Appendix C
M-CACES Cost Estimate

Markland Ave Quarry Cover
Continental Steel Superfund
Site (CSSS)
Kokomo, Indiana
Final Design--December 2003

Designed By: CH2M HILL
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SUMMARY REPORTS SUMMARY PAGE

PROJECT DIRECT SUMMARY - Task.....1

DETAILED ESTIMATE DETAIL PAGE

01. Preconstruction Submittals.....1
02. Field Management.....1
03. Mob Equip/Parking/Staging Areas.....1
04. Quarry Pond Sediment Removal.....1
05. Quarry Pond Backfilling.....1
06. Site Preparation.....1
07. Final Cover Construction.....1
08. Demobilization.....1
09. Subcontractor Costs.....2
10. Project Management Costs.....2

No Backup Reports...

* * * END TABLE OF CONTENTS * * *

U.S. Army Corps of Engineers
PROJECT CSSS15: Markland Ave Quarry Cover - Continental Steel Superfund
CSSS Markland Avenue Quarry Cover
** PROJECT DIRECT SUMMARY - Task **

		QUANTITY	UOM	UNIT COST	TOTAL COST
01	Preconstruction Submittals	1.00	EA	70000.00	70,000
02	Field Management	1.00	EA	160465.00	160,465
03	Mob Equip/Parking/Staging Areas	1.00	EA	55480.00	55,480
04	Quarry Pond Sediment Removal	1.00	EA	166000.00	166,000
05	Quarry Pond Backfilling	1.00	EA	3742000.00	3,742,000
06	Site Preparation	1.00	EA	96000.00	96,000
07	Final Cover Construction	1.00	EA	733595.00	733,595
08	Demobilization	1.00	EA	37500.00	37,500
09	Subcontractor Costs	1.00	EA	759156.00	759,156
10	Project Management Costs	1.00	EA	1265260.00	1,265,260
TOTAL	Markland Ave Quarry Cover	1.00	EA	7085456.00	7,085,456

		QUANTY	UOM	TOTAL COST
Preconstruction Submittals				
	Payment/performance Bonds	1.00	LS	40,000
	Safety Supply Allowance	1.00	LS	5,000
	Builder's Risk Insurance	1.00	LS	10,000
	Submittals	1.00	LS	7,500
	Home Office Engineering Support	1.00	LS	7,500
Field Management				
	Project Manager	3.00	MO	28,740
	Susperintendent	3.00	MO	23,250
	Field Engineer	3.00	MO	19,800
	HSO	3.00	MO	27,600
	FieldOffce/Utilities/Porta-Johns	3.00	MO	8,925
	Relocation Allowance	1.00	LS	10,000
	Fuel Storage	3.00	MO	750
	Fire Protection	1.00	LS	2,500
	Spill Prevent/Emergency Response	1.00	LS	2,000
	Site Vehicles	3.00	MO	16,800
	Mechanic with Truck	3.00	MO	20,100
Mob Equip/Parking/Staging Areas				
	Mobilize Equipment	1.00	LS	15,000
	Traffic Cntrl-Trucks at Markland	3.00	MO	18,600
	Traffic Control Signage	1.00	LS	5,000
	Silt Fencing	1000.00	LF	3,500
	Construction Survey Crew	1.00	MO	12,000
	Equipment Storage Trailers/Rent	3.00	MO	1,380
Quarry Pond Sediment Removal				
	Remove Sedment from Site	14500	CY	145,000
	SVE Treatment System	3.00	MO	21,000
Quarry Pond Backfilling				
	Surge Rock	500000	TON	3,250,000
	General Fill	82000	CY	492,000
Site Preparation				
	Clearning and Grubbing	19.00	AC	76,000
	Demolition	1.00	LS	20,000
Final Cover Construction				
	Import Soil Cover Material	45000	CY	270,000
	Place Soil Cover Material	45000	CY	135,000
	Dust Control	3.00	MO	24,600
	Type 1 Geotextile (8-oz)	28500	SY	58,995
	Orange Safety Fence	380000	SF	41,800
	Import Topsoil Material	19000	CY	114,000
	Place Topsoil Material	19000	CY	57,000
	Hydroseeding	23.00	AC	32,200
Demobilization				
	Record Dwgs/Topo Info(OffceTime)	1.00	MO	2,000
	Project Closeout	1.00	LS	17,500
	Demobilize Equipment	1.00	LS	18,000

		QUANTY	UOM	TOTAL COST
Subcontractor Costs				
	Subcontractor G&A (11%)	1.00	LS	556,714
	Subcontractor Fee (4%)	1.00	LS	202,442
Project Management Costs				
	Engineering Project Mgmt (10%)	1.00	LS	506,104
	Contingency (15%)	1.00	LS	759,156
TOTAL Markland Ave Quarry Cover				7,085,456

Cost Estimate

The estimated cost for this RA, based on the final design, is approximately $7 million. The estimated cost in the M-CACES Gold format is attached (Appendix C).

Biddability, Constructibility, and Operability Review

CH2M HILL's affiliate, CH2M HILL Constructors, Inc. (CCI), has reviewed the draft BOD and draft plans and specifications with an emphasis on biddability and constructibility. Comments from the CCI review, as well as those of the project review team, have been incorporated into this document and the accompanying plans and specifications.

Tables

TABLE 1
Soil SVE Performance Standards
Markland Avenue Quarry Cover Basis of Design Report

Contaminant	10 × UTS mg/kg[a]	Contaminant	10 × UTS mg/kg[a]
1,1,1-Trichloroethane	6	Cyclohexane	NA
1,1,2-Trichloroethane	6	Ethylbenzene	10
1,1-Dichloroethane	6	Isopropylbenzene	NA
1,1-Dichloroethene	6	M,P-Xylene (Sum of Isomers)	30
1,2-Dichloroethane	6	Methyl Acetate	NA
2-Butanone	36	Methylcyclohexane	NA
2-Hexanone	NA	Methylene Chloride	30
4-Methyl-2-Pentanone	33	O-Xylene (1,2-Dimethylbenzene)	30 (see Xylenes)
Acetone	160	Styrene	NA
Benzene	10	Tetrachloroethene	6
Bromomethane	15	Toluene	10
Carbon Disulfide	4.8 (mg/L TCLP)	Total 1,2-Dichloroethene	NA
Chlorobenzene	6	trans-1,2-Dichloroethene	30
Chloroethane	6	Trichloroethene	6
Chloromethane	30	Trichlorofluoromethane	30
cis-1,2-Dichloroethene	NA	Vinyl Chloride	6
cis-1,3-Dichloropropene	18	Xylenes (total)	30

[a]Universal Treatment Standards (UTS) from 40 CFR 268.48. Performance standard is the greater of 10 × UTS or 90% reduction in the contaminant concentration.
NA = Not applicable.

TABLE 2
Evaluation of ARARs
Markland Avenue Quarry Cover Basis of Design Report
Continental Steel Superfund Site

ARARs and TBCs	Design Components Addressing Requirement	Waivers Needed?
RCRA Subpart S CAMU **40 CFR 264.552—ARAR**		
The CAMU shall, to the extent practicable, be managed and contained so as to minimize future releases.	The CAMU landfill design criterion is to minimize future releases. Impoundment sludges will be stabilized, as needed, to meet minimum compressive strength criteria and will be disposed of in the CAMU. All wastes are placed in a double composite liner cell with leachate collection and detection systems. Leachable wastes with elevated VOC concentrations will be treated with SVE prior to placement in the CAMU. The cell will be covered with clay and synthetic liner to minimize infiltration.	No
The CAMU shall enable the use, when appropriate, of treatment technologies (including innovative technologies) to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of hazardous substances that will remain in place after closure of the CAMU.	The SVE pretreatment of sludges, soils and sediments containing elevated quantities of VOCs will reduce the toxicity and mobility of the hazardous substances that will be contained in the CAMU. SVE treatment is considered appropriate for the VOC soils because: (1) it can substantially reduce the VOC mass, and (2) VOCs are the primary contaminants that are leachable as evidenced by their presence in the groundwater. Treatment of other non-VOCs is not considered appropriate because they have much lower leachability and have not leached into groundwater at the site. Solidification treatment of the sludges is included to provide sufficient bearing capacity for the sludges.	No
The CAMU shall, to the extent practicable, minimize the land area of the facility upon which wastes will remain in place after closure of the CAMU.	The CAMU has been reduced in size from that presented in the FS to an area of about 500′ by′ 1,300′. This results in a landfill height of about 90′ above current land surface. The CAMU will be placed over the lagoon area impoundments to allow use of the impoundment area (including the volume from ground surface to 10′ below ground surface), thus minimizing the CAMU size.	No

TABLE 2
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Basis of Design Report
Continental Steel Superfund Site

ARARs and TBCs	Design Components Addressing Requirement	Waivers Needed?
Closure of corrective action management units shall minimize the need for further maintenance.	Cover side slopes will be kept to a maximum of 33% to minimize erosion. Cover surface slopes will be kept to a minimum of 5% to promote drainage. Design features reducing long-term maintenance include SVE pretreatment and the cover components. The SVE system reduces potential for releases, as well as dries the soil and sediment, thus minimizing the long-term collection and treatment of leachate. The CAMU includes two low-permeability layers to minimize infiltration, thus reducing long-term leachate collection and treatment.	No
Closure of corrective action management units shall control, minimize, or eliminate, to the extent necessary to protect human health and the environment, for areas where wastes remain in place, postclosure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, to surface waters, or to the atmosphere.	The CAMU design criterion is to minimize future releases to the soil underlying the CAMU, the groundwater, surface water and to the air. The most mobile contaminants, the VOCs, will be treated via SVE, thus reducing the mass available for potential leaching. The remaining VOCs will be contained within a multiliner cell meeting the technical requirements of new RCRA hazardous waste Subtitle N landfills. The design includes protective measures to prevent erosion of the covers and the wastes.	No
Closure requirements, including the need and type of capping of wastes should be made based on: (1) CAMU characteristics, (2) volume of wastes, (3) potential for releases, (4) physical and chemical characteristics of the waste, (5) hydrological and other relevant environmental conditions, (6) potential for exposure of humans and environmental receptors.	The CAMU will be capped with two low-permeability layers in accordance with requirements for RCRA hazardous waste Subtitle N landfills because of the leachability of the VOCs.	No

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Evaluation of ARARs
Markland Avenue Quarry Cover Basis of Design Report
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ARARs and TBCs	Design Components Addressing Requirement	Waivers Needed?
Amendments to the CAMU Rule (*December 21, 2001*)—TBC		
The amendments are not applicable because the CAMU was approved before the applicable date of the new regulations. They are not considered relevant and appropriate because the ROD had already selected a remedy that is considered protective of public health and the environment, yet did not include all the requirements of the new CAMU regulations. The amendments are considered TBCs.	The CAMU design includes a double composite liner with two 60-mil HDPE liners, a GCL and 3′ of clay having a permeability of less than 1×10^{-7} cm/sec. Also included are leachate collection and detection systems.	No
Include a composite liner and a leachate collection system that is designed and constructed to maintain less than a 30-cm depth of leachate over the liner. The composite liner system consists of two components; the upper component must consist of a minimum 30-mil FML, and the lower component must consist of at least a 2′ layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.		
FML components consisting of high-density polyethylene (HDPE) must be at least 60 mil thick.	HDPE FML liners of a minimum 60-mil thickness are specified.	No
Treatment to achieve a concentration that is the greater of 90% reduction or ten times the UTS for principal hazardous constituent concentrations. Principal hazardous constituents are those that pose a potential direct risk from ingestion or inhalation at the site at or above: 10^{-3} excess lifetime cancer risk, or an order of magnitude or greater over their reference dose for noncarcinogens, or that have a potential for migration to groundwater.	Treatment to achieve a concentration that is the greater of 90% reduction or ten times the UTS for each of the principal hazardous constituents will be specified for the SVE system.	No

TABLE 2
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Basis of Design Report
Continental Steel Superfund Site

ARARs and TBCs	Design Components Addressing Requirement	Waivers Needed?
The CAMU must be closed with a cap designed to: (1) provide long-term minimization of migration of liquids through the closed unit, (2) function with minimum maintenance, (3) promote drainage and minimize erosion or abrasion of the cover, (4) accommodate settling and subsidence so that the cover's integrity is maintained, and (5) have a permeability less than or equal to the permeability of any bottom liner system or natural subsoil present.	The stabilized sludges, soils, and sediments will be covered with two low-permeability layers. This cover will minimize migration of liquids. The cover will promote drainage and function with minimum maintenance by providing top (minimum 5%) and side slopes (maximum 33%) to promote drainage and minimize erosion. Erosion protection surfaces will be provided along the CAMU side slopes potentially affected by the river during high river stage or during flooding. Minimal settling and subsidence is expected because of the low organic content of the waste. However, the 5% top slopes will accommodate settling and subsidence if they occur. The cover will have a permeability equal to the bottom liner in that both are designed with two similar low-permeability layers.	No
Identification and Listing of Hazardous Waste		No
40 CFR Part 261 Defines those solid wastes which are subject to regulation as hazardous wastes under 40 CFR Parts 262-265 and Parts 270, 271, 124.	The sediments do not have to be managed as containing listed waste because specific documentation of the release of a listed waste to the sediments is not available. Portions of the sediments may be characteristic hazardous waste. The sediments will be disposed in the CAMU, thus meeting ARARs for both solid and hazardous waste.	
Standards Applicable to Generators of Hazardous Waste		No
40 CFR Part 262 Establishes standards for generators of hazardous waste.	Excavated sediments to be disposed in the CAMU are not considered to be "generated". Therefore these standards are not ARARs.	

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ARARs and TBCs	Design Components Addressing Requirement	Waivers Needed?
Standards for Owners and Operators of Hazardous Waste, Treatment, Storage and Disposal Facilities 40 CFR Part 264 Establishes standards for owners and operators of hazardous waste treatment, storage and disposal facilities. Includes prohibition of disposal of hazardous waste containing free liquids (264.314(c)) in a landfill. The material must pass the Paint Filter Test (Method 9095).	Excavated sediments to be disposed in the CAMU will be dewatered and/or solidified as necessary to no longer contain free liquids as measured by the Paint Filter Test.	No
40 CFR 268.49 Alternative Land Disposal Restriction Treatment Standards for Contaminated Soil Achieve the greater of 90 percent reduction in total constituent concentrations or ten times the Universal Treatment Standard (UTS) for that constituent.	The LDRs are not ARARs because the soil is being disposed in a CAMU. However these requirements are "to-be-considered" and will be used as target performance standards for the leachable VOC constituents treated with the SVE system. An example performance standard for TCE would be the higher of a 90% reduction in concentration or 60 mg/kg (10 x the UTS of 6 mg/kg). Note these TBC requirements are essentially identical to the treatment standards for principal hazardous constituents under the new CAMU requirements promulgated December 21, 2001 (Also note the new CAMU requirements are not applicable to the CSSS CAMU because they were promulgated after the CAMU was approved by EPA.).	No
Toxic Substances Control Act (TSCA) (40CFR 761.61) PCB Remediation Wastes Specifies requirements for self-implementing on-site cleanup of PCB remediation waste. Requirements are not binding on CERCLA sites (761.61 (a)(1)(ii)). Self-implementing requirements are not applicable to sediments.	Excavation and disposal of PCB contaminated sediment in the CAMU is included in design.	No

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Performance-based Cleanup (761.61(b)(3)). Material that has been dredged or excavated from waters of the United States must be managed in accordance with a permit issued under section 404 of the Clean Water Act, or the equivalent of such a permit.	The substantive requirements of the Section 404 permit will be met for excavation and the sediment will be disposed in the CAMU. The CAMU meets the requirements of hazardous waste landfills .	No
Toxic Substances Control Act (TSCA) (40CFR 761.65) Storage for Disposal		No
Bulk PCB remediation waste containing > 50 mg/kg PCBs may be stored onsite for up to 180 days provided controls are in place for prevention of dispersal by wind or generation of leachate.	No PCB concentrations > 50 mg/kg were detected.	
Storage site requirements include a foundation below the liner, a liner, a cover and a run-on control system.		
Clean Air Act		No
40 CFR 50-99 Specifies requirements for air emissions such as particulates, sulfur dioxide, VOCs, hazardous air pollutants and asbestos.	Particulates are not likely to be generated during excavation of sediments. Best available practices to control particulates will be used as needed. The use of Geotubes is expected to reduce the potential for VOC air emissions. Air monitoring for VOCs shall be conducted with photoionization devices (PIDs) and Summa Canisters, if appropriate.	
Fish and Wildlife Coordination Act		No
16 USC 661 *et seq.;* 40 CFR 6.304 Requires protection of fish and wildlife from adverse effects of site action.	Impacts on fish and wildlife will be minimized during dredging through reasonable methods of control.	

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ARARs and TBCs	Design Components Addressing Requirement	Waivers Needed?
Endangered Species Act		No
16 USC Sec. 1531-1543; 40 CFR 6-302(h), 50 CFR Part 200, 50 CFR Part 402		
Requires that Federal agencies insure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify critical habitat.	No endangered species known to be present that would be affected by sediment excavation activities.	
Executive Order 11990		No
Requires actions to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.	Much of the area in the quarry to be excavated is not a "wetland" as defined in the Executive Order. Wetlands include such areas as "river overflow", "swamp", or "marsh". Some areas along the banks of the pond may be considered wetlands. These areas will be protected during sediment excavation. However if such areas are within the target areas of sediment excavation, they will be removed. This is considered unavoidable and there is no practicable alternative to the excavation.	
Indiana Air Pollution Control Board Rules 326		No
Indiana rules specify requirements for air emissions such as particulates, sulfur dioxide, VOCs, hazardous air pollutants and asbestos. Rules generally parallel federal Clean Air Act Requirements.	Particulates are not likely to be generated during excavation of sediments. Best available practices to control particulates will be used as needed. The use of Geotubes is expected to reduce the potential for VOC air emissions. Air monitoring for VOCs shall be conducted with photoionization devices (PIDs) and Summa Canisters, if appropriate.	
Indiana Ground Water Quality Standards 327 IAC 2-11		No
Specifies use designations for ground waters of the state, and water quality criteria for specific substances for each use designation.	Remediation of quarry sediment is not expected to adversely effect groundwater quality.	

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Indiana Solid Waste Rules 329 IAC 4 Requirements for Disposal of Waste Containing PCBs. Incorporates the federal TSCA requirements by reference. See TSCA ARARs.	See TSCA ARARs.	No
Indiana Solid Waste Rules 329 IAC 10 Specifies rules for land disposal of solid wastes.	Disposal of special waste such as contaminated sediment in the CAMU meets the requirements of 329 IAC 10.	No

ARAR – Applicable or Relevant, and Appropriate Requirements
TBC – To be considered