Table F-1
Estimated Costs for Remedial Alternative SED-3 (1 mg/kg)
OU-1/OU-2 Feasibility Study Report
Anniston PCB Site, Anniston, Alabama

Alternative SED-3 (1 mg/kg): Remove sediment from culverts, excavate sediment from the OU-1/OU-2 portion of Snow Creek with polychlorinated biphenyl (PCB) concentrations≥1 milligram per kilogram (mg/kg) and use on-site/off-site disposal options, and apply monitored natural remediation (MNR) for the remainder of the sediment. The preliminary remediation goals (PRGs) for Snow Creek and the associated creek bank areas include 3 mg/kg for PCBs in sediment and 21 mg/kg for PCBs in the adjoining creek bank areas. The chronic ambient water quality criteria (AWQC) value of 0.014 micrograms per liter (µg/L) also applies to the waters of Snow Creek. PRGs for metals that apply to Snow Creek sediment include for 322 mg/kg barium, 111 mg/kg for chromium, 59 mg/kg for cobalt, 128 mg/kg for lead, 1,100 for manganese, 1 mg/kg for mercury, 49 mg/kg for nickel and 41 mg/kg for vanadium. Dispose of materials with PCB concentrations ≥50 mg/kg off-site, and dispose of excavated sediment with PCB concentrations <50 mg/kg on-site in the south staging and soil management area. MNR would be applied to sediment deposits that have average PCB concentrations <1 mg/kg. Monitoring and additional actions, if needed, would be implemented using an adaptive site management approach to assess effectiveness. Stabilize creek banks that are unstable or may become unstable during or following excavation of creek sediment and that have soil concentrations above PRGs.

Item No.	Item	Unit Cost	Units	Estimated Quantity	Estimated Cost
	Capital Costs				
1.	Mobilization / Demobilization	10%	Lump Sum	1	$219,000
2.	Temporary Facilities	$10,000	Month	7	$70,000
3.	Site Preparation	$64,000	Acres	3.7	$236,800
4.	Material Staging Pad	$135,000	Lump Sum	1	$135,000
5.	Surveying	$50,000	Lump Sum	1	$50,000
6.	Sediment Excavation and Handling	$210	Cubic Yard	4,000	$840,000
7.	Sediment Dewatering and Stabilization	$110	Cubic Yard	4,000	$440,000
8.	Backfill Placement	$35	Cubic Yard	1,500	$52,500
9.	Waste Transportation and Off-Site Disposal (≥50 mg/kg)	$200	Ton	800	$160,000
10.	Waste Transportation and On-Site Disposal (<50 mg/kg)	$8	Ton	5,500	$45,650
11.	Shoreline Restoration	$159,000	Lump Sum	1	$159,000
12.	Bank Stabilization	$6.50	Square Feet	13,800	$89,700
13.	Contractor Health & Safety/Air Monitoring	$10,000	Month	7	$70,000
14.	Predesign Investigation	$40,000	Lump Sum	1	$40,000
				TOTAL CAPITAL COST	**$2,608,000**
	Long-Term Costs				
15.	Long-Term Monitoring	$15,000	Annually	1	$15,000
				ADDITIONAL LONG-TERM COST	**$15,000**
	Present Worth of Long-Term Costs				
16.	Years of Long-Term Program	30	Years		
17.	Discount Rate	7	%		
				PRESENT WORTH OF ANNUAL LONG-TERM COSTS (YEARS 1-30)	**$186,000**
	Administrative/Management				
				CONSTRUCTION BONDING (3% of Capital Cost)	**$78,000**
				PROJECT MANAGEMENT (5% of Capital Cost)	**$130,000**
				PROJECT MANAGEMENT (5% of Long-Term Cost)	**$9,000**
				ENGINEERING DESIGN/PERMITTING (6% of Capital Cost)	**$156,000**
				CONSTRUCTION MANAGEMENT (6% of Capital Cost)	**$156,000**
				SUBTOTAL	**$3,323,000**
	Contingency Costs				
				CONTINGENCY CAPITAL COSTS (15% scope + 15% bid)	**$782,000**
				CONTINGENCY LONG-TERM COSTS (10% scope + 10% bid)	**$37,000**
				TOTAL PRESENT WORTH	**$4,142,000**

General Notes:

- Cost estimate is based on past experience, cost estimating resources, and vendor estimates. Costs provided in 2016 dollars.
- This estimate has been prepared for the purposes of comparing potential remedial alternatives. The information in this cost estimate is based on the available information regarding the site investigation and the anticipated scope of the remedial alternative. Changes in cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. This cost estimate is expected to be within -30% to +50% of the actual projected cost.
- Cost factors based on *A Guide to Developing and Documenting Cost Estimates During Feasibility Study,* prepared by the United States Environmental Protection Agency (USEPA) and United States Army Corps of Engineers (USACE), July 2000.

Table F-1
Estimated Costs for Remedial Alternative SED-3 (1 mg/kg)
OU-1/OU-2 Feasibility Study Report
Anniston PCB Site, Anniston, Alabama

Assumptions:

1. Includes costs for mobilization/demobilization of labor, equipment, and materials to perform the remedial construction activities. The cost is estimated as 10% of the total capital cost for the alternative, excluding transportation/disposal costs. It is assumed that a single mobilization/demobilization will be necessary.
2. Includes costs for temporary facilities and utilities including project trailers, sanitation/waste facilities and services, field office services, and fuel storage.
3. Includes costs for labor, equipment, and materials to perform clearing, construct support facilities areas, install temporary gravel roads for access, and otherwise prepare the site for construction. Estimate assumes that 3.7 acres of upland area adjacent to Snow Creek will require clearing, construction of temporary access ways, and erosion/sedimentation control in order to access the various targeted sediment deposits throughout Snow Creek. The unit cost is based on site clearing ($10,000 per acre), erosion/sedimentation control ($4,000 per acre), and construction of temporary gravel access roads ($50,000 per acre).
4. Includes costs for labor, equipment, and materials to construct a temporary material staging pad for the sediment excavated from the creek. The cost estimate assumes a 75-foot by 150-foot material staging area constructed of a 6-inch gravel subbase and 6-inch asphalt pavement and equipped with a 12-inch berm and sloped to a sump.
5. Includes costs for labor, equipment, and materials to perform pre- and post-construction survey of the remedial areas to verify, confirm, and document pre- and post-construction elevations and conditions.
6. Includes costs for labor, equipment and materials to remove sediment obstructing culverts and excavation of sediment from the OU-1/OU-2 portion of Snow Creek with concentrations above a PRG of 1 mg/kg. The cost estimate assumes that this will include the removal of 4,000 cubic yards of sediment within a footprint of 77,000 square feet. Cost estimate assumes that a long-reach excavator and a smaller skidsteer unit will be used to excavate the targeted sediment deposits and load those materials into watertight trucks for transfer to a material staging area. Due to the isolated nature of the sediment deposits, this cost estimate assumes that the average sediment removal production rate will be 50 cubic yards per day.
7. Sediment dewatering and stabilization cost assumes handling of dredged soils, stabilization of dredged material with a stabilization agent (5% by volume). Water generated during dredged material staging and processing (including storm water) will be collected and treated prior to discharge to Snow Creek or to a local publicly owned treatment works.
8. Includes labor, equipment, and materials to purchase, import and place a 1-foot backfill layer in the excavated areas.
9. Includes transportation and off-site disposal of excavated materials with PCB concentrations greater than or equal to 50 mg/kg at a Toxic Substances Control Act regulated landfill. Based on available PCB data, this cost estimate assumes that approximately 500 cubic yards of sediment within the Highway 202 culvert will have PCB concentrations exceeding 50 mg/kg. Cost estimate assumes a soil density of 1.5 tons per cubic yard plus additional weight (5% by volume) for applying stabilization agents.
10. Includes transportation and on-site disposal of excavated soils with PCB concentrations less than 50 mg/kg. Assumes that excavated sediments under this line item will be disposed in the SSSMA. This cost estimate assumes that approximately 3,500 cubic yards of sediment will be less than 50 mg/kg. Cost estimate assumes a soil density of 1.5 tons per cubic yard plus additional weight (5% by volume) for applying stabilization agents.
11. Includes costs for labor, equipment, and materials for removing the temporary roads constructed to provide access to the creek, importing and placing 6 inches of topsoil in the disturbed upland areas, seeding the topsoil, and planting a limited number of shrubs/trees in the disturbed upland areas. This cost estimate also assumes that riprap will be used to stabilize the shoreline in approximately one-third of the areas where sediment deposits were removed.
12. Includes costs for labor, equipment, and materials to perform bank stabilization of unstable creek banks. For cost estimating purposes, it is assumed that 1,400 linear feet of creek banks will require either engineered stabilization measures or natural stabilization measures. This cost estimate assumes that bank stabilization measures will include one or more of the following: placing "dirty" riprap, planting live stakes, or installing articulated concrete mats to protect against continued bank erosion.
13. Includes costs for labor, equipment, and materials for contractor health and safety activities, monitoring dust and air emissions during intrusive activities, and dust control, as necessary.
14. Includes costs for labor, equipment, and materials to perform predesign investigation activities. Under this alternative, it is assumed that the predesign investigation will include sediment sampling to characterize sediment deposits that were not previously sampled.
15. Includes sediment and surface water sampling and analysis to monitor the effectiveness of the remedy. The cost estimate assumes that 10 surface water samples and 10 sediment samples will be collected and analyzed during sampling events that occur once every 5 years.
16. Assumes 30 years for implementation of long-term cover inspection and maintenance activities based on industry standard and guidance in the document titled *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study,* prepared by USEPA and USACE, July 2000.
17. Present worth is estimated based on a 7% beginning-of-year discount rate. Present cost factor based on *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study,* prepared by USEPA and USACE, July 2000.

Table F-2
Estimated Costs for Remedial Alternative SED-4 (1 mg/kg)
OU-1/OU-2 Feasibility Study Report
Anniston PCB Site, Anniston, Alabama

Alternative SED-4 (1 mg/kg): Remove sediment from culverts and excavate and dispose of sediment from the OU-1/OU-2 portion of Snow Creek with polychlorinated biphenyl (PCB) concentrations above preliminary remediation goals (PRGs). The PRGs for Snow Creek and the associated creek bank areas include 3 milligrams per kilogram (mg/kg) for PCBs in sediment and 21 mg/kg for PCBs in the adjoining creek bank areas. The chronic ambient water quality criteria (AWQC) value of 0.014 micrograms per liter (µg/L) also applies to the waters of Snow Creek. PRGs for metals that apply to Snow Creek sediment include for 322 mg/kg barium, 111 mg/kg for chromium, 59 mg/kg for cobalt, 128 mg/kg for lead, 1,100 for manganese, 1 mg/kg for mercury, 49 mg/kg for nickel and 41 mg/kg for vanadium. Off-site disposal of materials with PCB concentrations ≥50 mg/kg with on-site disposal of excavated sediment with PCB concentrations <50 mg/kg in the south staging and soil management area (SSSMA). Stabilize creek banks that are unstable or may become unstable during or following excavation of creek sediment and that have soil concentrations above PRGs.

Item No.	Item	Unit Cost	Units	Estimated Quantity	Estimated Cost
	Capital Costs				
1.	Mobilization / Demobilization	10%	Lump Sum	1	$219,000
2.	Temporary Facilities	$10,000	Month	7	$70,000
3.	Site Preparation	$64,000	Acre	3.7	$236,800
4.	Material Staging Pad	$135,000	Lump Sum	1	$135,000
5.	Surveying	$50,000	Lump Sum	1	$50,000
6.	Sediment Excavation and Handling	$210	Cubic Yard	4,000	$840,000
7.	Sediment Dewatering and Stabilization	$110	Cubic Yard	4,000	$440,000
8.	Backfill Placement	$35	Cubic Yard	1,500	$52,500
9.	Waste Transportation and Off-Site Disposal (≥50 mg/kg)	$200	Ton	800	$160,000
10.	Waste Transportation and Off-Site Disposal (<50 mg/kg)	$50	Ton	5,500	$275,000
11.	Shoreline Restoration	$159,000	Lump Sum	1	$159,000
12.	Bank Stabilization	$6.50	Square Feet	13,800	$89,700
13.	Contractor Health & Safety/Air Monitoring	$10,000	Month	7	$70,000
14.	Predesign Investigation	$40,000	Lump Sum	1	$40,000
				TOTAL CAPITAL COST	**$2,837,000**
	Long-Term Costs				
15.	Long-Term Monitoring	$15,000	Annually	1	$15,000
				ADDITIONAL LONG-TERM COST	**$15,000**
	Present Worth of Long-Term Costs				
16.	Years of Long-Term Program	30	Years		
17.	Discount Rate	7	%		
				PRESENT WORTH OF ANNUAL LONG-TERM COSTS (YEARS 1-30)	**$186,000**
	Administrative/Management				
				CONSTRUCTION BONDING (3% of Capital Cost)	**$85,000**
				PROJECT MANAGEMENT (5% of Capital Cost)	**$142,000**
				PROJECT MANAGEMENT (5% of Long-Term Cost)	**$9,000**
				ENGINEERING DESIGN/PERMITTING (6% of Capital Cost)	**$170,000**
				CONSTRUCTION MANAGEMENT (6% of Capital Cost)	**$170,000**
				SUBTOTAL	**$3,599,000**
	Contingency Costs				
				CONTINGENCY CAPITAL COSTS (15% scope + 15% bid)	**$851,000**
				CONTINGENCY LONG-TERM COSTS (10% scope + 10% bid)	**$37,000**
				TOTAL PRESENT WORTH	**$4,487,000**

General Notes:

- Cost estimate is based on past experience, cost estimating resources, and vendor estimates. Costs provided in 2016 dollars.
- This estimate has been prepared for the purposes of comparing potential remedial alternatives. The information in this cost estimate is based on the available information regarding the site investigation and the anticipated scope of the remedial alternative. Changes in cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. This cost estimate is expected to be within -30% to +50% of the actual projected cost.
- Cost factors based on *A Guide to Developing and Documenting Cost Estimates During Feasibility Study,* prepared by the United States Environmental Protection Agency (USEPA) and United States Army Corps of Engineers (USACE), July 2000.

Table F-2
Estimated Costs for Remedial Alternative SED-4 (1 mg/kg)
OU-1/OU-2 Feasibility Study Report
Anniston PCB Site, Anniston, Alabama

Assumptions:

1. Includes costs for mobilization/demobilization of labor, equipment, and materials to perform the remedial construction activities. The cost is estimated as 10% of the total capital cost for the alternative, excluding transportation/disposal costs. It is assumed that a single mobilization/demobilization will be necessary.
2. Includes costs for temporary facilities and utilities including project trailers, sanitation/waste facilities and services, field office services, and fuel storage.
3. Includes costs for labor, equipment, and materials to perform clearing, construct support facilities areas, install temporary gravel roads for access, and otherwise prepare the site for construction. Estimate assumes that 3.7 acres of upland area adjacent to Snow Creek will require clearing, construction of temporary access ways, and erosion/sedimentation control in order to access the various targeted sediment deposits throughout Snow Creek. The unit cost is based on site clearing ($10,000 per acre), erosion/sedimentation control ($4,000 per acre), and construction of temporary gravel access roads ($50,000 per acre).
4. Includes costs for labor, equipment, and materials to construct a temporary material staging pad for the sediment excavated from the creek. The cost estimate assumes a 75-foot by 150-foot material staging area constructed of a 6-inch gravel subbase and 6-inch asphalt pavement and equipped with a 12-inch berm and sloped to a sump.
5. Includes costs for labor, equipment, and materials to perform pre- and post-construction survey of the remedial areas to verify, confirm, and document pre- and post-construction elevations and conditions.
6. Includes costs for labor, equipment and materials to remove sediment obstructing culverts and excavation of sediment from the OU-1/OU-2 portion of Snow Creek with concentrations above a PRG above 1 mg/kg. The cost estimate assumes that this will include the removal of 4,000 cubic yards of sediment within a footprint of 77,000 square feet. Cost estimate assumes that a long-reach excavator and a smaller skidsteer unit will be used to excavate the targeted sediment deposits and load those materials into watertight trucks for transfer to a material staging area. Due to the isolated nature of the sediment deposits, this cost estimate assumes that the average sediment removal production rate will be 50 cubic yards per day.
7. Sediment dewatering and stabilization cost assumes handling of dredged soils, stabilization of dredged material with a stabilization agent (5% by volume). Water generated during dredged material staging and processing (including storm water) will be collected and treated prior to discharge to Snow Creek or to a local publicly owned treatment works.
8. Includes labor, equipment, and materials to purchase, import and place a 1-foot backfill layer in the excavated areas.
9. Includes transportation and off-site disposal of excavated materials with PCB concentrations greater than or equal to 50 mg/kg at a Toxic Substances Control Act regulated landfill. Based on available PCB data, this cost estimate assumes that approximately 500 cubic yards of sediment within the Highway 202 culvert will have PCB concentrations exceeding 50 mg/kg. Cost estimate assumes a soil density of 1.5 tons per cubic yard plus additional weight (5% by volume) for applying stabilization agents.
10. Includes transportation and off-site disposal of excavated materials with PCB concentrations less than 50 mg/kg at a nonhazardous landfill. This cost estimate assumes that approximately 3,500 cubic yards of sediment will be less than 50 mg/kg. Cost estimate assumes a soil density of 1.5 tons per cubic yard plus additional weight (5% by volume) for applying stabilization agents.
11. Includes costs for labor, equipment, and materials for removing the temporary roads constructed to provide access to the creek, importing and placing 6 inches of topsoil in the disturbed upland areas, seeding the topsoil, and planting a limited number of shrubs/trees in the disturbed upland areas. This cost estimate also assumes that riprap will be used to stabilize the shoreline in approximately one-third of the areas where sediment deposits were removed.
12. Includes costs for labor, equipment, and materials to perform bank stabilization of unstable creek banks. For cost estimating purposes, it is assumed that 1,400 linear feet of creek banks will require either engineered stabilization measures or natural stabilization measures. This cost estimate assumes that bank stabilization measures will include one or more of the following: placing "dirty" riprap, planting live stakes, or installing articulated concrete mats to protect against continued bank erosion.
13. Includes costs for labor, equipment, and materials for contractor health and safety activities, monitoring dust and air emissions during intrusive activities, and dust control, as necessary.
14. Includes costs for labor, equipment, and materials to perform predesign investigation activities. Under this alternative, it is assumed that the predesign investigation will include sediment sampling to characterize sediment deposits that were not previously sampled.
15. Includes sediment and surface water sampling and analysis to monitor the effectiveness of the remedy. The cost estimate assumes that 10 surface water samples and 10 sediment samples will be collected and analyzed during sampling events that occur once every 5 years.
16. Assumes 30 years for implementation of long-term cover inspection and maintenance activities based on industry standard and guidance in the document titled *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study,* prepared by USEPA and USACE, July 2000.
17. Present worth is estimated based on a 7% beginning-of-year discount rate. Present cost factor based on *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study,* prepared by USEPA and USACE, July 2000.