APPENDIX J

Cost Details

Appendix J Cost Details

Cost estimates for the T-117 Removal Action Alternatives are based on the area-specific details provided in this appendix. Costs were prepared by each participating firm as indicated below:

T-117 Upland Removal Area:

- Table J-1: T-117 NTCRA Cost Estimate – T-117 Upland Removal Area (AECOM)

Adjacent Streets and Residential Streets Removal Area

- Table J-2: T-117 NTCRA Cost Estimate – Adjacent Streets and Residential Yards Removal Area (Integral Consulting, Inc.)

Sediment Removal Area

- Table J-3: T-117 EE/CA Dredging Cost Estimate: Alternative 1: Partial Dredging Plus Capping (Dalton, Olmsted & Fuglevand, Inc.)
- Table J-4: T-117 EE/CA Dredging Cost Estimate: Alternative 2: Full Dredging With Backfilling (Dalton, Olmsted & Fuglevand, Inc.)

Table J-1. T-117 NTCRA EE/CA COST ESTIMATE - UPLAND

	COST COMPONENT	UNIT	QUANTITY	UNIT COST	TOTAL COST	SOURCE	COMMENTS
DIRECT COSTS							
1	Mobilization/Demobilization	LS	1	$212,000	$212,000	Based on TCRA mob/demob cost	Calculated as a percentage of total construction cost not including waste and water disposal costs
2	Site Preparation	LS	1	$2,426,000	$2,426,000	Contractor estimate	Includes temporary facilities and controls, security and silt fences, hazardouis materials assessment and abatement, building and site demolition, loading and disposal, well abandonment and replacement, and sheetpile installation.
3	Well Point Dewatering system Installation and Operation	LS	1	$382,249	$382,000	Previous project costs	Includes well system and pump installation, Mob/demob, maintenance, and operation of the water treatment system, sand and carbon replacement, tank rental, analytical and POTW treatment cost.
4	Excavation and Disposal						
	4a Excavation and stockpiling	CY	36,924	$33	$1,235,000	TCRA cost	Assume staged excavation w/~1.5 cy tracked excavator; load directly onto haul trucks for disposal. Excavation production will be constrained by site access, coordination w/public, confirmation sampling, and likely standby time.
	4b Hauling and Disposal (>1, < 50ppm)	TN	48,489	$55	$2,667,000	Quote from Waste Management	Cost estimate includes loading time, but does not include standby time. Assume soil = 1.6 tons/cy for all calcs.
	4c Hauling and Disposal (>50 ppm)	TN	6,240	$209	$1,307,000	Quote from Waste Management	Cost estimate includes loading time, but does not include standby time. Volume estimate based on entire >50 ppm excavation prism excluding 2006 TCRA soils.
	4d Structural Backfill (Haul and Place)	TN	29,163	$40	$1,167,000	TCRA cost	Volume estimate based on backfilling to 14 mllw.
				Capital Costs	**$9,396,000**		
5	Confirmation Sampling	LS	1	$100,000	$100,000	Previous Project Experience and TCRA costs	
6	Longterm Monitoring	LS	1	$100,000	$100,000	Previous project experience	
7	Contingency	LS	50.0%	of Capital + O&M	$4,798,000		Contingency costs are applied to capital costs, confirmation sampling, and longterm monitoring.
				Total Direct Costs (Capital + O&M)	**$14,394,000**		
INDIRECT COSTS							
8	Design	LS	6%	of Direct Costs	$864,000	EPA, 2000	Data, planning, design, plans and specs, construction estimate.
9	Project Management	LS	5%	of Direct Costs	$720,000	EPA, 2001	Planning, community relations, bid/contract administration, cost and performance reporting, permitting, legal, construction completion report
10	Construction Quality Assurance/Management	LS	6%	of Direct Costs	$864,000	EPA, 2002	Submittal review, change order review, design modifications, construction observations, construction survey, construction schedule tracking, QA/QC documentation, O&M manual, record drawings.
11	Air Monitoring	LS	4%	of Direct Costs	$576,000		
12	Agency Oversight	LS	10%	of Direct Costs	$1,439,000	Based on TCRA percentage of 13%	Agency oversight
				TOTAL INDIRECT COSTS:	**$4,462,000**		
				SUBTOTAL (DIRECT + INDIRECT COSTS):	**$18,856,000**		
13	State Tax	LS	9.0%	of Direct and Indirect	$1,229,000		Sales tax is already included in the disposal quote and excluded from this calculation.
				TOTAL ESTIMATED PROJECT COST (T-117 UPLAND):	**$20,100,000**		Rounded to three significant digits

Reference

EPA, 2000. A Guide to Developing and Documenting Cost Estimates During the Feasibility Study. EPA 540-R-00-002. OSWER 9355.0-75

Table J-2. T-117 NTCRA EE/CA COST ESTIMATE - ADJACENT STREETS & RESIDENTIAL YARDS

	COMPONENT	UNIT	QUANTITY	UNIT COST	TOTAL COST	SOURCE	ASSUMPTIONS/NOTES
DIRECT COSTS (Excluding Stormwater Improvements)							
1	**Mobilization/Demobilization (% of total capital costs)**	7.50%	1	-	$195,728	Engineer's Estimate	Includes mob/demob of equipment and crew; project management, construction work plans, permits, bonds, insurance.
2	**Construction Engineering and Surveying**	LS	1	$35,000	$35,000	Engineer's Estimate	Includes submittals, backfill material testing, compaction testing, surveying
3	**Site Preparation**						
3a	Traffic Control and Fencing	LS	1	$30,000	$30,000	Engineer's Estimate	Traffic control plan for residents as well as trucks entering and leaving the site; signage and flaggers. Provide construction fencing around excavation areas and any stockpiled material. Assume 4-6 week construction period @ $1000/wk.
3b	Site Facilities	LS	1	$20,000	$20,000	Engineer's estimate, Means (2006)	Setting up site trailer, utilities, equipment laydown, soil processing for 4-6 wks @ $750/wk
4	**Environmental Controls**	LS	1	$100,000	$100,000	Contractor estimate	Includes decon pad/operation, air monitoring, erosion/sediment control, stormwater management, ppe gear, dust control, dewatering, etc.
Excavation and Disposal							
5	**Adjacent Streets (within City ROW including parking strips on S Cloverdale St.)**						
5a	Excavation and Stockpiling	CY	8300	$33	$273,900	Engineer's Estimate	Assume staged excavation w/~1.5 cy tracked excavator; load directly onto haul trucks for off-site disposal. Excavation production will be constrained by site access, coordination w/public, confirmation sampling, standby time. Excavation volume includes soil exceeding 1 ppm PCBs, asphalt pavement, and base material.
5b	Shoring	LS	1	$15,000	$15,000	RS Means, Engineer's Estimate	Includes provisions for temporary shoring of excavations adjacent to structures and utilties. Assume temporary shoring will include steel sheeting, trench boxes, or other bracing.
5c	Hauling and Disposal (PCBs >1, < 50ppm)	TN	11900	$55	$654,500	WM Quote	Assume avg wt of soils = 1.6 tons/cy. Disposal volume includes soil >1 ppm, <50 ppm. Subtitle D landfill dispsoal. Quote from WM (provided by ENSR 5/12/08)
5d	Hauling and Disposal (PCBs ≥50 ppm)	TN	1400	$209	$292,600	WM Quote	Soil exceeding or equal to 50 ppm segregated for waste characterization sampling. Assumes all segregated material will be classified as hazardous waste, requiring disposal @ Subtitle C landfill.
5e	Structural Backfill (Haul and Place)	TN	8500	$40	$340,000	Engineer's Estimate	Excavations to be backfilled in stages with clean granular fill, placed in ~9-inch lifts and compacted in prep for new pavement. Backfill production will be impacted by access and sampling coordination constraints
6	**Yards (For Yards and other Decision Units (DUs))**						
6a	Excavation and Stockpiling (Difficult Excavation)	CY	1700	$83	$140,250	Engineer's Estimate and RS Means	Assume difficult excavation due to obstructions. Excavation will be completed using small equipment and hand shovels. Material will transferred onto haul trucks for off-site disposal. Excavation production will be constrained by site access, coordination w/public, confirmation sampling, standby time. Excavation volume includes soil exceeding the RvAL of 1 ppm PCBs and grass/lawn at surface.
6b	Hauling and Disposal (PCBs >1, < 50ppm)	TN	2700	$55	$148,500	WM Quote	Assume avg wt of soils = 1.6 tons/cy. Disposal volume includes soil >1 ppm, <50 ppm. Subtitle D landfill dispsoal. Quote from WM (provided by ENSR 5/12/08)
6c	Hauling and Disposal (PCBs ≥50 ppm)	TN	0	$209	$0	WM Quote	Soil exceeding or equal to 50 ppm segregated for waste characterization sampling. Assumes all segregated material will be classified as hazardous waste, requiring disposal @ Subtitle C landfill.
7	**Restoration of Streets and Parking Strips Following Removal Action**						
7a	Base Course (Haul and Place)	TN	1900	$40	$76,000	Engineer's Estimate, Tucci and Sons	Volume based on 6-inch thick compacted granular base coarse.
7b	Asphalt Pavement	TN	2900	$90	$261,000	Engineer's Estimate, Tucci and Sons	Assumes up to 9-inch thick asphalt pavement. Unit cost from Tucci and Sons 2008. 2.1 TN/CY in place measure - per Contractor
7c	Furnish and Place Topsoil	SY	200	$5	$1,000	RS Means	Assume 6-inch thick layer of topsoil over all areas where sod is applied.
7d	Sodding, 1 inch, 1000 SF	MSF	2	$500	$1,000	RS Means	Based on replacement parking strips via sodding
8	**Restoration of Yards and other DUs Following Removal Action**						
8a	Structural Backfill (Haul and Place)	CY	1655	$40	$66,200		

Table J-2. T-117 NTCRA EE/CA COST ESTIMATE - ADJACENT STREETS & RESIDENTIAL YARDS

T	COMPONENT	UNIT	QUANTITY	UNIT COST	TOTAL COST	SOURCE	ASSUMPTIONS/NOTES
DIRECT COSTS (Excluding Stormwater Improvements)							
1	**Mobilization/Demobilization (% of total capital costs)**	7.50%	1	-	$195,728	Engineer's Estimate	Includes mob/demob of equipment and crew; project management, construction work plans, permits, bonds, insurance.
2	**Construction Engineering and Surveying**	LS	1	$35,000	$35,000	Engineer's Estimate	Includes submittals, backfill material testing, compaction testing, surveying
3	**Site Preparation**						
	3a Traffic Control and Fencing	LS	1	$30,000	$30,000	Engineer's Estimate	Traffic control plan for residents as well as trucks entering and leaving the site; signage and flaggers. Provide construction fencing around excavation areas and any stockpiled material. Assume 4-6 week construction period @ $1000/wk.
	3b Site Facilities	LS	1	$20,000	$20,000	Engineer's estimate, Means (2006)	Setting up site trailer, utilities, equipment laydown, soil processing for 4-6 wks @ $750/wk
4	**Environmental Controls**	LS	1	$100,000	$100,000	Contractor estimate	Includes decon pad/operation, air monitoring, erosion/sediment control, stormwater management, ppe gear, dust control, dewatering, etc.
Excavation and Disposal							
5	**Adjacent Streets (within City ROW including parking strips on S Cloverdale St.)**						
	5a Excavation and Stockpiling	CY	8300	$33	$273,900	Engineer's Estimate	Assume staged excavation w/~1.5 cy tracked excavator; load directly onto haul trucks for off-site disposal. Excavation production will be constrained by site access, coordination w/public, confirmation sampling, standby time. Excavation volume includes soil exceeding 1 ppm PCBs, asphalt pavement, and base material.
	5b Shoring	LS	1	$15,000	$15,000	RS Means, Engineer's Estimate	Includes provisions for temporary shoring of excavations adjacent to structures and utilties. Assume temporary shoring will include steel sheeting, trench boxes, or other bracing.
	5c Hauling and Disposal (PCBs >1, < 50ppm)	TN	11900	$55	$654,500	WM Quote	Assume avg wt of soils = 1.6 tons/cy. Disposal volume includes soil >1 ppm, <50 ppm. Subtitle D landfill dispsoal. Quote from WM (provided by ENSR 5/12/08)
	5d Hauling and Disposal (PCBs ≥50 ppm)	TN	1400	$209	$292,600	WM Quote	Soil exceeding or equal to 50 ppm segregated for waste characterization sampling. Assumes all segregated material will be classified as hazardous waste, requiring disposal @ Subtitle C landfill.
	5e Structural Backfill (Haul and Place)	TN	8500	$40	$340,000	Engineer's Estimate	Excavations to be backfilled in stages with clean granular fill, placed in ~9-inch lifts and compacted in prep for new pavement. Backfill production will be impacted by access and sampling coordination constraints
6	**Yards (For Yards and other Decision Units (DUs))**						
6a	Excavation and Stockpiling (Difficult Excavation)	CY	1700	$83	$140,250	Engineer's Estimate and RS Means	Assume difficult excavation due to obstructions. Excavation will be completed using small equipment and hand shovels. Material will transferred onto haul trucks for off-site disposal. Excavation production will be constrained by site access, coordination w/public, confirmation sampling, standby time. Excavation volume includes soil exceeding the RvAL of 1 ppm PCBs and grass/lawn at surface.
6b	Hauling and Disposal (PCBs >1, < 50ppm)	TN	2700	$55	$148,500	WM Quote	Assume avg wt of soils = 1.6 tons/cy. Disposal volume includes soil >1 ppm, <50 ppm. Subtitle D landfill dispsoal. Quote from WM (provided by ENSR 5/12/08)
6c	Hauling and Disposal (PCBs ≥50 ppm)	TN	0	$209	$0	WM Quote	Soil exceeding or equal to 50 ppm segregated for waste characterization sampling. Assumes all segregated material will be classified as hazardous waste, requiring disposal @ Subtitle C landfill.
7	**Restoration of Streets and Parking Strips Following Removal Action**						
	7a Base Course (Haul and Place)	TN	1900	$40	$76,000	Engineer's Estimate, Tucci and Sons	Volume based on 6-inch thick compacted granular base coarse.
	7b Asphalt Pavement	TN	2900	$90	$261,000	Engineer's Estimate, Tucci and Sons	Assumes up to 9-inch thick asphalt pavement. Unit cost from Tucci and Sons 2008. 2.1 TN/CY in place measure - per Contractor
	7c Furnish and Place Topsoil	SY	200	$5	$1,000	RS Means	Assume 6-inch thick layer of topsoil over all areas where sod is applied.
	7d Sodding, 1 inch, 1000 SF	MSF	2	$500	$1,000	RS Means	Based on replacement parking strips via sodding
8	**Restoration of Yards and other DUs Following Removal Action**						
	8a Structural Backfill (Haul and Place)	CY	1655	$40	$66,200		

Table J-2, continued. T-117 NTCRA EE/CA COST ESTIMATE - ADJACENT STREETS & RESIDENTIAL YARDS

T	COMPONENT	UNIT	QUANTITY	UNIT COST	TOTAL COST	SOURCE	ASSUMPTIONS/NOTES
	8b Miscelleaneous Landscaping	Per Yd	6	$2,000	$12,000	Engineer's Estimate	Assumes replacement of plants, fencing, etc. to restore yards to existing conditions.
	8c Furnish and Place Topsoil	SY	2700	$5	$13,500	RS Means	Assume 6-inch thick layer of topsoil over all areas where sod is applied.
	8d Sodding, 1 inch, 1000 SF	MSF	24	$500	$12,000	RS Means	Based on replacement of all decision units via sodding
	8e Sidewalk Reconstruction	SY	350	$15	$5,250	RS Means, Engineer's Estimate	Assume sidewalk reconstruction on both sides of S Cloverdale Street, and south side of Dallas Avenue.
	8f Guardrail	LF	800	$15	$12,000	RS Means, Engineer's Estimate	Replace guardrail along upper Donovan Street.
	8g Retaining wall	SF	4000	$25	$100,000	RS Means, Engineer's Estimate	Assume that a retaining wall will be required for steep slope between upper and lower S Donovan St.
			SUBTOTAL (Capital Costs)		**$2,810,000**		
	9 Confirmation Sampling						
	9a Point Sampling		100	$2,250	$225,000	Engineer's Estimate	Sampling cost includes provisions for PCB and dioxin/furan analysis, fast turnaround of selected samples, data validation, and reporting.
	9b MIS Sampling		30	$3,500	$105,000	Engineer's Estimate	Assume confirmation sampling uses MIS sampling protocol for Decision Units similar to characterization. Sampling cost includes provisions for PCB and dioxin/furan analysis, fast turnaround of selected samples, data validation, and reporting.
	10 Long-Term O & M, Performance Monitoring	-	-	-			Assume no long-term NTCRA-related O&M or performance monitoring for Adjacent Streets and Residential Yards, given removal to unrestricted land use. Assume 5-yr project review to be covered under T-117 Upland and Sediment removal action.
	11 Contingency (50% Direct Costs)	0.5	-	-	$1,570,000	EPA 540-R-00-002	Contingency costs are applied to capital costs, confirmation sampling, and long-term monitoring.
			SUBTOTAL (Direct Costs)		**$4,710,000**		
	INDIRECT COSTS						
	12 Coordination with Residents	LS	1	$50,000	$50,000	Engineer's Estimate	
	13 Remedial Design (% of total direct costs)	6%	-	-	$282,600	EPA 540-R-00-002	
	14 Project Management (% of total direct costs)	5%	-	-	$235,500	EPA 540-R-00-002	Includes bid/contract admin, legal and permitting support, construction completion report
	15 Construction Management/ Quality Assurance Support (% of total direct costs)	6%	-	-	$282,600	EPA 540-R-00-002	Contractor submittal reviews, QA field monitoring, completion reporting.
	16 Air Monitoring	LS	1	$112,400	$112,400	Engineer's Estimate	Assumed 4% of capital costs
	17 Agency Oversight (% of total direct costs)	10%	-	-	$471,000	Engineer's Estimate	
			-	-			
				TOTAL INDIRECT COSTS:	**$1,434,100**		
				SUBTOTAL (DIRECT + INDIRECT COSTS):	**$6,144,100**		
	18 State Tax	9%			**$454,365**		Applied to total indirect + direct costs. Disposal costs are excluded from tax base.
				TOTAL ESTIMATED PROJECT COST (STREETS AND YARDS):	**$6,600,000**		Rounded to two significant digits
	STORMWATER IMPROVEMENTS						
	19 Estimated Cost for Stormwater Collection System Restoration	LS	1	$1,001,200	$1,001,200	Integral 2006 Draft FS	Finished streets require replacement of stormwater collection system following remedial action. Line item reflects total estimated costs (direct & indirect) for stormwater system from draft 2006 FS for Adjacent Streets, adjusted 4% (per year) to account for 2006 to 2009 inflation.
				TOTAL ESTIMATED COST - STORMWATER IMPROVEMENTS:	**$1,001,200**		
				TOTAL COST (Including Stormwater Improvements):	**$7,600,000**		

Reference

EPA, 2000. A Guide to Developing and Documenting Cost Estimates During the Feasibility Study. EPA 540-R-00-002. OSWER 9355.0-75

Table J-3. T-117 NTCRA EE/CA COST ESTIMATE - SEDIMENT
ALTERNATIVE 1: PARTIAL DREDGING PLUS CAPPING

QUANTITIES Dredging (CY) 6,500
Capping (CY) 7,000

COST COMPONENT	UNIT	QUANTITY	UNIT COST	TOTAL COST	SOURCE	COMMENTS
DIRECT COSTS						
1. Mob/Demob						
1a. Dredging, Disposal, and Capping	LS	1	$117,000	$117,000	Engineer Est.	Mechanical dredge/derrick, buckets, tug
1b. Water management	LS	1	$212,000	$212,000	Engineer Est.	Tanks, piping, pumps, flexi floats, pump
1c. Tempoary relocate portion of Marina	LS	1	$75,000	$75,000	Engineer Est.	Place Holder
2. Open Water Dredging						
2a. Dredging	Daily Rate	8	$20,200	$164,125	Engineer Est.	12 hr. day. Marina and wedge above 0' MLLW along mudflat. Assume 800 cy/day. Load onto barges and deliver barges to sediment offloading facility located in Port of Seattle area.
2b. Water management	Daily Rate	8	$11,000	$89,375	Engineer Est.	12-hr day. Pump-off from sediment barge, and processing through upland water management facility
3. Sediment Offloading	Daily Rate	8	$9,000	$73,125	Engineer Est.	10 hr. day. Offloading of sediment from barges at a Port of Seattle area dock to trucks with 20' containers on chassis. Work includes purchasing and installing liners into containers. Assume $60/liner and 24 tons per container.
4. Landfill Disposal	Tons	9,750	$50	$487,500	Engineer Est.	Trucking of sediment from transload facility to Rabancoo Seattle transfer facility, landfill T&D. Subtitle D Rabanco Quote. Assume 1.5 tons/cy. Blended unit price to cover 75 tons of TSCA and the rest as Subtitle D disposal.
5. Capping of Aquatic Area						
5a. Purchase and deliver	CY	7,000	$35	$245,000	Engineer Est.	Purchase sand and gravel and deliver on barge to project site. Assume 70% gravel (2.5" minus)
5b. Place sand and gravel as	Daily Rate	9	$14,200	$124,250	Engineer Est.	12 hr. day. Place sand and gravel as capping material throughout sediment remediation area, except marina. Assume min. 3-ft thick. Assume 800 cy/day.
		Capital Costs		**$1,587,375**		
6. Confirmation Sampling	LS	1	$100,000	$100,000	Engineer Est.	
7. Long Term O&M for aquatic cap	LS	1		$330,000	Engineer Est.	Present value. Maintenance at year 7 at 25% of capping cost. Plus monitoring events years 1, 3, 6, and 10 at $75,000 each. Discount rate of 5%
8. Contingency	LS	1	50%	$1,008,688		Contingency applied to capitol costs, confirmation smpl & O&M
		Total Direct Costs		$3,026,063		
INDIRECT COSTS						
9. Project Management	5%			$151,303	EPA 2001	Planning, community relations, bid/contarct admin., cost and preformance reporting, permitting, legal, const. completion rpt.
10. Remedial Design	6%			$181,564	EPA 2000	Data, planning, design, plans & specs, construction est.
11. Construction Management / QA Support	6%			$181,564	EPA 2002	Submittal review, change order review, design modifications, construction observations, constructioin survey, construction schedule tracking, QA/QC documentation, O&M manual, record drawings
12. Agency Oversight	10%			$302,606		Agency oversight.
13. WSST (not on landfill T&D)	9%			$206,533		Sales tax on Total Direct Costs without Landfill Disposal
		Total Indirect Costs		$1,023,570		
TOTAL ESTIMATED PROJECT COSTS (Rounded to two significant digits)				**$4,000,000**		

Table J-4. T-117 NTCRA EE/CA COST ESTIMATE - SEDIMENT
ALTERNATIVE 2: FULL DREDGING WITH BACKFILLING

QUANTITIES

Dredge (CY)	14,000
Backfill (CY)	10,000

COST COMPONENT	UNIT	QUANTITY	UNIT COST	TOTAL COST	SOURCE	COMMENTS
DIRECT COSTS						
1. Mob/Demob						
1a. Dredging, Disposal, and Backfill	LS	1	$117,000	$117,000	Engineer Est.	Mechanical dredge/derrick, buckets, tug
1b. Water management	LS	1	$212,000	$212,000	Engineer Est.	Tanks, piping, pumps, flexi floats, pump
1c. Temporary relocate portion of Marina	LS	1	$75,000	$75,000	Engineer Est.	Place holder.
2. Open Water Dredging						
2a. Dredging sediment remediation area.	Daily Rate	18	$20,200	$353,500	Engineer Est.	12 hr. day. Assume 800 cy/day. Load onto barges and deliver barges to sediment offloading facility located in Port of Seattle area.
2b. Water management system operation,	Daily Rate	18	$11,000	$192,500	Engineer Est.	12-hr day. Pump-off from sediment barge, and processing through upland water management facility
3. Sediment Offloading						
	Daily Rate	18	$9,000	$157,500	Engineer Est.	10 hr. day. Offloading of sediment from barges at a Port of Seattle area dock to trucks with 20' containers on chassis. Work includes purchasing and installing liners into containers. Assume $60/liner and 24 tons per container.
4. Landfill Disposal	Tons	21,000	$50	$1,050,000	Engineer Est.	Trucking of sediment from transload facility to Rabancoo Seattle transfer facility, landfill T&D. Rabanco Quote. Assume 1.5 tons/cy. Blended unit price to cover 75 tons of TSCA and the rest as Subtitle D disposal.
5. Backfilling of Dredged Area						
5.a Purchase and deliver	CY	10,000	$35	$350,000	Engineer Est.	Purchase sand and gravel and deliver on barge to project site. Assume 70% gravel (2.5" minus)
5.b Place	Daily Rate	10	$14,200	$142,000	Engineer Est.	12 hr. day. Place sand and gravel as backfill to bring dredged area back to original grade. Assume 1,000 cy/day.
		Capital Costs		**$2,649,500**		
6. Confirmation Sampling	LS	1	$100,000	$100,000	Engineer Est.	
7. Long Term O&M - none for complete removal	LS	1	$0	$0		
8. Contingency	LS	1	50%	$1,374,750		Contingency applied to capitol costs, confirmation smpl
		Total Direct Costs		**$4,124,250**		
INDIRECT COSTS						
9. Project Management	5%			$206,213	EPA 2001	Planning, community relations, bid/contarct admin., cost and preformance reporting, permitting, legal, const. completion rpt.
10. Remedial Design	6%			$247,455	EPA 2000	Data, planning, design, plans & specs, construction est.
11. Construction Management / QA Support	6%			$247,455	EPA 2002	Submittal review, change order review, design modifications, construction observations, constructioin survey, construction schedule tracking, QA/QC documentation, record drawings
12. Agency Oversight	10%			$412,425		Agency oversight.
13. WSST (not on landfill T&D)	9%			$229,433		Sales tax on Total Direct Costs without Landfill Disposal
		Total Indirect Costs		$1,342,980		
TOTAL ESTIMATED PROJECT COSTS (Rounded to two significant digits)				**$5,500,000**		