#### WHATCOM COUNTY CONTRACT **INFORMATION SHEET**

Whatcom County Contract No. 201811039-1

Originating Department:	Public Works - Engineering
Division/Program: (i.e. Dept. Division and Program)	905910/Construction-other
Contract or Grant Administrator:	James E. Lee, P.E., Engineering Manager
Contractor's / Agency Name:	Herrera Environmental Consultants, Inc.
Is this a New Contract? If not, is this an Amendment or Rer	
	• • • •
Does contract require Council Approval? Yes No Already approved? Council Approved Date:	If No, include WCC: (Exclusions see: Whatcom County Codes 3.06.010, 3.08.090 and 3.08.100)
Is this a grant agreement?YesNoMoIf yes, grantor agency contract	number(s): CFDA#:
Is this contract grant funded? Yes No D If yes, Whatcom County grant	contract number(s): 201810012
Is this contract the result of a RFP or Bid process? Yes No If yes, RFP and Bid number(s): 18-4	42 Contract Cost Center: 128300
Is this agreement excluded from E-Verify? No 🗌 Yes 🖂	If no, include Attachment D Contractor Declaration form.
amount and any prior amendments): \$40,000, and p	ofessional.  Contract for Commercial off the shelf items (COTS).  Work related subcontract less than \$25,000.  Public Works - Local Agency/Federally Funded FHWA.  Val required for; all property leases, contracts or bid awards exceeding professional service contract amendments that have an increase greater or 10% of contract amount, whichever is greater, except when:
This Amendment Amount: 1. Exercisin	g an option contained in a contract previously approved by the council.
2. Contract :	is for design, construction, r-o-w acquisition, prof. services, or other osts approved by council in a capital budget appropriation ordinance.
Total Amended Amount:3. Bid or aw	vard is for supplies.
	nt is included in Exhibit "B" of the Budget Ordinance is for manufacturer's technical support and hardware maintenance of
electronic	s for manufacturer's technical support and software maintenance of systems and/or technical support and software maintenance from the r of proprietary software currently used by Whatcom County.
Summary of Scope: Contract Supplement for professional engine Management Action Plan projects as well as technical analysis to Repositories.	
Term of Contract: Not-to-exceed	Expiration Date: December 31, 2020
Contract Routing: 1. Prepared by: Christina Schoenfelder	Date: 1/11/19
2. Attorney signoff: Christopher Quin	
<ul><li>3. AS Finance reviewed:</li><li>4. IT reviewed (if IT related):</li></ul>	Date:
5. Contractor signed:	Date:
6. Submitted to Exec.:	Date: 2-8-19
7. Council approved (if necessary):	$\begin{array}{c} Date: 2 \cdot 12 \cdot 19 \end{array}$
8. Executive signed:	Date: 2.13.19
9. Original to Council:	Date: 2-15-19

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2-15-19

COUNTY ORIGINAL

#### Washington State Department of Transportation

Supplemental Agreement	Organization and Address Herrera Environmental	
Original Agreement Number 201811039	2200 Sixth Ave., Suite Phone: (206) 441-9080	1100, Seattle, WA 98121
Project Number n/a	Execution Date	Completion Date December 31, 2020
Project Title Swift Crk Sediment Mgmt Action Plan Implementation	New Maximum Amount Pa \$1,005,994.98	yable
Description of Work		

This Contract Supplement provides for technical analysis to support the Supplemental Environmental Impact Statement for Swift Creek Sediment Repositories as well as preliminary design for the Swift Creek Sediment Management Action Plan projects.

The Local Agency of Whatcom County

desires to supplement the agreement entered in to with Herrera Environmental Consultants

and executed on 11-29-18 and identified as Agreement No. 201811039

All provisions in the basic agreement remain in effect except as expressly modified by this supplement. The changes to the agreement are described as follows:

Section 1, SCOPE OF WORK, is hereby changed to read:

Supplemental work shall be amended to the contract as set forth in the attached Exhibit B

#### H

Section IV, TIME FOR BEGINNING AND COMPLETION, is amended to change the number of calendar days for completion of the work to read: <u>December 31, 2020</u>

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Section V, PAYMENT, shall be amended as follows:

The amount payable shall be increased by \$966,275.20 to a new maximum of \$1,005,994.98

as set forth in the attached Exhibit A, and by this reference made a part of this supplement. If you concur with this supplement and agree to the changes as stated above, please sign in the Appropriate spaces below and return to this office for final action.

By: Theresa M. Wood	By: Jack Louws Whatcom County Executive
Thur the Door	CLA-
Consultant Signature	Approving Authority Signature
Approved as to form: 1/30/2019	62713/19 Date 9

DOT Form 140-063 Revised 09/2005 Christopher Quinn Senior Deputy Prosecuting Attorney – Civil Division

#### Exhibit "A" Summary of Payments

	Basic Agreement	Supplement #1	Total
Direct Salary Cost	\$12,712.80	\$305,024.75	\$317,737.55
Overhead (Including Payroll Additives)	\$22,709.68	\$511,470.29	\$534,179.97
Direct Non-Salary Costs	\$356.98	\$63,092.72	\$63,449.70
Fixed Fee	\$3,940.32	\$86,687.44	\$90,627.76
Total	\$39,719.78	\$966,275.20	\$1,005,994.98

DOT Form 140-063 Revised 09/2005

## EXHIBIT A: FEE SUMMMARY

					LABO	R EXPENSE	S		0.00	ΤΟΤΑ
		TASKS / SUBTASKS	Hours	Direct & I	ndirect La	abor Costs	FEE	LABOR SUBTOTAL	ODC	PRICI
	ŗ	TASK/SUBTASK TITLES	Total Hours	Direct Labor Costs	Indirect Costs	Direct Labor + Indirect Costs	Fee on Escalated Direct	Escalated Direct + Indirect + Fee = TOTAL LABOR COST	Invoiced Other Direct Costs	
	1	Project Management and Coordination					-			
1	1.1.0	Project Coordination	346	\$20,950,10	\$40,525.45	\$61,475.55	\$6,213.13	\$67,688.68	\$406.00	\$68,09
1	1.2.0	SEIS Consultant Coordination	136	\$8,374.32	\$13,202,17	\$21,576.49	\$2,468.48	\$24,044.97	\$0,00	\$24,04
		Subtotal	482		\$53,727.62	\$83,052.04		\$91,733.65	\$406.00	\$92,13
(	4	Site-Specific Analysis and Data Collection for Pr	oject Desi	gn and Reposite	ory Sites Prel	iminary Design D	evelopment			
4,1	4.1.0	Geolechnical	0	\$0.00		\$0.00	the second se	\$0.00	\$0.00	\$
	4.1.1	Field Explorations	28	\$1,318.08		\$3,868,70	\$382.24	\$4,250,94	\$300.00	\$4,55
	4.1.1a	Upper and Lower Goodwin Reach Debris Deflection Ben	- 14	\$745_05		\$2,204.53	\$217.29	\$2,421.82	\$300.00	\$2,72
	4,1.1b	In-Stream Sediments Traps	46	\$2,136.62		\$6,306.67	\$622.07	\$6,928,74	\$13,800,00	\$20,72
	4.1.1c	Goodwin Reach Sediment Basins	24	\$1,191.25		\$3,514.18	\$346.69	\$3,860.86	\$9,450,00	\$13,31
	4.1.2	Field Logs, Laboratory Testing, Geologic Interpretations	52 82	\$2,378,16		\$6,980.14	-	\$7,669.80	\$4,000.00	\$11,68
	4.1.4	Geotechnical Engineering Analyses Geotechnical Engineering Reports	82	\$3,699.26		\$10,893,17	\$1,075.23	\$11,968.41	\$0.00	\$11,90
4.2	4.1.4	Geotechnical Engineering Reports	272	\$3,963.04 \$13,450.16		\$11,702.87 \$28,725,18	\$1,154.18 \$3,905.44	\$12,857.05	\$0.00	\$12,8
4.3	4.3.0	Survey	0	\$13,450,16	\$15,275,02	\$0.00	\$3,905,44	\$32,630,63	\$5,058.00	\$37,6
	4.3.1	Sediment Traps	155	\$6,122.65		\$13,317.00	\$1,779.22	\$15,096.22	\$0.00	\$15.0
	4.3.2	Oat Coles North (Parker) Site	137	\$5,273.49	\$6,309.39	\$11,582.88	\$1,533.63	\$13,116.51	\$0,00	\$13,1
	4.3.3	Goodwin North (Barlean) Site	91	\$3,502.29	and the second designed in the second s	\$7,832.01	\$1,019.98	\$8,851.99	\$0.00	\$8,8
	4.3.4	Stream Cross Sections	91	\$3,708,01	\$4,613.58	\$8,321.59	\$1,080,20	\$9,401.79	\$0.00	\$9,4
	4.3.5	Sediment Pilot Site	86	\$3,484.56	\$4,245.76	\$7,730.32	\$1,014.17	\$8,744,49	\$0,00	\$8,74
4.4	4.4.0	Debris Flow Modeling	250	\$14,518.38	\$23,829.88	\$38,348.26	\$3,661,50	\$42,009.76	\$0.00	\$42,00
4.5	4.5.0	Hydrologic and Hydaulic Modeling	596	\$28,193.18	the second se	\$81,732.22	\$8,197.21	\$89,929.43	\$301.60	\$90,23
4,6	4.6.0	Environmental Monitoring - Weather stations	104	\$4,931,60		\$15,189.33	\$1,479,48	\$16,668.81	\$8,500.00	\$25,16
		Subtotal	2,104	\$98,615,78	\$159,633,27	\$258,249.05	\$28,158,19	\$286,407.24	\$41,709.60	\$328,11
	5	Repository Site Analysis and Coordination for S	Statements of the state of the							_
5.1	5,1,0	Geotechnical	0	\$0,00		\$0.00	-	\$0.00	\$0.00	
	5.1.1	Geotechnical Explorations	24	\$1,411.68		\$4,143.42	\$409.39	\$4,552,81	\$150,00	\$4,70
_	5.1.1a	Canyon Central (Millman)	42	\$1,859,72		\$5,475.85	\$540.52	\$6,016.37	\$11,150.00	\$17,16
	5,1.1b 5,1.1c	Goodwin North (Barlean) Site Oat Coles (Parker) Site	13	\$491.74	\$968.95	\$1,460.69	\$143.80	\$1,604.50	\$150.00	\$1,75
	5.1.1d	Oat Coles South	13 13	\$491.74 \$491.74	\$968,95 \$968,95	\$1,460.69 \$1,460.69	\$143.80 \$143.80	\$1,604.50	\$2,150.00	\$3,75
_	5.1.2	Field Logs, Laboratory Testing, Geological Interpretation	18	\$805,16	\$1,558,07	\$2,363.23	\$143.60	\$1,604.50 \$2,598.72	\$2,150.00	\$3,75
	5.1.3	Geotechnical Engineering Assessments	46	\$2,431,72	\$4,705.62	\$7,137.34	\$705.20	\$7,842.54	\$0,00	\$7,84
	5.1.4	Reporting	68	\$3,473,40	\$6,721.38	\$10,194,78	\$1,007.29	\$11,202.06	\$0.00	\$11,2
5.2	520	Groundwater	144	\$7,717.92	\$8,489.71	\$16,207,63	\$2,238.20	\$18,445.83	\$58.00	\$18,50
5.3	5.3.0	Surface Water	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
		30% stormwater Report 1 site (Canyon Central)	80	\$3,572.62	\$7,431.05	\$11,003.67	\$1,071.79	\$12,075.46	\$0.00	\$12,0
		Conceptual Plans for 6 sites (Goodwin South, Oat Coles	80	\$3,618,96	\$7,527.44	\$11,146.40	\$1,085.69	\$12,232.08	\$0.00	\$12,2
		Interim stormwater design for Oat Coles North site and G	78	\$3,599.34	\$7,486.63	\$11,085.97	\$1,079.80	\$12,165,77	\$0.00	\$12,1
5.4	5.4.0	Wellands	0	\$0,00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
	5.4.1	Desktop Analysis	24	\$636.00		\$1,346.86	\$184.44	\$1,531.30	\$0.00	\$1,5
	5.4.2	Field Assessment	201	\$7,437.00		\$15,749.33	\$2,156.73	\$17,906.06	\$1,108.88	\$19,0
	5.4.3	Documentation	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
	5.4.3a	Reconnaissance-Level Analyses	308	\$11,821.37		\$25,034.12	\$3,428.20	\$28,462.31	\$0.00	\$28,46
	5.4.3b 5.4.3c	Wetland Delineations	218	\$8,066.00	\$9,015.37	\$17,081.37	\$2,339.14	\$19,420.51	\$0.00	\$19,4
	5.4.3c	Welland Characterization Wellands Fieldwork Coordination	41	\$1,359.50	\$1,519.51	\$2,879.01	\$394.26	\$3,273.27	\$0.00	\$3,2
5.5	5.5.0		100	\$5,477.00		\$11,598,64	\$1,588.33	\$13,186.97	\$0.00	\$13,11
0.0	0.0.0	Traffic Analysis Subtotal	84 1,595	\$4,510.00 \$69,272.61		\$11,221.33	\$1,307.90 \$20,201.77	\$12,529.23	\$142.68	\$12,6
-	6	SCSMAP Projects Design Development	1,090	ψ09,212.01	φου,//δ.42	\$168,051.03	920,201,17	\$188,252.79	\$20,059.56	\$208,31
6.1	6.1.0	Sediment Traps	246	\$12,143,86	\$23,357.91	825 EA4 75	62 CO.4 FC	020 100 20		
6.2	6.2.0	Sediment Basins	268	\$13,693.38		\$35,501.77 \$42,038.28	\$3,601.55 \$4,100.38	\$39,103.32 \$46,138.66	\$20.85	\$39,12 \$46,3
6.3	6.3.0	Debris Flow Deflection Berm and Levee	138	\$13,991.62	\$11,649,24	\$25,640,86	\$1,692,90	\$27,333.75	\$0.00	\$27,33
6.4	6.4.0	Williams Pipeline Crossing	262	\$14,993.64	\$26,805.64	\$41,799.28	\$4,413.02	\$46,212,30	\$316.68	\$45,52
6.5	6.5.0	Creek Channel Conveyance Improvements	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,0,0
6.6	6.6.0	Creek Channel Maintenance Support	62	\$3,450,56	\$7,021.74	\$10,472.30	\$1,027.23	\$11,499.53	\$0.00	\$11,49
6.7	6.7.0	Repository Design	٥	\$0,00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
	6,7,1	Interim Sile Development	225	\$10,486,12	\$21,811,13	\$32,297.25	\$3,145.84	\$35,443.09	\$406.00	\$35,84
	6.7.2	Repository Design	480	\$23,864.44	\$49,336.20	\$73,200.64	\$7,138.50	\$80,339,14	\$0.00	\$80,33
-	6.8.0	Basis of Design Report	295	\$15,188.31	\$31,004.21	\$46,192,52	\$4,526.47	\$50,719.00	\$0,00	\$50,7 <sup>.</sup>
6.8	0.0.0							and the second se		
6.8	0.0.0	Subtotal	1,976	\$107,811.93	\$199,330.98	\$307,142.91	\$29,645.88	\$336,788.79	\$917.56	\$337,70
6.8	0.0.0		Logities a	\$107,811.93 \$305,024.74		\$307,142.91 <b>\$816,495.0</b> 3		\$336,788.79 <b>\$903,182.47</b>	\$917.56 \$63,092.72	\$337,70 <b>\$966,27</b>

				LABOR	LABOR EXPENSES					
	1								ODC	TOTAL
TASKS / FIRMS	Hours	Total I	Direct & In	Total Direct & Indirect Labor Costs	Costs	L	FEE	LABOR		PRICE
TASK TITLES / CONSULTING FIRMS	Total Hours	Total Direct Labor Costs	Overhead Rate	Total Indirect Costs	Direct Labor + Indirect Costs	Fee Percentage	Fee on Escalated Direct	Escalated Direct + Indirect + Fee = TOTAL LABOR COST	Invaiced Other Direct Costs	
1 Project Management and Coordination										
Нептега	278	\$17,752.42	20:1.00%	\$36,925.03	\$54,677.45	30.00%	\$5,325.73	\$60,003.18	\$406.00	\$60,409.18
Aspect Consulting	40	\$2,084,66	19: 51%	\$4,034,06	\$6,118.74	29,00%	\$604.56	\$6,723.30	\$0,00	\$6,723.30
Associated Earth Sciences	128	\$1,153.80	11:0.00%	\$1,269.18	\$2,422.98	29.00%	\$334.60	\$2,757.58	\$0.00	\$2,757.58
Kerr Wood Leidal	0	\$0.00	1,00%	\$0.00	\$0.00	%00'0	\$0,00	\$0.00	\$0.00	20.00
PSE dba Element Solutions	92	\$5,038,84	11 .77%	\$5,631.91	\$10,670.75	29.00%	\$1,461.26	\$12,132.02	\$0.00	\$12,132.02
TranTech Engineering	16	\$860.00	14.1.81%	\$1,279.77	\$2,139.77	29.00%	\$249.40	\$2,389.17	\$0.00	\$2,369.17
Watesthed Science & Engineering	4	\$2,434,68	18.1.43%	\$4,587.67	\$7,022.35	29.00%	\$706,06		\$0.00	\$7,728,40
Subtotal, Task 1	482	\$29,324.42		\$53,727,62	\$83,052,04		\$8,681.61	\$91,733.65	\$406.00	\$92,139.65
4 Site-Specific Analysis and Data Collection for Proj		d Repository Sites	s Preliminary D	ct Design and Repository Sites Preliminary Design Developmen	t					
Herrera	320	\$16,281.20	20:100%	\$33,864.90	\$50,146.10	30.00%	\$4,884.36	\$55,030,46	\$8,500.00	\$63,530,46
Aspect Consulting	302	\$14,207.36	19.451%	\$27,492.66	\$41,7 30.02	29.00%	\$4,120.13	\$45,820.16	\$27,850,00	\$73,670,16
Associated Earth Sciences	264	\$12,960.52	111.00%	\$14,256,57	\$27,217.09	29,00%	\$3,758,55	\$30,975.64	\$5,058.00	\$36,023.64
Kerr Wood Leidal	80	\$2,080.00	%00'0	\$0.00	\$2,030.00	%00.0	\$0.00	\$2,080.00	\$0.00	\$2,050.00
PSE dba Element Solutions	530	\$20,887.20	11 77%	\$23,345.62	\$44,232,82	29.00%	\$6,057,29	\$50,290.11	\$0.00	\$50,250.11
TranTech Engineering	0	\$0.00	14.1.81%		\$0.00		\$0.00	\$0.00	\$0.00	\$0.00
Watershed Science & Engineering	680	\$32,199.50	18.143%	\$60,673.52	\$92,873.02	29.00%	\$9,337,86	\$102,210,87	\$301.60	\$102,512.47
Subtotal, Task 4	2,104	\$98,615.78		\$159,633.27	\$258,249,05		\$28,158.19	\$286,407.24	\$41,709.60	\$328,115.84
Repository Site Analysis and Coordination for SEI	EIS									
Herrera	254	\$11,270.92	201.00%		\$34,714 43	30,00%	\$3,381,28	\$38,095.71	\$0.02	\$38,055.71
Aspect Consulting	221	\$10,976.90	13:51%	\$21,241.40	\$32,218,30	29.00%	\$3,183.30	\$35,401.60	\$18,750.00	\$54,151,60
Associated Earth Sciences	144	\$7,717.92	110.00%	\$8,489.71	\$16,237.63	29.00%	\$2,238,20	\$18,445,83	\$58.00	\$18,503.83
Kerr Wood Leidal	•	\$0.00	%30'0	\$0.00	\$0.00	0.00%	\$0.00	\$0.00	\$0.00	\$0.00
PSE dba Element Solutions	892	\$34,796.87		\$38,892.46	\$73,639,33	29,00%	\$10,091.09	\$83,780.42	\$1,108.88	\$84,859.31
TranTech Engineering	64	\$4,510.00	14.1.81%	\$6,711.33	\$11,221.33	29.00%	\$1,307.90	\$12,529.23	\$142.68	\$12,671.91
Watershed Science & Engineering	0	\$0.00	18:042%	20.02	\$0.00	29,00%	\$0,00	\$0.00	\$0.00	\$0.00
Subtotal, Task 5	1,595	\$69,272.61		\$98,778,42	\$168,051,03		\$20,201.77	\$188,252.79	\$20,059.56	\$208,312.36
SCSMAP Projects Design Development										
Herrera	1,566	\$79,322,23	201.00%	\$1	\$244,312.47		\$23,796.67	\$268,109,14	\$754.00	\$268,863.14
Aspect Consulting	60	\$3,927,36	19 1.51%	\$7,5	\$11,527-19	29.00%	\$1,138.93	\$12,666.13	\$0.00	\$12,666.13
Associated Earth Sciences	0	\$0.00	11 1.00%	\$0.00	20.00	29.00%	\$0.00	\$0.00	\$0.00	\$0.00
Kerr Wood Leidal	32	\$8,320.00	1.00%		\$8,320.00	%00.0	\$0.00	\$8,320.00	\$0.00	\$8,320.00
PSE dba Element Solutions	0	\$0.00	11 .77%	\$0.00	\$0.00		\$0.00	\$0.00	\$0.00	\$0.00
TranTech Engineering	180	\$9,754.00	14.1.81%		\$24,238.93	29.00%		\$27,097,59	\$163.56	\$27,261.15
Watershed Science & Engineering	138	\$6,488.34	18:1,42%		\$18,714.32	29.00%			\$0.00	\$20,595.94
Subtotal, Task 6	1.976	\$107,811.93		\$199,330.98	\$307,142.91		\$29,645,88	\$336,788.79	\$917.56	\$337,706,35
SubTotal, All Tasks	6,157	\$305,024.74		\$511,470.29	\$816,495.03		\$86,687.44	\$903,182.47	\$63,092.72	\$966,275.20
19202										

						LAB	LABOR EXPENSES	INSES					INVOICED	TOTAL
		Hours	Total Direct & Indirect I	st & Indire	ect Labor Costs	ts	ב	LABOR ESCALATION	ATION		FEE	LABOR SUBTOTAL	ODC	PRICE
Names of CONSULTING FIRMS	% of Total Cost	Total Hours	Total Direct Labor Costs	Overhead Rate	Total Indirect Costs	Direct Labor + Indirect Costs	Escalation Percentage	Labor Escalation Pool	Escalated Direct & Indirect Cost	Fee Percentage	Fee on Escalated Direct	Escalated Direct + Indirect + Fee = TOTAL LABOR COST	Invoiced Other Direct Costs	
Herrera	44.6%	2,418	\$124,626.77	208.00%	\$259,223,68	\$383,850,45	0.00%	\$0.00	\$383,850.45	30.00%	\$37,388.03	\$421,238.48	\$9,660.00	\$430,898.48
Aspect Consulting	15.2%	623	\$31,196.30	193.51%	\$60,367.96	\$91,564,26	0.00%	S0.00	\$91,564,26	29.00%	\$9,046.93	\$100,611,19	\$46,600.00	\$147,211.19
Associated Earth Sciences	5.9%	420	\$21,832,24	110.00%	\$24,015,46	\$45,847,70	%00'0	\$0.00	\$45,847,70	29.00%	\$6,331,35	\$52,179.05	\$5,116.00	\$57,295.05
Kerr Wood Leidal	1.1%	40	\$10,400.00	0.00%	S0.00	\$10,400.00	%00'0	\$0.00	\$10,400.00	0.00%	\$0,00	\$10,400.00	\$0.00	\$10,400.00
PSE dba Element Solutions	15.2%	1,514	\$60,722 91	111.77%	\$67,870.00	\$128,592,91	%00'0	\$0.00	\$128,592.91	29,00%	\$17,609,64	\$146,202,55	\$1,108.88	\$147,311,43
TranTech Engineering	4.4%	280	\$15,124,00	148.81%	\$22,506.02	\$37,630.02	%00'0	\$0.00	\$37,630.02	29.00%	\$4,385.96	\$42,015,98	\$306.24	\$42,322,22
Watershed Science & Engineering	13.5%	862	\$41,122.52	168.43%	\$77,487.16	\$118,609.68	0.00%	\$0.00	\$118,609.68	29.00%	\$11,925.53	\$130,535,22	\$301.60	\$130,836.82
SubTotal	100.0%	6,157	\$305,024.74		\$511,470.29	\$816,495.03		\$0.00	\$816,495.03		\$86,687.44	\$903,182.47	\$63,092.72	\$966,275.20
Lump Sum ODC													*	\$0.00
TOTAL		6,157	\$305,024.74		\$511,470.29	\$816,495.03		\$0.00	\$816,495.03		\$86,687.44	\$903,182.47	\$63,092.72	\$966,275.20
Total Fee for Sub-Consultants											\$49,299.41			

87.3

	РНА	SES / TASKS / SUBTASKS	Herrera			President	ina President	Scientis! V	Enginee V	Engineer.v	Engineer v	Engineer V
hase or Task	Task or Subtask #	PHASES / TASKS / SUBTASKS TITLES	Prime's Total Labor Hours	Prima's Oirect Labor Cost	Prime's Total Labor Cost	Sp Itane. Michael	Wood The es	Atasm. Dy an	Wabb Chris	Parsons, Jaff	Mastronko, lan	Hourk Knum
	1	Project Management and Coordination										
1	1.1.0	Project Coordination	222	\$13,759.70	\$42,379 88	72	20			12	12	
x	1.2.0	ISEIS Consultant Coordination	50	\$3,892,72	\$12,297.58	40						
-	-	Subiota Site-Specific Analysis and Data Collection for Project Design	270	\$17,752,42	\$54,677,45	112	20	¢	0	12	12	
	4	and Repository Sites Preliminary Design Development	1 1						T	r		
4.1	4.1.0	Gestachnical	0	\$0.00	10.00							
-	4,1,1	Field Explorations		\$0.00	\$0.00							
	4.1.1.	Upper and Lower Goudwin Reacts Debris Dallaction BermalLerees		\$122.41	\$377.02					1	1	
	41.10	In-Stream Sediments Traps Geodwin Reach Sediment Basins		\$244.82 \$122.41	\$754.05					2	2	
	4.1.2	Field Logs, Laboratory Testing: Geologic Interpretations		\$122.41	\$0.00							
[	413	Geolechnical Engineering Analyses		\$0 00 \$244.82	\$754.05							
	41.4	Gestechnical Engineering Reports		\$489.84	\$1,508.09						â	
4.2	420	Greundwater		\$489.64	\$1.508.09							-
43	430	Survey	0	10.00	\$0.00							
	43.1	Bediment Traps	8	\$384.82	\$1,123.05					2	2	
	432	Ost Coles North (Parket) Site	10	\$431,48	\$1,326.96						2	
	4.3.3	Goodwin North (Barlauri) Ste	10	\$431,48	\$1.028.09						2	
	434	Biream Cross Sections	10	\$487.52	\$1,501.58					4	2	
	435	Bediment Pilot Site		\$364.8)	\$1,123.65					2	2	_
4.4	4,4,0	Debris Flow Modeling	104	\$5,437.04	\$16 746 08					60	8	_
4.5	450	Hydrologic and Hydraulic Medialing	36	\$2,118,70	\$6,525.00					18	12	
4.6	4.6.0	Environmental Monitoring - Weather stations	104	\$4,931.60	\$15 189 33			32		16		
	5	Subtola	320	\$18,281.28	\$50,148.10	0	0	32	0	118	44	
5.1		Repository Site Analysis and Coordination for SEIS					7					-
5.1	5.1.0	Gestechnical Esplorations	0	\$0.00	\$0.00							
	5.1.1a	Canyon Central (Millman)		\$0.00	\$0.00 \$309.00							
)	5,1,16	Goodwin North (Barlean) Ste	4	\$120.00	3300.00						_	
	5.1.1c	Dat Coles (Parker) Site	4	\$120.00	\$369.60							
-	5,1,1d	Dat Coles South	4	\$120.00	\$369.60							
	5.1.2	Field Legs, Laboratory Testing, Geological Interpretations	0	50.00	\$0.00							1
	51.3	Geotechnical Engineering Assessments	0	30.00	\$0.00							
	3114	Reputing		30.00	30.00							
52	\$20	Grown dwater	0	50.00	\$0.00	i			- í	i		-
5.3	5.3.0	Burdaces Water	0	\$0.00	\$0.00							
_		30% stammater Report 1 ste (Canyon Central) Conceptual Plans for 8 sites (Goodwin South, Oat Coles South, Oat Coles	89	\$3,572,82	\$11,003.67	4						
-	_	North, Goodwin North, Canyon North, and Canyon South) to support SEIS	60	\$3,618.98	\$11,148.40	4			2			
5.4	5.4.0	Interim starmwater design for Oat Coles North sile and Goodwin North	76	\$3,999,34	\$11,085.97	4			2			-
2.4	5.4.0	Wellands Desklop Analysis	0	\$0.00	\$0.00 \$0.00							
	542	Field Assosment		\$0.00	50 00							-
	543	Documentation	0	\$0.00	\$0.00							
	5.4.30	Reconneissance-Level Analyses	0	\$0.00	\$0.00							
	5.4.36	Welland Delineations	0	\$0.00	\$0.00							
	5.4.3c	Wetland Characterization	0	\$9.00	50.00							
	5.4.4	Wetlanda Fieldwork Coordination	0	\$0.00	\$0.00							
5.5	550	Traffic Analysis	D	\$9,00	\$0.00							
		Subtota	254	\$11,270.92	\$34,714.43	12	0	0	8	0	0	-
_	8	SCSMAP Projects Design Development			T	T						
0.1	6.1.0	Gediment Traps	168	\$7,983.04	\$24,587 76	8				20	36	
12	#2.0	Sediment Basins	252	\$12,029.85	\$39 823 41	16				60	60	
6.3	#3.0	Dabris Flow Deflector: Bern and Levee	tio)	\$4,812.54	\$14 822 82	ંત				12	40	
6.4	6.4.0	Williams Pipeline Crossing	106	55,406.68	\$19,978,97					24	70	-
0.5 0.0	#5.0 6.6.0	Clerk Channel Conveyance Improvements Creek Channel Maintenance Support	0	\$0.00 \$2,655.36	10.00 38,181.59	16				0	0	
6.7	87.0	Creek Channel Maintenance Support Ropository Design	44	\$2,656,36	38,187,59	16					e.	
	6.7.1	Interim Site Covelepment	226	\$10,488.12	\$32,297.26	28				-		
		Rapository Design	445	\$21,701.40	\$87,086.71	40						_
0.8		Basis of Design Report	233	\$12,166,41	\$37,534,14	32				34	24	
		Subtota	1,586	\$78,322.23	\$244,312,47	154	ം	0	0	140	238	
		TOTAL	2,418	\$124,626.77	\$383,850,45	278	20	32	8	268	294	
		Reflects total hours. Does not reflect the Total Price.	Direct Labor Rate Pe	r Hour	1.5	\$77.51	\$68.12	\$87.99	\$57.61	\$61.35	\$61.06	
			Overhead Rate		208.00%	\$161.22	\$141,69	\$141.42	\$140.63	\$127.61	\$127.00	\$
			Total Rate Per Hour		Sector Control	\$238.73	\$209.81	\$209.41	\$208.24	\$168.96	\$168.06	\$
			Total Labor Cost		\$383,850.45	\$66,367.16	\$4,196.19	\$5,701.09	\$1,665.91	\$50,640.74	\$55,291.05	\$54
			Total Direct Lobert		1134 mm	571 647 70						
			Total Direct Labor Cos Fixed Fee %	H	\$124,526.77 30.00%	\$21,547.78	\$1,352.40	\$2,175.68	\$540.88	\$16,441,80	\$17,951.64	\$17

F		SES / TASKS / SUBTASKS	Engineer N	Engineer IV	CAD Technician III	Enginaer 18	Engmeer #	Engineer II	S Analyst	Scientist II	an Russed S	Accounting Administrato	Admunis trative Coordinator IV	manuturity ordinator
	Task or Subtask #	PHASES / TASKS / SUBTASKS TITLES	Mitchell, Colloen	Dale, Blane E	Tumidge Laura	Schart, N	Wu. Valetre	Kayser Gretchen	Grige, Jerreph GIS	Bliss. Kyl	Blonson, Ryan	Saavedra Rohn Ac	Jackowich. Pam Ad	Coleman, Marrie Cool
-	11	Project Managemeni and Coordination	r		гт		`							
	1.1.0	Project Coordination BEIS Consultant Coordination	12									20		_
-		5ubtotal	12	0	0	0	0	0	0		0	20		
1	4	Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development												
	410	Geotechnical												
	4.1.1	Field Explorations			1							1		
-	4.1.1a	Upper and Lower Goostwin Reach Dates Deflection BermalLavees												
+	4.1.1b	In-Stream Sediments Traps												
+		Goodwin Reach Sediment Basins												
+	4.12	Field Legs, Laberatory Testing, Geologic Interpretations												
1		Geotechnical Engineering Analyses Geotechnical Engineering Reports												
-		Groundwater												
	and the second	Survey												
	4.3.1	iSodimont Traps							4					
	432	Dat Coles North (Parker) Site							4					
-		Goodwin North (Barlean) Site							4					
-		Stream Cross Sectoria							4					
+		Sadiment Pilot Site												
+		Debris Flow Medeling						36						_
		Hydrologic and Hydaulic Modeling Environmental Montoring - Weather stations						24						
-1		Environmental Montoring - Westher stations Subjotal			0			68	20	32				
5	5	Repository Site Analysis and Coordination for SEIS							44).		V	M	V	_
T	10	Geolechnical												
	511	Geolechnical Explorations												
1	5,1,1a	(Sanyon Central (Mělman)		·					4					
-	5.1.lb	Goodwin North (Badwan) Ste							्व	_				_
+		Ost Coles (Parker) Ste							4					
-		Ozi Coles South	<b>├</b> ───┤						4					
+	5.1.2	Field Logs, Laboratory Testing, Geological Interpretations												
1	5.1.4	Gestechnical Engineering Assessments Reporting												
T		Greundwater												
		Surface Water												
1		30% stormastar Report 1 site (Canyon Central)	32		12	18			10					
1		Conceptual Plans for 6 sites (Goodwin South, Oat Coles South, Oat Coles North, Goodwin North, Canyon North, and Canyon South) to support SEIS	32		24	18								
+		Interim stormyster design for Oal Coles North site and Goodwin North	40			10								
-		Wellands												
+		Desktop Ans(ysla												_
+	5.4.2	Field Assessment												-
1		Documeniation Reconnaissance-Level Analyses												-
1	And the second second	Reconnaissance-Level Analyses												-
1		Wetland Characterizetion												-
	-24244 6	Wellands Fieldwork Coordination												
	5.5.0	Traffic Analysis												
_		Subtoral	104	0	52	52	0	0	28	o	o	0	0	
8		SC9MAP Projects Design Development	r			r	r							
+		Sadiment Trapa			80		40		4					-
+		Sediment Basins			40			70	- 4					_
+		Debris Flow Deflection Barm and Lavee			30				•					_
T		Creek Channel Conveyance Improvements			0				4					
I		Creek Channel Maintenance Support			12				<u> </u>					
ſ		Repository Design	1											
1	0.7.1	InterIm Site Development	40	24	40	0			5		40			
+		Repository Design	40	60	160									-
L	0.8.0	Basis of Design Report	24					24		_			40	_
_		Subtotal	104	84	362	8	40	94	29	0	40	0	40	-
	4	TOTAL Reflects total hours. Does not reflect the Total Price	228	84	414	60	40	162	75	32	40	20	40	_
			\$47.34	\$43.86	\$40,13	\$38,65	\$35.25	\$35.21	\$30.00	\$29.04	\$26.86	\$32.63	\$33.04	_
		8	\$98.47 \$145.81	\$91.23	\$83.47 \$123.60	\$80.39 \$119.04	\$73.32 \$108.57	\$73.24 \$108.45	\$52.40 \$92.40	\$60.40 \$89.44	\$55.87 \$82.73	\$67.87	\$68.72 \$101.76	
		1	\$33,244.04 \$10,793.52	\$11,347.46 \$3,684.24	\$51,170.57 \$18,613.82	\$7,142.52 \$2,319.00	\$4,342.80 \$1,410.00	\$17,568.38 \$5,704.02	\$6,930.00 \$2,250.00	\$2,862.18	\$3,309.15	\$2,010.01 \$652.60	\$4,070.53	

	РНА	SES / TASKS / SUBTASKS	Associated Earth Sciences			St. Plinc part	Associate	Sr. Staff	Safe	Drafting	GIS/Comp Servicas	AdminWP
	Task or Soutask B	PHASES / TASKS / SUBTASKS TITLES	SUB #2's Tatul Labor Hours	Sub#2'n Direct Labor Cast	SUB #2's Total Labor Cost	Charles Lindsay S	Jay Cherceut	Katherins Bester	Anton Yinga	Bath Nathon	Karen B+tem	Erin Mahdama
	1	Project Management and Coordination			1				r			_
1	1.1.0	Prajet Costilization SEIS Consultant Coordination	12		\$2,472.98	12						_
1	120	jozia Consumant Coordination Sublotal	12	\$1,153.80	\$0.00	12	0	0	0	0	0	
	4	Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development										
1.1	4.1.0	Gentechnical	0	\$0.00	10.00							
	4.1.1	Field Explorations	0	\$0.00	\$0.00							
	45.10	Upper and Lower Goodein Reach Dates Deflection Bermallavees	0	\$0.00	\$0.00				-			
	4,1,1b	In-Stream Sediments Traps	a	\$0.00	\$0.00							
_	4.1.1c	Geodelin Reach Sediment Basins	0	\$0.00	\$0.00	_						
-	41.2	Field Logs, Laboratory Testing, Geologic Interpretations	0	\$0.00	\$0.04					-		
		Geotechnical Engineering Analyses		\$0.00	\$0.00							_
-	and the second	Geotechnical Engineering Reports	0	50.00	\$0.00							_
2		Greundwaler	264		\$27,217.09	80	12	60	80		16	_
2	43.0	Sediment Traps	0	\$0.00	\$0.00							
1	432	Sediment Jraps Ost Coles North (Parker) Site		50.00 50,00	\$0.00							_
	43.3	Opodwin North (Battaan) Site		\$0.06	\$0.00							
1	434	Stream Cross Sections	0	\$0.00	\$0.00							
	43.5	Sediment Pilot Site	0	\$0.00	\$0.D6							2
	4.4.0	Debris Flow Modeling	0	\$0.00	\$0.00							
5	4.5.0	Hydrologic and Hydaulic Madeling	0	\$0.00	\$0.00							_
	48.0	Environmental Monitoring - Weather stations	0	\$0.00	\$0.00							
_	×	Subtotal	264	\$12,980.52	\$27,217.05	80	12	38	80	8	- 16	_
-	5	Repository Sile Analysis and Coordination for SEIS		1			r				T	
		Gestechnical	0	\$0.00	\$0.00							
	100 million (100 m	Gestechnical Explorations	0	\$0.00	10.00						1	
-	5.1.18	Carryon Central (Milmun) Goodwin North (Barlean) Bite	0	\$0.00	\$0.00							-
-		Out Coles (Parker) Sile	0	\$0.00	\$0.00							
	5.1.1d	Cal Coles South	0	\$0.00	\$0.00							
1	5,1.2	Field Logs, Laboratory Testing, Geological Interpretations	0	\$0.00	\$0.00							
	51.3	Geotechnical Engineering Assessments	D	\$0.00	\$0.00							
	51,4	Reporting	0	\$0.00	\$0.00							
2	5 Z.U	lurðuhðwalat	144	31,111,921	\$16.207 AJ	40	40	32		-	- 19	_
2	83.0	Surface Water	0	\$0.00	\$0.06							-
-		30% stormwater Ropert 1 site (Canyon Central) Conceptual Plans for 6 sites (Goodwin South, Oat Coles South, Oat Coles	0	\$0.00	\$0.00							_
-		Nerth, Goodwin North, Canyon North, and Canyon South) to support SEIS		\$0.00	10.00	-				-		
1	540	Interim stormwater design for Oat Coles North site and Goodwin Nurth	0	\$0.00 \$0.00	10.00							-
-	54.1	Desktop Analysis		\$0.00	\$0.00							
	5.4.2	Flaid Assessment	0	\$0.00	\$0.06				1			
	543	Documentation	0	\$0.00	\$0.00							
		Reconnaissance-Level Analyses	0	\$0.00	\$0.00							
	5,4.3b	Welland Delineations	0	\$0.00	\$0.00							
	5.4.3c	Wetland Characterization	0	\$0.00	\$0.00					-		-
-		Wetlands Fieldwork Coordination		\$0.00	\$0.00							_
_	550	Traffic Analysis	0	\$0.00	\$0.00					20		
-	6	Subtotal	146	\$7,717.92	\$18,207.83	40	40	32	0	8	16	
_		Bediment Traps	0	\$0.04	\$0.00							
		Sediment Basins	0	50.00	\$0.00							
		Debris Flow Deflection Berm and Levre	0	\$0.00	\$0.00							
		Millions Plosfine Crossing	.0	\$0.00	\$0.00							
	8.5.0	Creek Channel Conveyance Improvements	0	\$0.00	\$0.00				_			
_	6.0.0	Creek Channel Maintenance Support	0	\$0.00	\$0.06							
_	87.0	Repository Design	0	\$0.00	\$0.00							
-		Interim Site Development	0	\$0.00	\$0.00							_
-		Repository Design	0	\$0.00	\$0.00							
_	6,8,0	Basis of Design Report	0	\$0.00	\$0.00					1		-
-	_	Subtota	420		\$0.00 \$45,847.70	132	52	92	0	0 16	32	
	1	Reflects total hours. Does not reflect the Total Price	0		a4a,847.70	132					1000	_
			Direct Labor Rate P Overhead Rate	er Hour	110.00%	\$95.15 \$105.77	\$50.00	\$28.45 \$31.30	\$25.00 \$27.50	\$26.56	\$34.40 \$37.84	
					e 10.00%							
			<b>Total Rate Per Hour</b>			\$201.92	\$105.00	\$59.75	\$52.50	\$55.78	\$72.24	1
			Total Labor Cost		\$45.847.70	\$26,652.78	\$5,450.00	\$5,496.54	\$4,200.00	\$892.42	\$2,311.68	\$
				st	\$45.847.70 \$21.832.24 28.00%							3

B	РНА	SES / TASKS / SUBTASKS	Aspect Consulting			Princ part	Associate	Project 1	S Tark 3	Service CAD Continuence of a	Projaci
Phase or Task #	Task or Sublask #	PHASES / TASKS / SUBTASKS TITLES	SUB #1's Total Labor Hours	Sub #1's Direct Labor Cost	SUB #1's Total Labor Cost	Ertk O Andersen	Andy Holmson	inc Sthefairge	Aaron Fitts	Caroline Var	Carla Hanafai
1	1	Project Management and Coordination									
1	1.1.0	Project Coordination	40	\$2,084.68	\$6,118.74	15			12		
17	120	BEIB Consultant Coordination	•	\$0.00	\$0.06	1					_
		Subtota Sile-Specific Analysis and Data Collection for Project Design	40	\$2,084.88	\$6,118.74	16	0	0	12	0	
41	1	and Repository Sites Preliminary Design Development									
41	4.1.0	Gentechnical Field Explorations	28	\$1,315.00	\$0.00 \$3,888.70				12		
	4,1,1a	Upper and Lower Goodwin Reach Debris Deflection Berms/Levees	12	124:003	\$1,827.51	1		4	- 12		
	4.1.1b	In-Stream Sedments Traps	42		\$5,552,62			4	30		
	4.1.10	Goodwin Reach Sediment Basina	22	\$1,088.84	<b>33</b> , 137, 15	a			10		
	4.12	Field Logs, Laboratory Testing, Geologic Interpretations	52	\$2 378 18	\$6,980.14	8	1	12	24		
	413	Gestechnical Engineering Analyses	78	\$3,454,44	\$10,139.13	12		48	18		
_	4.1.4	Gestechnical Engineering Reports	65	\$3,473.46	\$10,194.78	16		24	12	4	
42	42.0	Groundwater	9	\$0.09	\$0.00					_	-
43	4.3.0	Binny	d	\$0.00	\$0.00						
_	43.1	Badimant Trapp	9	10.00	\$0,00						
_	432	Out Coles North (Parker) Sile	0	\$0.00	\$0.00	_	-				
	433	Goodwin North (Barlean) Site	0	\$0,00	10.00						
-	4.3.4	IStream Cross Sections	0	\$0.00	\$0.00						
4.4	440	Debris Flow Modeling	0	\$0.00	\$0.00						
45	450	Hydrologic and Hydraulic Modeling	0	\$0.00	\$0.08						
4.0	4.0.0	Environmental Monitoring - Weather stations	0	\$0.06	50.00		13				
_		Sublota	302	\$14,207.36	\$41,700.02	62	8	92	118	12	
1	5	Repository Site Analysis and Coordination for SEIS									
51	5.1.0	Gestechnical	0	\$0.06	\$0.00						_
	5.1.1	Geotechnical Explorations	24	\$1,411,68	\$4,143,42	12			12		
	5.1.14	Canyon Central (Milman)	38		\$5,106.25	0		-	30		_
-	5.1.15	Goodwin North (Barlean) Site	9	\$371,74	\$1,091,09	1					
	5.1.te	Oat Coles (Parker) Bite	9	\$371.74	\$1,051.08	1					
-	5.1.14	Oal Coles South	18	\$371.74	\$1,091.09	1					
	5.1.3	Field Logs, Laboratory Testing, Goological Interpretations Gentechnical Engineering Assessments		1-01-12-0	\$2,383.21	16		24			
	5.1.4	Reporting	44	\$3,473,40	\$10,104.78	10		24	12	4	-
5.2	520	Groundwater	0	\$0.00	\$0.06						
5,3	5.3.0	Burface Water	0	\$9.00	\$0.06			_			
_		10% stormwater Report 1 site (Canyon Central)	0	\$0.00	\$0.00						
_		Conceptual Plans for 6 situs (Goodwin South, Oat Coles South, Oat Coles North, Goodwin Kerth, Carryon North, and Carryon South) to support BEtS	0	\$0.00	\$0.00		_				_
_		Interim stormwater design for Oat Coles North site and Goodwin North	0	\$0.00	\$0.00						
5.4	5.40	Wetlands		\$0.00	\$0.00						_
_	5.4.1	Desklop Analysis	0	\$0.00	\$0.00				-		_
-	5.4.2	Peld Assessment	0	\$0.00	\$0.00				_		_
	5.43	Documentation	0	\$9.00	\$0.00						-
_	5434	Recinnalisance-Level Analyses	0	10,00	\$0.00						
	5.4.3b	Weiland Delineations		\$0.00	\$0.00 \$0.00						
	5.4.4	Wellands Fieldwork Coordination	0	50.00	\$0.00						
5.5	550	Traffic Analysis	0		\$0.00						
		Sublota	221	1	\$32,218.30	57	8	52	92	8	
	6	SCSMAP Projects Design Development				_					
8.1	0.1.0	Bodiment Traps		\$584.04	\$1,655.63	6		2			
0.2	620	Sediment Baalns		\$238 72	\$700.67	2		2		-	-
6.3	0.3.0	Debris Fisw Deflection Berm and Levee		\$401.40	\$1,178,15	4		2			
6,4	6.40	Williams Pipeline Crassing	10		\$1,878.82			4			-
6.5	6.5.0	Creek Channel Conveyance Improvements	0	\$0.00	\$0.00						-
6.6	6.6.0	Creek Channel Maintenance Support	0	\$0,00	\$0.00						-
8.7	6.7.0	Repository Design	0	\$0.00	\$0.00			-			_
	8.7.2	Interim Site Development Repository Design	32		\$0.00 \$6.113.93	20		12			
8.8	0.8.0	Basis of Design Report	54	\$2.063.04	\$0.00			14			
		Subtota	60		\$11,527.19	38	0	22	0	0	
		TOTAL	623	\$31,196,30	\$91,564.26	173	16	166	220	20	
_		Reflects total hours. Does not reflect the Total Price		er Hour		\$81.34	163.50	\$38.02	\$35.30	\$50.00	-
			<b>Direct Labor Rate P</b>	at riseat							
			Overhead Rate	ar rivar	193.51%	\$157.40	\$122.88	\$73.57	\$70.24	\$96.76	_
			Overhead Rate Total Rate Per Hour			\$238.74	\$186.38	\$111.59	\$106.54	\$146.76	
			Overhead Rate		193.51% \$91,554.25 \$31,196.30	\$238.74 \$41,302.20		and a second data and			\$2, 52,

	РНА	SES / TASKS / SUBTASKS	Kerr Wood Leidal			Seritor Wattor Resources Erigimeer	Project	Project
Phase or Task #	Task or Sublask #	PHASES / TASKS / SUBTASKS TITLES	SUB #3's Total Laber Hours	Sub #3's Direct Labor Cost	SUB #3's Total Labor Cost	Mike Curris	E C	
1	1	Project Management and Coordination Project Coordination		\$0.00	\$0.00			-
1	1.2.0	SEIS Consultant Coordination	0.00		\$0.00			
_		Bubtota	4 0	\$0.00	\$0.00	O	0	
1	4	Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development						-
4.1	4.1.0	Gastechnical		\$0.00	\$0.00	_		
_	4,1,1	Field Explorations		50.00	\$0.60			-
	4.1.1a 4.1.1b	Upper and Lower Goodwin Reach Debrig Daffection Berns/Levees		\$0,00	\$0.00			
	4.1.10	In-Stream Sediments Traps Goodwin Reach Sediment Basins	0	\$0.00	\$0.00			
	4.1.2	Field Logs, Laboratory Testing, Geologic Interpretations	0	\$0.00	\$0.00			
	4,1.3	Geotechnical Englneering Analyses	9	\$0.00	\$0.00			
	4.1.4	Geolechnical Engineering Reports		\$0.00	\$0.00			
4.7	420	Groundwater	9	\$0.00	\$0.00			
4.3	430	Survey		\$0.00	\$0.00			
	43.1	Sediment Traps Oat Coles North (Parker) Site	0	\$0.00	- \$0.00 \$0.00			
	433	Goodwin North (Barlean) Site	0	\$0.00	\$0.00			
	43.4	Stream Cross Sections	0	\$0.00	\$0.00			
	43,5	Sediment Pilot Site		\$0.00	\$0.00			
4.4	440	Debris Flow Modeling		\$2,060.00	\$2,080.00			
4.5	45.0	Hydrologic and Hydraulic Modeling		\$0.00	\$0.00			
4.6	480	Environmental Monitoring - Weather stations	9	\$0.00	\$0.00			
1	5	Subtota Repository Site Analysis and Coordination for SEIS	1 0	\$2,080.00	\$2,080.00		0	L
5.1	5.1.0	Gastechnical	0	\$0.00	\$0.06			
	5.1.1	Geotechnical Explorations	0	\$0.00	\$0.00			
	5.1.18	Canyon Central (Millman)	0	\$0.00	\$0.00			
	5.1.1b	Goodwin North (Barlean) São		\$0.00	\$0.00			
_		Oat Coles (Parker) Site	0	\$0.00	\$0.00			
_		Oat Coles South	0	30.00	\$0.00			
		Field Logs Laboratory Testing Geological Interpretations Geotechnical Engineering Assessments	0	\$0.00	\$0.00			-
	1.12	Reporting.		\$0.00	\$0.00			-
42		editerane es		30.00	autor			
53	530	Surface Walter	0	\$0.00	\$0.00			
		30% stormwater Report 1 site (Canyon Cantral) Conceptual Plans for 0 sites (Quudwin Soulls, Oat Cules Puult, Oat Cules	0	\$0.06	\$0.00			
	-	North, Goodwin North, Canyon North, and Canyon Doubt to support SEIS	.0	\$0.00	\$0.00			
10	6.00	Inferim stormwater design for Oel Coles North site and Goodwin North	0	\$0.00	\$0.03			
5.4	540	Vetlands Desktop Anatysis	0	\$0.00	\$9,00			
	542	Field Assessment	0	\$0.00	\$0.00			
-		Decumentation	o	\$0.00	\$0.00			
	5.4.32	Reconnaissance-Level Analyzes	0	\$0.00	\$0.00			
	5.4.3b	Walland Dalineations	0	\$0.00	\$0.06			
-		Wettend Characlerization	0	\$0.00	\$0.00			
5.5		Watlands Fieldwork Coordination Traffic Analysis	o a	\$0.00	\$0.00			
~.~	500	Traine Analysis Subiola		\$0.00 \$0.00	\$0.06 \$0.00	0	c	
	6	SCSMAP Projects Design Development						
4.5		Sediment Traps	0	\$0.00	\$0.00			
8.2	820	Bodinent Basins	0	\$0.00	\$0.00			
6.5		Debris Flow Deflection Berm and Levee	32	\$8,320,00	\$8,320.00	32		
8.4	and the second se	Williams Pipeline Crossing	0	\$0.08	\$0.00			
8.5	1	Creek Channel Conveyance Improvements	0	\$0.00	\$0.00			
6.8 6.7		Creek Channel Maintenance Support Repartory Design	0	\$0.00	\$0.00 \$0.00			
	6	Interim Site Development	0	\$0.00	\$0.00			1 1.15
	1992	Repostory Design	0	\$9,00	\$0.00			
6.8	1	Besis of Design Report	0	\$0.00	\$0.00			-
×.		Subtola		\$8,320.00	\$8,320.00	32		-
		TOTAL Reflects total hours. Does not reflect the Total Price	40	\$10,400.00	\$10,400.00	40		
			Direct Labor Rate P	er Hour		\$260.00		
			Overhead Rate		0.09%	\$0.00	\$0.00	\$0
			Total Rale Per Hour			\$260.00	\$140 00	\$9/
			Total Rate Per Hour Total Labor Cost Total Direct Labor Co		\$10,400.00	\$260.00 \$10,400.00 \$10,400.00	\$140.00 \$0.00 \$0.00	\$0

	1		1				g	2	3	8	A =	
	PHA	SES / TASKS / SUBTASKS	PSE dba Element Solutions			Principal Scientist	Senior Proje Scientist	Survey Crew Chiat	Survey Crew Member	Principal Lan Surveyor	Senior CAD Technician	GIS/CAD Technician
#	fask or Gubtask #	PHASES / TASKS / SUBTASKS TITLES	SUB #4's Total Labor Hours	SV8 #4's Direct Labor Gast	SUB #4's Total Labor Cost	Name	Name	Pela Brandi	Hours represent two survey staft	Adam Nelson	Ryan Twat	Lucas Ph = p =
	1	Project Management and Coordination	T	1	. 1						T	
4	120	Project Coordination	12		\$1,391,84	12						
		Subtota	1		\$10,670.75	92	0	o	0	o	0	
	4	Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development	·									-
4.1	4.1.0	Gestechnical	0	\$0.00	\$0.00							
-	4.1.1	Pieki Explorations	0	\$0.00	\$0.00							
-	4.1.1a	Upper and Lower Goodwin Reach Debris Deflection Berms/Levees	0	\$0.00	\$0.00 \$0.00							
	41.15	Goodwin Reach Sediment Basins	0	\$0.00								
	4.12	Field Logs, Laboratory Testing Geologic Interpretations	0	\$0.00	\$0.00							
	412	Geotechnical Engineering Analyses	0	<b>S</b> O 00	\$0.00							
-	4.1.4	Gestechnical Engineering Reports	0	\$0.00	\$0.00							
42	42.0	Groundwater	0	\$0.00	\$0.00							
4.3	430	Burvey Sediment Traps	147	\$0.00	\$0.00 \$12,193.36					12		
	4.3.1	Ost Coles North (Parker) Site	147	\$4,842.01	\$12,193,38			1	108	12	20	
-	433	Goodwin North (Berlezn) Site		\$3,070.81	\$6,603.05			3	80	2	10	
	434	Biream Cross Sections	81	\$3,220.49	\$5,520,03			3	60	10		
-	4.15	ISedIment Pilot Site	78	\$3,119.74	\$0,608.87				48	10	16	
4.4	4.40	Debris Flow Modeling	16	\$878.32	\$1,855.78	10						
4.5	455	Hydrologic and Hydaulic Modeling Eminonmental Montoring - Weather stations	0	\$0.00	\$0.00							
	1 4000	Subtota	530			16	0	24	376	36	78	
	5	Repository Site Analysis and Coordination for SEIS			·							
5.1	510	Geotechnical	0	\$0.00	\$0.00							
-	5.1.1	Geotechnical Explorations	0	\$0.00	\$0.00							
-	5.1.1a	Canyon Central (Milman)	0	\$0.00	\$0.00							
-	5.1.1b 5.1.1c	Goodwin Nodh (Barlaan) Sita Oat Coles (Parker) Site	0	\$0.09	\$0.00							
-	5.1.1d	Dal Colas South	0	\$0.00	\$0.00							
	5.12	Field Legs. Laboratory Testing, Geological Interpretations	0	\$0.00	\$0.00							
	5,1.3	Gastechnical Engineering Assessments	0	\$0.00	\$0.00							
	5.1.4	Reporting	0	\$0,00	\$0.00							
52	520	Groundwater	0	\$0,00	\$0.00							
5.3	5.3.0	Surface Water 30% stormwater Report 1 site (Canyon Central)	0	\$0.00	\$0.00 \$0.00							
		Sow stormwater rupport 1 star (Canyon Central) Conceptual Plans for 8 sizes (Doodwin South, Oat Coles South, Ost Coles North, Goodwin North, Canyon North, and Canyon South) to support SEIS		\$0.00	\$0.00							
		Interim stormwater design for Oat Coles North site and Goodwin North	0	\$0.00	\$0.09							
4	5.40	Wellands	0	\$0.00	\$0.00							
-	5.4.9	Desklap Analysia		\$838.00	\$1,348.86							_
-	5.47	Pald Assessment	201	\$7,437.00	\$15,749.33		201					
-	5.43	Documentation	0	\$0.00	\$0.00							
	5.4.3a 5.4.3b	Welland Delineations	308	\$11,821.27	\$25,034.12	50	196					
		Wetland Characterization	41	\$1 359 50	\$2,879.01		20					(a)
-	544	Wellands Fieldwork Coordination	100	\$5,477.00	\$11,598.64	100						
5	550	Traffic Analysis	0	\$0.00	\$0.00							
		SUBLICIAN Sublicita	<b>892</b>	\$34,796.87	\$73,669,33	156	644	0	0	0	0	
1	a second of the	SCSMAP Projects Design Development	1 14	201		1		-	Т	r	T	
2	3511	Gediment Traps	0	\$0.00 \$0.00	\$0.00 \$0.00							
3		Debris Flow Deflection Berm and Lavee	0	\$0.00	\$0.00							
4	6.4.0	Williams Pipeline Crossing	0	\$0.00	\$0.06							
5	850	Greek Ghannel Conveyance Improvements	٥	50.00	\$0.00							
8		Crenk Channel Maintenance Support	0	\$0.00	\$0.00							_
7	1	Happsdary Design	0	30.00	50.00							
		Interim Site Development Repository Design	0	\$0.00 \$0.00	\$0.00 \$0.00	-						_
8	1.00 m	(lasis of Design Report	0	\$0.00	\$0.00							
		Subtotal	0	\$0.00	\$0.00	0	0	0	0	0	0	
		TOTAL Reflects total hours. Does not reflect the Total Price.	1,514	\$60,722.91	\$128,592.91	264	644	24	376	36	78	
		THE REAL PROPERTY OF A DESCRIPTION OF A DESCRIPTION	Direct Labor Rate P	ar Hour		\$54.77	\$37.00	\$54.77	\$37.00	\$54.77	\$38.06	5
			Overhead Rate		111.77%	\$61.22	\$41,35	\$61.22	\$41.35	\$61.22	\$40.30	\$
			Total Rate Per Hour Total Labor Cost		\$128,592.91	\$115.99 \$30,620,42	\$78.35 \$50,460.58	\$115.99 \$2,783.67	\$78.35 \$29,451.44	\$115.99 \$4,175.51	\$76.36 \$5,956.41	\$5,1
			Total Direct Labor Co	ist	\$60,722.91	\$14,450.28	\$23,828,00	\$1,314,48	\$13,912.00	\$1,971.72	\$2,812.68	\$2,4
			Fee %		25.03%							

	PHA	SES / TASKS / SUBTASKS	TranTech Engineering			Project Manage	Senar Sunzural Engineer	Samor Cvvi Engineer	Project Structural Engineer	Project Civil Enginteer	( Structural	Staff Civil Engineer	Century CAD ectimolari	Associani, 2	Assessed 1	Readent
T	Tabler Subsidie	PHASES / TASKS / SUBTASKS TITLES	SUB #5's Tolai Labor Hours	SUB HT's Dreat Laber Cole	51,8 MTs Total Labor Cost		2 1	al herbit	in the second	Harmony Pro	Enderna Rauge Err		Name of the Owner	Canay Acm	Margaret Acm Marcary Ac	Khunday Khunday
	.6.3	Project Management and Coordination	L			¥ .	I		1			8	8			
1	10	Promit Coordination	10	\$860,03	\$2,139.77		1	1	-						1	
	20	BEIS Consultani Coordination	0	50.00	\$0.00										1	
-	-	Subtot Site-Specific Analysis and Data Collection for Project Design and	1	\$860.00	\$2,539.77		2 (	i	0	8	0	0	0	0	4	
1		Repository Siles Preliminary Design Development						,								
+	41.0	Gentechnoid		\$9.00												
t	411	Field Explorations		\$0.00	\$0.06			-						_		
1	41.18	Upper and Lower Goodwin Reach Dennis Dedector (Jermal evers)	0	\$0.00	\$0.00	r	-									_
t	41.10	Condem Ilitatio Sectment Bases	a	\$0.00 \$0.00	10.05											
T	412	Field Logi. Laboratory Testing. Geologic Interpretations	0	50 D0 \$0 00	50.06											-
	413	Geolechnical Engineering Analyses		10 00	50.00 50.00		-									
	414	Seatechnical Engineering Reports	a	50 00	\$0.00											-
	420	Grounder	0	\$0.00	\$0.05											
1	430	Survey	. 0	50.00	\$0.00											
+	43.1	Sediment Traps	0	\$0.00	\$0.06											
+		Dat Side Harts (Parter) Ser	0	50.00	50 00											
+	433	Goodwin North (Batteer) Sta	0	\$0.00	S0.00											_
+	434	Bitream Cross Sections	0	50 00	\$0.00											_
t	435	Rediment Pilot Site	-	\$0.00	\$0,00						_					-
t	4.40	Debris Row Modeling	9	\$0.00	\$0.00											
t		Environmental Monitoring - Weather stations		50.00	\$2.00											-
		Subbola	0	\$0.00	\$0.06 \$0.00										****	
5	_	Repository Site Analysis and Coordination for SEIS		(Contraction)	10,00		1 <u> </u>			0]	91	01	0)	0[	0	
		Qestechnine	0	\$9.00	10.00											
L	51.1	Geotechnical Explorations	٥	50.00	\$0.00											
	51.14	Canypy Central (Miliman)	0	\$0.00	\$0.00											
	5.1.19	Gooden North (Balean) Sile	a	\$0.00	\$0.00											
+	\$1.N	Dat Coles (Pader) Sie		\$0.00	\$0.00								-			
	\$1,14	Oal Coles South	0	\$0.00	50.00											
+		Fight Logs, Laboratory Testing, Geological Interpretations		\$2,00	\$2.05	_										
+	1225.011	Geolechindal Engineering Assessments	0	\$0.00	t0.00											_
+	3.14	Reporting	٥	\$0.00	\$0.00		_									
÷		Groundwater	0	SDCO	50 02				_	1		1		-		
t		Surface Water	0	\$0.00	\$0.00											_
T		30% stormwater Report 1 sile (Cenvon Central) Convertial Plans Re 6 silves (Occolerin South, Oct Cores South, Cat Coles North, Goodern North, Catvon North, and Caryon South to support SEH	1	\$0.00 \$0.00	\$9.99 80.00							-		-		
T		Warms Mann-alter design for Out Coles Horts and and Route in Horts	]	\$0.00	50.00										-	_
		VVedande		\$0.00	50.00		_									-
1		Desktop Analysis	0	\$0.00	\$0.00											_
	1.1.1.1	Field Assument	o	\$0.00	\$2.00											-
1	542	Documentation	a	\$2.00	\$0.00											
	5.4.34	Reconnaissance-Level Analyses	ø	\$0.00	10 00											
	5430	Matiand Dekneations		\$0.00	\$0.00											
	12024	Weiland Characterization	e e	\$0.00	\$0.00										_	
-		Weltands Fieldwork Coordination	9	\$0.00	\$2.05											_
-	550	Traffic Analysis	64	\$4,510,00	\$11,221.33			50				30		4		_
		SGSMAP Projects Design Development	84	\$4,510,00	\$11,221.33		9	\$0	0	4	0	20	0	4	0	
-	Call: 10	Soster Projects Design Development	1	\$2,810,00	moul	1		1	r	T	T	Т	T			
-	1000	(Pediment Basins		\$2,016.00 \$0.00	\$7,006.49	1			.16		18	-				-
		Orbona Prove Deflection Dente and Lavee	a d	\$0.00	10 00											_
		Williams Pipeline Grossing	128	10,938.00	\$17,282.44	2	24				-					
	Chinese and	Creek Channel Conveyance Improvements	p.	\$0.00	\$0.00											
	860	Creek Channel Meintenance Support	a	\$0.00	50.00											
-	47.0	Repository Design	d d	\$0.00	\$0.66											
		(aleam Site Developmen)	0	50.00	50.00											
-		Repository Design	0	\$0.00	50.00											
-	4.40	Sasis of Design Report		\$9.00	92.00											
-	Т	Subtrat	180	\$9,754 00	\$24,268.93	4	32	0	52		56	0	24	0	0	
	Ļ	TOTAL Reflects total hours. Goes not reflect the Total Price.	240	\$15,124.00	\$37,\$30.02	22	32	50	62	10	56	22	24	4	4	
			Stoct Labor Rule Per	Наш		\$85.00	\$70.00	\$80.00	\$60.00	\$50.00	\$42.00	140.00	\$42.00	130 00	\$20.00	
			Overhead Rate Intal Role Per Hour		148.81%	\$99.73 \$101.73	\$104.17 \$174.17	\$89.29	\$89.28	174,41	562.00	\$59.52	562.50	\$44.64	\$29.76	-
		1	folal Labor Cost		\$17,630.02	\$101,72	\$174.17	\$149.79 \$7,464.30	3149 28 \$7,762,67	3124.41	\$104.50 \$5.852.01	\$99.92 \$1,990.48	\$104.50 \$2,508.00	\$74.64 \$298.57	\$49.76 \$189.05	31
			folal Direct Lebor Cost		\$15,124.00	\$1,430.00	\$2,240.00	\$3.000.00	\$3,720.00	\$500.00	\$2.352.00	\$800.00	\$1,008.00	\$120.00	\$80.00	
			ee %		29.00%											

	РНА	SES / TASKS / SUBTASKS	Watershed Science & Engineering			Principal	Seruor Engineer	Senior Secondorio	Carl Expire	Contract
	Fask or Subtask #	PHASES / TASKS / SUBTASKS TITLES	SUB #6's Total Labor Hours	SVB #6's Direct Labor Cent	SUB #6's Total Labor Cest	neanthe flat	Bab Elliot	Dan Scott 0	Tim Tschetter 5	Joan Schrader
	1	Project Management and Coordination	1							
1	1.1.0	Project Coordination	44	\$2,434.88	\$7.022.35	.24		-	- 4	
-	1.20	Subtota	44	\$2,434.68	\$0.00 \$7,022,35	24		0		
	4	Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development								
4.1	4.1.0	Geotechnical	0	\$0.00	\$9.00	1				
	41.1	Field Explorations	0	\$0.00	\$0.00					
	4.1.1a	Upper and Lower Goodwin Reach Dabris Deflection BermalLevees	0	\$0.00	\$0.00					
_	4.1.Ib	In-Stream Sediments Traps	0	\$0.00	\$0.00		_			_
	4.1.30	Goodwin Reach Sedmant Basina	0	\$0,00	\$0.00			_		
-	4.1.2	Field Logs, Laboratory Testing, Geologic Interpretations	0	\$0.00	\$0.00					
	4.1.3	Geotechnical Engineering Analyses	0	\$0.00	\$0.00					
120	4.1.4	Geotechnical Engineering Reports	0	\$0.00	\$0.00					_
4.3	420	Groundwater Survey	0	\$0.00	\$0.00				-	
	4.3.0	Burrey Bodiment Traps	0	\$0.00	\$0.00 \$0.00					
	4.3.2	Oat Celes North (Paiker) Bite	0	\$0.00	\$0.00					-
	4.3.3	Goodwin North (Barlean) Site	0	\$0.00	\$0.00					
_	434	Stream Cross Sections	0	\$0.00	\$0.00					
_	4,3,5	Sediment Pilot Sile	0	\$0.00	\$0,00		_		_	
A.	4.4.0	Debris Flow Modeling	122	\$8,125.02	\$17,658.40	12	60		50	
5	450	Hydrologic and Hydraulic Modeling	554	\$26,074,48	\$75,206.62	100	1.48	_	312	
Q.	4.0.0	Environmental Monitaring - Weather stations		\$0.00	\$0.00					
_		Subtota	680	\$32, 199, 50	\$92,873,02	112	206	Ð	362	
1	5.1.0	Repository Site Analysis and Coordination for SEIS					Т	1		
1	5.1.1	Geotechnical Explorations	0	\$0.00	\$0.00					_
-	5.1.14	(Canyon Central (Milman)	0	\$0.00	\$0.00					
	5.1.1b	Goodwin North (Bartaan) Sila	0	\$0.00	\$0.00					
	5.1.1c	Oat Coles (Pwher) 55e	0	\$0.00	\$0.00					
	5.1.1d	Dat Coles South	0	\$0.00	\$0.00					
	5.12	Field Logs. Laboratory Testing, Geological Interpretations	i o	\$0.00	\$0.00				-	
_	.5.1.3	Geotochnical Engineering Assessments	a	\$0.00	\$0.00					_
_	5,1,4	Raponisg	0	\$0.00	\$0.00					
2	5.2.0	Groundwater		\$0.00	\$0.00	_		_		_
3	530	Burface Water	0	\$0.00	\$0.00					_
-		30% stormwater Report 1 site (Canyon Central) Conceptual Plane for 6 sites (Goodwan South, Oat Coles South, Oat Coles	0	\$0,00	\$0.00					
		North, Goodwin North, Canyon North, and Canyon South) to support SEIS	0	\$0.00	\$0.00					
	5.40	Interim stormwater design for Oat Coles North stie and Goodwin North	0	\$0.00	\$0.08 \$0.08					_
	5.4.1	Desktop Analysis	0	\$0.00	\$0.06					
	5.4.2	Field Assessment	0	\$0.00	\$0.06					
	5.43	Documentation	0	\$0.00	\$0.00					
	5.4.38	Reconnalisance-Level Analysis	0	\$0.00	\$0.00					
	5.4.3b	Welland Delineations	0	\$0.00	\$0.00	-				
-	5.4.3c	Wetland Characterization	.0	\$0.00	\$0.00					_
	544	Wetlands Fieldwork Coordination	0	\$0,00	\$0.00					_
5	550	Traffic Analysis	0	\$0.00	\$0.00					-
	6	SCSMAP Projects Design Development	0	\$0.00	\$0.00	0	0	٥	0	
	6:1.0	Dediment Traps	18	\$780.74	\$2.251.69				12	
	62.0	Sedment Basins	12	\$524.98	\$1.514.20	2	2			
	6.3.0	Debris Flaw Deflection Berm and Lavee	10	\$457.81	\$1,320.09	7	2		6	
	5.4.0	Wilfams Pipeline Crossing	18	\$928.84	\$2.679.05	e	2			
13	6.5.0	Creek Channel Conveyance Improvements	0	\$0.00	\$0.00	0	0		o	
	80.0	Creek Channel Maintenance Support	18	\$794.20	\$2 290 71	-	2		12	
,	6.7.0	Rapository Design	0	\$0.00	\$0.00					
-	6.7.1	Interim Site Development	0	\$0.00	\$0.00					_
	0.7.2	Repository Design	0	\$0.00	\$0.00		-		1/2	_
_	680	Basis of Design Report	67	\$3,061.90	\$8,658,35	6	24		30	_
		Subtotal		\$6,488.34	\$18,714.32	28	36	0	78	_
		Reflects total hours. Does not reflect the Total Price.		\$41,122.52	\$118,609.68	162	250		442	_
			Direct Labor Rate Pe Overhead Rate	r Hour	165.43%	\$67.31 \$126.83	\$60.58 \$114,15	\$45.00 \$84.79	\$33,65 \$63,41	5
			Total Rate Per Hour		190.43%	\$126.83	\$174,15	\$129.79	\$63,41	
			Total Labor Cost		\$118,609.68	\$31,451.04	\$43,682.72	\$0.00	\$42,889.06	55
			The second s						and the second s	
			Total Direct Labor Cos Fee %	1	\$41,122.52 29.00%	\$10,904.22	\$15,145.00	\$0.00	\$14,873.30	\$2

# EXHIBIT A: INVOICED OTHER DIRECT COSTS FEE (pg 1 of 2)

Peter: Involved QDC are those costs for which the Consultant with have a receipt from an independent company for goods or services. These expenses are documented with receipts for extent costs such as for large-scale princip (cos, cby-he-th) travel, laboratory tests, alticling, etc. Scale specific type of cost should be larged or divisioned, with an schemade unit cost antened at specific specific type of cost should be larged or divisioned, with an schemade unit cost antened at the specific type of cost should be larged or divisioned, with an schemade unit cost antened at the specific type of cost should be larged or divisioned. When schema are specific type of the specific type of the schema at the specific type of cost should be larged or divisioned. The specific type of type of the specific type of type of

				Herreta		TRAVEL	Weather Station	Stating Simisol	Stream Gauge	Aspact Co	neuiting	Field prrent	Test pits	Bonras/well dniing/pumping	lab testing	peolactmical lab
Task #	Task or Subtask #	PHASES / TASKS / SUBTASKS TITLES	Total Involced ODC		Prime's Tetal Invoiced ODC	TRIPS	83	84			Bub #1"s Total Invoice d ODC	dəy	day	day	per site	per st
1	1	Project Management and Coordination Project Coordination	\$401.00		\$406.00	760		1	1	1		_				r
<b>i</b>	120	SEIS Consultant Coordination	10 151		\$0.00					1	10.00					-
_		Subtotal	\$406,00		\$406.00	700	0				\$0.00	0		0	0	
		Sile-Specific Analysis and Data Collection for Project	t Design and Reposit	ory Sites Prel	Ininary Design Develop	mant										
41	410	Destectional	59.00		50.00						50.00			-		
- 1	41.10	Field Explorations Upper and Lower Goodwin Reach Debris Deflection Berms	\$300.00 \$300.00		50.00						\$300.06	3				
	4 1 fb	In-Stream Bedmanta Traps	\$13 800.08		50.00		_			1	\$300.06	2			-	-
	4.1.10		59 450 04		50.00					1	\$13,800.00 \$9,450.00	2				-
	412	Field Logs. Laboratory Testing. Geologic Interpretations	\$4 000 00		\$0 00					1	54 000 00					
_	4.13	Geotechnical Engineering Analyses	50.00		\$0.00						50 00					
_	41.4	Geotechnical Engineering Hisports	\$0.06		\$0.00						\$0.06					
42	4.2.0	Oroundwater	\$5,058.00		\$0.00						10.00					
43	430	furvey Sediment Traps	\$0.00		50.00					1	\$0.00					-
	432	Gal Coles North (Parker) Dile	\$0.00 \$0.00		50 00 50 00						5000		_			
	433	Goodwin North (Barlinan) Erte	\$0 00 \$0 00		50 00						50.00					
	43.4	Stream Cross Sections	\$0.06		50 00						50.00					
_	425	Sediment Pilot Cita	80.06		\$0.00					]	50.00					
4.6	44.0	Dabas Flow Modeling	\$0.00		\$0.00						\$0.00					
45	450	Hydrologic and Hystaulic Modeling	\$301.60		50.00						50.08					
46	460	Environmental Monitoring - Weather stations	\$8.500.00		\$8,500.00		2				50.06					
_		Subtotal Repository Site Analysis and Coordination for SEIS	\$41,709.60		\$8,500,00	0	2		1	1	\$27,850.00	3	0	\$	0	
51	510	Geotecnical	\$0.00		50 00					1						
	5.1.1	(Seolechnical Explorations	\$150.00		50.00					0 8	\$150.00					
	5.1.14	Canvon Central (Mtiman)	\$11,150.00		\$0.00						\$11,150,00					1.
_	5.1.19	Coodwin North (Barleen) Site	\$150.00		\$0.00						\$ 150.00					
_	5.1.16	i Dat Coles (Parker) Site	\$2, 150.00		\$0 00						\$7,150.00	,	15			
-	5,1,14	Dal Coles South	\$2, 150.00	1	90.00						\$2 150.00	1	110			
Ť	447	Calificate 1 passed from the second barrantees	ara new res								Sutta ave		0		14	
-	513	Beoorling	\$0.00 \$0.00	1	\$0.00 \$0.00						\$0.00					
52	520	Broundwaler	359.00	1	50.00						\$0.00 \$0.00					
53	530	Surface Water	10.00	1	\$0.00						50.00					
		30% stammater Report 1 alle (Catyor Central)	30.00		\$0.00						SO OF					-
$\rightarrow$		Conceptual Plans for 6 siles (Goodwin South, Oat Coles Se	30.00		\$0.00						SD 00		_	1		
		Interm stormwater design for Oat Coles North site and God	\$0.06		\$0.00						\$0.96					
4	5.40	Wetlands	\$0.06		\$0.00						\$0.08					
+	541	Desktop Analysis Field Assessment	\$0.00		\$0.00			-			50.00					
	543	Dicumentation	\$1,108,88 \$0,00	1	\$0.00 \$0.00						80.00					
	5438	lleconnaissionce-Level Analyses	SO DE		\$0.00						10.00 90.00					-
	5.4 3b	Walfand Delineations	\$0.00	1	\$0.00						50.00					
-	5 4 30	Welland Charactenzation	S0 00	[	\$0 OQ						10.00					
-	54.4	Wetlands Finktwork Coordination	50.06		\$0.00						\$0.00					
s	550	Fraffic Analysis	\$142.68	-	\$0.00						10.00		-		-	
-		Subtotal	\$20,059.56	Į	\$0.00	0	٥	0	0		\$18,750.06	5	3	2	4	
		BCSMAP Projects Design Development Dedment Trape	\$20.88	í	mart			1				T	T	T		-
2		Sediment Basins	\$174.00	ł	\$0.00	300					\$0.00 \$0.00		-			
2		Debris Flow Defection filem and Levice	\$0.00	İ	\$0.00						10.00					
•	0.40	Williams Pipeline Crossing	1316.60	1	\$174.00	300					\$0.05					
5		Creek Channel Conveyance Improvements	\$0.06	[	50.00						\$3.00					
6		Creek Channel Maintenance Buggoot	\$0.00	ļ	\$0.00						50.00					
7		Repository Design	<b>SO DO</b>	Ļ	\$0.00						\$9.00					_
-	67.1	Interim Site Development	\$406.00	ł	\$406.00	700					50.00					
		Repository Design	50.00 \$0.00	ł	\$0.00 \$0.00						50.04			-		
-		Subtotal	\$917.56	ł	\$764.00	1,300	0	0			\$0.00 \$0.00	0	0	114		
_		TOTAL	\$63,092.72	-	\$9,660.00	2,000	2	. u			\$49,500.00	14	0	0	0	

	Associated Earth Sciences	TRAVEL	Total Meats and Asbestoa	പങ	PSE dba E	emant Solutions	TRAVEL	FIELD	TranTech E	ingineering	TRAVEL	OUTSIDE	Watershed Science & Engineering	TRAVEL	OUTSIDE
Task or Setteral #	Sub #2's Total Invoiced ODC	TRIPS	EACH	EACH		SUB #4's Total Involced ODC	Mileage	GPS Rental		SUB #5's Total Invoiced ODC	TRIPS	PAGES	SUB #6's Total Invojced ODC	Mdeage	PA
1.1.0	\$0.00				Ĩ	\$0.00	1		1	50.00			3000	(	
120	\$0.00				1	\$0.00				\$0.00			90.00		
4	\$0.00	0	0	0	4	\$0.00	0	0	1	\$0.00	6	0	\$0,00	0	
4.10	\$0.00				]	. \$0.00			1	50.00			5000		
4.1.1	\$0.00					\$0.00				50.00			50.00		_
4.1.18	50.00				1	\$0.00 \$0.00				50.00			50.00		
41.90	50.00					SO 00				50 00			\$0.00		
4.1.2	\$0.00 \$0.00					\$0 00 \$0 00				50 00 50 00			50.00		-
41.4	\$0.00					\$0.00			-	50.00			50.00		
42.0	\$5.058.00	100		1		60.00				\$0.00			50.00		_
430	\$0.00					\$0.00 \$0.00	(			\$0.00 \$0.00			50.00		
432	\$0.00					\$0.00				S0.00			10.00		
43.0	\$0.00	-				\$0.00 \$0.00	-			50.00			\$6.00		_
435	50 00					\$0.00 \$0.00			-	30.00			50.00	1	
4.4.0	\$0.00					\$0.00				\$0 D.1			\$0.00		
450	\$0.00 \$0.00					\$0 00 \$0 00				\$0.90 \$0.00			\$301.60 \$0.00	520	-
	\$5,058.00	100		2	1	\$0.00	0	0		\$0.00	O	0	\$301.40		
5	\$0.00	0			L	\$0.00		-		50.00	- 1		10.00		-
5.1.1	\$0.00				Č.	\$0.00				50.00			\$5.00		
51,1# 51,1b	\$0.00			-		\$0.00	1			\$0.00			\$0.00		
51.10	10 00					\$0.00				50.00			50.00		1
51.10	\$0.00					50 00		_		sa na			10.00		
512	00 02 00 02					\$0 00 \$0 00	2			50 00 50 00	_	-	50.00	-	-
514	\$0.00					\$0.00	V			\$0.00			\$12.00		
520	\$58.00	100			2	\$0.00	·			S0 00			\$0.00		-
\$30	so ooso ooso ooso oo					50.00 \$0.00				\$0.00 \$0.00			50.00		-
	\$0.00					\$0.00				10.00			\$0.00		
540	\$0.00 \$0.00			_		\$0.00				50.00			50.00		
541	50.00					50.00				50 10		_	10.00		
542	50.00			_	8	\$1,108 88	801	40		50.00					
543 543a	50 00 50 00					\$0.00 \$0.00				\$0 00 \$0 00			50 00		
54.36	\$0.00				4	\$0.00				50.00			\$0.00		
543c	50 00 30 00	-				\$0.00 \$0.00				\$0.00 \$0.00			50 00		-
550	\$0.00					\$0.00				\$142.68	245		50.00		
c	\$59.00	100	0	ė		\$1,108.88	8D3	40		\$142.68	246	0	\$0.00	0	
610	50 00					\$8.00				\$20 68	30		\$2'00		-
62.0	50.00					50.00				\$0.00			\$0.00		
6.3 0 8.4.0	50 00 \$0 00					50.00				S0 00 1142 68	246		\$0.00		
650	\$0.00					\$0.00				55.00			50.00		
6.6.0	\$0.00				di di	50 00 \$0 00				50.00			50.00		
67.0	50.00				6	\$0.00				50.00 \$0.00			50.00		-
67.2	50.00					\$0.00				50.00			\$0.00		
680	10.00 \$0.00	0	0	0		\$0.00 \$0.00	0			\$0.00 \$163.56	251	1.0	50.00		-
	\$5,116,00	200	4	2	1 3	\$1,108 88	803	40	8	\$306.24	528	0	\$201.60		-

### Actuals Not To Exceed Table (ANTE)

Whatcom County Agreemer Swift Creek Sediment Management Actio Herrera Environmental Cons 2200 Sixth Avenue, Suit Seattle, WA 98122	on Plan Impleme ultants, Inc. e 1100	ntation		
Job Classifications	Direct Labor Rate	Overhead NTE*	Fixed Fee NTE	All Inclusive Hourly Billng
	NTE*	208.00%	30.00%	Rate NTE
President, Executive Vice President, Vice President	\$77.51	\$161.22	\$23.25	\$261.99
Engineer VI, Scientist VI, Planner VI	\$68.87	\$143.25	\$20.66	\$232.77
Engineer V / Scientist V / Planner V / Analyst V	\$69.29	\$144.12	\$20.79	\$234.19
Engineer IV / Scientist IV / Planner IV / Landscape Architect IV / Analyst IV	\$59.26	\$123.26	\$17.78	\$200.30
Engineer III / Scientist III / Planner III / Landscape Architect III / CAD Technician III / Analyst III	\$45.15	\$93.91	\$13.55	\$152.61
Engineer II / Scientist II / Planner II / Landscape Architect II / CAD Technician II / Analyst II	\$38.66	\$80.40	\$11.60	\$130.66
Engineer I / Scientist I / Planner I / Analyst I	\$34.65	\$72.07	\$10.40	\$117.12
Intern	\$26.25	\$54.60	\$7.88	\$88.73
Accounting Administrator I, II, III, IV, V	\$50.93	\$105.92	\$15.28	\$172.13
Administrative Coordinator III, IV	\$33.34	\$69.34	\$10.00	\$112.68

# Actuals Not To Exceed Table (ANTE)

Whatco	om County Agree	ment: RFP-1	8-42	
Swift Creek Sedir	ment Management	Action Plan Im	plementation	
	Associated Earth So		premenation	
the second s				
	911 5th A			
	Kirkland, WA	98033		
	Direct	Overhead	Fixed Fee	All Inclusive
Job Classifications	Labor Rate	NTE*	NTE	Hourly Billng
	NTE*	110.00%	29.00%	Rate NTE
Sr. Principal	\$96.15	\$105.77	\$27.88	\$229.80
Principal	\$72.12	\$79.33	\$20.91	\$172.37
Sr. Associate	\$61.54	\$67.69	\$17.85	\$147.08
Associate	\$50.00	\$55.00	\$14.50	\$119.50
Senior	\$41.51	\$45.66	\$12.04	\$99.21
Sr. Project	\$36.06	\$39.67	\$10.46	\$86.18
Project	\$32.91	\$36.20	\$9.54	\$78.65
Sr. Staff	\$28.45	\$31.30	\$8.25	\$68.00
Saff	\$25.00	\$27.50	\$7.25	\$59.75
Laboratory Staff	\$23.75	\$26.13	\$6.89	\$56.76
Drafting	\$26.56	\$29.22	\$7.70	\$63.48
GIS/Comp Services	\$34.40	\$37.84	\$9.98	\$82.22
Admin/WP	\$24.83	\$27.31	\$7.20	\$59.34
		\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
	100 million	\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
£		\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
	12	\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
	12	\$0.00	\$0.00	\$0.00
127.0		\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00

# Whatcom County Agreement: RFP-18-42 Swift Creek Sediment Management Action Plan Implementation Aspect Consulting, LLC 350 Madison Ave North Bainbridge Island, WA 98110

Job Classifications	Direct Labor Rate	Overhead NTE*	Fixed Fee NTE	All Inclusive Hourly Billng
Fullion Dur 16 manor 8 m	NTE*	193.51%	29.00%	Rate NTE
Principal 2	\$81.34	\$157.40	\$23.59	\$262.33
Principal 1	\$85.00	\$164.48	\$24.65	\$274.13
Senior Associate	\$63.50	\$122.88	\$18.42	\$204.79
Associate	\$57.01	\$110.32	\$16.53	\$183.86
Senior 3	\$55.00	\$106.43	\$15.95	\$177.38
Senior 2	\$52.47	\$101.53	\$15.22	\$169.22
Senior 1	\$49.75	\$96.27	\$14.43	\$160.45
Project 3	\$43.27	\$83.73	\$12.55	\$139.55
Project 2	\$38.02	\$73.57	\$11.03	\$122.62
Project 1	\$36.30	\$70.24	\$10.53	\$117.07
Staff 3	\$34.62	\$66.99	\$10.04	\$111.65
Staff 2	\$30.37	\$58.77	\$8.81	\$97.95
Staff 1	\$27.89	\$53.97	\$8.09	\$89.95
Field/Construction Supervisor	\$27.97	\$54.12	\$8.11	\$90.21
Field Technician 2	\$25.00	\$48.38	\$7.25	\$80.63
Field Technician 1	\$22.66	\$43.85	\$6.57	\$73.08
Engineering Designer	\$50.00	\$96.76	\$14.50	\$161.26
Senior Developer	\$50.00	\$96.76	\$14.50	\$161.26
Senior CAD Technician/Specialist	\$35.24	\$68.19	\$10.22	\$113.65
CAD Technician	\$30.00	\$58.05	\$8.70	\$96.75
Senior Technical Editor	\$34.67	\$67.09	\$10.05	\$111.81
Technical Editor	\$28.97	\$56.06	\$8.40	\$93.43
Project Coordinator 2	\$30.40	\$58.83	\$8.82	\$98.04
Project Coordinator 1	\$24.88	\$48.15	\$7.22	\$80.24

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# Actuals Not To Exceed Table (ANTE)

# Whatcom County Agreement: RFP-18-42 Swift Creek Sediment Management Action Plan Implementation Kerr Wood Leidal 200 - 4185A Still Creek Drive Burnaby, British Columbia V5C 6G9

Job Classifications	Direct Labor Rate NTE*	Overhead NTE* 0.00%	Fixed Fee NTE 0.00%	All Inclusive Hourly Billng Rate NTE
Senior Water Resources Engineer	\$260.00	\$0.00	\$0.00	\$260.00
Project Engineer	\$140.00	\$0.00	\$0.00	\$140.00
Project Assistant	\$80.00	\$0.00	\$0.00	\$80.00

Whatcom County Agreement: RFP-18-42 Swift Creek Sediment Management Action Plan Implementation Pacific Survey and Engineering dba Element Solutions 909 Squalicum Way #111 Bellingham, WA 98225										
Job Classifications	Direct Labor Rate	Overhead NTE*	Fixed Fee NTE	All Inclusive Hourly Billng						
Principal Scientist	NTE*	111.77%	29.00%	Rate NTE						
	\$54.77	\$61.22	\$15.88	\$131.87						
Senior Project Scientist	\$37.00	\$41.35	\$10.73	\$89.08						
Project Scientist	\$30.00	\$33.53	\$8.70	\$72.23						
Wetland Ecologist	\$37.00	\$41.35	\$10.73	\$89.08						
Project Manager	\$54.77	\$61.22	\$15.88	\$131.87						
Field Scientist II	\$27.00	\$30.18	\$7.83	\$65.01						
Field Scientist I	\$22.00	\$24.59	\$6.38	\$52.97						
Office / Clerical	\$35.00	\$39.12	\$10.15	\$84.27						
Survey Crew Chief	\$54.77	\$61.22	\$15.88	\$131.87						
Survey Crew Member	\$37.00	\$41.35	\$10.73	\$89.08						
Principal Land Surveyor	\$54.77	\$61.22	\$15.88	\$131.87						
Senior CAD Technician	\$36.06	\$40.30	\$10.46	\$86.82						
UAV Licensed Pilot	\$36.06	\$40.30	\$10.46	\$86.82						

Whatco	om County Agree	ment: RFP-1	8-42							
	nent Management									
	TranTech Engine									
		•								
	1221 Fraser Street									
	Bellingham, WA	A 98229								
Direct Overhead Fixed Fee All Inclusive										
Job Classifications	Labor Rate	NTE*	NTE	Hourly Billng						
	NTE*	148.81%	29.00%	Rate NTE						
Principal	\$89.00	\$132.44	\$25.81	\$247.25						
Project Manager	\$65.00	\$96.73	\$18.85	\$180.58						
Marine Engineer	\$70.00	\$104.17	\$20.30	\$194.47						
Senior Structural Engineer	\$70.00	\$104.17	\$20.30	\$194.47						
Senior Civil Engineer	\$60.00	\$89.29	\$17.40	\$166.69						
Project Structural Engineer	\$60.00	\$89.29	\$17.40	\$166.69						
Project Civil Engineer	\$50.00	\$74.41	\$14.50	\$138.91						
Staff Structural Engineer 2	\$45.00	\$66.96	\$13.05	\$125.01						
Staff Structural Engineer 1	\$42.00	\$62.50	\$12.18	\$116.68						
Staff Civil Engineer	\$40.00	\$59.52	\$11.60	\$111.12						
Senior CAD Technician	\$42.00	\$62.50	\$12.18	\$116.68						
Administrative Assistant 2	\$30.00	\$44.64	\$8.70	\$83.34						
Administrative Assistant 1	\$20.00	\$29.76	\$5.80	\$55.56						
Resident Engineer (QA/QC)	\$79.00	\$117.56	\$22.91	\$219.47						
Senior Construction Inspector	\$60.00	\$89.29	\$17.40	\$166.69						
Construction Inspector	\$45.00	\$66.96	\$13.05	\$125.01						
Specialty Technician	\$45.00	\$66.96	\$13.05	\$125.01						

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# Actuals Not To Exceed Table (ANTE)

Whatco	om County Agree	ment: RFP-1	8-42								
Swift Creek Sedir	ment Management	Action Plan Im	plementation								
Wa	atershed Science ar	d Engineering									
	506 2nd Ave, Su										
Seattle, WA 98104											
Seattle, WA 98104											
Direct Overhead Fixed Fee All Inclusive											
Job Classifications	Labor Rate	NTE*	NTE	Hourly Billng							
induction and induction	NTE*	188.43%	29.00%	Rate NTE							
Principal	\$72.00	\$135.67	\$20.88	\$228.55							
Senior Engineer I	\$65.00	\$122.48	\$18.85	\$206.33							
Senior Engineer II	\$53.00	\$99.87	\$15.37	\$168.24							
Senior Geomorphologist	\$50.00	\$94.22	\$14.50	\$158.72							
Staff Engineer	\$45.00	\$84.79	\$13.05	\$142.84							
Junior Engineer	\$38.00	\$71.60	\$11.02	\$120.62							
GIS Specialist	\$40.00	\$75.37	\$11.60	\$126.97							
Technician/Drafter	\$25.00	\$47.11	\$7.25	\$79.36							
Engineering Intern	\$28.00	\$52.76	\$8.12	\$88.88							
Contract Administrator	\$40.00	\$75.37	\$11.60	\$126.97							

### EXHIBIT B: SCOPE OF WORK

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# **EXHIBIT B: CONTRACT SUPPLEMENT SCOPE OF WORK**

# **Project Description**

The Consultant team has successfully completed the initial scope of work for the implementation of the Swift Creek Sediment Management Action Plan (SCSMAP) project which included a review of background documents, site visits, and prioritization workshop. As a result of this process, a final Proposed Action has been identified for the Supplemental Environmental Impact Statement (SEIS) for the development of SCSMAP repositories. Additionally, the design team, in conjunction with Whatcom County (County) and the SEIS consultant identified desired project outcomes, objectives and constraints that set the framework for the following scope of work.

Based on available funding, property availability, proof of concept and feasibility, as well as costbenefit ratio, the Consultant team will provide technical analysis and evaluations to further refine and develop the SCSMAP projects including the upper and lower Goodwin Reach debris flow deflection berms/levees, in stream sediment traps, sediment basins, and creek and channel conveyance improvements. Additionally, the Consultant team will provide technical analysis to support the SEIS as well refine the conceptual plan and develop preliminary design analysis for the Proposed Action.

To accomplish this, the following scope of work will be amended to the contract. The anticipated deliverables are:

- 1. Special studies and analyses to support the Draft and Final SEIS
- 2. Conceptual plan for the selected SEIS Proposed Action including a basis of design memorandum with design drawings.
- 3. Special studies and analyses to support project designs including draft and final technical memorandums
- 4. 30% Design concepts and alternatives including:
  - a. Draft and final basis of design memoranda with design drawings
  - b. Recommendations for construction sequencing and strategies for transporting of sediment,
  - c. Identification of property requirements including acquisition, temporary and permanent easements, considerations for forestry practices and complying with State Budget requirements for marketable timber and
  - d. Recommendation for a construction package based on cost/benefit, funding and property availability.

The Consultant team and subcontractors are aware that the site contains asbestos. Site specific health and safety plans will be prepared and maintained by all team members and sub-

contractors accessing the site. Any on-site work that requires contact with asbestos-containing sediment will require special management consideration, may be subject to Federal and State regulations, and in general will consist of:

- Preparing a Safety Plan and providing a copy to the County
- Decontaminating all equipment prior to leaving site by thoroughly washing off all sediment
- Maintaining decontamination stations, boot washes, and pre-disposal material where workers enter and leave the site
- Any additional notifications and permits required to handle, manage, work within, transport, or dispose of asbestos-containing materials.

# **Project Team**

Prime Consultant	Herrera Environmental Consultants
Geotechnical Engineering	Aspect Consulting
Hydrogeology	Associated Earth Sciences, Inc
Hydraulic Modeling	Watershed Science and Engineering
Debris Flow Berm Design	Kerr Wood Leidel
Survey	PSE
Past Works & Coordination	Element Solutions
Traffic and Structural	Trantech
QA/QC / Editing	Herrera Environmental Consultants

### Schedule

Anticipating a project start date in early February 2019 all work is expected to be complete by the summer 2020 following sedimentation basis pilot study summary and recommendations.

Since the Draft SEIS is anticipated to be completed by late-summer of 2019, the repository design and support work will need to start in early February 2019. During February and March 2019, the team will conduct SEIS and site-specific technical analysis followed by concept design refinement necessary to identify specific sediment handling and management requirements for collection, consolidation, handling, transport and internment. Additionally, the Consultant will expedite the interim repository site development at the Oat Coles North and Goodwin North sites to accommodate maintenance activities scheduled for fall 2019. During April and May 2019, the concepts and designs will be reviewed and further refined with supplemental data collection, analysis and modeling to develop recommendations for sequencing, phasing, and implementing the designs based on-site constraints, property ownership, high benefit to cost ratio, and available funding.

In May and June 2019, the pilot study work plan will be developed and submitted to the County for review and planned implementation in the Fall of 2019. Following pilot study data collection

(yet to be scoped and budgeted), the Consultant will summarize the data and make recommendations to advance the design in early 2020.

In June and July, the SCSMP designs and concepts will be further developed and submitted to the County for review.

### **Task 1:** Project Management and Coordination

This task will be supplemented for continued SEIS and project coordination.

#### Task 1.1 Project Coordination

Michael Spillane, the project manager of the Herrera team, will interface directly with the SEIS team project manager or designee and the technical analysts for each discipline detailed below. Co-management will be required for coordination of deliverable requirements required for 30 percent design development and repository design for the SEIS.

#### **Assumptions:**

- Monthly invoicing and project status reports
- Weekly one-hour coordination meetings with preparation and follow-up (County PM, SEIS PM, Herrera PM and one team member)
- 12 project management meetings with analysts and designers (up to 7 staff for 1-hour meeting).
- Twelve (12) weekly meeting with 5 leads.
- Herrera PM will attend up to 3 public meetings with County to assist with presentations and questions (6 hours per meeting including prep and travel)
- Ecology and local jurisdiction coordination for verifying and establishing stormwater requirements is included in weekly meeting coordination above.
- Consultant will prepare project schedule in Microsoft Project and update it monthly.

#### **Deliverables:**

- Weekly E-mail follow-up after meetings with team and staff
- Workshop work products will be available to staff upon request
- Project log of meetings (in-person, on-line, phone) and associated decisions to be available to staff and the SEIS team.
- Monthly status report

#### Task 1.2 SEIS Consultant Coordination

Given the short time period for preliminary repository design and Draft SEIS preparation, ongoing collaboration between the two teams will be required to ensure that developed scopes

of work and associated deliverables meet the needs of the County. This task will include assistance with project administration such as distribution list preparation, notifications, mailings, document delivery, coordination activities and status updates with weekly 2-week look ahead action items.

#### Assumptions:

• Weekly coordination meetings over four-month period. – 8 hours per week

#### **Deliverables:**

- Weekly E-mail follow-up after meetings with team and staff
- Project log of meetings (in-person, on-line, phone) and associated decisions to be available to staff and the SEIS team.
- Monthly status reports

#### Task 2. Review Background Materials and Site Reconnaissance

The Consultant team has completed this task.

### Task 3. Prioritization and Guidance Workshop

The Consultant team has completed this task.

# Task 4. Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development

The Consultant team will apply a two-phased approach in this task: 1) data collection to support both the SEIS, for preliminary design development and "proof of concepts" for the sediment management plan implementation elements, and 2) subsequent data collection and evaluations to refine and develop project concepts and complete detailed design work. The early field work and data analysis will help us to refine cost estimates, evaluate benefits, evaluate schedule, assess sequencing issues, inform permitting pathways, and define sediment handling and management constraints to advance the designs and prioritize implementation. Examples include:

- Geotechnical investigations within the identified proposed project action areas, including:
  - o Reconnaissance-level geotechnical characterization for up to four repository areas;
  - Geotechnical borings for bedload sediment containment structures, log-bridge crossing replacement for potential repository access;
  - o Soil characterization for proposed stormwater management facilities;
  - Geotechnical characterization for proposed roads, construction access routes, and debris flow berm/levee footprints;

- Geotechnical characterization of sediment for stockpiling and slope stability;
- Geologically hazardous areas assessment to meet Whatcom County Critical Areas requirements.
- Debris flow and hydraulic modeling to refine the height and alignment of the debris flow berm/levee and to inform armoring properties.
- Groundwater analyses to support structure designs, including evaluating impacts on nearby steep slopes, construction-related issues, stormwater management, groundwater mounding from sediment basins, and critical aquifer recharge area impacts to address Whatcom County Critical Areas requirements.
- Wetland assessments and reports including reconnaissance-level, delineation, and characterization analyses within the proposed repository and project areas
- Stormwater management options analysis for repository site(s) and access/staging area(s) and preliminary concepts layout.
- Topographic survey to support 30% designs for early-phase project actions (debris flow berm, grade control structures, and setback levee) as appropriate.
- Survey of existing stockpile topography, utilities, wetland boundary, property line flagging, and ROW flagging for Parker Site.
- Installation of two weather stations and two stream gages to identify forces on sediment production and ultimately operate the sediment basins.
- Less time-critical evaluations and data collection will be scheduled in coordination with the SEIS team and as data gaps are identified; however, detailed scope and budgets are not provided at this time. Examples may include:
- Potential bridge design for repository site access;
- Detailed topographic survey and/or monitoring (drone data collection could be used to expedite work);
- Additional wetland, groundwater, and geotechnical study.

#### **Task 4.1 Geotechnical**

#### 4.1.1 Field Explorations

#### 4.1.1a Upper and Lower Goodwin Reach Debris Deflection Berms/Levees

The proposed Upper Goodwin Reach Deflection Berm (UGRDB) is approximately 1,500 feet long. The Lower Goodwin Reach Deflection Berm (LGRDB) is approximately 2,500 feet long. Prior test pits excavations by Converse et al., (1976) and other more recent explorations are considered adequate to inform preliminary design concepts for these deflection berms.

#### 4.1.1b In-Stream Sediment Traps

Sediment traps have been proposed to be constructed using cascading series of vertical steel piles (soldier piles) and low horizontal lagging boards, to retain/trap sediment at multiple locations. Geotechnical explorations will be completed to inform the design and construction of these traps. A track-mounted drill rig will be utilized to advance six exploratory borings along the proposed sediment traps; as three pairs of borings straddling Swift Creek channel. These borings will be drilled along the stream alignment where the sediment traps are proposed. Each of the borings will be drilled and sampled to depths of 30 feet below creek thalweg.

The borings along the southern side of the channel will be accessed by crossing the active river channel with tracked equipment. It is assumed that Whatcom County will facilitate and expedite any permits or rights of access that are needed.

#### 4.1.1c Goodwin Reach Sediment Basins

Conceptual plans show the two Goodwin Reach Sediment Basins occupying a combined 90-acre footprint, approximately 3,000 feet east/west by about 1,250 feet north/south. Previously, approximately four exploratory borings and standpipe piezometers were advanced by others around the perimeter of the proposed basin area. We consider this data adequate to inform preliminary design of the basins. However, one ground water pumping well is considered necessary to inform hydrogeologic study and analysis by Associated Earth Sciences Inc. (AESI). Aspect will coordinate and oversee the drilling and installation of the ground water pumping well. The pumping well will be located along accessible roadway area in close proximity to one of the previous standpipe piezometers. Aspect will coordinate with AESI on the location and installation of this well.

#### 4.1.2 Field Logs, Laboratory Testing, Geologic Interpretations

Soil samples retrieved from the test pits and borings will be returned to Aspect's geotechnical laboratory for further examination and visual/manual soil classifications. Selected samples will be identified for laboratory testing of index and engineering parameters. Laboratory tests will include grain size distribution, fines content, and plasticity indices (of fine-grained soils, if present). Aspect will develop subsurface profiles or cross sections illustrating subsurface geologic conditions. Final logs of the field explorations will be prepared.

#### 4.1.3 Geotechnical Engineering Analyses

Aspect will complete geotechnical engineering analyses to inform the preliminary design of deflection berms, in-stream sediment traps, and the 90-acre sediment basin(s). Analyses will include:

**Deflection Berms:** site earthwork (sub-excavation) requirements; berm geometry and zoned construction (sideslopes, low-permeability core, rip-rap exterior sideslopes, etc.).

**Sedimentation Traps:** Soldier pile constructability, required embedment depths, horizontal spacings, and maximum stick-up (retained) heights.

**Sediment Basins:** Geometric considerations such as depth to groundwater, maximum allowable sideslopes, interior berms/baffles), groundwater protection considerations, such as impervious liners, etc.

#### **Assumptions:**

- Site access for exploration machinery will be primarily restricted to existing roads or pathways adequate for tract-mounted machinery.
- Exploration Machinery configuration must comply with permit conditions, specifically relating to potential stream crossings.
- Proposed Field Explorations Map including, at a minimum, the following elements for The County's use in landowner coordination and permitting:

#### **Deliverables:**

- Map showing (or shapefile):
  - Test pit and boring locations
  - Access paths (sited to minimize disturbance)
  - o Approximate property boundaries
  - o Environmentally sensitive areas (streams, wetlands, marbled murrelet habitat, etc.)
- Equipment Information size/type
- Asbestos-containing sediment handling procedure for samples taken off-site

#### 4.1.4 Geotechnical Engineering Report

Aspect will prepare and submit a draft geotechnical engineering report presenting the results of the field explorations, laboratory testing, and interpreted geologic profiles. The report will include preliminary conclusions and recommendations for design and construction of the proposed berms, sediment traps, and sediment basins. The report will include an assessment of storm water management by infiltration and will provide preliminary design infiltration rates based on correlations to grain size distribution. The report will include detail to inform Herrera with construction cost estimates for geotechnical-related aspects of these improvements.

Once any review comments have been provided on the draft report, Aspect will address the comments and issue a final geotechnical engineering report for the 30 percent design effort. The final report will identify areas that require additional geotechnical engineering studies to advance the design beyond 30 percent.

Separately, Aspect will prepare brief geologically hazardous areas assessment reports for the various sites. The assessment reports will be sufficient to satisfy County code.

#### Task 4.2 Groundwater

AESI will conduct the hydrogeologic analysis for this project which will be primarily focused on acquiring and evaluating soil and groundwater data necessary to support the geotechnical design for the proposed debris deflection levees, in-stream sediment traps, and sediment basins. The study area for the groundwater evaluation will encompass Sections 26-35, Township 40 north, Range 4 east and Sections 2-6, Township 39 north, Range 4 east and will include all of the proposed sediment basins and repository sites for the project. The proposed approach will include:

- 1. Review of available pertinent ground surface elevation (LIDAR), geologic maps, hydrogeologic, groundwater quality data, and water well reports for the Swift Creek alluvial fan area and adjacent areas.
- 2. Review and summarize available water right information for properties located within the project area that are either currently owned by Whatcom County or targeted for potential future purchase.
- 3. Complete a detailed reconnaissance of the groundwater study area to identify/locate water supply wells (private and public), pertinent geologic/hydrogeologic features, and steep slope areas that could potentially be affected by the project.
- 4. Measure/record groundwater levels in the six monitoring wells (HMW01 HMW03 and PMW-01 PMW04) located within the groundwater study area.
- 5. Obtain representative composite soil samples from the sediment stockpiles located on the Oat Coles North site and a representative water sample from the wetland area located on the Oat Coles North site. Submit a single soil sample to an accredited analytical laboratory for total metals. Submit two soil samples for total Synthetic Precipitation Leaching Procedure (SPLP) metals, one using the standard water solution and one using the collected wetland water sample.
- 6. Review subsurface soil and groundwater information developed by Aspect during the completion of the geotechnical explorations described in Task 4.1.
- 7. Conduct aquifer testing activities (pumping tests and water quality evaluations) in the wells to determine aquifer parameters and groundwater quality characteristics necessary to evaluate the impact of the proposed structures on groundwater quantity and quality and/or to evaluate need for construction dewatering activities. To the extent possible, the exploration borings/monitoring wells will be located in a manner that will allow their use as post-construction quantity/quality monitoring points.
- 8. Obtain groundwater samples from the three monitoring wells. The groundwater samples will be submitted to an analytical laboratory for analyses of standard background water quality parameters and compounds specific to the Swift Creek alluvial fan sediments.

- 9. Complete a detailed groundwater evaluation of the groundwater study area, including a mounding analyses of the area proposed for the sediment basin(s) to evaluate potential impacts to the groundwater system due to proposed site development activities.
- 10. Prepare a groundwater monitoring plan for the proposed project.
- 11. Develop conclusions and recommendations regarding potential impacts to groundwater quantity and quality from the proposed structures and potential groundwater issues pertaining to the construction/operation of the proposed structures.

#### **Assumptions:**

- All personnel accessing the site will be notified of the naturally occurring asbestos in the sediment and will comply with their Corporate Health and Safety plans.
- Consultant will comply with all property easement requirements. Specifically, on the Canyon Central (Millman property), no material may be removed from the property without material manifests and chain of custody for return of material to property or documenting proper disposal.
- Groundwater and geotechnical data collected and or used for the Goodwin Reach sedimentation basins will be used as surrogate data for the analysis for development a potential Goodwin south repository or potential alternate sedimentation basin location.

#### **Deliverables:**

Technical report addressing site conditions and providing conclusions/recommendations
regarding potential impacts to groundwater quality/quantity in the vicinity of the site
structures. The summary report will be written in a manner that allows it to be easily
integrated into the SEIS.

#### Task 4.3 Survey

The following items are included in the scope for this phase of the project. It is assumed that LiDAR topography will be used for the preliminary designs, except as noted below. Traditional field survey methods will be used throughout the tasks identified below. Survey data will be collected in NAD83/NAVD88 datum. County staff will collect orthorectified aerial imagery with an Unmanned Aerial System (UAS).

#### Task 4.3.1 Sediment Traps

Survey topography within the footprint of the proposed sediment trap structures project area (approximately 9 acres). A benchmark will be established for future monitoring;

#### Task 4.3.2 Oat Coles North (Parker) Site

Survey wetland boundaries, OHWMs along north side of Swift Creek, utilities and 5 ground control points (pre-mark targets), 20 topographic check shots, and topography along the drainage ditch adjacent to South Pass Road at the Oat Coles North (Parker) Site (15-acre site);

#### Task 4.3.3 Goodwin North (Barlean) Site

Wetland boundary, 6 ground control points, 20 topographic check shots, utilities along Goodwin Road, and the on-site well at the Goodwin North (Barlean) Site;

#### Task 4.3.4 Stream Cross Sections

Up to 10 cross sections a directed by the Engineering Team between the Swift Creek confluence and the Sumas River;

#### Task 4.3.5 Sediment Pilot Site

A 1.5-acre area of open channel area, topography, planimetric features, OHWM and wetland flagging for the sediment pilot site as specified by the Engineering Team. A benchmark will be established for future monitoring.

#### **Assumptions:**

- Whatcom County will remove brush at the Goodwin North site prior to surveying.
- County will mark the locations of ground control points on a figure for PSE to set while in the field.
- County will process the UAS data and provide orthomosaics of the Goodwin North site and Oat Coles North site. County will provide a point cloud from UAS flights for the two sites.
- County will provide property boundaries from existing survey data.
- Raw survey points will be provided, but no base mapping or maps will be included as deliverables.
- It is assumed that field survey work / field investigations will be performed in March through April 2019 (weather, and stream flow conditions allowing) and prior to leaf on conditions.
- Necessary notices and right of entries will be provided by Whatcom County prior to any field surveying / site investigations.
- Field hours include necessary XYZ survey control at each work location, daily site mobilization / demobilization, safety briefings, and equipment / gear cleaning.

#### **Deliverables:**

• All survey to be provided in raw native files. No formal "standalone" survey products or base maps will be submitted.

#### **Task 4.4 Debris Flow Modeling**

Obtain known debris flow samples for rheological testing. Up to eight (8) specific locations will be identified following site reconnaissance. Use methods of Parsons et al. (2001) to determine rheological parameters if non-Newtonian fluid assumption is valid.

Determine model to be used, but for the purposes of this scope of work and fee estimate, RiverFlow2D is assumed to be appropriate. DFLOWZ or D-Claw will be used if granular conditions are present.

Analysis will simulate three conditions. These conditions are: existing conditions, conditions following the construction the sediment traps (without debris flow deflection berm), and conditions following the construction of both the deflection berm and sediment traps.

#### Assumptions:

- Debris flow event volumes will be 150,000 CY to represent an expected large debris flow and 300,000 CY to represent a several hundred year return period event that originates from the toe of the landslide as described in the 2005 BGC report. A 3rd event that will overtop the debris flow berm will also be used to establish berm design criteria.
- Existing lidar data (2017 USGS) merged with survey in previous subtask will be sufficient resolution for model.
- No geotechnical analysis of the deflection berm will be performed to support this modeling and the preliminary berm alignment will be assumed to be stable.
- Model results will be used to inform future geotechnical analyses necessary for berm design development.
- Modeling will be used to assess avulsion risk associated with sediment traps and sedimentation basins and impacts of constructing each with and without berms and levees
- Rheology of the samples will be a non-Newtonian fluid such that RiverFlow2D can be used to simulate the dynamics of the flow.

#### **Deliverables:**

• Debris flow model technical memorandum

#### Task 4.5 Hydrologic and Hydraulic Modeling

The consultant shall develop a RiverFlow2D hydraulic model of the project reach which extends from the Sumas River upstream beyond the proposed sediment traps. The most recent available LiDAR surface will be used to develop the model terrain, supplemented by new or recent topographic/bathymetric survey of the stream bed where it is available. Calibration of the model will not be possible given the ever-changing morphology to the river bed, and the lack of reliable highwater marks and stream flow data; therefore, model parameters will be assigned based upon engineering experience and judgement. In place of calibration, the consultant shall complete a validation analysis to make sure the model produces results that are similar to observations made by Whatcom County staff, Western Washington University researchers and/or consultant team members.

Flood magnitude, frequency, and duration data will be required for input to the hydraulic model. A long-term stream flow record is not available for Swift Creek; therefore, the consultant shall develop a WWHM hydrologic model of the watershed (Western Washington Hydrology Model) generate the hydrologic data needed for this investigation. Since historical rain data within the watershed does not exist, it will be generated from the closest dataset. Due to a lack of both stream flow and rain data, it will be impossible to calibrate the model, so instead the consultant will attempt to validate that the model will reproduce with a reasonable degree of accuracy observed stream flows. It is the understanding of the consultant that limited stream flow records may be available from studies conducted by the County and/or Western Washington University.

The RiverFLO2D hydraulic model will be used to document hydraulic conditions for the existing stream configuration. The model will be run for three flood events – a small, modest and large flood (e.g. 2-year, 10-year, and 100-year annual instantaneous peak flows). Figures will be produced that show inundation limits, flow depth, water surface elevation, and velocity. The results/figures will form the base to which all proposed actions will be compared in order to determine both regulatory compliance and proposed action performance.

The model will be used to aid in the design of the following project elements:

- inline sediment traps
- debris flow deflection berm/levee
- grade control and bank armor to protect Williams pipeline
- sediment basins
- bridge waterway configurations at Goodwin, Oat Coles Roads, and the Millman stringer bridge
- re-grading of all open channel segments within the project reach particularly between Goodwin and Oat Coles Roads
- restoration of channel capacity between Oat Coles Road and the Sumas River

It is assumed that the model will be used to evaluate up to three variations of each project element for the same three events modelled for existing conditions.

The results of the modeling will be provided to the design team along with recommendations for refinements to the individual project elements to address regulatory compliance and performance. This will be an iterative process, beginning with initial concepts and evolving to designs that meet project objectives. The model will be used to help refine the design of each project element in the following manner:

- Inline sediment traps
  - Water surface elevations to help refine weir crest design and to determine how best to tie the ends of each weir in to adjacent high ground so that they cannot be outflanked.

- Velocities to help evaluate weir performance, sediment capture potential, and to aid in the design of scour and erosion protection features.
- Debris flow deflection berm/levees
  - Water surface elevations and velocities to determine if scour and erosion protection countermeasures are needed.
- Grade control and bank armor to protect Williams pipeline
  - Water surface elevations and velocities to evaluate channel stability and inform the design of scour and erosion protection features to protect the pipeline.
  - Velocities to examine incision potential within the reach to help inform the design of grade control structures.
- Sediment basins
  - Water surface elevations to determine if flow containment berms are needed along the perimeter of the basins.
  - Flow patterns and velocities to determine how flow will move through the basins and at what velocity. This data will be used to help size and configure the basins to achieve maximum trap efficiency.
- Bridge waterway configurations at Goodwin and Oat Coles Roads
  - Water surface elevations and velocities to identify optimal configurations for both sites. Velocities to determine if scour and erosion countermeasures will be needed and inform their design if they are.
- Re-grading of all open channel segments within the project reach particularly between Goodwin and Oat Coles Roads
  - Water surface elevations, velocities, and flow patterns to evaluate the performance of proposed alignments and configurations. The data will be used to determine berm/levee heights; to evaluate sediment transport and incision potential, and to inform the design of scour and erosion countermeasures
- Restoration of channel capacity between Oat Coles Road and the Sumas River
  - Water surface elevations to determine flood hazard reduction benefits of proposed configurations and ensure regulatory compliance.
  - Velocities and flow patterns to determine if erosion countermeasures are needed and to assess sediment deposition potential within the reach.

Results of the existing condition and alternative modeling will be documented in a technical memorandum which will include flood data required by the SEIS). The model will be utilized to inform the 30% design as described under Task 6.

# **Assumptions:**

- RiverFlow2D can model be used to model both hydraulics and debris flows.
- The team's hydraulic modeling lead, senior modeling specialist, and staff engineer will conduct two site visits, one at the start of the task and the other after the initial model is

setup. The second visit will be to obtain additional data needed to refine / debug the model.

- Topographic data is available or will be collected by ground and bed survey.
- The RiverFlow2D model will not be used for sediment transport or routing because the asbestos laced sediment that is the focus of this investigation has unique transport properties and characteristics that cannot be addressed by the sediment transport equations in the model.

### **Deliverables:**

- Hydrologic model input and output
- Hydraulic model input and output
- Technical memorandum to summarize methods and results of the hydrologic and hydraulic analyses

# Task 4.6 Environmental Monitoring

The Consultant will install two weather stations and two stream gages to monitor conditions in the stream and on the hillside. This monitoring will provide early understanding of the sediment production mechanisms and overall environmental conditions for the SEIS, assist in engineering design decisions, improve inputs for hydraulic and debris flow modeling, and ultimately guide operation of the sediment basins. One weather station will be located near the landslide toe (i.e., the source of asbestos-laden sediment to Swift Creek) and telemetered to a website. The other weather station will be located in the lowlands near the Goodwin Road crossing. One stream gage will be located at the upper bridge crossing and use the flume constructed earlier by Whatcom County. The other stream gage will be located on the North Fork immediately upstream from the confluence with the South Fork. The main stem stream gage at the bridge will be ultrasonic and mounted to the bridge, while the North Fork stream gage will use a pressure transducer contained within a stilling basin.

# Task 5. Repository Site Analysis and Coordination for SEIS

The Consultant design team will coordinate to ensure that resources are available to perform the technical studies and analyses necessary to support the development of the SEIS. The following tasks have been identified in support of the SEIS.

# Task 5.1 Geotechnical

Aspect will conduct preliminary explorations at four of the potential repository sites, to inform both the SEIS consultant and the Herrera design team, regarding site hazards, constraints, and potential borrow/cover material that will need to be considered in detailed design. The Canyon Central repository site is a forested upland believed to be blanketed with glacially derived soil over bedrock at unknown depth. The Goodwin North (Barlean) site is believed to be underlain by wood waste and organic compost materials. The Oat Coles North and South repository sites are believed to have shallow groundwater conditions.

# 5.1.1 Geotechnical Explorations

# 5.1.1a Canyon Central (Miliman)

Aspect will mobilize an excavation contractor to perform minor clearing to provide access for track-mounted drilling equipment. Four exploratory borings will be drilled and sampled to depths of 35 feet or to bedrock refusal, whichever comes first.

In addition, the excavator used to clear and provide access for the drilled borings will be utilized to advance approximately four supplemental test pits to augment the boring data. The test pits and borings will located in relatively accessible locations within the heavily forested sloping area.

# 5.1.1b Goodwin North (Barlean) Site

Aspect will complete two to four trackhoe test pits within accessible areas on the property. The test pits will be located so as to explore for buried unsuitable material such as wood waste and compost, and they will be advanced down until groundwater is encountered.

# 5.1.1c Oat Coles North (Parker) Site

At the Oat Coles North (Parker) property, we will advance one to two trackhoe test pits to explore and characterize near surface materials, and they will be advanced down until groundwater is encountered. Native mineral soil samples encountered below fill will be submitted for laboratory testing of grain size distribution with hydrometer analysis to support textural correlations to infiltration evaluation.

# 5.1.1d Oat Coles South

Two to four trackhoe test pits will be excavated to explore and characterize near surface materials. The test pits will be advanced down until groundwater is encountered. Native mineral soil samples encountered below fill will be submitted for laboratory testing of grain size distribution with hydrometer analysis to support textural correlations to infiltration evaluation. 5.1.2 Field Logs, Laboratory Testing, Geologic Interpretations

Aspect will perform laboratory testing on soil samples recovered from the test pit explorations to characterize and index soil engineering properties. Aspect will prepare final test pit logs and make geologic interpretations as to conditions encountered.

# 5.1.3 Geotechnical Engineering Assessments

Aspect will complete preliminary geotechnical engineering assessments of the proposed repository sites. Assessment will include geohazards, slope stability, site preparation, temporary excavations, static groundwater and groundwater seepage considerations, fill placement including benching and permanent fill slope inclinations, etc.

# 5.1.4 Reporting

Aspect will provide the results of these preliminary assessments, conclusions and recommendations in a separate section of the technical report described in Section 3.1.4. The report will also include an extrapolation of assessment results to repository locations planned over the longer term, as well as the secondary sediment basin location.

A draft comprehensive technical report will be submitted for review by the SEIS and Herrera design team. Once any comments are received, Aspect will address the comments and issue a final preliminary geotechnical assessment memo.

#### **Assumptions:**

- Refer to Section 4.1
- Consultant will comply with all property easement requirements. Specifically, on the Canyon Central (Millman property), no material may be removed from the property without material manifests and chain of custody for return of material to property or documenting proper disposal.
- Geotechnical data collected and or used for the Goodwin Reach sedimentation basins will be used as surrogate data for the analysis for development a potential Goodwin south repository or potential alternate sedimentation basin location.

#### **Deliverables:**

Geotechnical analysis draft and final technical report

#### Task 5.2 Groundwater

The groundwater analysis will examine depth to groundwater and groundwater flow beneath each of the three near-term proposed repository sites and potential impacts associated with repository development. Methods are more thoroughly described in Section 3.2. Analysis will also include an interpretation of groundwater conditions based on a review of available information for repository locations planned over the longer term. This type of analysis will also extend to the secondary sediment basin location.

AESI will provide the results of these assessments, conclusions and recommendations in a separate section of the technical report described in Section 4.2.

#### **Assumptions:**

Refer to section 4.2

#### **Deliverables:**

Groundwater analysis draft and final technical report

# Task 5.3 Surface Water

The surface water analysis will include both a characterization of existing surface water dynamics at **each** repository site and a stormwater management plan concept to be utilized at each repository site into the future. Surface water analysis and characterization for each site will be incorporated into design development of each site under Task 6. Applicable stormwater requirements, anticipated treatment methods and management will be identified and summarized for each site necessary to support the SEIS under this task.

### **Assumptions:**

- Herrera design team will provide analysis for surface water, including stormwater engineering for a total of seven repository sites and two interim action sites to accommodate ongoing maintenance dredging.
- The Oat Coles North and Goodwin North site designs will be expedited to determine if there are potential conflicts for development and to determine if the sites could be used as interim fill locations for processing and or handling dredged annual maintenance materials or as future repository locations for later phases of the SCSMP implementation activities.
- Stormwater management plans and engineering reports will include analysis and design for runoff from the repository sites during construction activities, during active interim cover activities, and the final stabilized site condition.
- Stormwater management evaluation and design will include analysis of water quality treatment, flow control strategies, and maintaining hydrologic function in any tributary wetlands to the extent feasible.
- No downstream analysis is required.
- Grading, utilities and site design will be covered under separate task.
- No specifications will be produced.
- Floodplain impacts and analysis covered under separate task.
- Stormwater engineering report shall include:
  - Preliminary Design Drawings:
    - Temporary Erosion and Sediment Control (TESC) Plan
    - Active Stormwater Management Plan
    - Final Stormwater Management Plan
    - Stormwater Details (up to four)
  - o Basin map(s)
- Conceptual Designs for up to 6 sites shall include narrative for each site describing the permitting requirements, design constraints, and preliminary sizing of components.

• Interim Stormwater design concept for Oat Coles North and Goodwin North sites to include narrative describing the permitting requirements, design constraints, and preliminary sizing of components.

### **Deliverables:**

- Canyon Central:
  - o Stormwater Engineering Report to support 30% design
- Oat Coles North (Parker):
  - Interim Stormwater design concepts for permits/construction (designed in conjunction with task 6.7.1 'Interim Site Development')
- Goodwin North (Barlean)
  - Interim Stormwater design concepts for permits/construction for stockpiling up to 50,000 cy of sediment (designed in conjunction with task 6.7.1 'Interim Site Development').
- Conceptual Designs for up to 6 sites: Canyon South, Canyon North, Oat Coles South, Goodwin South, Oat Coles North, Goodwin North

# Task 5.4 Wetlands

# **Task Understanding**

Reconnaissance-level wetland analyses will be required for:

- Repository and project areas to be considered in the supplemental EIS as follows:
  - Canyon Central repository area
  - Oat Coles South repository area

Wetland delineations will be required for:

- Project areas identified in previous environmental review documentation including:
  - Sediment basin area designated for pilot project
  - Oat Coles setback levee
- One repository area to be considered in the supplemental EIS:
  - Goodwin North repository area

Wetland characterization will be conducted for:

Two parcels considered for future wetland mitigation

#### Methods

The assessment methods for the reconnaissance-level site areas will utilize the following steps:

- Desktop analysis and review
- Field assessment of project/repository footprints and areas within 300 feet
- Documentation

- Wetland reconnaissance reports for two repository areas including GIS-level mapping, field forms, rating system forms
- Wetland delineation reports for one repository area, sediment basin pilot project area, and setback levee area including survey-level mapping, field forms, rating system forms
- Wetland characterization memo for two future mitigation areas

# Task 5.4.1 Desktop Analysis

GIS and other remote sensing tools will be used to help determine where wetlands and streams are likely to occur. This assessment includes NRCS soil map, LIDAR, DOQ mapping.

# Task 5.4.2 Field Assessment

The Field Assessment will consist of a site evaluation as defined by WCC 16.16.670 or other regulatory standards as determined by Whatcom County. The permitting process requires assessment be conducted for areas within 300-feet of the proposed action or disturbance area. The assessment will be led by qualified individuals listed on the Whatcom County approved consultant list. The field assessment will utilize Washington Ecology / US Army Corps methods to determine regulated wetlands and streams occurring proximate to the proposed project/repository area on hydrologic, plant, and soil indicators. The boundary of regulated wetland(s) included in the delineation task will be flagged and GPS mapped (+/- 3 to 6 ft).

The Goodwin North (Barlean) site has been identified as a "problematic" site because of historic site grading, modifications, and fills and will need additional analysis to determine wetland conditions; therefore, extra time will be needed to evaluate this site. This site will need to include coordination with the Whatcom County Public Works project manager and geotechnical assessment staff for excavations through the stockpiles and up to two additional follow up site visits for hydrology confirmation.

# Task 5.4.3 Documentation

#### Task 5.4.3a - Reconnaissance-Level Analyses

Reconnaissance-level wetland analyses with GIS-level exhibits will be produced for the Canyon Central repository, and Oat Coles South repository, meeting the basic requirements of WCC 16.16.670, Sections C and D. The analyses will include wetland size, class, and category for site wetlands and wetlands within 300 feet; water sources and drainage patterns in the area; vegetation, soils, and hydrology; wildlife habitat within 300 feet; a wetland functional assessment; and standard buffer requirements. The impact analysis will conform to WCC 16.16.670 requirements or other regulatory standards as determined by Whatcom County.

The GIS exhibits will display wetland buffers. Soil pit logs and rating forms will be provided. One report documenting the field methods, date of assessment, field crew, and findings per 4.5.2, including field and rating forms, will be provided for the reconnaissance analysis area described above.

#### **Deliverables:**

- One reconnaissance-level report documenting wetland, hydrologic, and wildlife habitat conditions, and associated buffers within the Canyon Central repository, Oat Coles South repository site footprints and areas within 300 feet. Mapping will be conducted in GIS and provided in native GIS formats, including raw GPS points.
- Report, rating forms, and supporting GIS exhibits (up to 5 per site) will be provided in native word processing, GIS, and pdf format.
- A single memo documenting the methods and summarizing the findings will be provided in native and pdf format.
- Deliverables include one review draft and one final submittal.

#### Task 5.4.3b - Wetland Delineations

Full wetland delineation reports will be provided for

- Oat Coles North (Parker) setback levee
- Goodwin North (Barlean) repository site
- Millman property sediment basin pilot project area

The reports will follow the standards of WCC 16.16, Article 6 (Wetlands) or other regulatory standards as determined by Whatcom County and include documentation necessary for Army Corps of Engineers and Ecology review.

Individual delineation reports for the above-listed areas will be prepared following WCC 16.16.670, including a survey of the wetland boundary flags. It is understood that Whatcom County Public Works has requested wetland delineation and impact analysis and will complete mitigation planning separately.

**Deliverables**: Three wetland delineation reports inclusive of the requirements of WCC 16.16.670 in native digital format meeting professional standards and regulatory requirements will be provided. Surveyed linework will be provided in CAD format and in NAD 83 datum. Deliverables include one review draft and one final submittal.

#### Task 5.4.3c - Wetland Characterization

A basic characterization of the two parcels considered for future mitigation (up to 50 total acres). The analysis will determine location(s) of site wetlands, basic wetland category, and aerial extent. A basic determination of hydrology, vegetation, and soil types will also be provided. No analysis of mitigation credit potential, mitigation type, or conceptual mitigation plans are included in this scope of work.

**Deliverables**: One memo documenting description of site, wetland characteristics, a GIS level map, and methods. Mapping will be conducted in GIS and provided in native GIS formats, including raw GPS points. Report, rating forms, and supporting GIS shapefiles will be provided in native word processing, GIS, and pdf format. Deliverables will include one review draft and one final submittal.

# Task 5.4.4 Wetlands Fleidwork Coordination

Fieldwork coordination will be needed to provide:

- Coordination between the field assessment, technical assessments, SEIS Team, Engineering Team, and County
- Direction to field crews and technical teams
- Review and oversight of analyses and deliverables
- Presentations of findings and decision making needs to team leads and Whatcom County
- Reporting

#### **Assumptions and Exclusions:**

- The assessment area is limited to the project/repository footprint listed in Task Understanding, plus 300 feet, as necessary, and as shown on Figure 1 attached.
- Wetland assessments will be conducted during the wet season (October through March); wetland assessments occurring past this time period will take longer in forested conditions because of vegetation leaf-on conditions and will take longer in general because hydrologic indicators may not be available. If project delay outside the control of Element Solution causes field work to be pushed outside of the wet season, a budget revision will be needed.
- No more than 100 individual wetlands will be encountered. Wetland quantities beyond this are considered out of scope.
- No Critical Areas reports are included in this scope of work unless otherwise specified; additional reporting is considered out of scope work.
- Rights of entry and access to the entire site identified for this analysis have been granted for all properties. Consent will be obtained by the County.
- The Goodwin North site is a "problematic site" and the site visit will require coordination
  with the geotechnical team to excavate through the fill piles to expose native soils; it is
  assumed that the assessment will take up to three site visits and coordination with an
  excavation contractor provided by Whatcom County.
- A 300-foot assessment area beyond the proposed project impact area required by WCC 16.16 or other regulatory standards as determined by Whatcom County at the time of permitting and delineation reporting. For the reconnaissance-level assessment, the 300-

foot area beyond the identified project site will be evaluated remotely, particularly if it extends beyond a property line. For wetland delineations, the 300-foot area beyond the identified project site will be field evaluated if right of entry from the adjacent property owner has been provided; otherwise, it will be evaluated remotely. Wetland boundaries within the 300-foot assessment area will not be flagged or surveyed but will be GPS mapped if access is granted or estimated using remote sensing.

- Wetlands mosaics occurring within the study area will be lumped into a single wetland boundary. Detailed mosaic mapping will be considered outside of this project scope.
- GPS mapping (plus or minus 3 to 6-ft accuracy) is adequate for the reconnaissance-level mapping and SEIS review. Mapping to a higher accuracy will require a scope and budget amendment.
- The Reconnaissance-Level Assessment documentation will not be sufficient for permitting purposes and does not include a delineation report as required for permitting. If the review process determines that a wetland report is needed, a scope and budget amendment will be necessary.
- The proposed mitigation parcels will be less than 50 acres in total area.
- Additional reviews, project modifications, or document changes will be considered out of scope work.
- Note that this Critical Areas assessment excludes Geologically Hazardous Areas (Article 3), Frequently Flooded Areas (Article 4), Critical Aquifer Recharge Area (Article 5), and Habitat Conservation Areas (Article 7).

#### Task 5.5 Traffic Analysis

The purpose of this task is to prepare a report which: (1) evaluates existing traffic counts; (2) forecasts the traffic volumes under no-action conditions and the planning year of 2040; and (3) reviews warrants for potential traffic control measures to provide reasonable Level of Service (LOS), traffic delays, queuing and other mitigation measures. The scope of services for the traffic analysis includes:

1. Visit the project area; the proposed reclamation and repository sites; and the affected properties to identify traffic properties inclusive of; performing limited supplemental turning movement traffic counts and note sight distance issues that would affect traffic operations.

2. Use the Whatcom County Council of Government's (WCOG) travel demand models to forecast future entering volumes at each study intersection for the 2040 planning year and compare to the total entering intersection volumes from the existing year 2017 as provided by the County.

3. An annual growth rate will be calculated for each intersection based on the 2017 and 2040 WCOG model volume differences. This growth then will be applied to the existing traffic counts collected in 2017 at each study intersection.

4. The forecasted future intersection volumes will be adjusted based on the deviations observed between volumes in the existing model and from the existing traffic counts with the resulting traffic volumes used for the 2040 planning year analysis. Minor adjustments, including volume balancing to adjust for inherent deficiencies in travel demand models, may also be applied.

5. The V/C for the base year of 2017 and forecast of 2040 will be calculated for the following roadways:

- a. Goodwin Road between S. Pass Road and Massey Road.
- b. S. Pass Road between Oat Coles Road and Goodwin Road.
- c. Oat Coles Road between S. Pass Road and Massey Road.

6. Each of the four (4) intersections within the study area will be evaluated against traffic control warrants including; projected traffic volumes, LOS on each approach as well as overall intersection LOS, and volume to capacity ratios (V/C).

7. The four intersection points are depicted in the attached map include:

- a. Goodwin Road @ South Pass Road
- b. Oat Coles Road @ South Pass Road
- c. Goodwin Road @ Millman Property Access
- d. Oat Coles Road @ Gimmaka/Bosscher Properties Access

#### Assumption(s):

• Future 2040 traffic volume forecasts will be based on the future 2040 land use as presented in the WCOG travel demand model. WCOG's model inherently reflects traffic growth as well as any area roadway improvements anticipated by the planning year 2040. The 2040 traffic forecast volumes in the WCOG model also reflect any previously approved projects. We do not anticipate impacts to State owned transportation facilities including, but not limited to, SR 9 and SR 544.

• We do not anticipate impacts to State owned transportation facilities including, but not limited to, SR 9 and SR 544.

• Public and environmental impacts from noise and air pollution associated with increased project related truck traffic will be addressed by others.

• Legal access by means of easement and/or property ownership along either side of Swift Creek between Goodwin Road and Oat Coles Road currently exists and provides an alternative haul route for trucks from travelling exclusively on public roads.

#### **Deliverable(s):**

• A technical traffic report will be produced that includes information such as existing and projected traffic volumes, methodology, LOS by approach at each intersection, , and any recommended mitigation. The traffic report will follow the Whatcom County format for a traffic analysis based upon the level of information. Tables and figures may be prepared to aid in the understanding of project traffic impacts and mitigation.

• The report will include the following specific items:

Project Description, Study Approach, and Study Area

 Documenting the Existing Roadway Network, Traffic Volumes, Traffic Operations, and any Non -motorized activities

 Planned Transportation Improvements, Traffic Volumes, and Future Traffic Operations

• Project Description with Project Traffic Volumes and Traffic Operations for the purpose of Access Management

- o Appendix data for Traffic Counts, LOS Definitions, and LOS Worksheets
- Vicinity Map and Study Intersections, Existing Weekday Peak Hour Traffic
   Volumes, Traffic Volumes, and 2040 Weekday Peak Hour Forecasts.

• Tables for existing (2017) and planning year (2040) LOS as well as summaries of intersection traffic volumes.

# Task 6. SCSMAP Project Design Development

The Consultant team will advance each of the project design elements to a 30% level or to a concept level for design elements requiring additional data collection and analysis as noted. Development of each design element will include plan views, sections, and design detail drawings with enough detail to convey purpose and function as noted in the subsections below. Design drawings will be prepared in AutoCAD 2017. Design elements will be coordinated and integrated to function as combined system however the actual construction of the elements will be phased. Each design element will be advanced to allow preparation of capital and operational costs with design phase appropriate contingency.

Basis of design documentation will be prepared for each project element and incorporated into a basis of design memorandum for Task 6.8 as noted below.

#### Task 6.1 Sediment Traps

Consultant will assess and refine the sediment trap concepts to address bedload volumes, access, and long-term operations and maintenance issues, to thereby understand capital and operating costs as well as removal efficiencies for the cost-benefit analysis and sequencing and implementation options. Design will include robust sediment trap configurations to allow adaptive management during operation to meet varying sediment loading conditions including function and survivability after a debris flow. Design development of the sediment trap concepts will be based on-site specific geotechnical investigation data, sediment loading assessments and coordinated with repository locations and access. Selection of sediment trap concepts operations and maintenance activities, frequency of sediment removal, access, and robustness associated with debris flows.

#### Assumptions:

- Full North Fork reroute is not viable, but a shorter reroute to increase efficiency of removal operations will be considered
- Concept designs will include materials list, plan view of area, sections and details for trap configuration, and estimates of probable capital and operational costs.
- Function and performance standards for sediment trap design will be documented in basis of design report.

 Sediment trap structures – Up to two viable scour-resistant structural concepts and estimated construction costs will be developed for these structures in consultations with the team's geotechnical engineer.

1.) channel spanning structures with varying heights and

2.) partial spanning structures that allow low flow serpentine channel to be maintained.

- Structures will be designed using existing estimates of sediment flux in combination with scour analyses based the hydraulic modeling results prepared in Task 4.5.
- Structures will not be designed for debris flow loading.
- Structures will be sized to accommodate the size a typical large storm (i.e., 2-year return interval event), and will evaluate and optimize capacities to accommodate annual bedload sediment flux, targeting a frequency of removal of once per year.
- At a minimum, the 30% design package will include the following to aid in County permit preparation:
  - Project description including anticipated construction sequencing, equipment size/type, access and staging areas
  - Estimated construction duration and schedule, highlighting in-water work, stream crossings
  - o In-water work plan (if necessary)
  - Cut and fill volumes, anticipated depth of excavation, horizontal limits of project impact
  - Total project footprint and total disturbed areas (SF)
  - o Area (SF) of riparian clearing
  - o Preliminary TESC plan

#### **Deliverable(s):**

- Draft initial design concepts for alternative design comparison
- Draft and Final 30% design concept in CAD and PDF format
- Basis of Design Report Section (including estimates of capital and operation and maintenance costs) - Draft and Final prepared under Task 6.8.

# **Task 6.2 Sediment Basins**

The Consultant will refine and advance the sediment basin proof of concept to confidently understand the operations and maintenance requirements, risks, and capital costs. Because the water chemistry (pH) is critical in maintaining settling at an accelerated rate, locating the basins as far upstream as possible is a priority. Additionally, a groundwater mounding and hydrogeologic analysis tied to sediment basin operations is essential to determine benefits of a passive settling process versus a mechanical or chemical additive process. Based on geotechnical, geomorphic, and hydraulic analyses, the Consultant will refine the volume of sediment to be managed in the basins. The Consultant team will evaluate handling necessary for dewatering (passive or active), loading and haul if the stored sediment is removed and transported versus accumulation in place and capping; and to understand how it can be stockpiled within a repository. Key considerations will include:

- Passive versus active sediment collection and removal
- Suspended sediment characteristics versus bedload characteristics each will have specific handling, management, and stockpiling constraints and requirements
- Sediment handling in a basin compared to potential processing needed in a repository
- Opportunity to partially bypass flows in North Fork Swift Creek to minimize treated flows

The physical properties of the sediment (and how they vary with water content) and the requirements for where and how it will be contained drive the sediment basin design, operation, maintenance, and cost. The selected sediment basin function, design, and operations and maintenance requirements also impact the repository design and operation. Sediment handling within the basins, frequency of sediment consolidation and transport, haul requirements, and placement and handling criteria within a repository will be evaluated and documented in a feasibility and alternatives analysis report.

#### **Assumptions:**

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- The consultant team will prioritize and expedite the sediment basin proof of concept to ensure the repository design concepts are consistent and integrated.
- A pilot study will be recommended and the scope for testing identified as part of the recommendation. Up to two pilot study concepts will be prepared for discussion. One will be advanced with scoping detail based on County input.
- Design development of the sediment basin will be refined and advanced to 30% design level following the pilot study and covered on another contract.
- The pilot study plan will be prepared to be such that M&O staff will be able to construction and operate in time for installation in the fall of 2019.
- Recommended pilot study location will focus on areas up gradient of Goodwin Road.
- Sediment transport will be assessed through analysis of the sediment volume extracted combined measurements made at the inlet of the basin over time. This analysis will provide an estimate of trap efficiency over time.
- Adjustments to the pilot facility are expected and will be tracked over time and related to measured input flow rate and other meteorological variables to improve trapping efficiency.

# **Deliverables:**

- Basis of Design Report Section (including estimates of capital and operation and maintenance costs) Draft and Final prepared under Task 6.8.
- Sediment Basin Pilot Study Work Plan

# Task 6.3 Debris Flow Deflection Berm and Levee

The Consultant will resurrect and refine working models and estimates, such as the debris flow volume estimate previously used to develop the berm/levee design and determine whether a dynamic debris flow model will be required to determine the berm/levee size. We understand the limitations of the original estimate and can refine the facility alignment and height based on a recommended debris flow model that accurately captures debris flow mechanics to provide an alignment and height that will contain a minimum of (150,000 CY), prior to preparing concept design plans.

Consultant will review concept debris flow deflection berm and levee alignment based on debris flow modeling in Task 4.4, Marbled Murrelet surveys, and assessment of geologic hazard risk. Alignment of berm and levee will be coordinated to minimize risk and to increase protection of infrastructure.

#### **Assumptions:**

- Design concepts will include materials list, plan view of area, sections and details for configuration, and estimates of probable construction cost.
- Function and performance standards for design will be documented in basis of design report.
- Risk assessment for berm function and configuration will be performed by Herrera and reviewed by Element Solutions and Kerr Wood Leidal.
- Berm and levee will be evaluated using existing dredge spoils as berm core or as buttressing material with protective cover.
- Armoring and or face protection of the berm and levee will be developed and evaluated by Kerr Wood Leidal once they are provided hydraulic modeling results and design velocities.
- Design alignment and height of berm will be based on containing the modeled debris flow in Task 4.4.
- Volume of debris flow will come from original estimate made by Kerr Wood Leidal.
- No structural elements will be required to retain or redirect debris flow.

# **Deliverables:**

- Draft initial design concepts for alternative design comparison
- Design concepts in CAD and PDF format

- Final design concepts in CAD and PDF format.
- Basis of Design Report Section (including estimates of capital and operation and maintenance costs) Draft and Final prepared under Task 6.8.

#### Task 6.4 Williams Pipeline Crossing

Crossing protection is necessary for all individual elements of the project- Avoidance is the preferred method to relocation. Pipeline protection constraints and opportunities must be flushed out first prior to advancing analysis and development of the sedimentation basins and the upstream sediment traps.

Consultant will coordinate through the County to initiate meeting with Williams Pipeline in order to advance crossing design concepts. Consultant will prepare concept designs and collaborate with Williams Pipeline to evaluate and select a preferred crossing strategy for both the road and creek crossings.

Creek crossing and road crossing design development will require close coordination with Williams Pipeline. Consultant will work through the County Project Manager to facilitate coordination and design development. Design development may include channel grade controls and creek stabilization adjacent to and within the Williams Pipeline easement. Designs will be advanced to a 30% level in order to evaluate function, performance and risk in order to select a preferred method of protection.

#### Assumptions:

- Sediment reduction and removal both in the sediment traps above and sediment basins below drive protection mitigation for the pipeline crossing.
- Protection to focus on on-going system function and protection; Consultant will evaluate sedimentation basin design and operation in conjunction with alignment/location of crossings.
- Design to focus on available area; no work zone; and needed protection based on scour with over lay of robust survival of debris flow
- Opportunity at this location is that there is grade flexibility utilizing raising the bed of the creek using grade control structures to increase cover over the pipes
- Design concepts will include materials list, plan view of area, sections and details for configuration, and estimates of probable construction cost.
- Function and performance standards for design will be documented in basis of design report.
- Mitigation measures for Williams Company's Gas Pipelines A Truck loading analysis will be performed on all haul roads crossing the Williams Company's Gas Pipelines. In case the calculated truck loadings exceed safety thresholds under current conditions, up to

two structural concepts and estimated construction costs will be developed for mitigation of the loadings to within acceptable limits.

 In water Grade Control Structures – In coordination with hydraulic and geotechnical engineers, develop concepts for in-stream grade control structures and other ancillary structures as desired (i.e. walls, culverts, etc.) for controlling and channeling floodwaters in protecting area infrastructure, including the Williams Company's gas pipelines.

#### **Deliverables:**

- Draft initial design concepts for alternative design comparison
- Draft and Final 30% design concepts in CAD and PDF format
- At a minimum, the 30% design package will include the following to aid in County permit preparation:
  - Project description including anticipated construction sequencing, equipment size/type, access and staging areas
  - Estimated construction duration and schedule, highlighting in-water work, stream crossings
  - In-water work plan (if necessary)
  - Cut and fill volumes, anticipated depth of excavation, horizontal limits of project impact
  - Total project footprint and total disturbed areas (SF)
  - Area (SF) of riparian clearing
    - Preliminary TESC plan
- Basis of Design Report Section (including estimates of capital and operation and maintenance costs) - Draft and Final prepared under Task 6.8.

# Task 6.5 Creek Channel Conveyance Improvements

# Task on hold. Work to be performed following Sediment Basin Pilot Study Work Plan under separate authorization.

Consultant will use the model results to establish baseline hydraulic characteristics for important flows, including the design flood event. Hydraulic modeling will help to develop data for current and future conditions. Creek channel conveyance improvements will include dredging of channel to simulate historic bed elevations, bank stabilization and hydraulic structures to maintain alignment bed elevation

#### **Assumptions:**

• Creek channel improvements below the sedimentation basin may be performed after sediment trap and basin construction. Down gradient channel profile must be

incorporated into hydraulic model to support future sediment dredging and bank stockpile removals.

- Additional creek conveyance improvements can readily be assessed with model iterations reflecting different design configurations.
- Design concepts will include materials list, plan view of area, sections and details for configuration, and estimates of probable construction cost.
- Function and performance standards will be documented in basis of design report.
- Concept designs will be prepared as generic concepts that will be further advanced following sediment trap and sediment basin installation and pilot testing.

#### **Deliverables:**

- Draft initial design concepts for alternative design comparison
- Final design concepts in CAD and PDF format.
- Basis of Design Report Section (including estimates of capital and operation and maintenance costs) Draft and Final prepared under Task 6.8.

#### **Task 6.6 Creek Channel Maintenance Support**

Consultant will assist the County in determining dredging depths and extents based on conveyance modeling and assist in preparation of haul routes and access development as requested.

#### **Assumptions:**

- Creek channel maintenance support will include design support to develop haul routes, access to accomplish maintenance dredging at Oat Coles and Goodwin bridge locations,
- Dredge material will be deposited at the Oat Coles North (Parker) site.
- Design concepts will include materials list, plan view of area, sections and details for configuration, and estimates of probable construction cost.
- Haul route design and support will be vetted with M&O staff in order to develop final design.
- Consultant team will assist as requested during dredging and hauling activities.

# **Deliverables:**

- Draft initial design concepts for alternative design comparison
- Final design concepts in CAD and PDF format.
- Site visit notes for each day on-site.

# Task 6.7 Repository Design

# Task 6.7.1 Interim Site Development

Consultant will development site plans including access, rough grading, initial repository storage, interim stormwater management, and utility coordination for interim dredging and maintenance at Goodwin North and Oat Coles North sites.

#### **Assumptions:**

- Design plans will be prepared to allow permitting for maintenance activities.
- Design concepts will include materials list, plan view of area, sections and details for configuration, and estimates of probable construction cost.
- Stormwater design will be consistent and build off of stormwater design developed under Task 5.4. Interim stormwater design will be developed to permit level.
  - Oat Coles North stormwater design will be for maintenance work and will not include stormwater design for the final repository configuration. No stormwater engineering report will be prepared for this site during this phase.
  - Goodwin North stormwater design will be developed to a permit level to accommodate stockpiling of up to 25,000 cubic yards of sediment on site. No stormwater engineering report will be prepared for this site during this phase.
- Site plans will include access and haul road designs between Goodwin Road and Oat Coles road. Access will be coordinated with County and M&O staff.
- Technical specifications and construction execution guidelines and requirements will be included as notes on drawings.
- Stockpile and cover requirements will be noted on drawings. Interim cover will consist of hog fuel.
- Stockpile capacity will be provided on the interim grading plan.
- Interim designs will be prepared to allow for maintenance activities in Fall of 2019. Interim site work will be performed by County maintenance crews and the designs will not go out to public bid.

#### **Deliverables:**

• Draft and Final Design Drawings in CAD and PDF format. Files will be provided in native digital files.

# Task 6.7.2 Repository Design

The Consultant will provide concept site layouts and profiles for each of the seven identified repository locations in order to compare and contrast the locations necessary to identify

environmental impacts and operating requirements necessary to advance the SEIS. Consultant will advance the design of one repository location (Canyon Central) to 30% design level.

# **Assumptions:**

- The Consultant will develop layout plans that will include callouts of preliminary access, stormwater features, and general drainage for each site.
- Profiles will be cut for each site. Repository stability and bottom grades will be based on preliminary geotechnical and groundwater investigations. Final grades will be developed and will be used to calculate fill capacity. Sources of cover material or borrow material will be based on geotechnical evaluation and agronomic evaluation.
- Repository locations may be a single large location or a combination of smaller sites necessary to provide storage for up to 10 years of sediment and bedload capacity.
- The Canyon Central Repository will be advanced to 30% design and will include the following plans:
  - Vicinity Map/Notes/Legend
  - Site access/staging/clearing and grubbing
  - o Excavation and stockpile plan
  - o Interim filling plan
  - Final grading plan and drainage
  - o Stormwater treatment plan for Final Grading
  - Details (2 sheets) standard cap, runon ditch, interim cover, access features, and drainage features
- Drainage from repository locations is assumed to require settling and preliminary potential filtering prior to discharge to Swift Creek or a drainage feature discharging to Swift Creek.
- A stormwater engineering report will be developed for the Canyon Central Repository (in Task 5.3). No other stormwater engineering reports will be developed for this phase of work.
- Function and performance standards will be documented in basis of design report. Costs will be prepared for each site in the basis of design.

### **Deliverables:**

- Draft and Final Plan and Profiles for Oat Coles South, Canyon North, Canyon South, Oat Coles North, Goodwin North, and Goodwin South.
- Canyon Central:
  - o Draft and Final Stormwater Engineering Report (under Task 5.3)
  - Draft and Final 30% design

• Basis of Design (BOD) Report Section (including estimates of capital and operation and maintenance costs) - Draft and Final prepared under Task 6.8.

# Task 6.8 Basis of Design Report

This task will include compiling the individual design element basis of design memorandums into one document for the project elements.

#### **Assumptions:**

- Basis of design report will include existing hydrologic and hydraulic modeling summary as well as geomorphic assessment and downstream analyses.
- Basis of design report will compile individual project elements as separate sections.

#### **Deliverables:**

• Draft and Final Basis of Design Report (including estimates of capital and operation and maintenance costs).

# Future Work

As needed and at the County's discretion, this contract may be supplemented to provide for the following tasks.

# **Final Design and Construction Support**

The Consultant team will be available to prepare final design, bid-ready plans and specifications, and construction support.

# **Repository Closure / Post-Closure Plan**

The Consultant team will be available to assist in preparation or review of the prepare the Closure/Post-Closure Plan called for in the Consent Decree.

#### **SCSMAP** Revisions

The Consultant Team will be available to assist in the preparation or review of updates or revisions to the SCSMAP.

# Other work tasks that may be included following review of existing data and collection of scoped field data:

- Completion of wetland delineation Reports for sites that will be advanced to permitting
- Refinement of temporary or early repository development
- Supplemental Geotechnical

- Supplemental Groundwater
- Supplemental Survey
- Geomorphic Assessment and Downstream Analysis
- Supplementary Traffic Analysis or Bridge Replacement
- Operation and Maintenance Plan(s)
- Creek Channel Conveyance Improvements

# WHATCOM COUNTY PUBLIC WORKS DEPARTMENT

Jon Hutchings Director



Joseph P. Rutan, P. E. County Engineer/Assistant Director 322 N. Commercial Street, Ste 301 Bellingham, WA 98225-4042 Phone: (360) 778-6210 Fax: (360) 778-6211

MEMORANDUM

# RECEIVED

То:	The Honorable Jack Louws, Whatcom County Executive, and Honorable Members of the Whatcom County Council	FEB 8 2019
Through:	Jon Hutchings, Public Works Director	JACK LOUWS COUNTY EXECUTIVE
From:	Joseph P. Rutan, P.E., County Engineer/Assistant Director/ James E. Lee, P.E., Engineering Manager	
Date:	January 29, 2019	
Re:	Swift Creek Sediment Management Action Plan (SCSMAP) Implementation Engineering Services Contract Supplement No. 1 with Herrera Environmental	

Enclosed for your review and signature are two (2) originals of a Local Agency Standard Consultant Agreement Supplement between Whatcom County and Herrera Environmental Consultants, Inc.

# **Requested Action**

Public Works respectfully requests that the County Council authorize the County Executive to enter into a Local Agency Standard Consultant Agreement with Herrera Environmental Consultants, Inc. (Herrera) for professional engineering services to implement the Swift Creek Sediment Management Action Plan Projects (SCSMAP).

# **Background and Purpose**

Herrera has successfully completed the first phase of work under this contract which included initial background research, site visits, identification of data gaps, and establishment of project goals for the implementation of SCSMAP projects.

This multi-year contract amendment includes analysis support for the Swift Creek Supplemental Environmental Impact Statement for Sediment Repositories as well as preliminary design of the SCSMAP capital projects, interim channel conveyance improvements, and interim stockpile site development. Herrera was selected through Request for Proposals (RFP# 18-42).

# **Funding Amount and Source**

The original contract amount is \$39,719.78, this not-to-exceed supplement increases the contract by \$966,275.20 for a new total of \$1,005,994.98. Washington State, through the Department of Ecology has approved funding of a \$1 million grant (#2018-09003) for this project and an additional \$3 million has been approved for future use from the State Building Construction account. Whatcom County Council approved ordinance #2018-208 on July 24, 2018 to establish the Swift Creek Sediment Management Fund and budget. There is sufficient budget authority for the work planned for 2019.

Please contact Christina Schoenfelder (ext. 6274) if you have any questions regarding this request.