no more. I'm 70 years of age, and used to I'd let people come out there and fish, but when you start leaving your junk behind, I put a stop to it. And if you come out there riffraff, I will tell you off, and I will tell you, "Get off my property and do not come back." Because I am the kindest person and the sweetest person you'll ever meet, but you rile me up, I'll be the hell on heels. I'll tell you that much.

MS. SCULLY: Well, in case I haven't mentioned it, there is a no-consumption fish advisory for Choccolocco Creek. So if you fish for -- in Choccolocco Creek, please do not eat fish from Choccolocco Creek.

AUDIENCE MEMBER: They say fishing helps you to live a longer life. Did you know that?

MS. SCULLY: I know fish does, but I'd get them from somewhere else. Go to the grocery store.

MS. MILLER: Do we have any other questions?

AUDIENCE MEMBER: A million-dollar check, I'm waiting. Hey, I like to kid, y'all.

MS. MILLER: Okay. Again, the comment period is through July the 30th, and we talked about the different ways that you can comment. You can pick up the fact sheet in the back that has information. There's a website; all the information on how to comment is on the website.

And thank you again so much for coming out in this weather. We really, really appreciate it.

MS. SCULLY: Yes, thank you.

MS. MILLER: Thank you so much.

(THE PROCEEDINGS CONCLUDED AT 7:39 P.M.)

C E R T I F I C A T E

STATE OF ALABAMA)
WALKER COUNTY)

I hereby certify that the above and foregoing proceeding was taken down by me by stenographic means, and that the questions and answers therein were produced in transcript form by computer aid, and that the foregoing represents a true and correct transcript of the proceedings occurring on said date.

I further certify that I am not of counsel, nor related to any of the parties to this action; nor am I in anywise interested in the result of said cause.

Witness my signature and seal this the 2nd day of August 2024.

SUZANNE LEE, CCR
Certified Court Reporter
ACCR No.: 476
Expires: 09/30/24

Notary Public, State of Alabama at Large
My commission expires January 5, 2025

APPENDIX G

PUBLIC COMMENT RECEIPT SUMMARY

Table 1. Comments received on the OU4 Proposed Plan and Related Administrative Record Documents During the Comment Period from June 1, 2024 ,through July 30, 2024.

Proposed Plan Comment ID	Date	Name	Number of Comments	Delivery
1	5/31/2024	[redacted]	1	Email
2	6/27/2024	CAG	2	Email
3	7/1/2024	[redacted]	1	Email
4	7/1/2024	[redacted]	1	Email
5	7/13/2024	[redacted]	1	Email, Mail
6	7/16/2024	[redacted] Wild Alabama (1 Form 2)	16	Email
7	7/16/2024	[redacted] (1 Form 2)	repeat	Email
8	7/18/2024	[redacted] (1 part of Form 1)	repeat	Mail
9	7/20/2024	[redacted] (7 Form 1)	3	Mail
10	7/22/2024	[redacted] City of Lincoln	1	Mail
11	7/25/2024	[redacted] Native Fish (1 Form 2)	repeats	Email
12	7/26/2024	[redacted] Alabama Scenic River Trail	5	Email
13	7/26/2024	[redacted] NRDAR	4	Email
14	7/26/2024	[redacted]	1	Email
15	7/26/2024	[redacted] Aqua Blok	1	Email
16	7/26/2024	[redacted]	1	Email
17	7/27/2024	[redacted]	1	Email
18	7/28/2024	[redacted] Friends of the Talladega National Forest (1 Form 2)	repeat	Email
19	7/29/2024	[redacted] Coosa River Keeper	27	Email
20	7/29/2024	[redacted] Eastaboga Tackle	6	Email, Mail
21	7/29/2024	[redacted] United Way East Central Alabama	1	Email
22	7/29/2024	[redacted]	1	Email
23	7/29/2024	[redacted] Lay Lake HOBO (1 Form 2)	repeat	Email
24	7/29/2024	[redacted] AUMNH (1 Part Form 2)	repeat	Email
25	7/29/2024	Alabama Pinhoti Trail Association (Form 2)	repeat	Email
26	7/29/2024	[redacted]	3	Email
27	7/29/2024	[redacted] (Form 1)	repeat	Mail
28	7/29/2024	[redacted] (Form 1)	repeat	Mail
29	7/30/2024	[redacted] WAF (5 Form 1, 26 Form 2)	repeat	Email
30	7/30/2024	[redacted] East Alabama Works	1	Email
31	7/30/2024	[redacted]	1	Email
NA	7/30/2024	[redacted]	NA	Email
32	7/30/2024	[redacted] WAF (28 Form 2)	repeat	Email
33	7/30/2024	[redacted] for P/S	17	Email
34	7/30/2024	[redacted] (Form 2)	repeat	Email
35	7/30/2024	[redacted] WAF (17 form 1, 2 form 3, 53 form 2)	repeat + 1	Email
36	7/30/2024	[redacted] WAF (42 Form 2)	repeat	Email

Proposed Plan Comment ID	Date	Name	Number of Comments	Delivery
37	7/30/2024	[redacted] WAF (6 Form 2)	repeat	Email
38	7/30/2024	[redacted] (1 Form 2)	repeat	Email
39	7/30/2024	[redacted] (2 Form 2)	repeat	Email
40	7/30/2024	[redacted] Alabama Rivers Alliance	4	Email
41	7/30/2024	[redacted] (1 Form 2)	repeat	Email
42	7/30/2024	[redacted] WAF (4 Form 1, 96 Form2)	repeat	Email
NA	7/30/2024	[redacted]	NA	Email
43	7/30/2024	[redacted] WAF (31 Form 2)	repeat	Email
44	7/30/2024	[redacted] WAF (7 Form 2)	repeat	Email
45	7/30/2024	[redacted] LMLPO	3	Email
46	7/30/2024	[redacted]	2	Email
47	7/30/2024	[redacted] (1 Form 2)	repeat	Email
48	7/30/2024	[redacted] (1 Form 2)	repeat	Email
49	7/30/2024	[redacted] WAF (1 form 1, 135 form 2)	repeat	Email
NA	7/30/2024	[redacted]	NA	Email
50	7/30/2024	[redacted] (1 Form 2)	repeat	Email
51	7/30/2024	[redacted] CCW	3	Email
52	7/30/2024	[redacted]	1	Email
53	7/30/2024	[redacted]	5	Email
54	7/30/2024	[redacted]	1	Email
55	7/30/2024	[redacted]	1	Email
56	7/30/2024	[redacted] (Form 1)	repeat	Mail
57	7/30/2024	[redacted] (Form 1)	repeat	Mail
58	7/30/2024	[redacted] (1 Form 2)	repeat	Mail
59	7/30/2024	[redacted] (4 Form 1)	repeat	Mail
60	7/30/2021	[redacted] (379 Form 1)	repeat	Mail
61	7/30/2024	[redacted] (1 Form 2)	repeat	Mail
62	7/30/2024	[redacted] (1 Form 1)	repeat	Mail
63	7/30/2024	[redacted] (26 Form 1)	repeat	Mail
64	7/31/2021	[redacted] (10 Form 1)	repeat	Mail
65	7/31/2024	[redacted] (Form 1)	repeat	Mail
66	7/31/2024	[redacted] (Form 1)	repeat	Mail
67	7/31/2024	[redacted] (1 Form 1 and 2)	Repeat	Mail
68	7/31/2024	[redacted] (1 Form 1 and 2)	Repeat	Mail
69	7/31/2024	[redacted] (1 Form 1 and 2)	Repeat	Mail
70	7/31/2024	[redacted] (1 Form 1 and 2)	Repeat	Mail
71	8/2/2024	[redacted] for WAF	29	Email
NA	8/3/2024	[redacted] 1 Form 2,letter about civil rights)	repeat	Fax, Mail
72	8/6/2024	[redacted] (1 Form 1)	repeat	Mail
73	8/7/2024	[redacted] (1 Form 1)	repeat	Mail
74	8/21/2024	[redacted] (1 Form 1)	repeat	Mail

Proposed Plan Comment ID	Date	Name	Number of Comments	Delivery
75	8/21/2024	[redacted] (1 Form 1)	repeat	Mail
76	8/31/2024	[redacted] (4 Form 2)	repeat	Mail
77	9/6/2024	[redacted] (1 Form 2)	repeat	Mail

146 Comments that need to be responded to. There are 473 Form 1 comments, and 478 Form 2 comments, and 2 Form 3 comments.