

May 29, 2008

Mr. Pete Kmet
Senior Environmental Engineer
Washington State Department of Ecology
Toxics Cleanup Program
P.O. Box 47600
Olympia, Washington 98504-4760

**Re: Planning-Level Cost Estimate for Swift Creek Asbestos Site
Swift Creek
Whatcom County, Washington
17330-16**

Dear Mr. Kmet:

Hart Crowser is pleased to provide the Washington State Department of Ecology (Ecology) with this planning-level cost estimate for the Swift Creek Site (Site) located east of Everson, Washington. The purpose of this work assignment is to develop a planning-level cost estimate for selected management options to support a potential Ecology budget request on behalf of Whatcom County (County) for the 2009-11 biennium. Our understanding of this project is based on our May 1 and 6, 2008, meetings and the Work Plan for Swift Creek Asbestos Site, Whatcom County, dated April 23, 2008. The scope of this cost estimate includes the costs associated with completing activities to address potential data gaps, preparing a cost estimate for design and permitting, preparing a cost estimate for land acquisition, preparing a construction costs estimate to relocate approximately 100,000 cubic yards (cy) of stockpiled dredge material, and performing project management.

SITE BACKGROUND AND HISTORY

The Site, located in eastern Whatcom County (Figure 1), contains naturally occurring asbestos and naturally elevated concentrations of certain metals. Numerous studies of the creek sediments have been completed, and options for managing the substantial amount of sediment washed down the creek each year are being evaluated.

Swift Creek drains an area of about 3 square miles near the town of Everson in Whatcom County, Washington. The creek originates on the west flank of Sumas Mountain and flows west approximately 4 miles through agricultural land into the Sumas River. The Sumas River, in turn,



meanders roughly 15 miles northeast to the Canadian border (about 7 mile straight-line distance) where it eventually flows into British Columbia's Fraser River 10 miles north of the border.

A large landslide on Sumas Mountain that occurred in the 1930s is a recurring source of sediment deposition in Swift Creek during periods of rain and snowmelt. Much of this sediment is deposited in the lower reaches (approximately 2 miles) of Swift Creek where a large volume (tens of thousands cy) settles annually (Kerr Wood Leidal Associates 2005). Sediment deposition causes continuing flood control problems.

To prevent flooding, Whatcom County Public Works has dredged a 1-mile reach of Swift Creek from Goodwin Road west beyond Oat Coles Road. Dredging normally occurs on an annual basis (or as needed) with dredged material piled into high levees, which provide temporary storage, on private property on both sides of the creek. In the past, most dredged sediment was removed from the Site by the public and contractors for use as fill in construction projects. This provided an inexpensive method for removing dredged sediments from the area. This practice was later halted based on renewed human health concerns related to naturally occurring asbestos in Swift Creek sediments (United States Environmental Protection Agency 2005).

Because dredged sediments are no longer removed from the stockpiles along the banks of Swift Creek, large piles are located on both sides of the creek year-round. Storage capacity within the existing bounds of the easements was reached in the summer of 2006, when an additional 30,000 to 50,000 cy were added to the existing 150,000 + cy. Land owners are reluctant to allow the easements to widen because this would further reduce the amount of productive land available for agriculture. There is also an issue with impact to wetlands that would add significant cost for wetland mitigation.

In the fall of 2007, EPA's Superfund Removal Contractor regraded and stabilized the stockpiles. The regrading provided additional storage capacity within the existing stockpile footprint. The County currently plans to use this capacity by conducting additional maintenance dredging in the summer of 2008 to reduce the risk of the creek overtopping its banks next fall/winter. However, this action will not remove all of the accumulated sediment and will provide only a temporary reprieve.

In 2005, the County completed a long-term sediment management plan for Swift Creek, which was updated in 2008. Three options identified in that plan include:

- Construction of levees set back from the creek to facilitate conveyance and minimize flooding during major flood events;



- Construction of a near-site disposal facility for the long-term disposal of sediments dredged from the creek; and
- Modification of drainage conditions in the slide area.

COST ESTIMATE AND ASSUMPTIONS

For the purposes of this planning-level cost estimate, three alternative locations for a sediment disposal facility have been conceptually identified (Areas 1, 2, and 3). A separate cost estimate has been provided for each alternative. These alternatives may or may not be selected as the location for the disposal facility. We have reviewed existing reports provided to us by Ecology and identified information needed for the design and permitting of a sediment disposal facility with at least a 10-year capacity. The Planning-Level Cost Estimate Summary (Table 1) provides the projected costs to complete the following:

- Collect data necessary to design and permit a disposal facility with a 10-year design capacity;
- Evaluate subsurface conditions in the current stockpile area and in potential sediment disposal facility areas;
- Purchase land necessary to locate a sediment disposal facility;
- Design and permit a sediment disposal facility; and
- Relocate 100,000 cy of currently stockpiled dredge material.

We understand there are three potential sediment disposal facility disposal sites (Areas 1, 2, and 3). This planning-level cost estimate is presented to allow for the evaluation of each of the three options based on which parcel of land is selected as the sediment disposal facility site.

- Area 1 includes the parcels of land located southeast of the intersection of South Pass Road and Oat Coles Road. This land is primarily residential and agricultural. If Area 1 is selected as the sediment disposal facility site, it is likely that containment levees will be required to minimize the risk of flooding of Swift Creek east of the sediment collection area and into Area 2 and possibly Area 3.



- Area 2 includes the parcels of land east of Goodwin Road. This land is primarily residential and forested. If Area 2 is selected, we assume that a levee system will be designed and installed to contain the creek and allow for on-site deposition of the sediment.
- Area 3 is an individual parcel of land east of Area 2.

The following general comments were made for each of the items in the planning-level cost estimate. The specific assumptions used in determining the cost estimate are included in the Planning-Level Cost Estimate Summary (Table 1):

- **Item 1 - Geotechnical Investigation.** The geotechnical investigation has been divided into the following:
 - **1.1 - Area 1.** Includes the estimated costs to evaluate a potential sediment disposal facility located within Area 1, as well as the geotechnical and environmental investigations and permitting necessary to allow for the design of a flood prevention levee in Area 2 and potentially Area 3.
 - **1.2 - Area 2.** Includes the estimated costs to design a sediment collection system. This system should be designed to alleviate the need for a downstream flood control levee system; therefore, no additional investigation work will be performed in Areas 1 and 3.
 - **1.3 - Area 3.** Includes the estimated costs to design a sediment collection system. This system should be designed to alleviate the need for a downstream flood control levee system; therefore, no additional investigation work will be performed in Areas 1 and 2.
- **Item 2 - Sediment Yield Analysis.** The sediment yield analysis will be based on the size and rate of the landslide movement. Previous reports will be relied on to provide the majority of this information. A limited inspection of the landslide is included in this estimate to observe and evaluate changes in the landslide over the 32 years since the initial report was prepared. These observations will be compared to the estimated movement rates and predictions contained in the report.
- **Item 3 - Pre-disposal Groundwater Characterization.** The pre-disposal groundwater characterization includes a subsurface investigation in the proposed sediment disposal facility area. The purpose of this investigation is to establish a baseline of current soil and groundwater conditions in the proposed sediment disposal facility area.



- **Item 4 - Air Monitoring.** The cost estimate includes the projected costs for conducting both pre-disposal and post-disposal air assessments. The intent of the pre-disposal assessment is to evaluate the naturally occurring asbestos concentrations in the air prior to construction or sediment disposal facility activities. The purpose of the post-disposal air assessment is to identify any potential airborne asbestos issues that exceed baseline conditions.
- **Item 5 - Slide Area Drainage Modifications.** The cost estimate includes projected costs to perform a thorough evaluation of options and to collect data to allow for design cost analysis.
- **Item 6 - Landslide Monitoring.** The landslide monitoring will include monthly optical survey of the landslide for 3 years to document its movement. The optical survey will include establishing surveyed monitoring points and measuring the movement of these points to document the slide movement over time.
- **Item 7 - Wetland Delineation.** A site stream and wetland reconnaissance will be conducted on each of the three areas to determine a general understanding of the wetland quality in each of the areas to aid in the selection process. Once an area has been selected, a more comprehensive wetland delineation will be required for the design and permitting process.
- **Item 8 - Groundwater Assessment, Current Stockpile Area.** This groundwater characterization includes a subsurface investigation adjacent to the current dredged material stockpiled next to Swift Creek. The purpose of this investigation is to evaluate potential impacts of stockpiling this material on local soil and groundwater quality.
- **Item 9 - Design of Setback Levees.** The costs associated with the design of the setback levees are included in Items 1, 10, and 11.
- **Item 10 - Design of Sediment Disposal Facility.** Includes design fees for the selected disposal facility. This estimate does not include construction.
- **Item 11 - Permitting.** There are several possible paths for compliance with environmental impact disclosure laws (i.e., National Environmental Policy Act [NEPA] or State Environmental Policy Act [SEPA]). The path determined will depend on the lead agency (e.g., federal or state), whether federal funding is involved, and whether a federal action (e.g., permit) is involved. The level of effort for environmental documentation will also be determined by whether there is a potential for significant adverse impacts for which mitigation cannot be easily identified.
- **Item 12 - Construction Cost Estimate of Moving 100,000 cy of Sediment.** Includes construction oversight, air monitoring for asbestos, and relocation of the material to one of the



three areas. This estimate does not include the cost to construct potential levee systems or any additional dredging. The construction cost estimates and assumptions are presented in Tables 2 and 3.

- **Item 13 - Land Values.** Restricted use property appraisals for each parcel are provided in Appendix A.
 - **13.1 - Appraised Value.** The land values presented in Table 4 are “Restricted Use” land valuation appraisal. A restricted use appraisal is based on public information from the Whatcom County Tax Assessor, exterior observation, and sale histories for comparable properties in the area. This estimate does not include interior improvements or undeclared additions or added structures. The Restricted Use Land Valuations table (Table 4) includes the individual property restricted use valuation and the Whatcom County Tax Assessor valuation.
 - **13.2 - Wetland Mitigation.** Based on the potential wetlands map provided by Whatcom County, Area 1 is potentially greater than 75 percent wetlands. Areas 2 and 3 are potentially 10 percent wetlands. The cost to mitigate for the reduction in wetlands is presented in Table 1. We assumed an average cost of \$100,000 per acre to construct a new wetland. The mitigation cost can vary significantly based on the quality of the existing wetland.

Since the project is in a conceptual phase, these are rough planning-level estimated costs. We emphasize that a more detailed breakdown of these costs would require a more extensive engineering and cost evaluation effort more appropriately reserved for follow-on design-level studies. Based on our discussions and projected level of effort, a design-level breakdown of costs is beyond our current level of effort. We also caution that the rough planning-level costs presented in this document include substantial uncertainties and should not be relied upon for final budgeting or bidding purposes.



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We appreciate the opportunity to work with Ecology on this challenging project. If you have any questions or concerns, please feel free to contact me at (206) 826-4485.

Sincerely,

HART CROWSER, INC.

ROSS R. STAINSBY, LG, PMP

Associate

Attachments:

Table 1 - Planning-Level Cost Estimate Summary

Table 2 - Planning-Level Construction Costs for Area 1

Table 3 - Planning-Level Construction Costs for Areas 2 and 3

Table 4 - Restricted Use Land Valuations

Figure 1 - Swift Creek Area Map

Appendix A - Restricted Use Property Appraisals (provided on CD)

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Table 1 - Cost Estimate Summary

Item	Unit Cost	Unit	Quantity	Area 1	Area 2	Area 3	Assumptions
1 Geotechnical Investigation							
1.1 AREA 1							
Geotechnical investigation of potential disposal site area 1 & design of setback levees in from area 1 to area 2							Area 1 = 0.5 x 0.4 miles = 128 acres Setback levee length = 1.5 miles x 2 = 7920 feet
Topo survey (1-ft contours)	\$2,000	crew-day	88	\$176,485			Include Area 1 & additional 2 miles of levees @ 200-ft width 2 acres per crew-day (clear to light tree cover)
Geotechnical explorations - drilling	\$80	linear foot	1461	\$116,887			Area 1 - One boring every 500 feet @ 30-ft depth Levee - One boring every 300 feet @ 30-ft depth 60 feet per day of drilling, including clearing
Field engineering	\$1,500	man-day	24	\$36,527			
Field supply and laboratory testing	\$3,000	LS	1	\$3,000			
Geotechnical engineering analysis & report	\$115	man-hour	1425	\$163,875			
				<u>\$496,773</u>			
1.2 AREA 2							
Geotechnical investigation of potential disposal site area 2 & deign of setback levees within area 2							Area 2 = 0.5 x 0.6 miles = 192 acres levees within Area 2 = 0.5 miles x 2 = 5280 feet
Topo survey (1-ft countour)	\$2,000	crew-day	128		\$256,000		include area 2 1.5 acres per crew-day (medium tree cover)
Geotechnical explorations - drilling	\$80	linear foot	1225		\$97,997		One boring every 500 ft along perimeter and every 300 ft along levees @ 30-ft depth
Field engineering	\$1,500	man-day	20		\$30,624		60 feet per day of drilling, including clearing
Field supply and laboratory testing	\$20,000	LS	1		\$20,000		
Geotechnical engineering analysis & report	\$115	man-hour	1375		\$158,125		including feasibility study of Area 2 as a quarry site
					<u>\$562,746</u>		
1.3 AREA 3							
Geotechnical investigation of potential disposal site area 3 & deign of setback levees within area 3							Area 3 = 0.5 x 0.5 miles = 160 acres levees within area 3 = 0.5 miles x 2 = 5280 feet
Topo survey (1-ft countour)	\$2,000	crew-day	107			\$213,333	include area 2 1.5 acres per crew-day (medium tree cover)
Geotechnical explorations - drilling	\$80	linear foot	1162			\$92,928	One boring every 500 ft along perimeter and every 300 ft along levees @ 30-ft depth
Field engineering	\$1,500	man-day	22			\$33,540	60 feet per day of drilling, additional 3 days for clearing
Field supply and laboratory testing	\$20,000	LS	1			\$20,000	
Geotechnical engineering analysis & report	\$115	man-hour	1300			\$149,500	
						<u>\$509,301</u>	
2 Sediment Yield Analysis							
Existing Data Review	\$4,000	LS	1	\$4,000	\$4,000	\$4,000	
Field Visit	\$3,000	LS	1	\$3,000	\$3,000	\$3,000	
Summary Report	\$8,000	LS	1	\$8,000	\$8,000	\$8,000	
				<u>\$15,000</u>	<u>\$15,000</u>	<u>\$15,000</u>	
3 Pre-disposal Groundwater Characterization							
Work Plan	\$6,000	LS	1	\$6,000	\$6,000	\$6,000	
Well Installation	\$80	linear foot	180	\$14,400	\$14,400	\$14,400	6 groundwater monitoring wells
Field Geologist and Supplies	\$1,500	man-day	7	\$10,500	\$10,500	\$10,500	Includes soil analysis for Metals and Asbestos and three rounds of water sampling for Metals, Asbestos, Chloride, Sulfate, Hardness and field parameters
Analytical	\$6,500	LS	1	\$6,500	\$6,500	\$6,500	
Summary Report	\$9,500	LS	1	\$9,500	\$9,500	\$9,500	
				<u>\$46,900</u>	<u>\$46,900</u>	<u>\$46,900</u>	

Table 1 - Cost Estimate Summary

4 Air Monitoring						
4.1 Pre-disposal characterization						
Work Plan	\$7,500	LS	1	\$7,500	\$7,500	\$7,500
TEM Analysis (40 samples @ \$85ea)	\$85	EA	40	\$3,400	\$3,400	\$3,400
Field Staff (10/day @ \$65/hour)	\$1,000	man-day	4	\$4,000	\$4,000	\$4,000
Field Equipment	\$200	day	8	\$1,600	\$1,600	\$1,600
Summary Report and Project MGT	\$10,000	LS	1	\$10,000	\$10,000	\$10,000
				<u>\$26,500</u>	<u>\$26,500</u>	<u>\$26,500</u>
Emission Estimates and Dispersion Modeling						
Emission Calculations	\$4,000	LS	1	\$4,000	\$4,000	\$4,000
Dispersion Modeling	\$10,000	LS	1	\$10,000	\$10,000	\$10,000
Summary Report and Project Management	\$4,000	LS	1	\$4,000	\$4,000	\$4,000
				<u>\$18,000</u>	<u>\$18,000</u>	<u>\$18,000</u>
4.2 Post-disposal characterization						
Work Plan	\$4,000	LS	1	\$4,000	\$4,000	\$4,000
TEM Analysis (40 samples @ \$85ea)	\$85	EA	40	\$3,400	\$3,400	\$3,400
Field Staff (10/day @ \$65/hour)	\$1,000	man-day	4	\$2,600	\$2,600	\$2,600
Field Equipment	\$200	day	8	\$3,000	\$3,000	\$3,000
Summary Report and Project MGT	\$10,000	LS	1	\$6,000	\$6,000	\$6,000
				<u>\$19,000</u>	<u>\$19,000</u>	<u>\$19,000</u>
5 Slide Area Drainage Modifications Evaluation						
	\$100,000	LS	1	\$100,000	\$100,000	\$100,000
				<u>\$100,000</u>	<u>\$100,000</u>	<u>\$100,000</u>
6 Landslide Monitoring						
	\$2,000	crew-day	36	\$72,000	\$72,000	\$72,000
				<u>\$72,000</u>	<u>\$72,000</u>	<u>\$72,000</u>
7 Wetland Delineation						
Field Staff (2 / 10 hour day @ \$105/hour)	\$2,100	day	10	\$21,000	\$14,000	\$14,000
Equipment & Expenses	\$400	day	10	\$4,000	\$2,667	\$2,667
Report and Project Management	\$8,500	LS	1	\$8,500	\$8,500	\$8,500
				<u>\$33,500</u>	<u>\$25,167</u>	<u>\$25,167</u>
Stream and Wetland Site Reconnaissance (all alternatives)						
Field Staff (2 / 10-hour day @ \$105/hour)	\$2,100	day	9	\$18,900	\$18,900	\$18,900
Equipment & Expenses	\$400	day	9	\$3,600	\$3,600	\$3,600
Report and Project Management	\$5,000	LS	1	\$5,000	\$5,000	\$5,000
				<u>\$27,500</u>	<u>\$27,500</u>	<u>\$27,500</u>

Table 1 - Cost Estimate Summary

8 Existing Stockpile Groundwater Characterization (six groundwater monitoring wells)						
Work Plan	\$6,000	LS	1	\$6,000	\$6,000	\$6,000
Well Installation	\$80	linear foot	180	\$14,400	\$14,400	\$14,400
Field Geologist and Supplies	\$1,500	man-day	7	\$10,500	\$10,500	\$10,500
						6 groundwater monitoring wells
						Includes soil analysis for Metals and Asbestos and three rounds of water sampling for Metals, Asbestos, Chloride, Sulfate, Hardness and field parameters
Analytical	\$6,500	LS	1	\$6,500	\$6,500	\$6,500
Summary Report	\$9,500	LS	1	\$9,500	\$9,500	\$9,500
				<u>\$46,900</u>	<u>\$46,900</u>	<u>\$46,900</u>
9 Design of Setback Levees						
Costs for Item 9 are included in Item 1, 10, and 11						
10 Design of Sediment Disposal Facility						
Grading plans & specifications	\$115	man-hour	1000	\$115,000	\$115,000	\$115,000
				<u>\$115,000</u>	<u>\$115,000</u>	<u>\$115,000</u>
						Earth embankment only - no hydraulic structures
11 Environmental Impact Statement						
Hydraulic Analysis and FEMA Permitting						
Reach Analysis	\$60,000	LS	1	\$60,000	\$60,000	\$60,000
HEC-RAS of Alternatives	\$15,000	LS	1	\$15,000	\$15,000	\$15,000
Reporting and Input on Design of Alternatives	\$10,000	LS	1	\$10,000	\$10,000	\$10,000
				<u>\$85,000</u>	<u>\$85,000</u>	<u>\$85,000</u>
						Assume HEC-RAS modeling required for each preferred alternative
						Assume HEC-RAS model needed to model sediment as hydraulics
Cultural Resources						
Phase 1 Cultural resources assessment	\$5,000	LS	1	\$5,000	\$5,000	\$5,000
Phase 2 Cultural Resources survey						
Field Staff (2 / 10 hour day @ \$105/hour)	\$2,100	Day	5	\$10,500	\$10,500	\$10,500
Equipment & Expenses	\$400	Day	5	\$2,000	\$2,000	\$2,000
Report and Project Management	\$6,300	LS	1	\$6,300	\$6,300	\$6,300
				<u>\$18,800</u>	<u>\$18,800</u>	<u>\$18,800</u>
						Assume assessment required for each alternative evaluated in the EIS
Permitting						
401/404/HPA Permitting	\$35,000	LS	1	\$35,000	\$35,000	\$35,000
FEMA Permitting (\$20,000 - \$50,000)	\$50,000	LS	1	\$50,000	\$50,000	\$50,000
Levee & Dike Certification (\$40,000 - \$50,000)	\$50,000	LS	1	\$50,000	\$50,000	\$50,000
Whatcom County Building/Planning Permitting	\$40,000	LS	1	\$40,000	\$40,000	\$40,000
				<u>\$175,000</u>	<u>\$175,000</u>	<u>\$175,000</u>

Table 1 - Cost Estimate Summary

12 Construction Cost Estimate of Moving 100,000 cy of Sediment						
Construction Project Duration (Months)				2	3	3
12.1 Construction						
Project Management				\$174,555	\$207,509	\$210,000
Mobilization/Demobilization				\$7,619	\$9,195	\$10,000
Site Prep and Restoration			See Construction Cost Estimate Worksheet for	\$151,304	\$165,234	\$166,000
Load, Haul, and Place Material			Further Cost Breakdown (Tables 2 and 3)	\$330,255	\$627,561	\$627,000
Health and Safety				\$86,933	\$135,406	\$136,000
				<u>\$750,666</u>	<u>\$1,144,905</u>	<u>\$1,149,000</u>
12.2 Construction Monitoring and Oversight						
Field Staff and Supplies	\$1,500	man-day	Based on Construction	\$60,000	\$90,000	\$90,000
Summary Report	\$15,000	LS	Schedule 1	\$15,000	\$15,000	\$15,000
Project MGT	\$4,800	month	Based on Construction	\$9,600	\$14,400	\$14,400
			Schedule	<u>\$84,600</u>	<u>\$119,400</u>	<u>\$119,400</u>
12.3 Construction Air Monitoring						
PEL Analysis	\$15	EA	10 Day	\$6,000	\$9,000	\$9,000
Field Staff and Supplies	\$1,000	man-day	Based on Construction	\$40,000	\$60,000	\$60,000
Summary Report	\$10,000	LS	Schedule 1	\$10,000	\$10,000	\$10,000
Project MGT	\$2,000	month	Based on Construction	\$4,000	\$6,000	\$6,000
			Schedule	<u>\$60,000</u>	<u>\$85,000</u>	<u>\$85,000</u>
			Total Construction Cost Estimate	<u>\$895,266</u>	<u>\$1,349,305</u>	<u>\$1,353,400</u>
13 Land Value						
13.1 Appraised Value			See Table 4 for Individual Property Values	<u>\$1,905,000</u>	<u>\$2,323,000</u>	<u>\$320,000</u>
13.2 Wetland Mitigation						
Design	\$30,000 to 70,000	LS	Assumes 75% of Area 1, and 10% of Area 2	\$70,000	\$30,000	\$30,000
Construction (\$40,000 - \$150,000 per acre)	\$100,000 Acre		and 3 are wetlands	\$7,215,750	\$1,716,800	\$1,600,000
				<u>\$7,285,750</u>	<u>\$1,746,800</u>	<u>\$1,630,000</u>
						Assume property costs not included in cost estimate Per Acre costs provided Does not include monitoring
13.3 Biological Assessment						
	\$50,000	LS	1	<u>\$50,000</u>	<u>\$50,000</u>	<u>\$50,000</u>
			Total	<u>\$11,436,890</u>	<u>\$6,827,618</u>	<u>\$4,658,468</u>

Table 2 - Area 1 Construction Cost Estimate

			Project Management		Mobilization and Demobilization		Site Preparation and Restoration		Load, Haul, and Place Material		Health and Safety			
			Units	Total Task Cost	Units	Total Task Cost	Units	Total Task Cost	Units	Total Task Cost	Units	Total Task Cost	Total Units	Total Cost
1. Labor	Rate	Unit												
Project Manager	\$115.00	hour	568	\$65,320.00							96	\$11,040.00	664.00	\$76,360.00
Project Engineer/SSO	\$85.00	hour	568	\$48,280.00							448	\$38,080.00	1,016.00	\$86,360.00
Project Administrator	\$60.00	hour	80	\$4,800.00									80.00	\$4,800.00
Word Processor	\$50.00	hour									40	\$2,000.00	40.00	\$2,000.00
CADD Operator	\$70.00	hour									40	\$2,800.00	40.00	\$2,800.00
Foreman	\$57.00	hour					120	\$6,840.00	360	\$20,520.00			480.00	\$27,360.00
Certified Industrial Hygienist	\$130.00	hour									120	\$15,600.00	120.00	\$15,600.00
Flagman/Laborer	\$35.00	hour					96	\$3,360.00	0				96.00	\$3,360.00
Operator Group 2	\$55.00	hour					368	\$20,240.00	1080	\$59,400.00			1,448.00	\$79,640.00
Driver Group 1	\$50.00	hour					360	\$18,000.00	1440	\$72,000.00			1,800.00	\$90,000.00
Subtotals			1216	\$118,400.00	0	\$0.00	944	\$48,440.00	2880	\$151,920.00	744	\$69,520.00	5,784.00	\$388,280.00
2. Other Direct Costs	Rate	Unit	Units	Total Cost	Units	Total Cost	Units	Total Cost	Units	Total Cost	Units	Total Cost	Total Units	Total Cost
Equipment FOG/machine/Hour	\$18.00	hour					368	\$6,624.00	2520	\$45,360.00			2,888.00	\$51,984.00
Silt Fencing - 96 lf	\$66.87	bundle					80	\$5,349.60					80.00	\$5,349.60
hand tools	\$257.17	ls									1	\$257.17	1.00	\$257.17
Subtotals				\$0.00		\$0.00		\$11,973.60		\$45,360.00		\$257.17		\$57,590.77
3. Equipment	Rate	Unit	Units	Total Cost	Units	Total Cost	Units	Total Cost	Units	Total Cost	Units	Total Cost	Total Units	Total Cost
Cat 345 excavator	\$12,858.67	mo					1	\$12,858.67	2	\$25,717.34			3.00	\$38,576.01
Cat D6 Dozer	\$7,715.20	mo					1	\$7,715.20	2	\$15,430.40			3.00	\$23,145.60
Cat 735 Trucks	\$10,029.77	mo					3	\$30,089.31	6	\$60,178.62			9.00	\$90,267.93
connex box	\$128.59	mo	3	\$385.77									3.00	\$385.77
office trailer w/ generator	\$1,285.87	mo	3	\$3,857.61									3.00	\$3,857.61
pickups (3)	\$51.43	day	198	\$10,183.14							45	\$2,314.35	243.00	\$12,497.49
Cat 140 blade	\$8,358.14	mo							2	\$16,716.28			2.00	\$16,716.28
Water truck	\$2,571.73	mo							2	\$5,143.46			2.00	\$5,143.46
3" pump	\$771.52	mo							2	\$1,543.04			2.00	\$1,543.04
3" hose -100 LF	\$1,285.87	ls							1	\$1,285.87			1.00	\$1,285.87
pickup fuel	\$25.72	day	198	\$5,092.56							45	\$1,157.40	243.00	\$6,249.96
3" Trencher (SWPPP)	\$1,543.04	week					1	\$1,543.04					1.00	\$1,543.04
Cat 966 Loader	\$2,828.91	week					2	\$5,657.82					2.00	\$5,657.82
Mobe and setup trailer RT	\$1,285.87	RT			1	\$1,285.87							1.00	\$1,285.87
Mobe Heavy Equip RT each machine	\$771.52	RT			8	\$6,172.16							8.00	\$6,172.16
Radios/each	\$64.29	mo	36	\$2,314.44									36.00	\$2,314.44
Subtotals				\$21,833.52		\$7,458.03		\$57,864.04		\$126,015.01		\$3,471.75		\$216,642.35
4. Subcontractors	Rate	Unit	Units	Total Cost	Units	Total Cost	Units	Total Cost	Units	Total Cost	Units	Total Cost	Total Units	Total Cost
Surveyor - field layout only, no Topo	\$266.41	hour					32	\$8,525.12					32.00	\$8,525.12
Hydroseed stockpile	\$2,368.08	acre					9	\$21,312.72					9.00	\$21,312.72
Subtotals				\$0.00		\$0.00		\$29,837.84		\$0.00		\$0.00		\$29,837.84

Table 2 - Area 1 Construction Cost Estimate

			Project Management		Mobilization and Demobilization		Site Preparation and Restoration		Load, Haul, and Place Material		Health and Safety			
5. Travel	Rate	Unit	Units	Total Cost	Units	Total Cost	Units	Total Cost	Units	Total Cost	Units	Total Cost	Total Units	Total Cost
Document Shipping	\$29.60	week									16	\$473.60	16.00	\$473.60
Portable Toilets & handwash - 2 ea	\$192.88	mo	6	\$1,157.28									6.00	\$1,157.28
Trash Bin (3cyd)	\$128.59	mo	3	\$385.77									3.00	\$385.77
personal air monitoring	\$92.36	day									45	\$4,156.20	45.00	\$4,156.20
PPE/man/day	\$23.68	day									225	\$5,328.00	225.00	\$5,328.00
Sample shipping & analysis	\$118.40	week									12	\$1,420.80	12.00	\$1,420.80
Lodging	\$84.84	day	180	\$15,271.20									180.00	\$15,271.20
Per Diem	\$53.99	day	180	\$9,718.20									180.00	\$9,718.20
Design Supplies - Paper, binders, CD, copies	\$473.62	ls									1	\$473.62	1.00	\$473.62
misc travel expenses	\$59.20	week	12	\$710.40									12.00	\$710.40
copier + office supplies	\$642.93	mo	3	\$1,928.79									3.00	\$1,928.79
bottled water	\$64.29	mo	3	\$192.87									3.00	\$192.87
phone/aircard service	\$213.13	mo	6	\$1,278.78									6.00	\$1,278.78
Subtotals				\$30,643.29		\$0.00		\$0.00		\$0.00		\$11,852.22		\$42,495.51
6. Bonding	2.15%			\$3,678.64		\$160.56		\$3,188.63		\$6,959.89		\$1,832.06		\$15,819.78
TOTALS				\$174,555.45		\$7,618.59		\$151,304.11		\$330,254.90		\$86,933.20		\$750,666.25

Table 3 - Area 2 and Area 3 Construction Cost Estimate

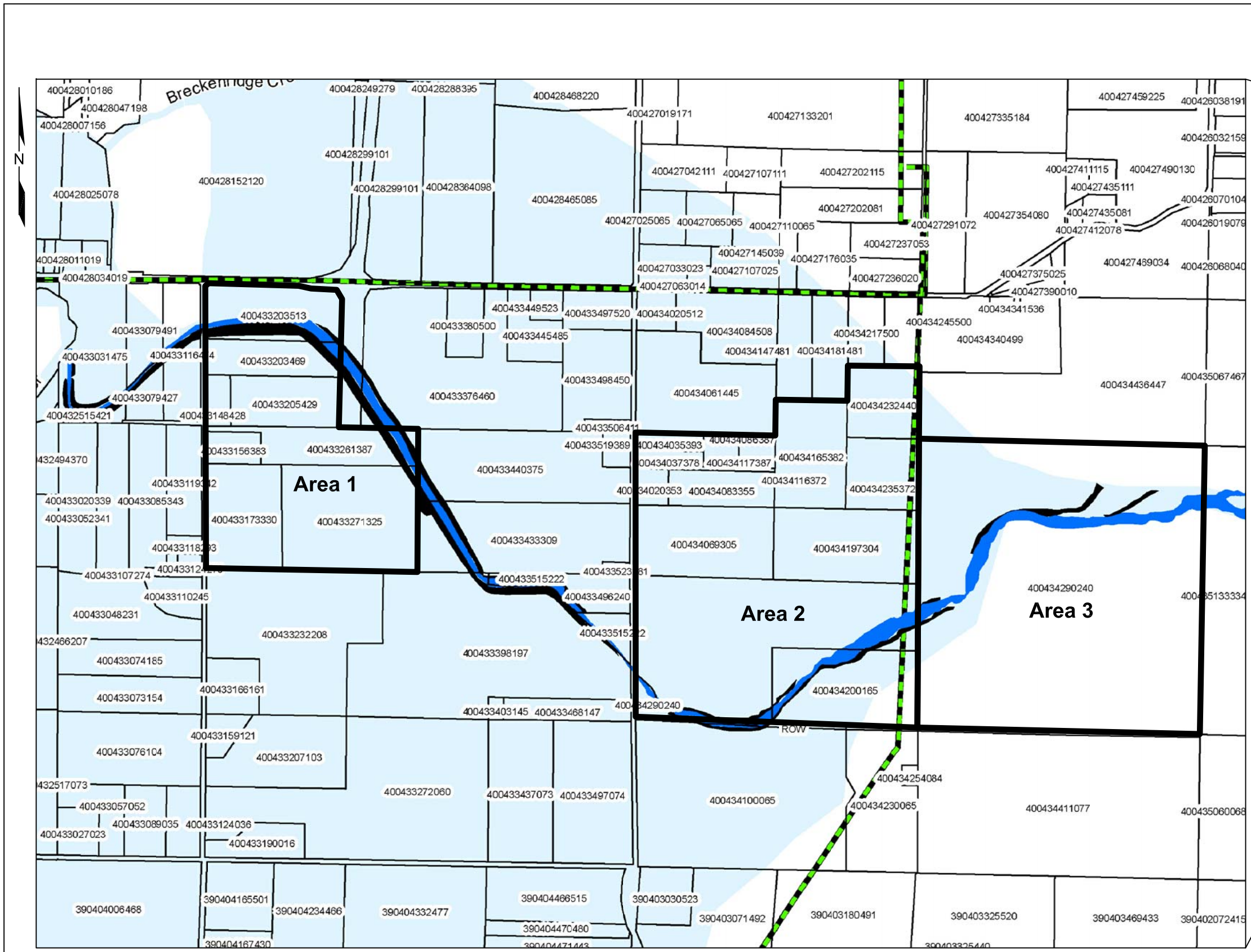
			Project Management		Mobilization and Demobilization		Site Preparation and Restoration		Load, Haul, and Place Material		Health and Safety			
1. Labor	Rate (\$)	Unit	Units	Total Task Cost (\$)	Units	Total Task Cost (\$)	Units	Total Task Cost (\$)	Units	Total Task Cost (\$)	Units	Total Task Cost (\$)	Total Units	Total Cost (\$)
Project Manager	\$115.00	hour	568	\$65,320.00							96	\$11,040.00	664.00	\$76,360.00
Project Engineer/SSO	\$85.00	hour	744	\$63,240.00							624	\$53,040.00	1,368.00	\$116,280.00
Project Administrator	\$60.00	hour	80	\$4,800.00									80.00	\$4,800.00
Word Processor	\$50.00	hour									40	\$2,000.00	40.00	\$2,000.00
CADD Operator	\$70.00	hour									40	\$2,800.00	40.00	\$2,800.00
Foreman	\$57.00	hour					120	\$6,840.00	480	\$27,360.00			600.00	\$34,200.00
Certified Industrial Hygienist	\$130.00	hour									160	\$20,800.00	160.00	\$20,800.00
Flagman/Laborer	\$35.00	hour					96	\$3,360.00	960	\$33,600.00			1,056.00	\$36,960.00
Operator Group 2	\$55.00	hour					368	\$20,240.00	1440	\$79,200.00			1,808.00	\$99,440.00
Driver Group 1	\$50.00	hour					360	\$18,000.00	2880	\$144,000.00			3,240.00	\$162,000.00
Subtotals			1392	\$133,360.00	0	\$0.00	944	\$48,440.00	5760	\$284,160.00	960	\$89,680.00	9,056.00	\$555,640.00
2. Other Direct Costs	Rate (\$)	Unit	Units	Total Cost (\$)	Units	Total Cost (\$)	Units	Total Cost (\$)	Units	Total Cost (\$)	Units	Total Cost (\$)	Total Units	Total Cost (\$)
Equipment FOG/machine/Hour	\$18.00	hour					368	\$6,624.00	4320	\$77,760.00			4,688.00	\$84,384.00
Silt Fencing - 96 lf	\$66.87	bundle					80	\$5,349.60					80.00	\$5,349.60
Safety Signs & T-posts	\$32.15	each									20	\$643.00	20.00	\$643.00
hand tools	\$257.17	ls									1	\$257.17	1.00	\$257.17
10mil Polysheeting	\$186.45	rolls									10	\$1,864.50	10.00	\$1,864.50
3" wheel wash rock	\$25.72	ton					300	\$7,716.00					300.00	\$7,716.00
Subtotals				\$0.00		\$0.00		\$19,689.60		\$77,760.00		\$2,764.67		\$100,214.27
3. Equipment	Rate (\$)	Unit	Units	Total Cost (\$)	Units	Total Cost (\$)	Units	Total Cost (\$)	Units	Total Cost (\$)	Units	Total Cost (\$)	Total Units	Total Cost (\$)
Cat 345 excavator	\$12,858.67	mo					1	\$12,858.67	3	\$38,576.01			4.00	\$51,434.68
Cat D6 Dozer	\$7,715.20	mo					1	\$7,715.20	3	\$23,145.60			4.00	\$30,860.80
Cat 735 Trucks	\$10,029.77	mo					3	\$30,089.31	15	\$150,446.55			18.00	\$180,535.86
connex box	\$128.59	mo	4	\$514.36									4.00	\$514.36
office trailer w/ generator	\$1,285.87	mo	4	\$5,143.48									4.00	\$5,143.48
pickups (3)	\$51.43	day	264	\$13,577.52							60	\$3,085.80	324.00	\$16,663.32
Cat 140 blade	\$8,358.14	mo							3	\$25,074.42			3.00	\$25,074.42
Water truck	\$2,571.73	mo							3	\$7,715.19			3.00	\$7,715.19
3" pump	\$771.52	mo							3	\$2,314.56			3.00	\$2,314.56
3" hose -100 LF	\$1,285.87	ls							1	\$1,285.87			1.00	\$1,285.87
Water Tanks	\$1,285.87	mo							3	\$3,857.61			3.00	\$3,857.61
pickup fuel	\$25.72	day	264	\$6,790.08							60	\$1,543.20	324.00	\$8,333.28
3" Trencher (SWPPP)	\$1,543.04	week					1	\$1,543.04					1.00	\$1,543.04
Cat 966 Loader	\$2,828.91	week					2	\$5,657.82					2.00	\$5,657.82
Mobe and setup trailer RT	\$1,285.87	RT			1	\$1,285.87							1.00	\$1,285.87
Mobe Heavy Equip RT each machine	\$771.52	RT			10	\$7,715.20							10.00	\$7,715.20
Radios/each	\$64.29	mo	45	\$2,893.05									45.00	\$2,893.05
Subtotals				\$28,918.49		\$9,001.07		\$57,864.04		\$252,415.81		\$4,629.00		\$352,828.41
4. Subcontractors	Rate (\$)	Unit	Units	Total Cost (\$)	Units	Total Cost (\$)	Units	Total Cost (\$)	Units	Total Cost (\$)	Units	Total Cost (\$)	Total Units	Total Cost (\$)
Asphalt Road restoration - 4" AC	\$7.40	SF					800	\$5,920.00					800.00	\$5,920.00
Surveyor - field layout only, no Topo	\$266.41	HR					32	\$8,525.12					32.00	\$8,525.12
Hydroseed stockpile	\$2,368.08	acre					9	\$21,312.72					9.00	\$21,312.72
Subtotals				\$0.00		\$0.00		\$35,757.84		\$0.00		\$0.00		\$35,757.84

Table 3 - Area 2 and Area 3 Construction Cost Estimate

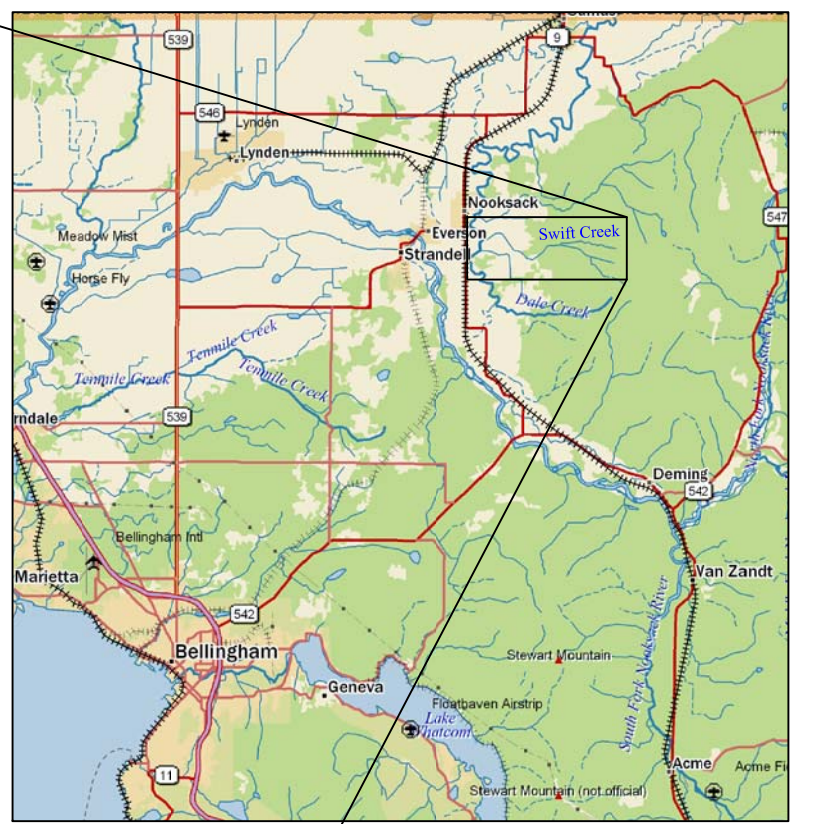
			Project Management		Mobilization and Demobilization		Site Preparation and Restoration		Load, Haul, and Place Material		Health and Safety			
5. Travel	Rate (\$)	Unit	Units	Total Cost (\$)	Units	Total Cost (\$)	Units	Total Cost (\$)	Units	Total Cost (\$)	Units	Total Cost (\$)	Total Units	Total Cost (\$)
Document Shipping	\$29.60	week									16	\$473.60	16.00	\$473.60
Portable Toilets & handwash - 2 ea	\$192.88	mo	8	\$1,543.04									8.00	\$1,543.04
Trash Bin (3cyd)	\$128.59	mo	4	\$514.36									4.00	\$514.36
personal air monitoring	\$92.36	day									168	\$15,516.48	168.00	\$15,516.48
PPE/man/day	\$23.68	day									643	\$15,226.24	643.00	\$15,226.24
Sample shipping & analysis	\$118.40	week									32	\$3,788.80	32.00	\$3,788.80
Lodging	\$84.84	day	240	\$20,361.60									240.00	\$20,361.60
Per Diem	\$53.99	day	240	\$12,957.60									240.00	\$12,957.60
Design Supplies - Paper, binders, CD, copies	\$473.62	ls									1	\$473.62	1.00	\$473.62
misc travel expenses	\$59.20	week	16	\$947.20									16.00	\$947.20
copier + office supplies	\$642.93	mo	4	\$2,571.72									4.00	\$2,571.72
bottled water	\$64.29	mo	4	\$257.16									4.00	\$257.16
phone/aircard service	\$213.13	mo	8	\$1,705.04									8.00	\$1,705.04
Subtotals				\$40,857.72		\$0.00		\$0.00		\$0.00		\$35,478.74		\$76,336.46
6. Bonding	2.15%			\$4,373.12		\$193.78		\$3,482.19		\$13,225.42		\$2,853.59		\$24,128.09
TOTALS				\$207,509.33		\$9,194.85		\$165,233.67		\$627,561.23		\$135,406.00		\$1,144,905.07

Table 4 - Property Values

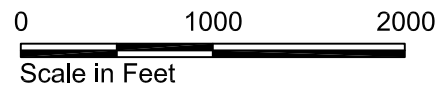
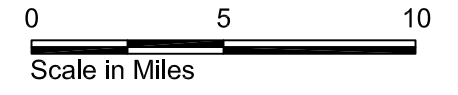
Area	Parcel Number	Acres	Property Value Based on Whatcom County Tax Assessor Records	Restricted Use Appraised Value
1	400433203513	14.25	\$224,805	\$350,000
	400433203469	9.28	\$29,890	\$140,000
	400433148428	2.60	\$97,060	\$240,000
	400433205429	10.62	\$32,805	\$175,000
	400433156383	3.10	\$142,235	\$300,000
	400433261387	11.86	\$13,520	\$150,000
	400433173330	16.00	\$18,285	\$200,000
	400433271325	28.50	\$32,490	\$350,000
	Area 1 Total Value	96.21	\$591,090	\$1,905,000
2	400434290240*	56.75	\$27,960	\$227,000
	400434200165	20.00	\$2,155	\$100,000
	400434069305	20.00	\$141,840	\$150,000
	400434197304	20.00	\$322,040	\$450,000
	400434020353	2.30	\$85,000	\$90,000
	400434083355	7.50	\$105,000	\$125,000
	400434116372	0.23	\$5,000	\$1,000
	400434037378	2.63	\$84,680	\$85,000
	400434035393	2.43	\$80,000	\$60,000
	400434086387	2.28	\$95,510	\$100,000
	400434117387	2.28	\$206,865	\$320,000
	400434165382	15.00	\$70,820	\$265,000
	400434235372	10.00	\$151,535	\$175,000
	400434232440	10.28	\$143,920	\$175,000
	Area 2 Total Value	171.68	\$1,522,325	\$2,323,000
3	400434290240*	160	\$27,960	\$320,000
	Area 3 Total Value	160	\$27,960	\$320,000



Source: Base map provided by Whatcom County, 05/29/08.



Source: Base map prepared from Delorme Topo, 2007.



Swift Creek Whatcom County, Washington	
Swift Creek Area Map	
17330-16	5/08
HARTCROWSER	Figure 1

EAL 05/29/08 1733016-001.dwg