

## **Appendix D**

### Monitoring and Maintenance Cost Tables

**TABLE D-1: Tailings Treatment Facility (TTF) - Facility Monitoring Cost Estimate.**

**Post-Closure Quarterly Surface Water Monitoring at TTF (Years 2-4)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Bi-annually				
Number of Years	3				
Number of Events	9				
Number of SW Locations	3				
Laboratory Analysis	3	\$422	\$1,266	\$3,798	\$11,394
Field Labor (hrs/event)	10	\$75	\$750	\$2,250	\$6,750
Reporting Labor (hrs/event)	6	\$90	\$540	\$1,080	\$3,240
Helicopter Flight Time (hrs/event)	5	\$1,526	\$7,630	\$7,630	\$22,890
Helicopter Standby (hrs/event)	5	\$725	\$3,625	\$3,625	\$10,875
<b>Total</b>			<b>\$13,811</b>	<b>\$18,383</b>	<b>\$55,149</b>

**Assumptions**

1. Surface water monitoring during Q1 for years 2,3, and 4 would be conducted in conjunction with temperature, pH, and oxygen profiling, therefore transportation cost is only included for three inspections during the post-closure period.
2. Helicopter support quote from Coastal Helicopters, Juneau, Alaska. The estimate is the hourly rate for a A-star B-2 Helicopter during flight and during standby. The helicopter can carry a crew of six with light field gear (roughly 1200 lbs).
3. Parameters analyzed during TTF Water Quality analysis include: Al, NH4, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, NO3, Se, Ag, SO4, TDS, Zn, Mn, and pH

**Post-Closure Annual Surface Water Monitoring at TTF (Years 10, 15, 20 and 30)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Annual				
Number of Years	4				
Number of Events	4				
Number of SW Locations	3				
Laboratory Analysis	3	\$422	\$1,266	\$1,266	\$5,064
Field Labor (hrs/event for year 15 and 30)	12	\$75	\$900	\$900	\$1,800
Field Labor (hrs/event for year 10 and 20)	10	\$75	\$750	\$750	\$1,500
Reporting Labor (hrs/event)	6	\$90	\$540	\$540	\$2,160
Helicopter Flight Time (hrs/event)	5	\$1,526	\$7,630	\$7,630	\$30,520
Helicopter Standby (hrs/event)	5	\$725	\$3,625	\$3,625	\$14,500
<b>Total</b>			<b>\$14,711</b>	<b>\$14,711</b>	<b>\$55,544</b>

**Assumptions**

1. In post closure years 1 to 5 each sample location will be monitored quarterly. In years 10, 15, 20 and 30 each location will be sampled annually.
2. The initial dam safety inspection would occur during the reclamation period.
3. Helicopter support quote from Coastal Helicopters, Juneau, Alaska. The estimate is the hourly rate for a A-star B-2 Helicopter during flight and during standby. The helicopter can carry a crew of six with light field gear (roughly 1200 lbs).

**Reclamation Period TTF Dam Safety Inspections, Monitoring, and Maintenance (Year 1 to 3)**

	Quantity	Unit Cost	Event Cost	Total Cost
Frequency	Annual			
Number of Events	3			
Geotechnical Engineer (hrs)	48	\$140	\$6,720	\$20,160
Staff Engineer (hrs)	48	\$90	\$4,320	\$12,960
Laborers (hrs)/Equipment Cost (hr)	20	\$65	\$1,303	\$3,909
Reporting (hrs)	40	\$140	\$5,600	\$16,800
<b>Total</b>			<b>Varies</b>	<b>\$53,829</b>

**Assumptions**

1. Dam safety inspections, monitoring and maintenance would occur during reclamation activities therefore transportation cost is not included.
2. Geotechnical and staff engineer hours account for 38 hours of planning and preparation and a 10 hour dam inspection.
3. Labor hours account for two laborers at 10 hrs each to perform dam/spillway maintenance including brush/debris removal, erosion repair, and miscellaneous. This cost includes hourly equipment rate.

**Post-Closure TTF Dam Safety Inspections, Monitoring, and Maintenance (Year 1 to 30)**

	Quantity	Unit Cost	Event Cost	Total Cost
Frequency	Every 3 Years			
Number of Events	11			
Geotechnical Engineer (hrs)	48	\$140	\$6,720	\$73,920
Staff Engineer (hrs)	48	\$90	\$4,320	\$47,520
Laborers (hrs) (2@10hrs)	20	\$61	\$1,211	\$13,317
Chain Saws (2@8hrs)	16	\$4.62	\$74	\$813
Reporting (hrs)	40	\$140	\$5,600	\$61,600
Helicopter Flight Time (hrs/event)	4	\$1,526	\$6,104	\$48,832
Helicopter Standby (hrs/event)	6	\$725	\$4,350	\$34,800
<b>Total</b>			<b>Varies</b>	<b>\$280,802</b>

**Assumptions**

1. Three of the dam safety inspections would occur at the same time as water quality monitoring, therefore transportation cost is only included for eight inspections during the post-closure period.
2. Geotechnical and staff engineer hours account for 38 hours of planning and preparation and a 10 hour dam inspection.
3. Labor hours account for two laborers at 10 hrs each to perform dam/spillway maintenance including brush/debris removal, erosion repair, and miscellaneous. This cost includes hourly equipment rate.
4. Helicopter support quote from Coastal Helicopters, Juneau, Alaska. The estimate is the hourly rate for a A-star B-2 Helicopter during flight and during standby. The helicopter can carry a crew of six with light field gear (roughly 1200 lbs).

**TABLE D-2: TTF Ecological Monitoring Program Cost Estimate.**

**TTF Annual Monitoring - Fish, Plants and Invertebrates (Years 1 to 10 Post-closure)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Annual				
Number of Years	10				
Number of Events	10				
Project Scientist (Field/Mobilization) (hr)	36	\$90	\$3,240	\$3,240	\$32,400
Project Scientist (Reporting) (hr)	24	\$90	\$2,160	\$2,160	\$21,600
Field Technician (hr)	30	\$75	\$2,250	\$2,250	\$22,500
Fish Traps and Nets (day)	3	\$100	\$300	\$300	\$3,000
Monitoring Equipment (day)	3	\$200	\$600	\$600	\$6,000
Phytoplankton Chlorophyll A (sample)	10	\$35	\$350	\$350	\$3,500
Digital Camera (day)	3	\$20	\$60	\$60	\$600
Digital Scale (day)	3	\$50	\$150	\$150	\$1,500
PIT Tag Scanner (day)	3	\$50	\$150	\$150	\$1,500
Miscellaneous (per event)	1	\$300	\$300	\$300	\$3,000
Landing Craft (day)	2	\$3,612	\$7,224	\$7,224	\$72,240
UTV (day)	3	\$150	\$450	\$450	\$4,500
	<b>Total</b>		<b>\$17,234</b>	<b>\$17,234</b>	<b>\$172,340</b>

**Assumptions**

1. TTF Monitoring for this task to occur during July-August and assumes three 10-hour field days. Two biologist would camp on site during the field work.
2. Transportation costs assume that the biologist would travel to the site on a landing craft and use a UTV to access the TTF. Two landing craft trips are required for each event.

**TTF Temperature, pH, Oxygen Profiling and Whole Body Metal Analysis (Years 1-10 Post-closure)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Annual				
Events per year	1				
Number of Years	10				
Number of Events	10				
Project Scientist (Planning, Field and Mobilization) (hr)	40	\$90	\$3,600	\$3,600	\$36,000
Project Scientist (Reporting) (hr)	24	\$90	\$2,160	\$2,160	\$21,600
Field Technician (hr)	30	\$75	\$2,250	\$2,250	\$22,500
Handheld GPS (day)	2	\$20	\$40	\$40	\$400
Hydrolab Multi-Probe (day)	2	\$150	\$300	\$300	\$3,000
Whole Body Metals Analysis (sample)	6	\$250	\$1,500	\$1,500	\$15,000
Miscellaneous (per event)	1	\$300	\$300	\$300	\$3,000
Helicopter Flight Time (hrs/event)	15	\$1,526	\$22,890	\$22,890	\$228,900
Helicopter Standby (hrs/event)	15	\$725	\$10,875	\$10,875	\$108,750
	<b>Total</b>		<b>\$43,915</b>	<b>\$43,915</b>	<b>\$439,150</b>

**Assumptions**

1. Monitoring and fish trapping would be completed over a three day period in late winter. The budget assumes that 15 holes would be profiled. Fish traps would be set to collect samples for the whole body metals analysis.
2. Biologist would travel to the TTF lake by helicopter each day during the 3 day event.
3. Helicopter support quote from Coastal Helicopters, Juneau, Alaska. The estimate is the hourly rate for a A-star B-2 Helicopter during flight and during standby. The helicopter can carry a crew of six with light field gear (roughly 1200 lbs).
4. Project scientist hours account for 10 hours of planning and preparation and an 30 field hours.

**TOTAL TTF ECOLOGICAL MONITORING** **\$611,490**

**TABLE D-3: Stream Ecological Monitoring Program Cost Estimate.**

**Sediment and Metals Toxicity Sampling (Years 1, 5, 10, 20 and 30 Post-closure)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Annual				
Number of Years	5				
Number of Events	5				
Project Scientist (Field/Mobilization) (hr) <sup>4</sup>	18	\$90	\$1,620	\$1,620	\$8,100
Project Scientist (Sample Prep. And Reporting) (hr)	12	\$90	\$1,080	\$1,080	\$5,400
Field Technician (hr)	10	\$75	\$750	\$750	\$3,750
Sediment, Physical Composition, Metals and Sediment Toxicit	4	\$2,428	\$9,712	\$9,712	\$48,560
Ponar Sampler (day)	2	\$50	\$100	\$100	\$500
Handheld GPS (day)	2	\$20	\$40	\$40	\$200
Digital Camera (day)	2	\$20	\$40	\$40	\$200
Miscellaneous (per event)	1	\$3,000	\$3,000	\$3,000	\$15,000
Helicopter Flight Time (hrs/event)	5	\$1,526	\$7,630	\$7,630	\$38,150
Helicopter Standby (hrs/event)	5	\$725	\$3,625	\$3,625	\$18,125
<b>Total</b>			<b>\$27,597</b>	<b>\$27,597</b>	<b>\$137,985</b>

**Assumptions**

1. Monitoring and sampling to be completed during May of each year. Sediment sample locations are located in Upper Slate Creek, Middle Slate Creek and Lower Slate Creek.
2. Helicopter support quote from Coastal Helicopters, Juneau, Alaska. The estimate is the hourly rate for a A-star B-2 Helicopter during flight and during standby. The helicopter can carry a crew of six with light field gear (roughly 1200 lbs).
3. Miscellaneous cost includes laboratory reporting charge.
3. Project scientist (field/mobilization) hours account for 8 hours of planning and preparation and a 10 hour field day.

**Spawning Salmon Escapement surveys (Years 1, 2, 7, 8, 13 and 14 Post-closure)**

**No Longer in the Plan 1/2/13**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Annual				
Number of Years	6				
Number of Events	6				
Project Scientist (Field/Mobilization) (hr) <sup>4</sup>	12	\$90	\$1,080	\$1,080	\$6,480
Project Scientist (Reporting) (hr)	8	\$90	\$720	\$720	\$4,320
Field Technician (hr)	10	\$75	\$750	\$750	\$4,500
Handheld GPS (day)	2	\$20	\$40	\$40	\$240
Miscellaneous (per event)	1	\$150	\$150	\$150	\$900
Helicopter Flight Time (hrs/event)	5	\$1,526	\$7,630	\$7,630	\$38,150
Helicopter Standby (hrs/event)	5	\$725	\$3,625	\$3,625	\$18,125
<b>Total</b>			<b>\$13,995</b>	<b>\$13,995</b>	<b>\$72,715</b>

**Assumptions**

1. Foot surveys would be completed during the Pink Salmon run on Slate Creek and Sherman Creek in August. Helicopter support would be required to survey all three drainages in one day.
2. The year 2 survey would occur in conjunction with surface water sampling, therefore the cost of helicopter support is not included.
3. Helicopter support quote from Coastal Helicopters, Juneau, Alaska. The estimate is the hourly rate for a A-star B-2 Helicopter during flight and during standby. The helicopter can carry a crew of six with light field gear (roughly 1200 lbs).
4. Project scientist (field/mobilization) hours account for 2 hours of planning and preparation and a 10 hour field day.

**Periphyton Biomass and Community Composition (Years 1, 5, 10, 20 and 30 Post-closure)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Annual				
Number of Years	5				
Number of Events	5				
Project Scientist (Field/Mobilization) (hr) <sup>5</sup>	12	\$90	\$1,080	\$1,080	\$5,400
Project Scientist (Sample Prep and Reporting) (hr)	10	\$90	\$900	\$900	\$4,500
Field Technician (hr)	10	\$75	\$750	\$750	\$3,750
Periphyton Processing	30	\$480	\$14,400	\$14,400	\$72,000
Handheld GPS (day)	2	\$20	\$40	\$40	\$200
Miscellaneous (per event)	1	\$3,000	\$3,000	\$3,000	\$15,000
<b>Total</b>			<b>\$20,170</b>	<b>\$20,170</b>	<b>\$100,850</b>

**Assumptions**

1. Samples would be collected from Sherman, Johnson and Slate Creek locations during August of each year. A total of 10 samples would be collected at each location. The samples would be submitted to the laboratory to determine biomass and community composition.
2. Sample collection would occur in conjunction with other activities therefore the budget helicopter support is not included in the estimate.
3. Periphyton processing includes biomass, and composition.
4. Miscellaneous cost includes laboratory reporting charge.
5. Project scientist (field/mobilization) hours account for 2 hours of planning and preparation and a 10 hour field day.

**TOTAL STREAM ECOLOGICAL MONITORING COST \$311,550**

**TABLE D-4: Site Wide Water Quality Monitoring Cost Estimate.**

**Reclamation Period - Monthly Receiving Water Quality Monitoring (18 months)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Monthly				
Number of Years	1.5				
Number of Events	18				
Number of SW Locations	2				
Analytical Testing (sample)	2	\$422	\$844	\$10,128	\$15,192
Helicopter Flight	0	\$1,526	\$0	\$0	\$0
Helicopter Standby	0	\$725	\$0	\$0	\$0
<b>Total</b>			<b>Varies</b>	<b>\$10,128</b>	<b>\$15,192</b>

Excludes TTF

**Assumptions**

1. Monthly receiving water quality monitoring would occur during the reclamation period where transportation will be available, therefore transportation cost is not included.

**Reclamation Period - Quarterly Water Quality Monitoring (18 months)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Quarterly				
Number of Years	1.5				
Number of Events	6				
Number of SW Locations	9				
Analytical Testing (sample)	9	\$422	\$3,798	\$15,192	\$22,788
Helicopter Flight	0	\$1,526	\$0	\$0	\$0
Helicopter Standby	0	\$725	\$0	\$0	\$0
<b>Total</b>			<b>Varies</b>	<b>\$15,192</b>	<b>\$22,788</b>

Excludes TTF

**Assumptions**

1. Quarterly water quality monitoring would occur during the reclamation period where transportation will be available, therefore transportation cost is not included.

**Post-Closure Quarterly Water Quality Monitoring (Years 1 and 2)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Quarterly				
Number of Years	2				
Number of Events	8				
Number of SW Locations	9				
Field Technician (Field/Mob)(hr) <sup>2</sup>	14	\$75	\$1,050	\$4,200	\$8,400
Field Technician (Reporting)(hr)	8	\$75	\$600	\$2,400	\$4,800
Analytical Testing (sample)	9	\$422	\$3,798	\$15,192	\$30,384
Helicopter Flight	5	\$1,526	\$7,630	\$7,630	\$22,890
Helicopter Standby	5	\$725	\$3,625	\$3,625	\$10,875
<b>Total</b>			<b>\$5,448</b>	<b>\$21,792</b>	<b>\$43,584</b>

**Assumptions**

1. Helicopter support for quarters 1-3 of year 1 and quarters 1 and 2 of year 2 are provided under Post Closure Annual Water Quality Monitoring (Years 5, 10, 15, 20, and 30). The remaining 3 helicopter support activities are provided under this task.  
 2. Project scientist (field/mobilization) hours account for 4 hours of planning and preparation and a 10 hour field day.

**Post Closure Annual Water Quality Monitoring (Years 5, 10, 15, 20, and 30)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Annual				
Number of Years	5				
Number of Events	5				
Number of SW Locations	9				
Field Technician (Field/Mob)(hr) <sup>2</sup>	14	\$75	\$1,050	\$1,050	\$5,250
Field Technician (Reporting)(hr)	8	\$75	\$600	\$600	\$3,000
Analytical Testing (sample)	9	\$422	\$3,798	\$3,798	\$18,990
Helicopter Flight	5	\$1,526	\$7,630	\$7,630	\$7,630
Helicopter Standby	5	\$725	\$3,625	\$3,625	\$3,625
<b>Total</b>			<b>\$16,703</b>	<b>\$16,703</b>	<b>\$38,495</b>

**Assumptions**

1. Helicopter support for years 10, 15, 20, and 30 are included under TTF Surface Water Monitoring. Helicopter support for year 5 is included under this task.  
 2. Helicopter support quote from Coastal Helicopters, Juneau, Alaska. The estimate is the hourly rate for a A-star B-2 Helicopter during flight and during standby. The helicopter can carry a crew of six with light field gear (roughly 1200 lbs).  
 3. Project scientist (field/mobilization) hours account for 4 hours of planning and preparation and a 10 hour field day.

**TOTAL SITE WIDE WATER QUALITY MONITORING COST** **\$120,059**

**Assumptions**

**TABLE D-5: Site Wide Reclamation Success Monitoring and Periodic Maintenance Cost Estimate.**

**Post Closure Soil and Vegetation Monitoring and Maintenance (Years 1 and 2)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Annual				
Number of Years	2				
Number of Events	2				
Field Technician (Field/Mob)(hr)	20	\$75	\$1,500	\$1,500	\$3,000
Field Technician (Reporting)(hr)	8	\$75	\$600	\$600	\$1,200
Laborers (hr)	170	\$68	\$11,635	\$11,635	\$23,270
Skid Steer (hr)	80	\$125	\$10,000	\$10,000	\$20,000
UTV (day)	8	\$150	\$1,200	\$1,200	\$2,400
Materials (ls)	1	\$2,000	\$2,000	\$2,000	\$4,000
Mobilization/Demobilization (ls)	2	\$3,612	\$7,224	\$7,224	\$14,448
Subsistence (day)	18	\$60	\$1,080	\$1,080	\$2,160
Landing Craft (day)	2	\$3,612	\$7,224	\$7,224	\$14,448
	<b>Total</b>		<b>\$35,239</b>	<b>\$35,239</b>	<b>\$70,478</b>

**Assumptions**

1. Maintenance during years 1 and 2 assumes two laborers for eight, 10-hour days.
2. The maintenance crew would travel to the site on a landing craft and camp out on the location.

**Post Closure Soil and Vegetation Monitoring and Maintenance (Years 5 and 10)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Annual				
Number of Years	2				
Number of Events	2				
Field Technician (Field/Mob)(hr)	20	\$75	\$1,500	\$1,500	\$3,000
Field Technician (Reporting)(hr)	8	\$75	\$600	\$600	\$1,200
Laborers (hr)	90	\$68	\$6,160	\$6,160	\$12,319
Skid Steer (hr)	40	\$125	\$5,000	\$5,000	\$10,000
UTV (day)	4	\$150	\$600	\$600	\$1,200
Materials (ls)	1	\$2,000	\$2,000	\$2,000	\$4,000
Mobilization/Demobilization (ls)	2	\$3,612	\$7,224	\$7,224	\$14,448
Subsistence (day)	10	\$60	\$600	\$600	\$1,200
Landing Craft (day)	2	\$3,612	\$7,224	\$7,224	\$14,448
	<b>Total</b>		<b>\$23,684</b>	<b>\$23,684</b>	<b>\$47,367</b>

**Assumptions**

1. Maintenance during years 5 and 10 would be completed during 4, 10-hour days.

**TOTAL RECLAMATION SUCCESS MONITORING COST**

**\$117,845**

TABLE D-6: Kensington Restored Wetland Site Monitoring.

**Post Closure Quarterly Wetland Quality Monitoring (Years 1 and 2)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Quarterly				
Number of Years	2				
Number of Events	8				
Number of SW Samples	3				
Field Technician (Field/Mob)(hr)	12	\$75	\$900	\$3,600	\$7,200
Field Technician (Reporting)(hr)	8	\$75	\$600	\$2,400	\$4,800
Analytical Testing (sample)	3	\$405	\$1,215	\$4,860	\$9,720
	<b>Total</b>		<b>\$2,715</b>	<b>\$10,860</b>	<b>\$21,720</b>

**Assumptions**

1. Field technician (field/mobilization) hours account for 2 hours of planning and preparation and a 10 hour field day.
2. Wetland monitoring will be completed in conjunction with other monitoring activities, therefore helicopter support costs are not included.

**Post Closure Annual Wetland Quality Monitoring (Years 5, 10, 15, 20, and 30)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Annual				
Number of Years	5				
Number of Events	5				
Number of SW Samples	3				
Field Technician (Field/Mob)(hr)	12	\$75	\$900	\$900	\$4,500
Field Technician (Reporting)(hr)	8	\$75	\$600	\$600	\$3,000
Analytical Testing (sample)	3	\$405	\$1,215	\$1,215	\$6,075
	<b>Total</b>		<b>\$2,715</b>	<b>\$2,715</b>	<b>\$13,575</b>

**Assumptions**

1. Wetland monitoring will be completed in conjunction with other monitoring activities, therefore helicopter support costs are not included.
2. Field technician (field/mobilization) hours account for 2 hours of planning and preparation and a 10 hour field day.

**TOTAL RECLAMATION SUCCESS MONITORING COST** **\$35,295**

**TABLE D-7: Road Inspection and Monitoring Cost Estimate for Kensington Road, TTF Access Road, and Jualin Access Road**

**Post Closure Annual Road Inspections (Years 8, 11, 17, 23 ,26, 29 )**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Annual				
Number of Years	6				
Number of Events	6				
Inspector (filed/mob) (hr)	10	\$75	\$750	\$750	\$4,500
Reporting Labor (hrs/event)	4	\$75	\$300	\$300	\$1,800
GPS Unit (day)	1	\$20	\$20	\$20	\$120
Helicopter Flight Time (hrs/event)	5	\$1,526	\$7,630	\$7,630	\$45,780
Helicopter Standby (hrs/event)	5	\$725	\$3,625	\$3,625	\$21,750
	<b>Total</b>		<b>Varies</b>	<b>\$1,050</b>	<b>\$73,950</b>

**Assumptions**

2. Helicopter support quote from Coastal Helicopters, Juneau, Alaska. The estimate is the hourly rate for a A-star B-2 Helicopter during flight and during standby. The helicopter can carry a crew of six with light field gear (roughly 1200 lbs).

**Post Closure Annual Road Inspections (Years 2-3, 5-6, 9, 12, 14-15, 18, 20-21, 24, 27, 30)**

	Quantity	Unit Cost	Event Cost	Annual Cost	Total Cost
Frequency	Annual				
Number of Years	14				
Number of Events	14				
Inspector (filed/mob) (hr)	10	\$75	\$750	\$750	\$4,500
Reporting Labor (hrs/event)	4	\$75	\$300	\$300	\$1,800
GPS Unit (day)	1	\$20	\$20	\$20	\$280
	<b>Total</b>		<b>Varies</b>	<b>\$1,050</b>	<b>\$6,580</b>

**Assumptions**

1. Road inspections during years 1-2, 4-5, 7-8, 10, 13-14, and 20 would occur in conjunction with other monitoring events.

**TOTAL TTF MONITORING COST** **\$80,530**

**Table D-8: Estimated Long-Term Dam Inspections and Maintenance**

Item	Incremental Time Step for Post Closure Care and Maintenance from Closure (years)							
	0 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 40	40 to 60	60 to 100
<b>ESTIMATED POST CLOSURE CARE AND MAINTENANCE COSTS</b>								
Allowance to provide periodic maintenance to dam and spillway including brush/debris removal	\$10,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
Allowance for periodic geotechnical (Dam Safety) and environmental inspections	\$20,000	#####	\$5,000	\$5,000	\$2,000	\$2,000	\$2,000	\$2,000
<b>Sub total annual cost (per year)</b>	<b>\$30,000</b>	<b>#####</b>	<b>\$8,000</b>	<b>\$8,000</b>	<b>\$5,000</b>	<b>\$5,000</b>	<b>\$5,000</b>	<b>\$5,000</b>
<b>TOTAL ANNUAL COST</b>	<b>\$30,000</b>	<b>\$13,000</b>	<b>\$8,000</b>	<b>\$8,000</b>	<b>\$5,000</b>	<b>\$5,000</b>	<b>\$5,000</b>	<b>\$5,000</b>
	#####	\$65,000	#####	\$40,000	#####	#####	#####	\$200,000
								Total
								<b>\$695,000</b>

**D-7: Schedule of Monitoring Activities and Anticipated Mobilization and Demobilization Requirements.**

Monitoring Activity	TTF Surface Water Monitoring	TTF Dam Safety Inspections	TTF Lake Fish, Plants and Invertebrate Surveys	11F Temp, Oxygen, pH Profiling and Whole Body Metals	Spawning Salmon Escapement Survey	Surface Water Sediment and Metals Toxicity	Surface Water Periphyton Biomass and Composition	Site-wide Surface Water Monitoring	Soil and Vegetation Monitoring and Maintenance	Surface Water Comet WTP Wetlands Site	Annual Road Inspections	Road Maintenance	Transportation requirements	Helicopter Days	Helicopter Flight (hr)	Helicopter Standby (hr)	Helicopter Crew	Landing Craft (days)
	Table D-1	D-1	D-2	D-2	D-3	D-3	D-3	D-4	D-5	D-6	D-7	A-3						
Task Hours	10	10	30	30	10	10	10	10	20	10	10	32						
Year/Quarter																		
R1Q4		H+1						H+1						1	5	5	1	
R2Q1		H+1						H+1						1	5	5	1	
R2Q3		H+1						1						1	5	5	2	
R2Q4		H+1						H+1						1	5	5	1	
Y1Q1				H+2				1		1				3	15	15	4	
Y1Q2						H+1		1		1				1	5	5	3	
Y1Q3			lc		H+1		1	1	lc	1		lc		1	5	5	4	4
Y1Q4								H+1						1	5	5	1	
Y2Q1	1			H+2				1		1				3	15	15	5	
Y2Q2								H+1		1				1	5	5	2	
Y2Q3	H+1		lc		1			1	lc	1	1			1	5	5	5	4
Y2Q4								H+1		1				1	5	5	2	
Y3Q1	1			H+2										3	15	5	3	
Y3Q3	H+1	1	lc								1			1	5	5	3	
Y4Q1	1			H+2										3	15	15	3	
Y4Q3	H+1		lc									lc		1	5	5	1	4
Y5Q1				H+2										3	15	15	2	
Y5Q2						H+1								1	5	5	1	
Y5Q3			lc				1	H+1	lc	1	1			1	5	5	4	4
Y6 Q1				H+2										3	15	5	2	
Y6 Q3		H+1	lc									1		1	5	5	2	2
Y7Q1				H+2										3	15	15	2	
Y7Q2					H+1									1	5	5	1	
Y7 Q3			lc									lc						4
Y8Q1				H+2										3	15	15	2	
Y8Q2					H+1									1	15	8	1	
Y8 Q3			lc								H+1			1	5	5	1	2
Y9Q1				H+2										3	15	15	2	
Y9 Q3		H+1	lc								1			1	5	5	1	2
Y10Q1				H+2										3	15	5	2	
Y10Q2						H+1								1	5	5	1	
Y10Q3	H+1		lc				1	1	lc	1		lc		1	5	5	4	4
Y11Q3											H+1			1	5	5	1	
Y12Q3		H+1									1			1	5	5	2	
Y13Q3					H+1						lc			1	2	2	1	4
Y14Q3					H+1						1			1	5	5	2	
Y15Q3	H+1	1						1		1	1			1	5	5	5	
Y16Q3												lc						4
Y17Q3											H+1			1	5	5	1	
Y18Q3		H+1									1			1	5	5	2	
Y19Q3												lc						4
Y20Q2						H+1								1	5	5	1	
Y20Q3	H+1						1	1		1	1			1	5	5	5	
Y21Q3		H+1									1			1	5	5	2	
Y22Q3												lc						4
Y23Q3											H+1			1	5	5	1	
Y24Q3		H+1									1			1	5	5	2	
Y25Q3												lc						4
Y26Q3											H+1			1	5	5	1	
Y27Q3		H+1									1			1	5	5	2	
Y28Q3												lc						4
Y29Q3											H+1			1	5	5	1	
Y30Q2						H+1								1	5	5	1	
Y30Q3	H+1	1					1	1		1	1			1	5	5	6	