

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.																			
<p>Is this a New Contract? If not, is this an Amendment or Renewal to an Existing Contract? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If Amendment or Renewal, (per WCC 3.08.100 (a)) Original Contract #: 201811039</p>																					
<p>Does contract require Council Approval? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If No, include WCC: _____</p> <p>Already approved? Council Approved Date: _____ (Exclusions see: Whatcom County Codes 3.06.010, 3.08.090 and 3.08.100)</p>																					
<p>Is this a grant agreement? If yes, grantor agency contract number(s): _____ CFDA#: _____</p> <p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>																					
<p>Is this contract grant funded? If yes, Whatcom County grant contract number(s): _____</p> <p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 201810012</p>																					
<p>Is this contract the result of a RFP or Bid process? Contract</p> <p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, RFP and Bid number(s): 18-42 Cost Center: 128300</p>																					
<p>Is this agreement excluded from E-Verify? No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> If no, include Attachment D Contractor Declaration form.</p>																					
<p>If YES, indicate exclusion(s) below:</p> <p><input checked="" type="checkbox"/> Professional services agreement for certified/licensed professional.</p> <p><input type="checkbox"/> Contract work is for less than \$100,000. <input type="checkbox"/> Contract for Commercial off the shelf items (COTS).</p> <p><input type="checkbox"/> Contract work is for less than 120 days. <input type="checkbox"/> Work related subcontract less than \$25,000.</p> <p><input type="checkbox"/> Interlocal Agreement (between Governments). <input type="checkbox"/> Public Works - Local Agency/Federally Funded FHWA.</p>																					
<p>Contract Amount:(sum of original contract amount and any prior amendments):</p> <p>\$ 39,719.78</p> <p>This Amendment Amount:</p> <p>\$ 966,275.20</p> <p>Total Amended Amount:</p> <p>\$ 1,005,994.98</p>		<p>Council approval required for; all property leases, contracts or bid awards exceeding \$40,000, and professional service contract amendments that have an increase greater than \$10,000 or 10% of contract amount, whichever is greater, except when:</p> <ol style="list-style-type: none"> 1. Exercising 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 capital costs approved by council in a capital budget appropriation ordinance. 3. Bid or award is for supplies. 4. Equipment is included in Exhibit "B" of the Budget Ordinance 5. Contract is for manufacturer's technical support and hardware maintenance of electronic systems and/or technical support and software maintenance from the developer of proprietary software currently used by Whatcom County. 																			
<p>Summary of Scope: Contract Supplement for professional engineering services for the design of Swift Creek Sediment Management Action Plan projects as well as technical analysis to support the Supplemental EIS for Swift Creek Sediment Repositories.</p>																					
Term of Contract: Not-to-exceed		Expiration Date: December 31, 2020																			
<p>Contract Routing:</p> <table style="width:100%;"> <tr> <td>1. Prepared by: Christina Schoenfelder</td> <td>Date: 1/11/19</td> </tr> <tr> <td>2. Attorney signoff: Christopher Quinn</td> <td>Date: 1/25/2019</td> </tr> <tr> <td>3. AS Finance reviewed:</td> <td>Date: _____</td> </tr> <tr> <td>4. IT reviewed (if IT related):</td> <td>Date: _____</td> </tr> <tr> <td>5. Contractor signed:</td> <td>Date: _____</td> </tr> <tr> <td>6. Submitted to Exec.:</td> <td>Date: _____</td> </tr> <tr> <td>7. Council approved (if necessary):</td> <td>Date: _____</td> </tr> <tr> <td>8. Executive signed:</td> <td>Date: _____</td> </tr> <tr> <td>9. Original to Council:</td> <td>Date: _____</td> </tr> </table>				1. Prepared by: Christina Schoenfelder	Date: 1/11/19	2. Attorney signoff: Christopher Quinn	Date: 1/25/2019	3. AS Finance reviewed:	Date: _____	4. IT reviewed (if IT related):	Date: _____	5. Contractor signed:	Date: _____	6. Submitted to Exec.:	Date: _____	7. Council approved (if necessary):	Date: _____	8. Executive signed:	Date: _____	9. Original to Council:	Date: _____
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8. Executive signed:	Date: _____																				
9. Original to Council:	Date: _____																				



**Washington State
Department of Transportation**

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

I

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

II

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

III

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

Consultant Signature

Approving Authority Signature

Approved as to form:

1/30/2019
Christopher Quinn
Senior Deputy Prosecuting Attorney - Civil Division

Date

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

EXHIBIT A: FEE SUMMMARY

TASKS / SUBTASKS			LABOR EXPENSES						ODC	TOTAL PRICE
			Hours	Direct & Indirect Labor Costs			FEE	LABOR SUBTOTAL		
			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	
TASK/SUBTASK TITLES										
1	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	\$68,094.68
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	\$24,044.97
		Subtotal	482	\$29,324.42	\$53,727.62	\$83,052.04	\$8,681.61	\$91,733.65	\$406.00	\$92,139.65
1	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	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	4.1.1	Field Explorations	28	\$1,318.08	\$2,550.62	\$3,868.70	\$382.24	\$4,250.94	\$300.00	\$4,550.94
	4.1.1a	Upper and Lower Goodwin Reach Debris Deflection Berm	14	\$745.05	\$1,459.48	\$2,204.53	\$217.29	\$2,421.82	\$300.00	\$2,721.82
	4.1.1b	In-Stream Sediments Traps	46	\$2,136.62	\$4,170.05	\$6,306.67	\$622.07	\$6,928.74	\$13,800.00	\$20,728.74
	4.1.1c	Goodwin Reach Sediment Basins	24	\$1,191.25	\$2,322.93	\$3,514.18	\$346.69	\$3,860.86	\$9,450.00	\$13,310.86
	4.1.2	Field Logs, Laboratory Testing, Geologic Interpretations	52	\$2,378.16	\$4,601.98	\$6,980.14	\$689.67	\$7,669.81	\$4,000.00	\$11,669.81
	4.1.3	Geotechnical Engineering Analyses	82	\$3,699.26	\$7,193.91	\$10,893.17	\$1,075.23	\$11,968.40	\$0.00	\$11,968.40
	4.1.4	Geotechnical Engineering Reports	76	\$3,963.04	\$7,739.83	\$11,702.87	\$1,154.18	\$12,857.05	\$0.00	\$12,857.05
4.2	4.2.0	Groundwater	272	\$13,450.16	\$15,275.02	\$28,725.18	\$3,905.44	\$32,630.63	\$5,058.00	\$37,688.63
4.3	4.3.0	Survey	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	4.3.1	Sediment Traps	155	\$6,122.65	\$7,194.35	\$13,317.00	\$1,779.22	\$15,096.22	\$0.00	\$15,096.22
	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	\$13,116.51
	4.3.3	Goodwin North (Barlean) Site	91	\$3,502.29	\$4,329.72	\$7,832.01	\$1,019.98	\$8,851.99	\$0.00	\$8,851.99
	4.3.4	Stream Cross Sections	91	\$3,708.01	\$4,613.58	\$8,321.59	\$1,080.20	\$9,401.79	\$0.00	\$9,401.79
	4.3.5	Sediment Pilot Site	86	\$3,484.56	\$4,245.76	\$7,730.32	\$1,014.17	\$8,744.49	\$0.00	\$8,744.49
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	\$42,009.76
4.5	4.5.0	Hydrologic and Hydraulic Modeling	596	\$28,193.18	\$53,539.04	\$81,732.22	\$8,197.21	\$89,929.43	\$301.60	\$90,231.03
4.6	4.6.0	Environmental Monitoring - Weather stations	104	\$4,931.60	\$10,257.73	\$15,189.33	\$1,479.48	\$16,668.81	\$8,500.00	\$25,168.81
		Subtotal	2,104	\$98,615.78	\$159,633.27	\$258,249.05	\$28,158.19	\$286,407.24	\$41,709.60	\$328,116.84
1	5	Repository Site Analysis and Coordination for SEIS								
5.1	5.1.0	Geotechnical	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	5.1.1	Geotechnical Explorations	24	\$1,411.68	\$2,731.74	\$4,143.42	\$409.39	\$4,552.81	\$150.00	\$4,702.81
	5.1.1a	Canyon Central (Millman)	42	\$1,859.72	\$3,616.13	\$5,475.85	\$540.52	\$6,016.37	\$11,150.00	\$17,166.37
	5.1.1b	Goodwin North (Barlean) Site	13	\$491.74	\$968.95	\$1,460.69	\$143.80	\$1,604.50	\$150.00	\$1,754.50
	5.1.1c	Oat Coles (Parker) Site	13	\$491.74	\$968.95	\$1,460.69	\$143.80	\$1,604.50	\$2,150.00	\$3,754.50
	5.1.1d	Oat Coles South	13	\$491.74	\$968.95	\$1,460.69	\$143.80	\$1,604.50	\$2,150.00	\$3,754.50
	5.1.2	Field Logs, Laboratory Testing, Geological Interpretation	18	\$805.16	\$1,558.07	\$2,363.23	\$233.50	\$2,596.72	\$3,000.00	\$5,596.72
	5.1.3	Geotechnical Engineering Assessments	46	\$2,431.72	\$4,705.62	\$7,137.34	\$705.20	\$7,842.54	\$0.00	\$7,842.54
	5.1.4	Reporting	68	\$3,473.40	\$6,721.38	\$10,194.78	\$1,007.29	\$11,202.06	\$0.00	\$11,202.06
5.2	5.2.0	Groundwater	144	\$7,717.92	\$8,489.71	\$16,207.63	\$2,238.20	\$18,445.83	\$58.00	\$18,503.83
5.3	5.3.0	Surface Water	0	\$0.00	\$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	\$12,075.46
		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	\$12,232.08
		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	\$12,165.77
5.4	5.4.0	Wetlands	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	5.4.1	Desktop Analysis	24	\$636.00	\$710.86	\$1,346.86	\$184.44	\$1,531.30	\$0.00	\$1,531.30
	5.4.2	Field Assessment	201	\$7,437.00	\$8,312.33	\$15,749.33	\$2,156.73	\$17,906.06	\$1,108.88	\$19,014.95
	5.4.3	Documentation	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	5.4.3a	Reconnaissance-Level Analyses	308	\$11,821.37	\$13,212.75	\$25,034.12	\$3,428.20	\$28,462.31	\$0.00	\$28,462.31
	5.4.3b	Wetland Delineations	218	\$8,066.00	\$9,015.37	\$17,081.37	\$2,339.14	\$19,420.51	\$0.00	\$19,420.51
	5.4.3c	Wetland Characterization	41	\$1,359.50	\$1,519.51	\$2,879.01	\$394.26	\$3,273.27	\$0.00	\$3,273.27
	5.4.4	Wetlands Fieldwork Coordination	100	\$5,477.00	\$6,121.64	\$11,598.64	\$1,588.33	\$13,186.97	\$0.00	\$13,186.97
5.5	5.5.0	Traffic Analysis	84	\$4,510.00	\$6,711.33	\$11,221.33	\$1,307.90	\$12,529.23	\$142.68	\$12,671.91
		Subtotal	1,595	\$69,272.61	\$98,778.42	\$168,051.03	\$20,201.77	\$188,252.79	\$20,059.56	\$208,312.36
1	6	SCSMAP Projects Design Development								
6.1	6.1.0	Sediment Traps	246	\$12,143.86	\$23,357.91	\$35,501.77	\$3,601.55	\$39,103.32	\$20.88	\$39,124.20
6.2	6.2.0	Sediment Basins	268	\$13,693.38	\$28,344.90	\$42,038.28	\$4,100.38	\$46,138.66	\$174.00	\$46,312.66
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	\$27,333.75
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	\$46,528.98
6.5	6.5.0	Creek Channel Conveyance Improvements	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
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	\$11,499.53
6.7	6.7.0	Repository Design	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	6.7.1	Interim Site Development	225	\$10,486.12	\$21,811.13	\$32,297.25	\$3,145.84	\$35,443.09	\$406.00	\$35,849.09
	6.7.2	Repository Design	480	\$23,864.44	\$49,336.20	\$73,200.64	\$7,138.50	\$80,339.14	\$0.00	\$80,339.14
6.8	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	\$50,719.00
		Subtotal	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
		TOTAL	6,157	\$305,024.74	\$511,470.29	\$816,495.03	\$86,687.44	\$903,182.47	\$63,092.72	\$966,275.20

EXHIBIT A: FEE SUMMARY BY TASK

TASKS / FIRMS	LABOR EXPENSES						ODC	TOTAL PRICE
	Hours	Total Direct Labor Costs	Overhead Rate	Total Indirect Costs	Direct Labor + Indirect Costs	Fee Percentage		
TASK TITLES / CONSULTING FIRMS	Total Hours	Total Direct Labor Costs	Overhead Rate	Total Indirect Costs	Direct Labor + Indirect Costs	Fee Percentage	Escalated Direct + Indirect + Fee = TOTAL LABOR COST	
1 Project Management and Coordination								
Herrera	278	\$17,752.42	20.00%	\$36,925.03	\$54,677.45	30.00%	\$5,325.73	\$60,003.18
Aspect Consulting	40	\$2,084.66	19.51%	\$4,034.06	\$6,118.74	29.00%	\$604.56	\$6,723.30
Associated Earth Sciences	12	\$1,153.80	11.00%	\$1,269.18	\$2,422.98	29.00%	\$334.60	\$2,757.58
Kerr Wood Leidal	0	\$0.00	10.00%	\$0.00	\$0.00	0.00%	\$0.00	\$0.00
PSE dba Element Solutions	92	\$5,038.84	11.77%	\$5,631.91	\$10,670.75	29.00%	\$1,461.26	\$12,132.02
TranTech Engineering	16	\$860.00	14.81%	\$1,279.77	\$2,139.77	29.00%	\$249.40	\$2,389.17
Watershed Science & Engineering	44	\$2,434.66	18.43%	\$4,567.67	\$7,002.35	29.00%	\$706.06	\$7,728.40
Subtotal, Task 1	482	\$29,324.42		\$53,727.62	\$83,052.04		\$8,681.61	\$91,733.65
4 Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development								
Herrera	320	\$16,281.20	20.00%	\$33,864.90	\$50,146.10	30.00%	\$4,884.36	\$55,030.46
Aspect Consulting	302	\$14,207.36	19.51%	\$27,492.66	\$41,700.02	29.00%	\$4,120.13	\$45,820.16
Associated Earth Sciences	264	\$12,950.52	11.00%	\$14,266.57	\$27,217.09	29.00%	\$3,756.55	\$30,973.64
Kerr Wood Leidal	8	\$2,080.00	10.00%	\$0.00	\$2,080.00	0.00%	\$0.00	\$2,080.00
PSE dba Element Solutions	530	\$20,887.20	11.77%	\$23,345.62	\$44,232.82	29.00%	\$6,057.29	\$50,290.11
TranTech Engineering	0	\$0.00	14.81%	\$0.00	\$0.00	29.00%	\$0.00	\$0.00
Watershed Science & Engineering	680	\$32,199.50	18.43%	\$60,673.52	\$92,873.02	29.00%	\$9,337.86	\$102,210.87
Subtotal, Task 4	2,104	\$98,615.76		\$159,633.27	\$258,249.05		\$28,158.19	\$286,407.24
5 Repository Site Analysis and Coordination for SEIS								
Herrera	254	\$11,270.92	20.00%	\$23,443.51	\$34,714.43	30.00%	\$3,381.28	\$38,095.71
Aspect Consulting	221	\$10,976.90	19.51%	\$21,241.40	\$32,218.30	29.00%	\$3,183.30	\$35,401.60
Associated Earth Sciences	144	\$7,717.92	11.00%	\$8,489.71	\$16,207.63	29.00%	\$2,238.20	\$18,445.83
Kerr Wood Leidal	0	\$0.00	10.00%	\$0.00	\$0.00	0.00%	\$0.00	\$0.00
PSE dba Element Solutions	892	\$34,796.87	11.77%	\$38,892.46	\$73,689.33	29.00%	\$10,091.09	\$83,780.42
TranTech Engineering	84	\$4,510.00	14.81%	\$6,711.33	\$11,221.33	29.00%	\$1,307.90	\$12,529.23
Watershed Science & Engineering	0	\$0.00	18.43%	\$0.00	\$0.00	29.00%	\$0.00	\$0.00
Subtotal, Task 5	1,595	\$69,272.61		\$88,778.42	\$158,051.03		\$20,201.77	\$178,252.79
6 SCSSMAP Projects Design Development								
Herrera	1,566	\$79,322.23	20.00%	\$164,980.24	\$244,312.47	30.00%	\$23,796.67	\$268,109.14
Aspect Consulting	60	\$3,927.36	19.51%	\$7,599.83	\$11,527.19	29.00%	\$1,138.93	\$12,666.13
Associated Earth Sciences	0	\$0.00	11.00%	\$0.00	\$0.00	29.00%	\$0.00	\$0.00
Kerr Wood Leidal	32	\$8,320.00	10.00%	\$0.00	\$8,320.00	0.00%	\$0.00	\$8,320.00
PSE dba Element Solutions	0	\$0.00	11.77%	\$0.00	\$0.00	29.00%	\$0.00	\$0.00
TranTech Engineering	180	\$9,754.00	14.81%	\$14,514.93	\$24,268.93	29.00%	\$2,828.66	\$27,097.59
Watershed Science & Engineering	138	\$6,488.34	18.43%	\$12,225.98	\$18,714.32	29.00%	\$1,881.62	\$20,595.94
Subtotal, Task 6	1,976	\$107,611.93		\$199,330.98	\$307,142.91		\$29,645.88	\$336,788.79
SubTotal, All Tasks	6,157	\$305,024.74		\$511,470.29	\$816,495.03		\$86,687.44	\$903,182.47
TOTAL	6,157	\$305,024.74		\$511,470.29	\$816,495.03		\$86,687.44	\$903,182.47

EXHIBIT A: FEE SUMMARY BY FIRM

LABOR EXPENSES														INVOICED ODC	TOTAL PRICE
Names of CONSULTING FIRMS	% of Total Cost	Hours	Total Direct & Indirect Labor Costs				LABOR ESCALATION				FEE		LABOR SUBTOTAL		
			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			
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%	\$0.00	\$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	0.00%	\$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%	\$0.00	\$10,400.00	0.00%	\$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	0.00%	\$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	0.00%	\$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	188.43%	\$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				

EXHIBIT A: HERRERA (PRIME) LABOR FEE pg 1 of 2

		PHASES / TASKS / SUBTASKS	Herrera			Spillane, Michael	Wood, Theresa Vice President	Alarain, Dylan Scientist V	Webb, Chris Engineer V	Pearson, Jeff Engineer V	Mustreanu, Iulian Engineer V	Huck, Kent Engineer V
Phase or Task #	Task or Subtask #	PHASES / TASKS / SUBTASKS TITLES	Prime's Total Labor Hours	Prime's Direct Labor Cost	Prime's Total Labor Cost							
1	1	Project Management and Coordination										
1	1.1.0	Project Coordination	222	\$13,759.70	\$42,379.88	72	20			12	12	74
1	1.2.0	SEIS Consultant Coordination	56	\$3,992.72	\$12,297.58	40						16
		Subtotal	278	\$17,752.42	\$54,677.45	112	20	0	0	12	12	90
1	4	Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development										
	4.1	Geotechnical	0	\$0.00	\$0.00							
	4.1.1	Field Explorations	0	\$0.00	\$0.00							
	4.1.1a	Upper and Lower Goodwin Reach Debris Deflection Berms/Levees	2	\$122.41	\$377.02					1	1	
	4.1.1b	In-Stream Sediments Traps	4	\$244.82	\$754.05					2	2	
	4.1.1c	Goodwin Reach Sediment Basins	2	\$122.41	\$377.02					1	1	
	4.1.2	Field Logs, Laboratory Testing, Geologic Interpretations	0	\$0.00	\$0.00							
	4.1.3	Geotechnical Engineering Analyses	4	\$244.82	\$754.05					2	2	
	4.1.4	Geotechnical Engineering Reports	8	\$489.64	\$1,508.09					4	4	
	4.2	Groundwater	8	\$489.64	\$1,508.09					4	4	
	4.3	Survey	0	\$0.00	\$0.00							
	4.3.1	Sediment Traps	8	\$364.82	\$1,123.85					2	2	
	4.3.2	Oat Coles North (Parker) Site	10	\$431.48	\$1,328.96							2
	4.3.3	Goodwin North (Barlean) Site	10	\$431.48	\$1,328.96							2
	4.3.4	Stream Cross Sections	10	\$487.52	\$1,501.56					4	2	
	4.3.5	Sediment Pilot Site	8	\$364.82	\$1,123.85					2	2	
	4.4	Debris Flow Modeling	104	\$5,437.04	\$16,746.08					60	8	
	4.5	Hydrologic and Hydraulic Modeling	38	\$2,118.70	\$6,525.80					18	12	
	4.6	Environmental Monitoring - Weather stations	104	\$4,931.60	\$15,189.33			32		16		
		Subtotal	320	\$16,281.20	\$50,146.10	0	0	32	0	116	44	0
1	5	Repository Site Analysis and Coordination for SEIS										
	5.1	Geotechnical	0	\$0.00	\$0.00							
	5.1.1	Geotechnical Explorations	0	\$0.00	\$0.00							
	5.1.1a	Canyon Central (Millman)	4	\$120.00	\$369.60							
	5.1.1b	Goodwin North (Barlean) Site	4	\$120.00	\$369.60							
	5.1.1c	Oat Coles (Parker) Site	4	\$120.00	\$369.60							
	5.1.1d	Oat Coles South	4	\$120.00	\$369.60							
	5.1.2	Field Logs, Laboratory Testing, Geological Interpretations	0	\$0.00	\$0.00							
	5.1.3	Geotechnical Engineering Assessments	0	\$0.00	\$0.00							
	5.1.4	Reporting	0	\$0.00	\$0.00							
	5.2	Groundwater	0	\$0.00	\$0.00							
	5.3	Surface Water	0	\$0.00	\$0.00							
		30% stormwater Report 1 site (Canyon Central)	80	\$3,572.82	\$11,003.87	4			4			
		Conceptual Plans for 6 sites (Goodwin South, Oat Coles South, Oat Coles North, Goodwin North, Canyon North, and Canyon South) to support SEIS	80	\$3,618.96	\$11,146.40	4			2			
		Interim stormwater design for Oat Coles North site and Goodwin North	78	\$3,589.34	\$11,085.97	4			2			
	5.4	Wetlands	0	\$0.00	\$0.00							
	5.4.1	Desktop Analysis	0	\$0.00	\$0.00							
	5.4.2	Field Assessment	0	\$0.00	\$0.00							
	5.4.3	Documentation	0	\$0.00	\$0.00							
	5.4.3a	Reconnaissance-Level Analyses	0	\$0.00	\$0.00							
	5.4.3b	Wetland Delineations	0	\$0.00	\$0.00							
	5.4.3c	Wetland Characterization	0	\$0.00	\$0.00							
	5.4.4	Wetlands Fieldwork Coordination	0	\$0.00	\$0.00							
	5.5	Traffic Analysis	0	\$0.00	\$0.00							
		Subtotal	254	\$11,270.92	\$34,714.43	12	0	0	8	0	0	0
1	6	SCSMAP Projects Design Development										
	6.1	Sediment Traps	168	\$7,983.04	\$24,587.76	8				20	36	
	6.2	Sediment Basins	252	\$12,929.88	\$39,823.41	18				90	60	
	6.3	Debris Flow Deflection Berm and Levee	90	\$4,812.54	\$14,822.62	4				12	40	
	6.4	Williams Pipeline Crossing	108	\$6,486.68	\$19,978.97	8				24	70	
	6.5	Creek Channel Conveyance Improvements	0	\$0.00	\$0.00	0				0	0	
	6.6	Creek Channel Maintenance Support	44	\$2,656.36	\$8,181.59	16					8	8
	6.7	Repository Design	0	\$0.00	\$0.00							
	6.7.1	Interim Site Development	226	\$10,486.12	\$32,297.25	28						40
	6.7.2	Repository Design	448	\$21,781.40	\$67,086.71	40						120
	6.8	Basis of Design Report	233	\$12,186.41	\$37,534.14	32				24	24	60
		Subtotal	1,566	\$79,322.23	\$244,312.47	154	0	0	0	140	238	228
		TOTAL	2,418	\$124,626.77	\$383,850.45	278	20	32	8	268	294	318
		Reflects total hours. Does not reflect the Total Price										
		Direct Labor Rate Per Hour				\$77.51	\$68.12	\$67.99	\$67.61	\$61.35	\$61.06	\$55.77
		Overhead Rate				208.00%	\$161.22	\$141.69	\$141.42	\$140.63	\$127.61	\$127.00
		Total Rate Per Hour				\$238.73	\$209.81	\$209.41	\$208.24	\$188.96	\$188.06	\$171.77
		Total Labor Cost		\$383,850.45	\$66,367.16	\$4,196.19	\$6,701.09	\$1,665.91	\$50,640.74	\$55,291.05	\$54,623.37	\$54,623.37
		Total Direct Labor Cost		\$124,626.77	\$21,547.78	\$1,362.40	\$2,175.68	\$540.88	\$16,441.80	\$17,951.64	\$17,734.86	
		Fixed Fee %				30.00%						
		Escalation %				0.00%						
		Basis Year				2018						

EXHIBIT A: HERRERA (PRIME) LABOR FEE pg 2 of 2

PHASES / TASKS / SUBTASKS			Engineer IV	Engineer IV	CAO Technician III	Engineer II	Engineer II	Engineer II	Analyst II	Scientist II	Scientist I	Accounting Administrator III	Administrative Coordinator IV	Administrative Coordinator III
Phase or Task #	Task or Subtask #	PHASES / TASKS / SUBTASKS TITLES	Mitchell, Coleen	Dale, Blana	Turnidge, Laura	Schauer, Neil	Wu, Valerie	Kramer, Gretchen	Gagel, Joseph	Biss, Kyle	Bromson, Ryan	Saavedra, Robert	Jackowich, Pam	Coleman, Marnie
1	1	Project Management and Coordination												
1	1.1.0	Project Coordination	12									20		
1	1.2.0	SEIS Consultant Coordination												
Subtotal			12	0	0	0	0	0	0	0	0	20	0	0
1	4	Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development												
4.1	4.1.0	Geotechnical												
	4.1.1	Field Explorations												
	4.1.1a	Upper and Lower Goodwin Reach Debris Deflection Berms/Levees												
	4.1.1b	In-Stream Sediments Traps												
	4.1.1c	Goodwin Reach Sediment Basins												
	4.1.2	Field Logs, Laboratory Testing, Geologic Interpretations												
	4.1.3	Geotechnical Engineering Analyses												
	4.1.4	Geotechnical Engineering Reports												
4.2	4.2.0	Groundwater												
4.3	4.3.0	Survey												
	4.3.1	Sediment Traps								4				
	4.3.2	Oat Coles North (Parker) Site	4							4				
	4.3.3	Goodwin North (Barlean) Site	4							4				
	4.3.4	Stream Cross Sections								4				
	4.3.5	Sediment Pilot Site								4				
4.4	4.4.0	Debris Flow Modeling						36						
4.5	4.5.0	Hydrologic and Hydraulic Modeling						8						
4.6	4.6.0	Environmental Monitoring - Weather stations						24		32				
Subtotal			8	0	0	0	0	68	20	32	0	0	0	0
1	5	Repository Site Analysis and Coordination for SEIS												
5.1	5.1.0	Geotechnical												
	5.1.1	Geotechnical Explorations												
	5.1.1a	Canyon Central (Millman)								4				
	5.1.1b	Goodwin North (Barlean) Site								4				
	5.1.1c	Oat Coles (Parker) Site								4				
	5.1.1d	Oat Coles South								4				
	5.1.2	Field Logs, Laboratory Testing, Geological Interpretations												
	5.1.3	Geotechnical Engineering Assessments												
	5.1.4	Reporting												
5.2	5.2.0	Groundwater												
5.3	5.3.0	Surface Water												
		30% stormwater Report 1 site (Canyon Central)	32		12	18			10					
		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 stormwater design for Oat Coles North site and Goodwin North	40		16	18								
5.4	5.4.0	Wetlands												
	5.4.1	Desktop Analysis												
	5.4.2	Field Assessment												
	5.4.3	Documentation												
	5.4.3a	Reconnaissance-Level Analyses												
	5.4.3b	Wetland Delineations												
	5.4.3c	Wetland Characterization												
	5.4.4	Wetlands Fieldwork Coordination												
5.5	5.5.0	Traffic Analysis												
Subtotal			104	0	52	52	0	0	26	0	0	0	0	0
1	6	SCSMAP Projects Design Development												
6.1	6.1.0	Sediment Traps			80		40			4				
6.2	6.2.0	Sediment Basins			40			70		4				
6.3	6.3.0	Debris Flow Deflection Berm and Levee			30					4				
6.4	6.4.0	Williams Pipeline Crossing								4				
6.5	6.5.0	Creek Channel Conveyance Improvements			0					0				
6.6	6.6.0	Creek Channel Maintenance Support			12									
6.7	6.7.0	Repository Design												
	6.7.1	Interim Site Development	40	24	40	8				5		40		
	6.7.2	Repository Design	40	80	180					8				
6.8	6.8.0	Basis of Design Report	24					24					40	5
Subtotal			104	84	362	8	40	94	29	0	40	0	40	5
TOTAL			228	84	414	60	40	162	75	32	40	20	40	5
Reflects total hours. Does not reflect the Total Price														
			\$47.34	\$43.86	\$40.13	\$38.95	\$35.25	\$35.21	\$30.00	\$29.04	\$26.86	\$32.63	\$33.04	\$23.85
			\$98.47	\$91.23	\$83.47	\$80.39	\$73.32	\$73.24	\$62.40	\$60.40	\$55.87	\$67.87	\$68.72	\$49.61
			\$145.81	\$135.09	\$123.60	\$119.04	\$108.57	\$108.45	\$92.40	\$89.44	\$82.73	\$100.50	\$101.76	\$73.46
			\$33,244.04	\$11,347.46	\$51,170.57	\$7,142.52	\$4,342.80	\$17,568.38	\$6,930.00	\$2,862.18	\$3,309.15	\$2,010.01	\$4,070.53	\$367.29
			\$10,793.52	\$3,684.24	\$16,613.82	\$2,319.00	\$1,410.00	\$5,704.02	\$2,250.00	\$929.28	\$1,074.40	\$652.60	\$1,321.60	\$119.25

EXHIBIT A: ASSOCIATED EARTH SCIENCES INC LABOR FEE

Phase or Task #	Task or Subtask #	PHASES / TASKS / SUBTASKS	Associated Earth Sciences			Charles Lindsey Sr. Principal	Jay Chennault Associate	Katherine Baker Sr. Staff	Anton Ynga Staff	Beth Nelson Drafting	Karen Baham GIS/Camp Services	Erin Nishikawa Admin/VP
			SUB #2's Total Labor Hours	Sub #2's Direct Labor Cost	SUB #2's Total Labor Cost							
1	1	Project Management and Coordination										
	1.1.0	Project Coordination	12	\$1,153.80	\$2,422.98	12						
	1.2.0	SEIS Consultant Coordination	0	\$0.00	\$0.00							
		Subtotal	12	\$1,153.80	\$2,422.98	12	0	0	0	0	0	0
1	4	Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development										
	4.1	Geotechnical	0	\$0.00	\$0.00							
	4.1.1	Field Explorations	0	\$0.00	\$0.00							
	4.1.1a	Upper and Lower Goodwin Reach Debris Deflection Berms/Levees	0	\$0.00	\$0.00							
	4.1.1b	In-Stream Sediments Traps	0	\$0.00	\$0.00							
	4.1.1c	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 Engineering Analyses	0	\$0.00	\$0.00							
	4.1.4	Geotechnical Engineering Reports	0	\$0.00	\$0.00							
	4.2	Groundwater	264	\$12,960.52	\$27,217.09	80	12	60	80	8	16	8
	4.3	Survey	0	\$0.00	\$0.00							
	4.3.1	Sediment Traps	0	\$0.00	\$0.00							
	4.3.2	Oat Coles North (Parker) Site	0	\$0.00	\$0.00							
	4.3.3	Goodwin North (Barlean) Site	0	\$0.00	\$0.00							
	4.3.4	Stream Cross Sections	0	\$0.00	\$0.00							
	4.3.5	Sediment Pilot Site	0	\$0.00	\$0.00							
	4.4	Debris Flow Modeling	0	\$0.00	\$0.00							
	4.5	Hydrologic and Hydraulic Modeling	0	\$0.00	\$0.00							
	4.6	Environmental Monitoring - Weather stations	0	\$0.00	\$0.00							
		Subtotal	264	\$12,960.52	\$27,217.09	80	12	60	80	8	16	8
1	5	Repository Site Analysis and Coordination for SEIS										
	5.1	Geotechnical	0	\$0.00	\$0.00							
	5.1.1	Geotechnical Explorations	0	\$0.00	\$0.00							
	5.1.1a	Canyon Central (Millman)	0	\$0.00	\$0.00							
	5.1.1b	Goodwin North (Barlean) Site	0	\$0.00	\$0.00							
	5.1.1c	Oat Coles (Parker) Site	0	\$0.00	\$0.00							
	5.1.1d	Oat Coles South	0	\$0.00	\$0.00							
	5.1.2	Field Logs, Laboratory Testing, Geological Interpretations	0	\$0.00	\$0.00							
	5.1.3	Geotechnical Engineering Assessments	0	\$0.00	\$0.00							
	5.1.4	Reporting	0	\$0.00	\$0.00							
	5.2	Groundwater	144	\$7,171.92	\$16,207.63	40	40	32	0	8	16	8
	5.3	Surface Water	0	\$0.00	\$0.00							
		30% stormwater Report 1 site (Canyon Central)	0	\$0.00	\$0.00							
		Conceptual Plans for 6 sites (Goodwin South, Oat Coles South, Oat Coles North, Goodwin North, Canyon North, and Canyon South) to support SEIS	0	\$0.00	\$0.00							
		Interim stormwater design for Oat Coles North site and Goodwin North	0	\$0.00	\$0.00							
	5.4	Wetlands	0	\$0.00	\$0.00							
	5.4.1	Desktop Analysis	0	\$0.00	\$0.00							
	5.4.2	Field Assessment	0	\$0.00	\$0.00							
	5.4.3	Documentation	0	\$0.00	\$0.00							
	5.4.3a	Reconnaissance-Level Analyses	0	\$0.00	\$0.00							
	5.4.3b	Wetland Delineations	0	\$0.00	\$0.00							
	5.4.3c	Wetland Characterization	0	\$0.00	\$0.00							
	5.4.4	Wetlands Fieldwork Coordination	0	\$0.00	\$0.00							
	5.5	Traffic Analysis	0	\$0.00	\$0.00							
		Subtotal	144	\$7,171.92	\$16,207.63	40	40	32	0	8	16	8
1	6	SCSMAP Projects Design Development										
	6.1	Sediment Traps	0	\$0.00	\$0.00							
	6.2	Sediment Basins	0	\$0.00	\$0.00							
	6.3	Debris Flow Deflection Berm and Levee	0	\$0.00	\$0.00							
	6.4	Williams Pipeline Crossing	0	\$0.00	\$0.00							
	6.5	Creek Channel Conveyance Improvements	0	\$0.00	\$0.00							
	6.6	Creek Channel Maintenance Support	0	\$0.00	\$0.00							
	6.7	Repository Design	0	\$0.00	\$0.00							
	6.7.1	Interim Site Development	0	\$0.00	\$0.00							
	6.7.2	Repository Design	0	\$0.00	\$0.00							
	6.8	Basis of Design Report	0	\$0.00	\$0.00							
		Subtotal	0	\$0.00	\$0.00	0	0	0	0	0	0	0
		TOTAL	420	\$21,832.24	\$45,847.70	132	52	92	80	16	32	16
		Reflects total hours. Does not reflect the Total Price.										
		Direct Labor Rate Per Hour				\$96.15	\$50.00	\$28.45	\$25.00	\$26.56	\$34.40	\$24.83
		Overhead Rate				110.00%	\$105.77	\$55.00	\$31.30	\$29.22	\$37.84	\$27.31
		Total Rate Per Hour				\$201.92	\$105.00	\$59.75	\$55.78	\$55.78	\$72.24	\$52.14
		Total Labor Cost				\$45,847.70	\$26,652.78	\$5,496.54	\$4,200.00	\$892.42	\$2,311.68	\$834.29
		Total Direct Labor Cost				\$21,832.24	\$12,691.80	\$2,600.00	\$2,617.40	\$2,000.00	\$424.96	\$1,100.80
		Fee %				29.00%						
		Escalation %				0.00%						
		Basis Year				2018						

EXHIBIT A: ASPECT CONSULTING LABOR FEE

Phase or Task	PHASES / TASKS / SUBTASKS		Aspect Consulting			Principal 1	Associate	Project 1	Staff 3	Senior CAD Technician / equalist	Project Coordinator 2
	Task or Subtask #	PHASES / TASKS / SUBTASKS TITLES	SUB #1's Total Labor Hours	Sub #1's Direct Labor Cost	SUB #1's Total Labor Cost	Eric O. Andersen	Andy Holmson	Eric Schallenger	Aaron Fitts	Caroline Vail	Celia Harshbarger
1	1	Project Management and Coordination									
	1.1.0	Project Coordination	40	\$2,084.68	\$6,118.74	16			12		12
	1.2.0	SEIS Consultant Coordination	0	\$0.00	\$0.00						
		Subtotal	40	\$2,084.68	\$6,118.74	16	0	0	12	0	12
1	4	Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development									
	4.1	Geotechnical	0	\$0.00	\$0.00						
	4.1.1	Field Explorations	28	\$1,318.08	\$3,868.70	8			12		8
	4.1.1a	Upper and Lower Goodwin Reach Debris Deflection Berms/Levees	12	\$622.64	\$1,827.51	4		4	4		
	4.1.1b	In-Stream Sediments Traps	42	\$1,891.80	\$5,552.62	8		4	30		
	4.1.1c	Goodwin Reach Sediment Basins	22	\$1,088.84	\$3,137.15	6			16		
	4.1.2	Field Logs, Laboratory Testing, Geologic Interpretations	52	\$2,378.16	\$6,980.14	8		12	24		8
	4.1.3	Geotechnical Engineering Analyses	78	\$3,454.44	\$10,139.13	12		48	18		
	4.1.4	Geotechnical Engineering Reports	68	\$3,473.40	\$10,194.78	16	8	24	12	4	4
	4.2	Groundwater	0	\$0.00	\$0.00						
	4.3	Survey	0	\$0.00	\$0.00						
	4.3.1	Sediment Traps	0	\$0.00	\$0.00						
	4.3.2	Oat Coles North (Parker) Site	0	\$0.00	\$0.00						
	4.3.3	Goodwin North (Barlean) Site	0	\$0.00	\$0.00						
	4.3.4	Stream Cross Sections	0	\$0.00	\$0.00						
	4.3.5	Sediment Pilot Site	0	\$0.00	\$0.00						
	4.4	Debris Flow Modeling	0	\$0.00	\$0.00						
	4.5	Hydrologic and Hydraulic Modeling	0	\$0.00	\$0.00						
	4.6	Environmental Monitoring - Weather stations	0	\$0.00	\$0.00						
		Subtotal	302	\$14,207.36	\$41,700.02	62	8	92	116	12	12
1	5	Repository Site Analysis and Coordination for SEIS									
	5.1	Geotechnical	0	\$0.00	\$0.00						
	5.1.1	Geotechnical Explorations	24	\$1,411.88	\$4,143.42	12			12		
	5.1.1a	Canyon Central (Millman)	38	\$1,739.72	\$5,109.25	8			30		
	5.1.1b	Goodwin North (Barlean) Site	9	\$371.74	\$1,091.09	1			8		
	5.1.1c	Oat Coles (Parker) Site	9	\$371.74	\$1,091.09	1			8		
	5.1.1d	Oat Coles South	9	\$371.74	\$1,091.09	1			8		
	5.1.2	Field Logs, Laboratory Testing, Geological Interpretations	18	\$805.18	\$2,383.23	2		4	8		4
	5.1.3	Geotechnical Engineering Assessments	46	\$2,431.72	\$7,137.34	16		24	8		
	5.1.4	Reporting	68	\$3,473.40	\$10,194.78	16	8	24	12	4	4
	5.2	Groundwater	0	\$0.00	\$0.00						
	5.3	Surface Water	0	\$0.00	\$0.00						
		30% stormwater Report 1 site (Canyon Central)	0	\$0.00	\$0.00						
		Conceptual Plans for 8 sites (Goodwin South, Oat Coles South, Oat Coles North, Goodwin North, Canyon North, and Canyon South) to support SEIS	0	\$0.00	\$0.00						
		Interim stormwater design for Oat Coles North site and Goodwin North	0	\$0.00	\$0.00						
	5.4	Wetlands	0	\$0.00	\$0.00						
	5.4.1	Desktop Analysis	0	\$0.00	\$0.00						
	5.4.2	Field Assessment	0	\$0.00	\$0.00						
	5.4.3	Documentation	0	\$0.00	\$0.00						
	5.4.3a	Reconnaissance-Level Analyses	0	\$0.00	\$0.00						
	5.4.3b	Wetland Delineations	0	\$0.00	\$0.00						
	5.4.3c	Wetland Characterization	0	\$0.00	\$0.00						
	5.4.4	Wetlands Fieldwork Coordination	0	\$0.00	\$0.00						
	5.5	Traffic Analysis	0	\$0.00	\$0.00						
		Subtotal	221	\$10,976.90	\$32,218.30	57	8	52	92	8	4
1	6	SCSMAP Projects Design Development									
	6.1	Sediment Traps	8	\$564.08	\$1,655.63	6			2		
	6.2	Sediment Basins	4	\$238.72	\$700.67	2			2		
	6.3	Debris Flow Deflection Berm and Levee	6	\$401.40	\$1,178.15	4			2		
	6.4	Williams Pipeline Crossing	10	\$640.12	\$1,878.82	8			4		
	6.5	Creek Channel Conveyance Improvements	0	\$0.00	\$0.00	0					
	6.6	Creek Channel Maintenance Support	0	\$0.00	\$0.00						
	6.7	Repository Design	0	\$0.00	\$0.00						
	6.7.1	Interim Site Development	0	\$0.00	\$0.00						
	6.7.2	Repository Design	32	\$2,083.04	\$6,113.93	20			12		
	6.8	Basis of Design Report	0	\$0.00	\$0.00						
		Subtotal	60	\$3,927.36	\$11,527.19	38	0	22	0	0	0
		TOTAL	623	\$31,196.30	\$91,564.26	173	16	166	220	20	28
		Reflects total hours. Does not reflect the Total Price									
		Direct Labor Rate Per Hour			\$81.34	\$63.50	\$38.02	\$36.30	\$50.00	\$28.97	
		Overhead Rate		193.51%	\$157.40	\$122.88	\$73.57	\$70.24	\$96.76	\$56.06	
		Total Rate Per Hour			\$238.74	\$186.38	\$111.59	\$106.54	\$146.76	\$85.03	
		Total Labor Cost	\$91,564.26	\$41,302.20	\$2,982.06	\$18,524.36	\$23,439.71	\$2,935.10	\$2,380.84		
		Total Direct Labor Cost	\$31,196.30	\$14,071.82	\$1,016.00	\$6,311.32	\$7,986.00	\$1,000.00	\$811.15		
		Fee %		29.00%							
		Escalation %		0.00%							
		Basis Year		2018							

EXHIBIT A: KERR WOOD LEIDAL LABOR FEE

PHASES / TASKS / SUBTASKS								
Kerr Wood Leidal				Senior Value Engineer		Project Engineer	Project Assistant	
Phase or Task #	Task or Subtask #	PHASES / TASKS / SUBTASKS TITLES	SUB #3's Total Labor Hours	Sub #3's Direct Labor Cost	SUB #3's Total Labor Cost	Max Compensation	Name	Name
1	1	Project Management and Coordination						
1	1.1.0	Project Coordination	0	\$0.00	\$0.00			
1	1.2.0	SEIS Consultant Coordination	0	\$0.00	\$0.00			
		Subtotal	0	\$0.00	\$0.00	0	0	0
1	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	\$0.00			
	4.1.1	Field Explorations	0	\$0.00	\$0.00			
	4.1.1a	Upper and Lower Goodwin Reach Debris Deflection Berms/Levees	0	\$0.00	\$0.00			
	4.1.1b	In-Stream Sediment Traps	0	\$0.00	\$0.00			
	4.1.1c	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 Engineering Analyses	0	\$0.00	\$0.00			
	4.1.4	Geotechnical Engineering Reports	0	\$0.00	\$0.00			
4.2	4.2.0	Groundwater	0	\$0.00	\$0.00			
4.3	4.3.0	Survey	0	\$0.00	\$0.00			
	4.3.1	Sediment Traps	0	\$0.00	\$0.00			
	4.3.2	Oat Coles North (Parker) Site	0	\$0.00	\$0.00			
	4.3.3	Goodwin North (Barlean) Site	0	\$0.00	\$0.00			
	4.3.4	Stream Cross Sections	0	\$0.00	\$0.00			
	4.3.5	Sediment Pilot Site	0	\$0.00	\$0.00			
4.4	4.4.0	Debris Flow Modeling	8	\$2,080.00	\$2,080.00	8		
4.5	4.5.0	Hydrologic and Hydraulic Modeling	0	\$0.00	\$0.00			
4.6	4.6.0	Environmental Monitoring - Weather stations	0	\$0.00	\$0.00			
		Subtotal	8	\$2,080.00	\$2,080.00	8	0	0
1	5	Repository Site Analysis and Coordination for SEIS						
5.1	5.1.0	Geotechnical	0	\$0.00	\$0.00			
	5.1.1	Geotechnical Explorations	0	\$0.00	\$0.00			
	5.1.1a	Canyon Central (Millman)	0	\$0.00	\$0.00			
	5.1.1b	Goodwin North (Barlean) Site	0	\$0.00	\$0.00			
	5.1.1c	Oat Coles (Parker) Site	0	\$0.00	\$0.00			
	5.1.1d	Oat Coles South	0	\$0.00	\$0.00			
	5.1.2	Field Logs, Laboratory Testing, Geological Interpretations	0	\$0.00	\$0.00			
	5.1.3	Geotechnical Engineering Assessments	0	\$0.00	\$0.00			
	5.1.4	Reporting	0	\$0.00	\$0.00			
5.2	5.2.0	Groundwater	0	\$0.00	\$0.00			
5.3	5.3.0	Surface Water	0	\$0.00	\$0.00			
		30% stormwater Report 1 site (Canyon Central)	0	\$0.00	\$0.00			
		Conceptual Plans for 9 sites (Goodwin South, Oat Coles South, Oat Coles North, Goodwin North, Canyon North, and Canyon South) to support SEIS	0	\$0.00	\$0.00			
		Interim stormwater design for Oat Coles North site and Goodwin North	0	\$0.00	\$0.00			
5.4	5.4.0	Wetlands	0	\$0.00	\$0.00			
	5.4.1	Desktop Analysis	0	\$0.00	\$0.00			
	5.4.2	Field Assessment	0	\$0.00	\$0.00			
	5.4.3	Documentation	0	\$0.00	\$0.00			
	5.4.3a	Reconnaissance-Level Analyses	0	\$0.00	\$0.00			
	5.4.3b	Wetland Delineations	0	\$0.00	\$0.00			
	5.4.3c	Wetland Characterization	0	\$0.00	\$0.00			
	5.4.4	Wetlands Fieldwork Coordination	0	\$0.00	\$0.00			
5.5	5.5.0	Traffic Analysis	0	\$0.00	\$0.00			
		Subtotal	0	\$0.00	\$0.00	0	0	0
1	6	SCSMAP Projects Design Development						
6.1	6.1.0	Sediment Traps	0	\$0.00	\$0.00			
6.2	6.2.0	Sediment Basins	0	\$0.00	\$0.00			
6.3	6.3.0	Debris Flow Deflection Berm and Levee	32	\$8,320.00	\$8,320.00	32		
6.4	6.4.0	Williams Pipeline Crossing	0	\$0.00	\$0.00			
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			
6.7	6.7.0	Repository Design	0	\$0.00	\$0.00			
	6.7.1	Interim Site Development	0	\$0.00	\$0.00			
	6.7.2	Repository Design	0	\$0.00	\$0.00			
6.8	6.8.0	Basis of Design Report	0	\$0.00	\$0.00			
		Subtotal	32	\$8,320.00	\$8,320.00	32	0	0
		TOTAL	40	\$10,400.00	\$10,400.00	40	0	0
Reflects total hours. Does not reflect the Total Price								
Direct Labor Rate Per Hour				\$260.00	\$140.00	\$80.00		
Overhead Rate				0.00%	\$0.00	\$0.00		
Total Rate Per Hour				\$260.00	\$140.00	\$80.00		
Total Labor Cost				\$10,400.00	\$10,400.00	\$0.00		
Total Direct Labor Cost				\$10,400.00	\$10,400.00	\$0.00		
Fee %				0.00%				
Escalation %				0.00%				
Basis Year				2018				

EXHIBIT A: PSE dba ELEMENT SOLUTIONS LABOR FEE

PHASES / TASKS / SUBTASKS		PSE dba Element Solutions			Principal Scientist	Senior Project Scientist	Survey Crew Chief	Survey Crew Member	Principal Land Surveyor	Senior CAD Technician	GIS/CAD Technician	
Phase or Task #	Task or Subtask #	PHASES / TASKS / SUBTASKS TITLES	SUB #4's Total Labor Hours	SUB #4's Direct Labor Cost	SUB #4's Total Labor Cost	Name	Name	Pete Brands	Hours represent two survey staff	Adam Nelson	Ryan Twiss	Lucas Phillips
1	1	Project Management and Coordination										
	1.1.0	Project Coordination	12	\$657.24	\$1,391.84	12						
	1.2.0	SEIS Consultant Coordination	80	\$4,381.60	\$9,278.91	80						
Subtotal			92	\$5,038.84	\$10,670.75	92	0	0	0	0	0	0
1	4	Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development										
	4.1	Geotechnical	0	\$0.00	\$0.00							
	4.1.1	Field Explorations	0	\$0.00	\$0.00							
	4.1.1a	Upper and Lower Goodwin Reach Debris Deflection Berms/Levees	0	\$0.00	\$0.00							
	4.1.1b	In-Stream Sediments Traps	0	\$0.00	\$0.00							
	4.1.1c	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 Engineering Analyses	0	\$0.00	\$0.00							
	4.1.4	Geotechnical Engineering Reports	0	\$0.00	\$0.00							
	4.2	Groundwater	0	\$0.00	\$0.00							
	4.3	Survey	0	\$0.00	\$0.00							
	4.3.1	Sediment Traps	147	\$5,757.83	\$12,193.36			7	108	12	20	
	4.3.2	Oat Coles North (Parker) Site	127	\$4,842.01	\$10,253.92			7	100	2	18	
	4.3.3	Goodwin North (Barlean) Site	81	\$3,070.81	\$6,503.05			3	80	2	16	
	4.3.4	Stream Cross Sections	81	\$3,220.49	\$6,820.03			3	60	10	8	
	4.3.5	Sediment Pilot Site	78	\$3,119.74	\$6,806.87			4	48	10	16	
	4.4	Debris Flow Modeling	16	\$876.32	\$1,855.78	16						
	4.5	Hydrologic and Hydraulic Modeling	0	\$0.00	\$0.00							
	4.6	Environmental Monitoring - Weather stations	0	\$0.00	\$0.00							
Subtotal			530	\$20,887.20	\$44,232.82	16	0	24	376	36	78	0
1	5	Repository Site Analysis and Coordination for SEIS										
	5.1	Geotechnical	0	\$0.00	\$0.00							
	5.1.1	Geotechnical Explorations	0	\$0.00	\$0.00							
	5.1.1a	Canyon Central (Millman)	0	\$0.00	\$0.00							
	5.1.1b	Goodwin North (Barlean) Site	0	\$0.00	\$0.00							
	5.1.1c	Oat Coles (Parker) Site	0	\$0.00	\$0.00							
	5.1.1d	Oat Coles South	0	\$0.00	\$0.00							
	5.1.2	Field Logs, Laboratory Testing, Geological Interpretations	0	\$0.00	\$0.00							
	5.1.3	Geotechnical Engineering Assessments	0	\$0.00	\$0.00							
	5.1.4	Reporting	0	\$0.00	\$0.00							
	5.2	Groundwater	0	\$0.00	\$0.00							
	5.3	Surface Water	0	\$0.00	\$0.00							
		30% stormwater Report 1 site (Canyon Central)	0	\$0.00	\$0.00							
		Conceptual Plans for 6 sites (Goodwin South, Oat Coles South, Oat Coles North, Goodwin North, Canyon North, and Canyon South) to support SEIS	0	\$0.00	\$0.00							
		Interim stormwater design for Oat Coles North site and Goodwin North	0	\$0.00	\$0.00							
	5.4	Wetlands	0	\$0.00	\$0.00							
	5.4.1	Desktop Analysis	24	\$636.00	\$1,346.86							24
	5.4.2	Field Assessment	201	\$7,437.00	\$15,749.33		201					
	5.4.3	Documentation	0	\$0.00	\$0.00							
	5.4.3a	Reconnaissance-Level Analyses	308	\$11,821.37	\$25,034.12	56	199					53
	5.4.3b	Wetland Delineations	218	\$8,066.00	\$17,081.37		218					
	5.4.3c	Wetland Characterization	41	\$1,359.50	\$2,879.01		26					15
	5.4.4	Wetlands Fieldwork Coordination	100	\$5,477.00	\$11,598.64	100						
	5.5	Traffic Analysis	0	\$0.00	\$0.00							
Subtotal			892	\$34,796.87	\$73,689.33	156	644	0	0	0	0	92
1	6	SCSMAP Projects Design Development										
	6.1	Sediment Traps	0	\$0.00	\$0.00							
	6.2	Sediment Basins	0	\$0.00	\$0.00							
	6.3	Debris Flow Deflection Berm and Levee	0	\$0.00	\$0.00							
	6.4	Williams Pipeline Crossing	0	\$0.00	\$0.00							
	6.5	Creek Channel Conveyance Improvements	0	\$0.00	\$0.00							
	6.6	Creek Channel Maintenance Support	0	\$0.00	\$0.00							
	6.7	Repository Design	0	\$0.00	\$0.00							
	6.7.1	Interim Site Development	0	\$0.00	\$0.00							
	6.7.2	Repository Design	0	\$0.00	\$0.00							
	6.8	Basis of Design Report	0	\$0.00	\$0.00							
Subtotal			0	\$0.00	\$0.00	0	0	0	0	0	0	0
TOTAL			1,514	\$60,722.91	\$128,592.91	264	644	24	376	36	78	92
Reflects total hours. Does not reflect the Total Price												
Direct Labor Rate Per Hour						\$54.77	\$37.00	\$54.77	\$37.00	\$54.77	\$36.06	\$26.50
Overhead Rate					111.77%	\$61.22	\$41.35	\$61.22	\$41.35	\$61.22	\$40.30	\$29.62
Total Rate Per Hour						\$115.99	\$78.35	\$115.99	\$78.35	\$115.99	\$76.36	\$56.12
Total Labor Cost					\$128,592.91	\$30,620.42	\$50,460.56	\$2,783.67	\$29,461.44	\$4,175.51	\$5,956.41	\$5,134.89
Total Direct Labor Cost					\$60,722.91	\$14,459.28	\$23,828.00	\$1,314.48	\$13,912.00	\$1,971.72	\$2,812.68	\$2,424.75
Fee %					29.00%							
Escalation %					0.00%							
Basis Year					2018							

EXHIBIT A: TRANTECH ENGINEERING LABOR FEE

PHASES / TASKS / SUBTASKS			TranTech Engineering			Project Manager	Senior Structural Engineer	Senior Civil Engineer	Project Structural Engineer	Project Civil Engineer	Senior Structural Engineer I	Staff Civil Engineer	Senior CAD Technician	Administrative Assistant 2	Administrative Assistant 1	Resident Engineer (O&M)
Phase or Task #	Task or Subtask #	PHASES / TASKS / SUBTASKS TITLES	SUB #5's Total Labor Hours	SUB #5's Direct Labor Cost	SUB #5's Total Labor Cost	Thomas Weber	Jim King	Nick Atzal	Scott Sain	Rethanasap Bar	Swarna Raju	Kenneth Massey	Donna Jensen	Cheryl Berry	Meghan Mackay	Kristina Neal
1	1	Project Management and Coordination														
1	1.1.0	Project Coordination	16	\$860.00	\$2,139.77	12										
1	1.2.0	SEIS Consultant Coordination	0	\$0.00	\$0.00											4
Subtotal			16	\$860.00	\$2,139.77	12	0	0	0	0	0	0	0	0	0	4
1	4	Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development														0
4.1	4.1.0	Geotechnical	0	\$0.00	\$0.00											
	4.1.1	Field Explorations	0	\$0.00	\$0.00											
	4.1.1a	Upper and Lower Goodwin Reach Debris Deflection Berms/Levees	0	\$0.00	\$0.00											
	4.1.1b	In-Stream Sediments Traps	0	\$0.00	\$0.00											
	4.1.1c	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 Engineering Analyses	0	\$0.00	\$0.00											
	4.1.4	Geotechnical Engineering Reports	0	\$0.00	\$0.00											
4.2	4.2.0	Groundwater	0	\$0.00	\$0.00											
4.3	4.3.0	Survey	0	\$0.00	\$0.00											
	4.3.1	Sediment Traps	0	\$0.00	\$0.00											
	4.3.2	Oat Coles North (Parker) Site	0	\$0.00	\$0.00											
	4.3.3	Goodwin North (Barlean) Site	0	\$0.00	\$0.00											
	4.3.4	Stream Cross Sections	0	\$0.00	\$0.00											
	4.3.5	Sediment Pilot Site	0	\$0.00	\$0.00											
4.4	4.4.0	Debris Flow Modeling	0	\$0.00	\$0.00											
4.5	4.5.0	Hydrologic and Hydraulic Modeling	0	\$0.00	\$0.00											
4.6	4.6.0	Environmental Monitoring - Weather stations	0	\$0.00	\$0.00											
Subtotal			0	\$0.00	\$0.00	0	0	0	0	0	0	0	0	0	0	0
1	5	Repository Site Analysis and Coordination for SEIS														0
5.1	5.1.0	Geotechnical	0	\$0.00	\$0.00											
	5.1.1	Geotechnical Explorations	0	\$0.00	\$0.00											
	5.1.1a	Canyon Central (Millman)	0	\$0.00	\$0.00											
	5.1.1b	Goodwin North (Barlean) Site	0	\$0.00	\$0.00											
	5.1.1c	Oat Coles (Parker) Site	0	\$0.00	\$0.00											
	5.1.1d	Oat Coles South	0	\$0.00	\$0.00											
	5.1.2	Field Logs, Laboratory Testing, Geological Interpretations	0	\$0.00	\$0.00											
	5.1.3	Geotechnical Engineering Assessments	0	\$0.00	\$0.00											
	5.1.4	Reporting	0	\$0.00	\$0.00											
5.2	5.2.0	Groundwater	0	\$0.00	\$0.00											
5.3	5.3.0	Surface Water	0	\$0.00	\$0.00											
		30% stormwater Report 1 site (Canyon Central)	0	\$0.00	\$0.00											
		Conceptual Plans for 6 sites (Goodwin South, Oat Coles South, Oat Coles North, Goodwin North, Canyon North, and Canyon South) to support SEIS	0	\$0.00	\$0.00											
		Interim stormwater design for Oat Coles North site and Goodwin North	0	\$0.00	\$0.00											
5.4	5.4.0	Wetlands	0	\$0.00	\$0.00											
	5.4.1	Desktop Analyses	0	\$0.00	\$0.00											
	5.4.2	Field Assessment	0	\$0.00	\$0.00											
	5.4.3	Documentation	0	\$0.00	\$0.00											
	5.4.3a	Reconnaissance-Level Analyses	0	\$0.00	\$0.00											
	5.4.3b	Wetland Delineations	0	\$0.00	\$0.00											
	5.4.3c	Wetland Characterization	0	\$0.00	\$0.00											
	5.4.4	Wetlands Fieldwork Coordination	0	\$0.00	\$0.00											
5.5	5.5.0	Traffic Analysis	84	\$4,510.00	\$11,221.33	6		50			4		20		4	
Subtotal			84	\$4,510.00	\$11,221.33	6	0	50	0	4	0	20	0		4	0
1	6	SCSMAP Projects Design Development														0
6.1	6.1.0	Sediment Traps	52	\$2,816.00	\$7,006.49	2	8		16		16			8		2
6.2	6.2.0	Sediment Basins	0	\$0.00	\$0.00											
6.3	6.3.0	Debris Flow Deflection Berm and Levee	0	\$0.00	\$0.00											
6.4	6.4.0	Williams Pipeline Crossing	128	\$6,938.00	\$17,262.44	2	24		36	8	40			16		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											
6.7	6.7.0	Repository Design	0	\$0.00	\$0.00											
	6.7.1	Interim Site Development	0	\$0.00	\$0.00											
	6.7.2	Repository Design	0	\$0.00	\$0.00											
6.8	6.8.0	Basis of Design Report	0	\$0.00	\$0.00											
Subtotal			180	\$9,754.00	\$24,268.93	4	32	0	52	6	56	0	24	0	0	6
TOTAL			280	\$15,124.00	\$37,630.02	22	32	50	52	10	56	20	24	4	4	6
Reflects total hours. Does not reflect the Total Price.																
Direct Labor Rate Per Hour				\$65.00	\$70.00		\$80.00	\$80.00	\$80.00	\$80.00	\$42.00	\$40.00	\$42.00	\$30.00	\$20.00	\$79.00
Overhead Rate				148.81%	\$96.73	\$104.17	\$89.29	\$89.29	\$74.41	\$62.50	\$59.52	\$62.50	\$44.64	\$29.76	\$117.56	
Total Rate Per Hour					\$161.73	\$174.17	\$149.29	\$149.29	\$124.41	\$104.50	\$89.52	\$104.50	\$74.64	\$49.76	\$196.56	
Total Labor Cost					\$37,630.02	\$5,573.34	\$7,464.30	\$7,762.87	\$1,244.05	\$5,852.01	\$1,990.48	\$2,508.00	\$298.57	\$199.05	\$1,179.36	
Total Direct Labor Cost					\$15,124.00	\$1,430.00	\$2,240.00	\$3,000.00	\$3,120.00	\$500.00	\$2,352.00	\$800.00	\$1,008.00	\$120.00	\$80.00	\$474.00
Fee %					29.00%											
Escalation %					0.00%											
Basis Year					2018											

EXHIBIT A: WATERSHED SCIENCE & ENGINEERING LABOR FEE

		PHASES / TASKS / SUBTASKS	Watershed Science & Engineering			Principal	Senior Engineer I	Senior Geomorphologist	Staff Engineer	Contract Administrator
Phase or Task	Task or Subtask	PHASES / TASKS / SUBTASKS TITLES	SUB #6's Total Labor Hours	SUB #6's Direct Labor Cost	SUB #6's Total Labor Cost	Jeff Johnson	Bob Elliot	Dan Scott	Tim Tschetter	Joan Schroder
1	1	Project Management and Coordination								
1	1.1.0	Project Coordination	44	\$2,434.68	\$7,022.35	24	8		4	8
1	1.2.0	SEIS Consultant Coordination	0	\$0.00	\$0.00					
		Subtotal	44	\$2,434.68	\$7,022.35	24	8	0	4	8
1	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	\$0.00					
	4.1.1	Field Explorations	0	\$0.00	\$0.00					
	4.1.1a	Upper and Lower Goodwin Reach Debris Deflection Berms/Levees	0	\$0.00	\$0.00					
	4.1.1b	In-Stream Sediments Traps	0	\$0.00	\$0.00					
	4.1.1c	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 Engineering Analyses	0	\$0.00	\$0.00					
	4.1.4	Geotechnical Engineering Reports	0	\$0.00	\$0.00					
4.2	4.2.0	Groundwater	0	\$0.00	\$0.00					
4.3	4.3.0	Survey	0	\$0.00	\$0.00					
	4.3.1	Sediment Traps	0	\$0.00	\$0.00					
	4.3.2	Oat Coles North (Parker) Site	0	\$0.00	\$0.00					
	4.3.3	Goodwin North (Barlean) Site	0	\$0.00	\$0.00					
	4.3.4	Stream Cross Sections	0	\$0.00	\$0.00					
	4.3.5	Sediment Pilot Site	0	\$0.00	\$0.00					
4.4	4.4.0	Debris Flow Modeling	122	\$6,125.02	\$17,666.40	12	60		50	
4.5	4.5.0	Hydrologic and Hydraulic Modeling	558	\$26,074.48	\$75,206.82	100	146		312	
4.6	4.6.0	Environmental Monitoring - Weather stations	0	\$0.00	\$0.00					
		Subtotal	680	\$32,199.50	\$92,873.02	112	206	0	362	0
1	5	Repository Site Analysis and Coordination for SEIS								
5.1	5.1.0	Geotechnical	0	\$0.00	\$0.00					
	5.1.1	Geotechnical Explorations	0	\$0.00	\$0.00					
	5.1.1a	Canyon Central (Millman)	0	\$0.00	\$0.00					
	5.1.1b	Goodwin North (Barlean) Site	0	\$0.00	\$0.00					
	5.1.1c	Oat Coles (Parker) Site	0	\$0.00	\$0.00					
	5.1.1d	Oat Coles South	0	\$0.00	\$0.00					
	5.1.2	Field Logs, Laboratory Testing, Geological Interpretations	0	\$0.00	\$0.00					
	5.1.3	Geotechnical Engineering Assessments	0	\$0.00	\$0.00					
	5.1.4	Reporting	0	\$0.00	\$0.00					
5.2	5.2.0	Groundwater	0	\$0.00	\$0.00					
5.3	5.3.0	Surface Water	0	\$0.00	\$0.00					
		30% stormwater Report 1 site (Canyon Central)	0	\$0.00	\$0.00					
		Conceptual Plans for 8 sites (Goodwin South, Oat Coles South, Oat Coles North, Goodwin North, Canyon North, and Canyon South) to support SEIS	0	\$0.00	\$0.00					
		Interim stormwater design for Oat Coles North site and Goodwin North	0	\$0.00	\$0.00					
5.4	5.4.0	Wetlands	0	\$0.00	\$0.00					
	5.4.1	Desktop Analysis	0	\$0.00	\$0.00					
	5.4.2	Field Assessment	0	\$0.00	\$0.00					
	5.4.3	Documentation	0	\$0.00	\$0.00					
	5.4.3a	Reconnaissance-Level Analyses	0	\$0.00	\$0.00					
	5.4.3b	Wetland Delineations	0	\$0.00	\$0.00					
	5.4.3c	Wetland Characterization	0	\$0.00	\$0.00					
	5.4.4	Wetlands Fieldwork Coordination	0	\$0.00	\$0.00					
5.5	5.5.0	Traffic Analysis	0	\$0.00	\$0.00					
		Subtotal	0	\$0.00	\$0.00	0	0	0	0	0
1	6	SCSMAP Projects Design Development								
6.1	6.1.0	Sediment Traps	18	\$780.74	\$2,251.89	2	4		12	
6.2	6.2.0	Sediment Basins	12	\$524.98	\$1,514.20	2	2		8	
6.3	6.3.0	Debris Flow Deflection Berm and Levee	10	\$457.88	\$1,320.09	2	2		6	
6.4	6.4.0	Williams Pipeline Crossing	18	\$928.84	\$2,679.05	8	2		8	
6.5	6.5.0	Creek Channel Conveyance Improvements	0	\$0.00	\$0.00	0	0		0	
6.6	6.6.0	Creek Channel Maintenance Support	18	\$794.20	\$2,290.71	4	2		12	
6.7	6.7.0	Repository Design	0	\$0.00	\$0.00					
	6.7.1	Interim Site Development	0	\$0.00	\$0.00					
	6.7.2	Repository Design	0	\$0.00	\$0.00					
6.8	6.8.0	Basis of Design Report	62	\$3,001.90	\$8,658.38	8	24		30	
		Subtotal	138	\$6,488.34	\$18,714.32	26	36	0	76	0
		TOTAL	862	\$41,122.52	\$118,608.68	162	250	0	442	8
Reflects total hours. Does not reflect the Total Price.										
Direct Labor Rate Per Hour						\$67.31	\$60.58	\$45.00	\$33.65	\$25.00
Overhead Rate				188.43%		\$126.83	\$114.15	\$84.79	\$63.41	\$47.11
Total Rate Per Hour						\$194.14	\$174.73	\$129.79	\$97.06	\$72.11
Total Labor Cost				\$118,608.68		\$31,451.04	\$43,682.72	\$0.00	\$42,899.06	\$576.86
Total Direct Labor Cost				\$41,122.52		\$10,904.22	\$15,145.00	\$0.00	\$14,873.30	\$200.00
Fee %				29.00%						
Escalation %				0.00%						
Basis Year				2018						

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

Note: Invoiced ODC are those costs for which the Consultant will have a receipt from an independent company for goods or services. These expenses are documented with receipts for actual costs such as for large-scale printing jobs, city-to-city travel, laboratory tests, drilling, etc. Each specific type of cost should be itemized on this sheet, with an estimated unit cost entered at the bottom, and the number of units for each task/subtask entered in the cells corresponding to the (sub)task.

				Horner					Aspect Consulting							
Phase or Task #	Task or Subtask #	PHASES / TASKS / SUBTASKS TITLES	Total Invoiced ODC	Prime's Total Invoiced ODC	TRIPS	na	na	na	Sub #1's Total Invoiced ODC	day	day	day	per site	per site		
1	1	Project Management and Coordination														
1	1.1	Project Coordination	\$406.00	\$406.00	700				\$0.00							
1	1.2	SEIS Consultant Coordination	\$0.00	\$0.00					\$0.00							
Subtotal			\$406.00	\$406.00	700	0	0	0	\$0.00	0	0	0	0	0		
1	4	Site-Specific Analysis and Data Collection for Project Design and Repository Sites Preliminary Design Development														
4.1	4.1.0	Geotechnical	\$0.00	\$0.00					\$0.00							
4.1	4.1.1	Field Explorations	\$300.00	\$0.00					\$300.00	2						
4.1	4.1.1a	Upper and Lower Goodwin Reach Debris Deflection Berms	\$300.00	\$0.00					\$300.00	2						
4.1	4.1.1b	In-Stream Sediments Traps	\$13,800.00	\$0.00					\$13,800.00	2		3				
4.1	4.1.1c	Goodwin Reach Sediment Basins	\$9,450.00	\$0.00					\$9,450.00	3		2				
4.1	4.1.2	Field Logs, Laboratory Testing, Geologic Interpretations	\$4,000.00	\$0.00					\$4,000.00							
4.1	4.1.3	Geotechnical Engineering Analyses	\$0.00	\$0.00					\$0.00							
4.1	4.1.4	Geotechnical Engineering Reports	\$0.00	\$0.00					\$0.00							
4.2	4.2.0	Groundwater	\$5,058.00	\$0.00					\$0.00							
4.3	4.3.0	Survey	\$0.00	\$0.00					\$0.00							
4.3	4.3.1	Sediment Traps	\$0.00	\$0.00					\$0.00							
4.3	4.3.2	Oat Coles North (Parker) Site	\$0.00	\$0.00					\$0.00							
4.3	4.3.3	Goodwin North (Barlean) Site	\$0.00	\$0.00					\$0.00							
4.3	4.3.4	Stream Cross Sections	\$0.00	\$0.00					\$0.00							
4.3	4.3.5	Sediment Pilot Gic	\$0.00	\$0.00					\$0.00							
4.4	4.4.0	Debris Flow Modeling	\$0.00	\$0.00					\$0.00							
4.5	4.5.0	Hydrologic and Hydraulic Modeling	\$301.60	\$0.00					\$0.00							
4.6	4.6.0	Environmental Monitoring - Weather stations	\$8,500.00	\$8,500.00	2		1	1	\$0.00							
Subtotal			\$41,709.60	\$8,500.00	0	2	1	1	\$27,850.00	9	0	5	0	1		
1	5	Repository Site Analysis and Coordination for SEIS														
5.1	5.1.0	Geotechnical	\$0.00	\$0.00					\$0.00							
5.1	5.1.1	Geotechnical Explorations	\$150.00	\$0.00					\$150.00	1						
5.1	5.1.1a	Canyon Central (Millman)	\$11,150.00	\$0.00					\$11,150.00	1	1	2				
5.1	5.1.1b	Goodwin North (Barlean) Site	\$150.00	\$0.00					\$150.00	1						
5.1	5.1.1c	Oat Coles (Parker) Site	\$2,150.00	\$0.00					\$2,150.00	1	1					
5.1	5.1.1d	Oat Coles South	\$2,150.00	\$0.00					\$2,150.00	1	1					
5.1	5.1.2	Field Logs, Laboratory Testing, Geologic Interpretations	\$4,000.00	\$0.00					\$4,000.00							
5.1	5.1.3	Geotechnical Engineering Assessments	\$0.00	\$0.00					\$0.00							
5.1	5.1.4	Reporting	\$0.00	\$0.00					\$0.00							
5.2	5.2.0	Groundwater	\$58.00	\$0.00					\$0.00							
5.3	5.3.0	Surface Water	\$0.00	\$0.00					\$0.00							
		30% stormwater Report 1 site (Canyon Central)	\$0.00	\$0.00					\$0.00							
		Conceptual Plans for 6 sites (Goodwin South, Oat Coles So	\$0.00	\$0.00					\$0.00							
		Interim stormwater design for Oat Coles North site and Goo	\$0.00	\$0.00					\$0.00							
5.4	5.4.0	Wetlands	\$0.00	\$0.00					\$0.00							
5.4	5.4.1	Desktop Analysis	\$0.00	\$0.00					\$0.00							
5.4	5.4.2	Field Assessment	\$1,108.88	\$0.00					\$0.00							
5.4	5.4.3	Documentation	\$0.00	\$0.00					\$0.00							
5.4	5.4.3a	Reconnaissance-Level Analyses	\$0.00	\$0.00					\$0.00							
5.4	5.4.3b	Wetland Delineations	\$0.00	\$0.00					\$0.00							
5.4	5.4.3c	Wetland Characterization	\$0.00	\$0.00					\$0.00							
5.4	5.4.4	Wetlands Fieldwork Coordination	\$0.00	\$0.00					\$0.00							
5.5	5.5.0	Traffic Analysis	\$142.68	\$0.00					\$0.00							
Subtotal			\$20,059.56	\$0.00	0	0	0	0	\$18,750.00	5	3	2	4	0		
1	6	SCSMAP Projects Design Development														
6.1	6.1.0	Sediment Traps	\$20.88	\$0.00					\$0.00							
6.2	6.2.0	Sediment Basins	\$174.00	\$174.00	300				\$0.00							
6.3	6.3.0	Debris Flow Deflection Berm and Levee	\$0.00	\$0.00					\$0.00							
6.4	6.4.0	Williams Pipeline Crossing	\$316.68	\$174.00	300				\$0.00							
6.5	6.5.0	Creek Channel Conveyance Improvements	\$0.00	\$0.00					\$0.00							
6.6	6.6.0	Creek Channel Maintenance Support	\$0.00	\$0.00					\$0.00							
6.7	6.7.0	Repository Design	\$0.00	\$0.00					\$0.00							
6.7	6.7.1	Interim Site Development	\$406.00	\$406.00	700				\$0.00							
6.7	6.7.2	Repository Design	\$0.00	\$0.00					\$0.00							
6.8	6.8.0	Basis of Design Report	\$0.00	\$0.00					\$0.00							
Subtotal			\$917.56	\$754.00	1,300	0	0	0	\$0.00	0	0	0	0	0		
TOTAL			\$63,092.72	\$9,660.00	2,000	2	1	1	\$46,600.00	14	3	7	4	1		
ODC Estimated Unit Cost				\$0.58	\$2,000.00	\$3,000.00	\$1,500.00	ODC Estimated Unit Cost	\$150.00	\$2,000.00	\$4,500.00	\$750.00	\$4,000.00			
Total ODC				\$9,660.00	\$1,160.00	\$4,000.00	\$3,000.00	\$1,500.00	Total ODC	\$46,600.00	\$4,100.00	\$9,000.00	\$21,500.00	\$3,000.00	\$4,000.00	

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

		Associated Earth Sciences			PSE dba Element Solutions			TranTech Engineering			Watershed Science & Engineering		
Phase or Task #	Task or Subtask #	Sub #2's Total Invoiced ODC	TRIPS	EACH	SUB #4's Total Invoiced ODC	Mileage	GPS Rental	SUB #5's Total Invoiced ODC	TRIPS	PAGES	SUB #6's Total Invoiced ODC	Mileage	PAGES
1	1												
1	1.1.0	\$0.00			\$0.00			\$0.00			\$0.00		
1	1.2.0	\$0.00			\$0.00			\$0.00			\$0.00		
		\$0.00	0	0	\$0.00	0	0	\$0.00	0	0	\$0.00	0	0
1	4												
4.1	4.1.0	\$0.00			\$0.00			\$0.00			\$0.00		
	4.1.1	\$0.00			\$0.00			\$0.00			\$0.00		
	4.1.1a	\$0.00			\$0.00			\$0.00			\$0.00		
	4.1.1b	\$0.00			\$0.00			\$0.00			\$0.00		
	4.1.1c	\$0.00			\$0.00			\$0.00			\$0.00		
	4.1.2	\$0.00			\$0.00			\$0.00			\$0.00		
	4.1.3	\$0.00			\$0.00			\$0.00			\$0.00		
	4.1.4	\$0.00			\$0.00			\$0.00			\$0.00		
4.2	4.2.0	\$5,058.00	100	4	\$0.00			\$0.00			\$0.00		
4.3	4.3.0	\$0.00			\$0.00			\$0.00			\$0.00		
	4.3.1	\$0.00			\$0.00			\$0.00			\$0.00		
	4.3.2	\$0.00			\$0.00			\$0.00			\$0.00		
	4.3.3	\$0.00			\$0.00			\$0.00			\$0.00		
	4.3.4	\$0.00			\$0.00			\$0.00			\$0.00		
	4.3.5	\$0.00			\$0.00			\$0.00			\$0.00		
4.4	4.4.0	\$0.00			\$0.00			\$0.00			\$0.00		
4.5	4.5.0	\$0.00			\$0.00			\$0.00			\$0.00		
4.6	4.6.0	\$0.00			\$0.00			\$0.00			\$301.60	520	
		\$5,058.00	100	4	\$0.00	0	0	\$0.00	0	0	\$301.60	520	0
1	5												
5.1	5.1.0	\$0.00			\$0.00			\$0.00			\$0.00		
	5.1.1	\$0.00			\$0.00			\$0.00			\$0.00		
	5.1.1a	\$0.00			\$0.00			\$0.00			\$0.00		
	5.1.1b	\$0.00			\$0.00			\$0.00			\$0.00		
	5.1.1c	\$0.00			\$0.00			\$0.00			\$0.00		
	5.1.1d	\$0.00			\$0.00			\$0.00			\$0.00		
	5.1.2	\$0.00			\$0.00			\$0.00			\$0.00		
	5.1.3	\$0.00			\$0.00			\$0.00			\$0.00		
	5.1.4	\$0.00			\$0.00			\$0.00			\$0.00		
5.2	5.2.0	\$58.00	100		\$0.00			\$0.00			\$0.00		
5.3	5.3.0	\$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			\$0.00		
5.4	5.4.0	\$0.00			\$0.00			\$0.00			\$0.00		
	5.4.1	\$0.00			\$0.00			\$0.00			\$0.00		
	5.4.2	\$0.00			\$1,108.88	803	40	\$0.00			\$0.00		
	5.4.3	\$0.00			\$0.00			\$0.00			\$0.00		
	5.4.3a	\$0.00			\$0.00			\$0.00			\$0.00		
	5.4.3b	\$0.00			\$0.00			\$0.00			\$0.00		
	5.4.3c	\$0.00			\$0.00			\$0.00			\$0.00		
	5.4.4	\$0.00			\$0.00			\$0.00			\$0.00		
5.5	5.5.0	\$0.00			\$0.00			\$142.68	246		\$0.00		
		\$58.00	100	0	\$1,108.88	803	40	\$142.68	246	0	\$0.00	0	0
1	6												
6.1	6.1.0	\$0.00			\$0.00			\$20.88	36		\$0.00		
6.2	6.2.0	\$0.00			\$0.00			\$0.00			\$0.00		
6.3	6.3.0	\$0.00			\$0.00			\$0.00			\$0.00		
6.4	6.4.0	\$0.00			\$0.00			\$142.68	246		\$0.00		
6.5	6.5.0	\$0.00			\$0.00			\$0.00			\$0.00		
6.6	6.6.0	\$0.00			\$0.00			\$0.00			\$0.00		
6.7	6.7.0	\$0.00			\$0.00			\$0.00			\$0.00		
	6.7.1	\$0.00			\$0.00			\$0.00			\$0.00		
	6.7.2	\$0.00			\$0.00			\$0.00			\$0.00		
6.8	6.8.0	\$0.00			\$0.00			\$0.00			\$0.00		
		\$0.00	0	0	\$0.00	0	0	\$163.56	282	0	\$0.00	0	0
		\$5,116.00	200	4	\$1,108.88	803	40	\$306.24	528	0	\$301.60	520	0
ODC Estimated Unit Cost		\$0.58	\$750.00	\$1,000.00	ODC Estimated Unit Cost	\$0.58	\$16.00	ODC Estimated Unit Cost	\$0.58	\$0.00	ODC Estimated Unit Cost	\$0.58	
Total ODC		\$5,116.00	\$116.00	\$3,000.00	\$2,000.00	Total ODC	\$1,108.88	\$465.68	\$643.20	Total ODC	\$306.24	\$306.24	\$0.00
Total ODC		\$5,116.00	\$116.00	\$3,000.00	\$2,000.00	Total ODC	\$1,108.88	\$465.68	\$643.20	Total ODC	\$306.24	\$306.24	\$0.00
Total ODC		\$5,116.00	\$116.00	\$3,000.00	\$2,000.00	Total ODC	\$1,108.88	\$465.68	\$643.20	Total ODC	\$306.24	\$306.24	\$0.00

Actuals Not To Exceed Table (ANTE)

Whatcom County Agreement: RFP-18-42
 Swift Creek Sediment Management Action Plan Implementation
 Herrera Environmental Consultants, Inc.
 2200 Sixth Avenue, Suite 1100
 Seattle, WA 98121

Job Classifications	Direct Labor Rate NTE*	Overhead NTE*	Fixed Fee NTE	All Inclusive Hourly Billing 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)

Whatcom County Agreement: RFP-18-42

Swift Creek Sediment Management Action Plan Implementation

Associated Earth Sciences, Inc.

911 5th Ave

Kirkland, WA 98033

[illegible]

Actuals Not To Exceed Table (ANTE)

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 NTE*	Overhead NTE*	Fixed Fee NTE	All Inclusive Hourly Billing Rate NTE
		193.51%	29.00%	
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

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*	Fixed Fee NTE	All Inclusive Hourly Billing Rate NTE
		0.00%	0.00%	
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

Actuals Not To Exceed Table (ANTE)

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 NTE*	Overhead NTE*	Fixed Fee NTE	All Inclusive Hourly Billing Rate NTE
		111.77%	29.00%	
Principal Scientist	\$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

Actuals Not To Exceed Table (ANTE)

Whatcom County Agreement: RFP-18-42
Swift Creek Sediment Management Action Plan Implementation
TranTech Engineering, LLC
1221 Fraser Street; Suite E-3
Bellingham, WA 98229

Job Classifications	Direct Labor Rate NTE*	Overhead NTE*	Fixed Fee NTE	All Inclusive Hourly Billing Rate NTE
		148.81%	29.00%	
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

Actuals Not To Exceed Table (ANTE)

Whatcom County Agreement: RFP-18-42
 Swift Creek Sediment Management Action Plan Implementation
 Watershed Science and Engineering
 506 2nd Ave, Suite 2700
 Seattle, WA 98104

Job Classifications	Direct Labor Rate NTE*	Overhead NTE*	Fixed Fee NTE	All Inclusive Hourly Billing Rate NTE
		188.43%	29.00%	
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 cost-benefit 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:
 - 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;
 - 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)
 - Approximate property boundaries
 - 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 (Millman)

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 be 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)
 - 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:
 - 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 Fieldwork 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

- 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
 - 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

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:

- 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 develop 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
 - Excavation and stockpile plan
 - Interim filling plan
 - Final grading plan and drainage
 - Stormwater treatment plan for Final Grading
 - Details (2 sheets) – standard cap, runoff 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:
 - 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