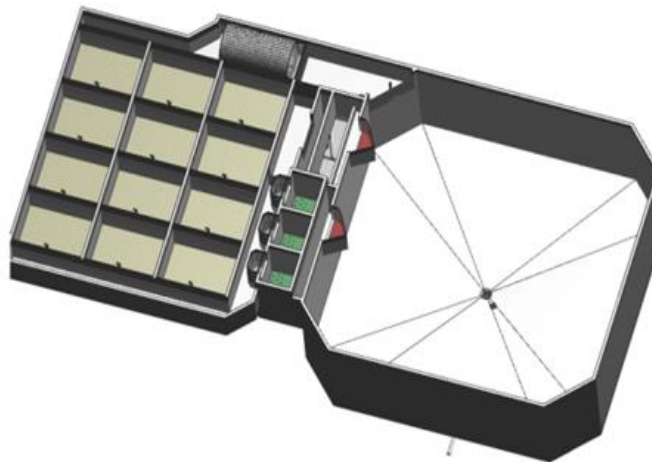


**CTFC Recirculating Aquaculture System Demonstration Project
Colville Tribal Federal Corporation**

NEPA Environmental Assessment

August 12, 2022



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Prepared for and Issued by:

U.S. Environmental Protection Agency, Region 10
NPDES Permits Unit
Seattle, Washington

**CTFC Recirculating Aquaculture System Demonstration Project
NEPA Environmental Assessment
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1.0 INTRODUCTION

This *NEPA Environmental Assessment* evaluates the potential environmental impacts associated with authorization of the wastewater discharge from a proposed land-based recirculating aquaculture system (RAS) to the Okanogan River or Columbia River in northeastern Washington. Discharges into waters of the United States are regulated under Section 402 of the Clean Water Act (CWA) – the National Pollutant Discharge Elimination System (NPDES). Discharges from the operation of the Colville Tribal Federal Corporation (CTFC) RAS are specifically regulated under the Flow-Through and Recirculating Systems Subcategory of the Concentrated Aquatic Animal Production Point Source Category (40 CFR Part 451, Subpart A). A recirculating system means:

“... a system that filters and reuses water in which the aquatic animals are produced prior to discharge. Recirculating systems typically use tanks, biological or mechanical filtration, and mechanical support equipment to maintain high quality water to produce aquatic animals” (40 CFR Part 451 Subpart A, Section 451.2(n))

The preferred and alternative sites considered for the location of the CTFC RAS facility are within the boundaries of the Confederated Tribes of the Colville (CCT) Reservation. The U.S. Environmental Protection Agency (EPA) is the NPDES permitting authority for the proposed action, and the NEPA Lead Agency.

CTFC will apply to EPA for coverage under the NPDES General Permit for Discharges from Federal Aquaculture Facilities and Aquaculture Facilities Located in Indian Country in Washington State (WAG130000). The 2016 General Permit (2016 GP) applies to upland facilities that discharge for at least 30 days per year except facilities that produce less than approximately 20,000 pounds of aquatic animals per year and facilities that feed less than approximately 5,000 pounds of food during the calendar month of maximum feeding. The 2016 GP expired on July 31, 2021, and was in the reissuance process at the time of this writing. It is expected that the CTFC RAS project will qualify for coverage under the GP when it is reissued in 2023. A pollution discharge permit will also be required from CCT under the authority of the Confederated Colville Tribes Code of Laws. NEPA EA Chapter 3, Section 3.1.5 lists all known permitting requirements for the project.

1.1 PROJECT PROPONENT

The Colville Tribal Federal Corporation is the project proponent of the CTFC Recirculating Aquaculture System (RAS). CTFC is organized, incorporated, and granted its corporate powers, privileges, and immunities under the laws of the United States as a Federally-chartered Indian business corporation. This corporation is a distinct legal entity wholly owned by the Confederated Tribes of the Colville Reservation. The purpose of the corporation is to:

- 1) Engage in any type of lawful business, enterprise or venture,
- 2) Promote the economic development of the Confederated Tribes of the Colville Reservation, and
- 3) To enable the Confederated Tribes of the Colville Reservation to develop its resources for the benefit of the people of the Confederated Tribes of the Colville Reservation.

The Fish and Wildlife Department of the Confederated Tribes of the Colville operates two hatcheries within the boundaries of the Reservation at the present time: the Chief Joseph Salmon Hatchery on the downstream side of Chief Joseph Dam, and the Colville Tribal Trout Hatchery downstream of the City of Bridgeport, both on the Columbia River mainstem. These hatcheries were constructed by the Bonneville

Power Administration, the Trout Hatchery in 1988 and the Chief Joseph Hatchery in 2013, to assist in the protection of and mitigation for Chinook Salmon (*Oncorhynchus tshawytscha*) populations in the Okanogan River and the Columbia River between the Okanogan River and Chief Joseph Dam that are affected by operation of the Federal Columbia River Power System.

1.2 PROPOSED ACTION

The proposed action is to construct and operate a prototype RAS project to demonstrate the feasibility of a full-scale project on the CCT Reservation. The preferred site for the CTFC RAS demonstration project and full-scale facility is a former CCT Trout/Salmon hatchery complex at Cassimer Bar (see Figure 1.3-1). The alternative site evaluated for the project is the existing Colville Tribal Trout Hatchery downriver from the City of Bridgeport (see Figure 1.3-2).

Land-based recirculating aquaculture system (RAS) technology for raising salmon on a commercial scale is new in Washington State. This will be the first project of its kind to operate under the jurisdiction of EPA Region 10. A demonstration project is proposed to confirm the feasibility and actual costs for a full-scale project on the CCT Reservation. The demonstration project would operate for approximately 2 years as “proof of concept.”

CTFC has had preliminary communications with two large commercial seafood processing companies in western Washington and British Columbia who have expressed an interest in purchasing fish produced by the CTFC RAS demonstration project and full-scale facility if a decision is made to proceed with the larger RAS in the future.

1.3 LOCATION

Both alternative sites are located on the right bank of the Columbia River adjacent to the Wells Pool between Chief Joseph Dam and Wells Dam.

The Cassimer Bar Hatchery site is located east of Brewster, near the right bank of Lake Pateros. Lake Pateros (also known as the Wells Pool) is the impoundment reservoir of Wells Dam owned and operated by Douglas County Public Utility District (PUD) on the Columbia River. The Cassimer Bar Hatchery site is located at elevation 790 feet, near the confluence of the Okanogan River with the Columbia River. Vegetative cover is predominantly sparse sage brush. Adjacent properties are undeveloped, informally used as rangeland. Vehicle access to the site is from SR-97 north, then south approximately one mile on a gravel road.

Tax Parcel No. 3025210001
Section 16 Township 30N Range 25E, Okanogan County, WA
Latitude 48.0918N, Longitude 119.6955W

The Colville Tribal Trout Hatchery site is located upriver from the Cassimer Bar site, downstream from the City of Bridgeport, at elevation 831 feet. The location of the RAS prototype building would be within the improved area of this site.

Tax Parcel No. 2925091002
Section 9 Township 29N Range 25E, Okanogan County, WA
Latitude 48.01 49.3N, Longitude 119.41 22.25W

1.4 ENVIRONMENTAL ASSESSMENT REQUIRED

New effluent limitation guidelines and new source performance standards for the Concentrated Aquatic Animal Production Point Source Category became effective on September 22, 2004. Aquaculture facilities constructed after promulgation of these new source performance standards are considered *new sources* under 40 CFR 122.29. In accordance with Section 511 (c)(1) of the CWA and EPA's regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA) at 40 CFR Part 6, issuance of NPDES permits for *new sources* are considered major Federal actions subject to NEPA review. EPA has determined the CTFC RAS is a new source. As a new source, coverage of the project's discharge under the reissued General Permit is subject to NEPA review. EPA has prepared this *NEPA Environmental Assessment* (EA) in compliance with the Council on Environmental Quality's (CEQ) NEPA regulations at 40 CFR Part 1500 and EPA's regulations for implementing the procedural provisions of NEPA at 40 CFR Part 6.

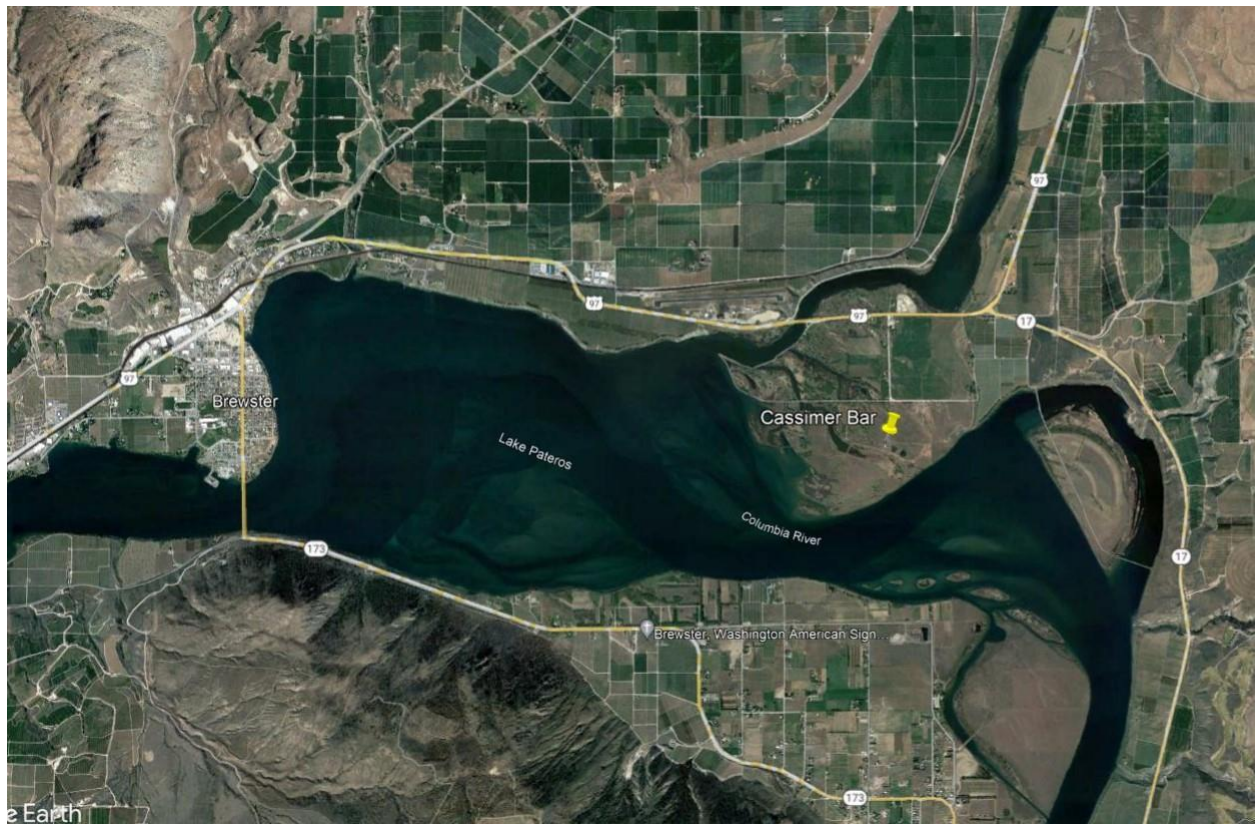


Figure 1.3-1. Cassimer Bar Vicinity and Location Map.

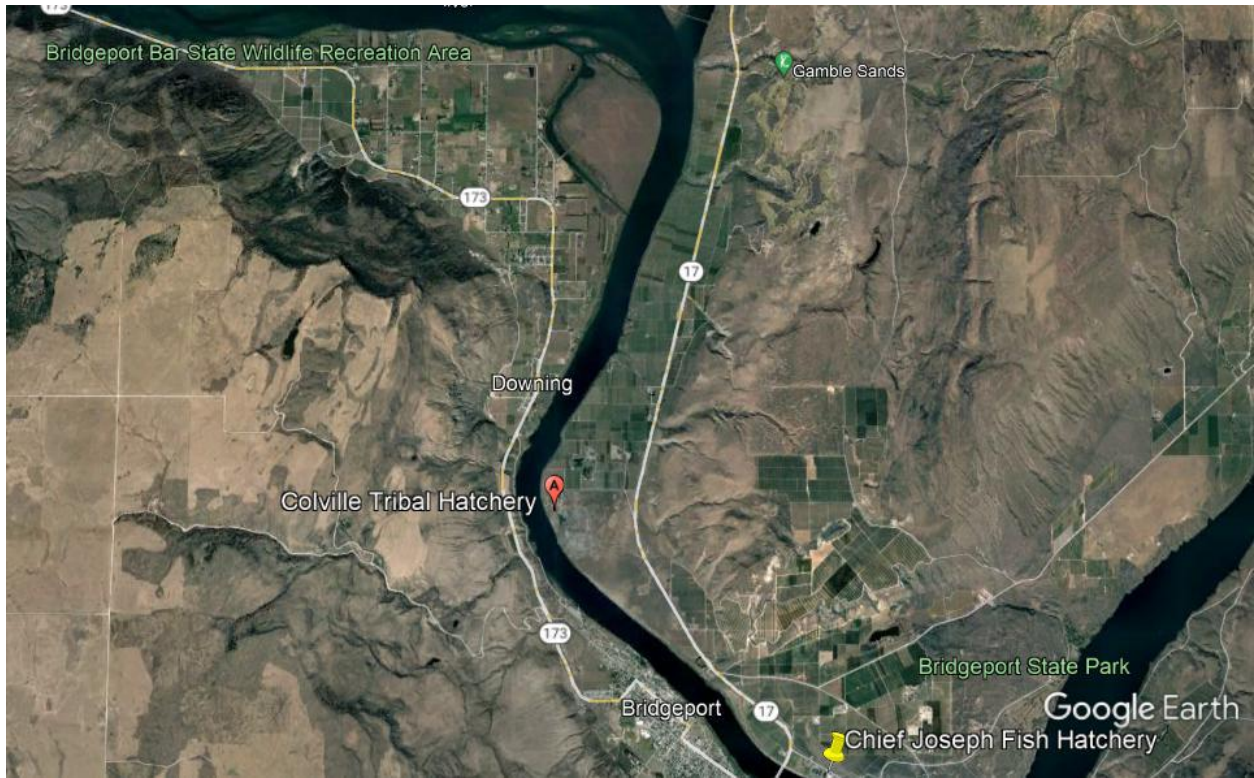


Figure 1.3-2. Colville Tribal Trout Hatchery Vicinity and Location Map.

2.0 PURPOSE AND NEED FOR THE PROJECT

The goal of the RAS demonstration project is to test a cost-effective recirculating aquaculture system that can be used to grow a variety of fin fish for food production. Objectives of the project are to:

- Increase Tribal net income
- Contribute to U.S. food security
- Help to reduce the U.S. seafood trade deficit.

The need for the project is to increase and diversify revenue-generating enterprises and employment opportunities for the Confederated Tribes of the Colville Reservation that are consistent with cultural beliefs. One of those opportunities is growing and processing trout or salmon for human consumption. The CTFC RAS demonstration project would temporarily provide employment and food source benefits on a smaller scale (less than 2 percent of the full-scale project).

Technical objectives of the CTFC RAS demonstration project are to:

- Build and evaluate a prototype modular RAS that demonstrates the economic viability of a larger RAS system.
- Test the performance of the prototype RAS using all female triploid Steelhead Trout (*Oncorhynchus mykiss*) reared from eggs to harvest size (5.5 pounds).
- Develop an economic model that accurately predicts return on investment and profit margins scalable to a larger, commercial CTFC RAS system.

3.0 PROPOSED ACTION AND ALTERNATIVES

3.1 APPLICANT'S PREFERRED ALTERNATIVE

Alternative sites were considered for the proposed facility, as described in Section 3.2 below. The applicant's preferred site is the Cassimer Bar former Sockeye Salmon/Steelhead Trout hatchery complex east of the town of Brewster near the right bank of the Columbia River, on the CCT Reservation. The infrastructure of the former hatchery would be the most cost-effective and time-efficient to restore and upgrade as needed, and has the capacity to produce the desired volume of fish during the demonstration project phase. The site has adequate water supply (three existing wells, with good prospects for developing additional wells if needed) with optimum temperature and water quality for rearing Rainbow Trout. An existing 24-inch diameter outfall (when operational) discharges to a backwater slough approximately 200 feet south of the existing hatchery building. The slough flows northwesterly to the Okanogan River. There are feasible options for obtaining adjacent property if CCT decides to expand the operation to a full-scale commercial RAS at this location in the future.

3.1.1 Existing Site Characteristics, Former Hatchery Operations, and Reuse Opportunities

Hatchery facilities were originally constructed on 3 acres of the Cassimer Bar site by Douglas County PUD during the period 1988-1993 as a temporary Sockeye Salmon (*Oncorhynchus nerka*) hatchery. In February 2002, the PUD transferred ownership of the facility to the Colville Confederated Tribes. The Sockeye program was discontinued and replaced by a Steelhead Trout (*Oncorhynchus mykiss*) program operated by CCT. Incubation and early rearing facilities were upgraded in 2007 with construction of a 4,000 square foot hatchery building and a new (additional) production well. Grant County Public Utility District (PUD), through the Priest Rapids Project Settlement Agreement process, provided the operation and maintenance funding for implementation of the locally-adapted Steelhead production program, with production targets set at 20,000 yearling Steelhead smolts for release in the Okanogan River Basin, and a kelt¹ reconditioning facility. The Cassimer Bar Hatchery was mothballed in 2013 when CCT discontinued the Steelhead program (McMillen Jacobs Associates 2015). Figure 3.1-1 provides an aerial view of the remaining facility components.

The existing hatchery building is a 2,030 sf pre-engineered metal building with concrete floor slab, constructed in 2008. It is in generally good condition and has adequate lighting, heating, domestic plumbing, and ventilation systems. The proposed action includes repairing damage done by vandalism, and using this building in the RAS demonstration project.

Outbuildings located on the hatchery site include an electrical building within the east fenced perimeter, a walk-in freezer/cooler adjacent to the north side of the electrical building, and three pre-fabricated, wood constructed sheds located along the north fenced perimeter of the site. A mobile home, the former residence of the hatchery manager, is just outside of the north fenced perimeter. All of these buildings including the mobile home will be demolished and removed from the site. The electrical room will be reconstructed in a new building proposed to house the RAS fish culture tank.

¹ A "kelt" is an adult Salmon or Steelhead Trout that has finished spawning. Unlike most Salmon which die after spawning, Steelhead Trout can spawn, return to the ocean, and migrate back upstream to spawn many times.



Note 1: The circular tanks, raceways, and hatchery building all identified as “Existing” would be repaired and used in the RAS demonstration project.

Note 2: Facilities in the white footprint east of the existing hatchery building would be newly constructed.

Figure 3.1-1. Cassimer Bar Hatchery Site Existing and Proposed Infrastructure.

Three existing groundwater wells on the Cassimer Bar Hatchery site were developed for the former fish production operations. Existing plumbing (a piping network) extends from the wells to three main locations: the hatchery building head box, two circular tanks, and two outdoor linear raceways. The three existing wells will be rehabilitated and new well houses will be constructed. The circular tanks and outdoor raceways will be repaired and used in the RAS demonstration project.

A buried drainpipe system conveyed overflow water from hatchery system components (the central headbox, hatchery building floor trenches, and the existing outdoor rearing units) into a manhole located near the south edge of the hatchery property. A 24-inch diameter corrugated metal drainpipe (CMP) conveyed the combined drain flow to an outfall approximately 200 feet south that discharges into a backwater slough of the Okanogan River. There is no effluent discharge at the present time. Treatment was not required for past hatchery operations due to the small quantity of fish produced (approximately 5,600 pounds).

3.1.2 Principal Features of the Proposed RAS

The basic design elements of a RAS include a fish culture tank, mechanical filter (to remove particles), biomedica (a medium in which bacteria are cultured to feed on the ammonia produced in fish waste), degasser (to remove carbon dioxide and other undesirable gases), pumps (to return water to the fish tank), oxygenation (for the survival of the fish), and miscellaneous control systems for monitoring, feeding, temperature, light, and pH control. Figure 3.1-2 is a schematic drawing of the proposed facility.

The predominant feature of the CTFC RAS demonstration project would be a newly-constructed 600 cubic meter concrete tank equipped with a biofilter and associated water treatment facilities (see Figure 3.1-3). The biofilter would remove water soluble constituents such as ammonia and nitrite. The culture tank would be 45 feet in diameter, and 15 feet deep.

Water would flow from the center and side box of the culture tank directly to the drum filter. The drum filter would remove solids. Dead fish (mortalities, or “morts”) would be transported via a 12-inch diameter bottom center pipe to the front of the drum filter. Bar grating would prevent live or dead fish from entering the drum. Live fish could swim back out of the drum filter area into the culture tank. Morts would be removed twice per day from the grating in front of the drum filter.

Water in the culture tank would be pumped in a circular flow. Feces and feed waste would be transported to a centralized drum filter where the particles would be removed. This process for rapidly removing waste products would minimize the leakage of nutrients from feces and help maintain water quality. Sludge from the wastewater collection and filtering process would be collected in a septic tank pumping truck, with two options for disposal. It may be transported to a local orchard for use as land-application fertilizer, taking care not to apply the sludge in offsite locations where runoff could enter a stream or the Columbia River. Alternatively, the sludge from process water could be disposed at a landfill authorized to receive this type of waste. The land application option would comply with the permitting requirements of the Colville Tribal Law & Order Code.

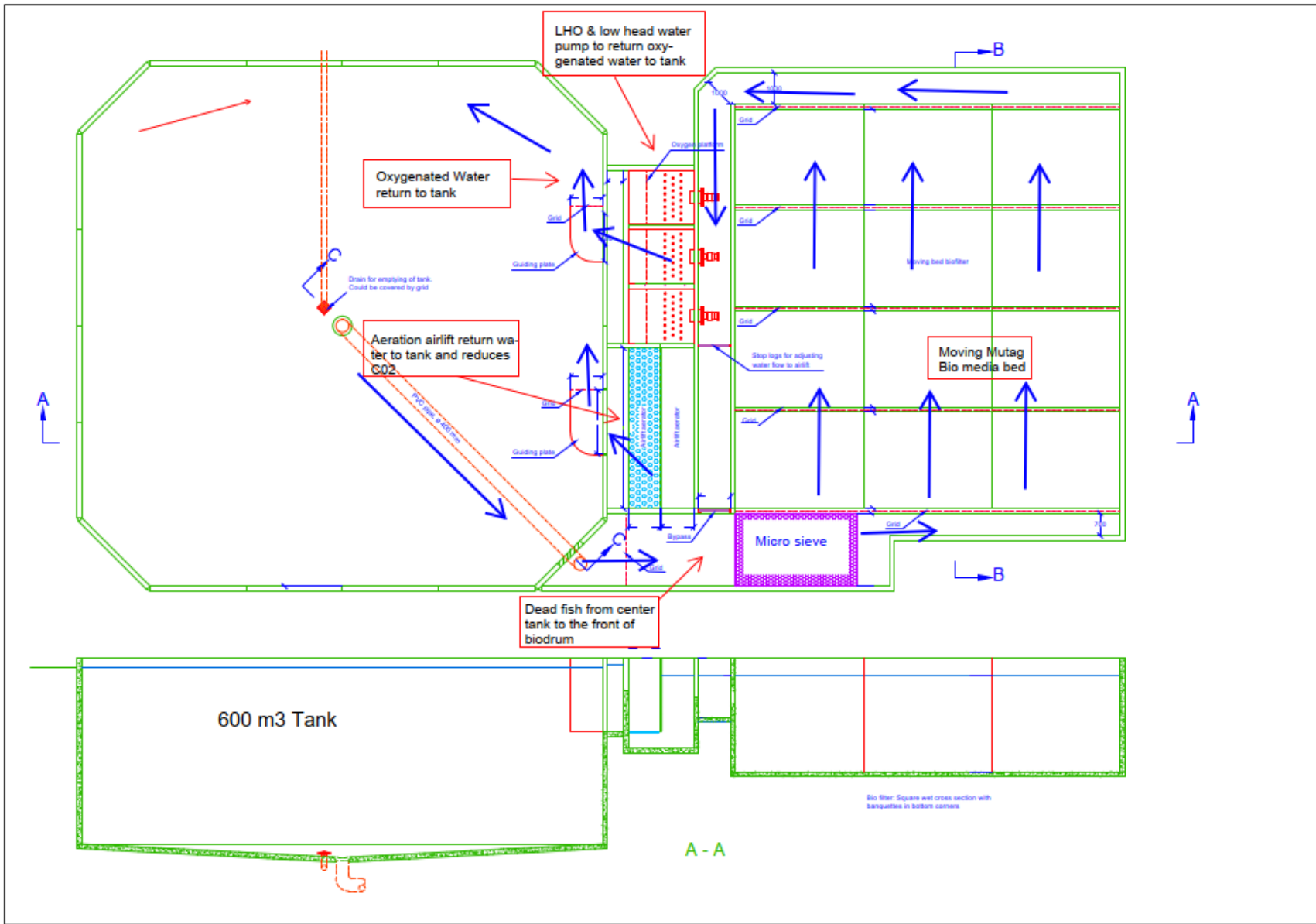
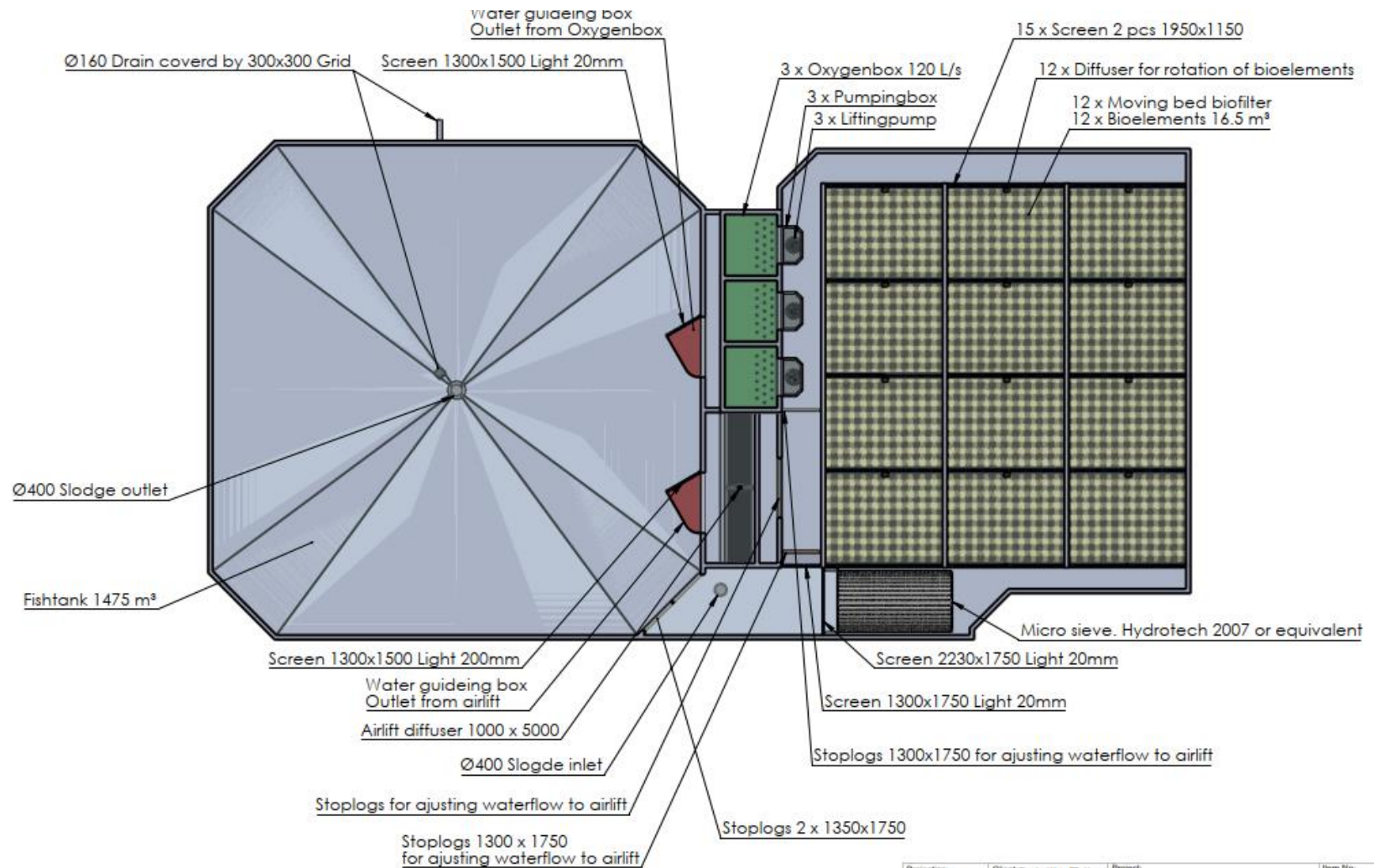


Figure 3.1-2. Schematic Drawing of CTFC Recirculating Aquaculture System (RAS) Demonstration Project.



NOTIS! This drawing is NOT to use for construction,
 Strength calculation for concrete construction is NOT made.
 Perhaps it is necessary to change 8 edge tank to circular tank to achieve greater strength.

Projection:	Client: Colville Tribe	Project:	Item No:
	Part / Assembly		Drawing No:
	Complete Concrete Fish Farm		
Scale: 1:120	Material:	Weight:	Date:
			Drawn by:

Figure 3.1-3. Proposed Recirculating Aquaculture System Culture Tank and Biofilter.

A buried 24-inch diameter corrugated metal drainpipe system conveyed overflow water from existing hatchery facilities on the site to a manhole located near the south edge of the property, to an outfall located approximately 200 feet south that discharges into a backwater slough of the Okanogan River (see Figure 3.1-4). There is presently no effluent treatment on this discharge system from the existing hatchery complex. Treatment was not required for past hatchery operations due to the small quantity of fish produced. The 2010 Cassimer Bar Hatchery Annual Report identified a range of 13,000 to 32,000 steelhead smolts released to the Okanogan River watershed per year between 2004 and 2010. At approximately 80 grams in size, the maximum year of steelhead smolt production at the hatchery was approximately 5,600 pounds (Colville Confederated Tribes Fish & Wildlife Department 2010).

The drum filter would be equipped with filter cloth with a mesh size of approximately 40 to 60 μm (e.g., a micro sieve). Water turnover in each tank during normal operation would be around 42 to 85 gallons per second (160 to 320 liters per second), resulting in an average residence time of water in the tank between 30 minutes to one hour. The drum filter would be equipped with a level regulator which, at a given water level in the drum, would start the high-pressure pump for cleaning the filter cloth.

Biological filters would be designed as moving bed filters. The total combined volume of the chambers would be 100 cubic meters. Each filter chamber would be divided partly along and partly across to create a horizontal grid for optimal flow in each chamber (see Figures 3.1-2 and 3.1-3).

There would be an aeration diffuser in front of each horizontal grid for aerating and moving the medium. The diffuser system for the filters would be supplied with air from a centrally-placed blower with a capacity of approximately 800 cubic meters (28,250 cubic feet) per hour. The blower would also be used to degas the water before it is returned to the culture tank, controlling the CO₂ level and total gas pressure.

3.1.3 Hatchery Management Proposal

The hatchery management proposal is summarized here from the description in the *Cassimer Bar Land-based Trout Farm Standard Operating Procedures and Quality Assurance Plan* (J. Bielka, Catchy Marine, May 2022).

3.1.3.1 Eggs and Fry

The RAS culture tank will be stocked with all female triploid Rainbow Trout.² Approximately 25,000 eggs would be purchased for the demonstration project tank. These may be obtained from a number of different suppliers, both local and international. Preferred suppliers include Troutlodge August-spawned eggs for their fast-growing characteristics, and eggs from the University of Idaho.

² Domesticated stocks of mono-sex (all-female) sterile (triploid) Rainbow Trout are proposed to ensure that sexual maturation will not occur. The extra set of chromosomes make these fish incapable of reproducing. The advantages of triploid stock include: 1) in the unlikely event of escapement, these fish would be unable to breed with wild stock salmonids in receiving waters; and 2) these fish convert their energy almost entirely to growth.

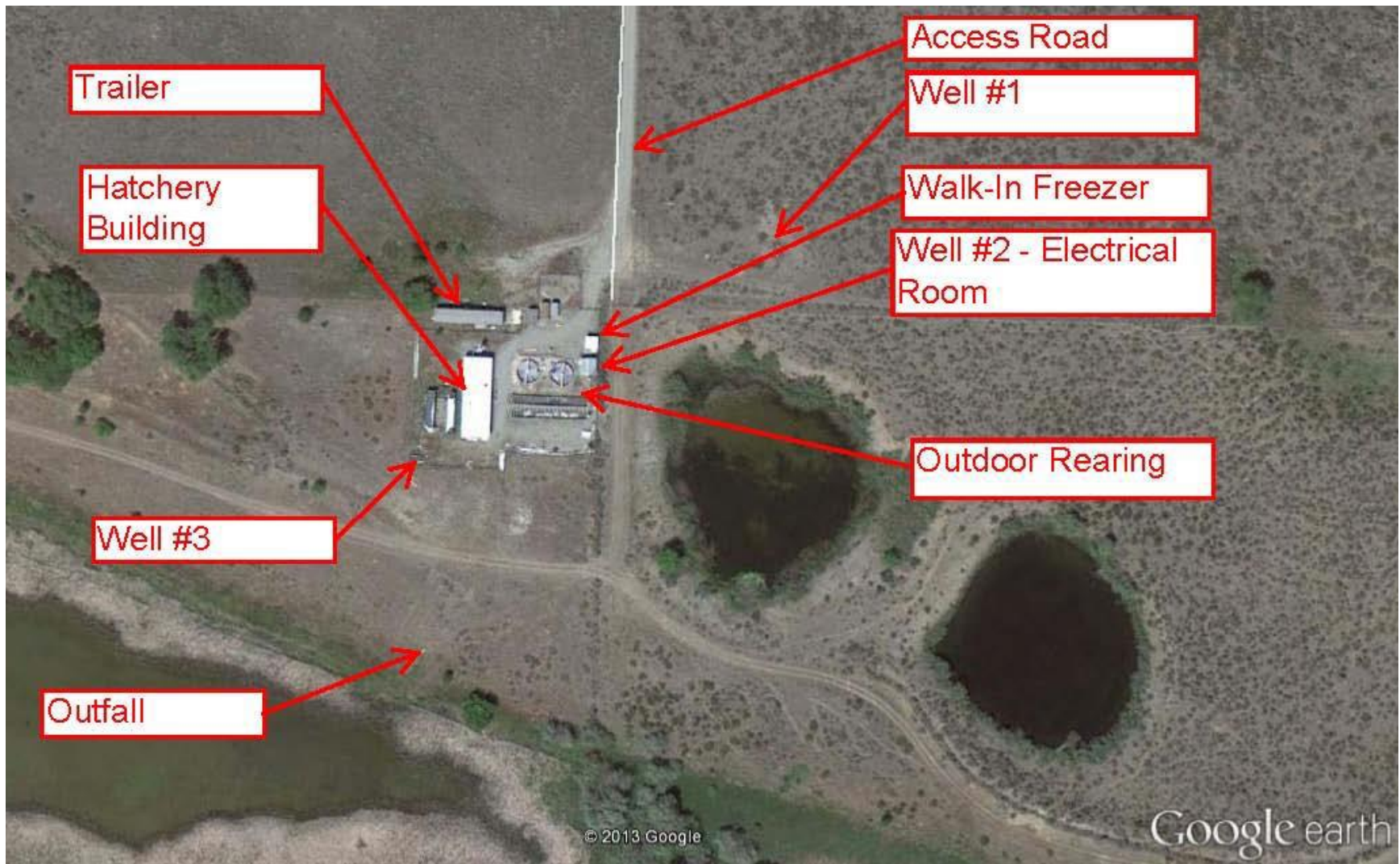


Figure 3.1-4. Cassimer Bar Hatchery Site Existing Facility Components (McMillen Jacobs Associates 2015).

Upon receiving eggs, biosecurity measures will be implemented to ensure survival of the delivered, eyed eggs. Eggs will be carefully removed from the boxes and placed into totes of water where they will be rehydrated and brought up to existing water temperatures over the course of approximately 30 minutes. Egg boxes will be sterilized with chlorine (50 ppm), placed back onto the truck, and removed from the site to discard. Once all eggs are tempered, buckets of ovadine (100 ppm) will be prepared. Eggs will be placed in the ovadine solution for 10 minutes, rinsed, and then placed into the egg collection area. These eggs will be counted and placed into designated incubation stacks and/or egg boxes. Equipment and the area where the eggs were unloaded will be sterilized with a 50 ppm chlorine solution once eggs are in the incubation trays. The hatching process will take approximately 7 to 10 days in water at 12 to 14°C.

Once eggs have hatched, a 3 ppt salt treatment will be conducted for 10 minutes every 3 to 4 days if a fungus is present. At 18 to 21 days post hatch at 12 to 14°C, fry will be ready to be ponded. Substrate in the egg boxes will be removed before ponding can take place. Then trays will be removed from the holder and gently placed in the tank, allowing the fry to swim out. It will likely be necessary to remove some fry manually. Upon removal of all fry from the egg boxes, each box will be removed from the tank and set aside for cleaning and disinfection. At the point, the fry will be 21 to 25 days post-hatch and ready for first feed.

3.1.3.2 Culture Methods, Production Estimates, and Reference Facilities

Eggs could be hatched and grown to 600-gram (1.3-pound) juveniles within the existing infrastructure (troughs, tanks, and outdoor raceways) on the Cassimer Bar Hatchery site (see Figure 3.1-1). Approximately 20,000 of these juveniles would be stocked into to the new 600 cubic meter recirculating tank at a stocking density of 80 kg of fish per cubic meter (175 pounds per 265 gallons). Fish would be fed over a 24-hour period using constant lighting. It is projected that they would grow to 5.5 pounds (harvest size) within 6 months, producing two cycles per year.

Staggered stocking of production groups is proposed to distribute the growth of market-sized fish throughout the year (see Table 3-1). The maximum month of feeding is projected to be February and/or August (approximately 14 to 14.2 million tons).

It is estimated that each cycle will produce approximately 107,000 pounds (48.7 million tons, MT) for a combined volume of 214,000 pounds of fish per year (98 MT/YR). Growth is highly dependent on temperature. An advantage of a land-based RAS is the opportunity to control optimum factors such as temperature and light, reducing the overall production cycle.

		Year 2											
		January	February	March	April	May	June	July	August	September	October	November	December
		Total Year Harvest Pounds										214,431	
Farm Harvest KG		-	-	48,856	-	-	-	-	-	48,408	-	-	-
Farm Harvest LBS		-	-	107,709	-	-	-	-	-	106,721	-	-	-
Production Group 1	Harvest Kg	-	-	48,856	-	-	-	-	-	-	-	-	-
	Numbers	19,845	19,710	19,576	-	-	-	-	-	-	-	-	-
	Total Biomass (kg)	34,146	41,640	49,191	-	-	-	-	-	-	-	-	-
	Feed Usage (MT)	9.87	11.06	0.04	-	-	-	-	-	-	-	-	-
Production Group 2	Harvest Kg	-	-	-	-	-	-	-	-	48,408	-	-	-
	Numbers	20,674	20,534	20,394	20,255	20,118	19,981	19,845	19,710	19,576	-	-	-
	Total Biomass (kg)	3,010	5,390	8,395	13,229	20,537	27,066	33,210	40,499	48,739	-	-	-
	Feed Usage (MT)	2.26	3.13	4.54	7.09	7.33	8.35	9.60	10.87	0.04	-	-	-
Production Group 3	Harvest Kg	-	-	-	-	-	-	-	-	-	-	-	-
	Numbers	-	-	-	-	-	20,816	20,816	20,674	20,534	20,394	20,255	20,118
	Total Biomass (kg)	-	-	-	-	-	1,717	2,955	5,292	8,650	13,428	21,160	27,633
	Feed Usage (MT)	-	-	-	-	-	1.21	2.22	3.16	4.64	7.26	7.51	8.56
Total Production	Harvest Kg												
	Total Numbers at Facility	40,519	40,244	39,970	20,255	20,118	40,797	40,661	40,384	40,110	20,394	20,255	20,118
	Total Standing Biomass (kg)	37,155	47,030	57,586	13,229	20,537	28,782	36,165	45,791	57,389	13,428	21,160	27,633
	Total Monthly Feed Usage (MT)	12.13	14.19	4.58	7.09	7.33	9.56	11.81	14.03	4.68	7.26	7.51	8.56

Table 3-1. CTFC RAS demonstration project production projections (J. Bielka 2022).

Growth rate, feed quantity estimates, and water quality parameters in RAS process water are provided in the NEPA EA based on reference to the performance of existing facilities in other locations (e.g., Denmark, Norway, and the USA), as reported in the *Feasibility Study and Preliminary Engineering Report* prepared for the CTFC RAS (Bielka 2021 and 2022). Growth rates were obtained from a Skretting³ growth model and from research conducted by the Freshwater Institute (FWI)⁴ in West Virginia. Comparable to the proposed CTFC RAS, the FWI facility has equipment that houses the fish, removes solids, pumps water throughout the system, reduces carbon dioxide, and increases oxygen in the water before it flows back into the culture tank (see Figure 3.1-5). Both systems have equipment that keeps the pH in the optimal range for fish, monitors water temperatures on a constant basis, uses 24-hr lighting, and logs carbon dioxide, ammonia, and oxygen for optimal fish health. Effluent is processed through 40 to 60 µm drum screens, has a water temperature in the 15 to 16° C range, and has an oxygen concentration of 70% saturation.

FWI uses four systems to assess continuous production within a one-quarter commercial-scale research facility capable of producing 20 to 40 metric tons (MT) or 44,000 to 88,000 pounds of finfish per year. These systems include:

- A chilled RAS to hatch eyed eggs.
- A single-pass system with twelve 600 liter tanks to raise the first-feeding fry to fingerling/parr/smolt size.
- A partial reuse system with three 10 m³ culture tanks to raise fingerling/parr/smolt to an advanced fingerling or post-smolt size, and
- A RAS with a single 150 m³ tank to produce market-size fish.

Each system uses the unit process (i.e., a microscreen drum filter, fluidized sand biofilter, forced ventilated cascade aeration column, low head oxygenator, dual-drain circular culture tank, and radial flow settler). The CTFC RAS demonstration project would have components that function in a similar manner, though there would be a difference in the size of the equipment. Table 3-2 provides a comparison of the FWI and CTFC RAS system components.

³ Skretting is a commercial fish food manufacturer based in Norway.

⁴ The Freshwater Institute is a program of The Conservation Fund, and a leader in state-of-the-art water recirculating aquaculture system (RAS) technologies research. Among their core competencies, water chemistry professionals perform chemical, biological, and physical water quality testing, and research scientists analyze data to characterize effects of diets on fish performance, nitrification, solids removal efficiency, and waste production metrics.

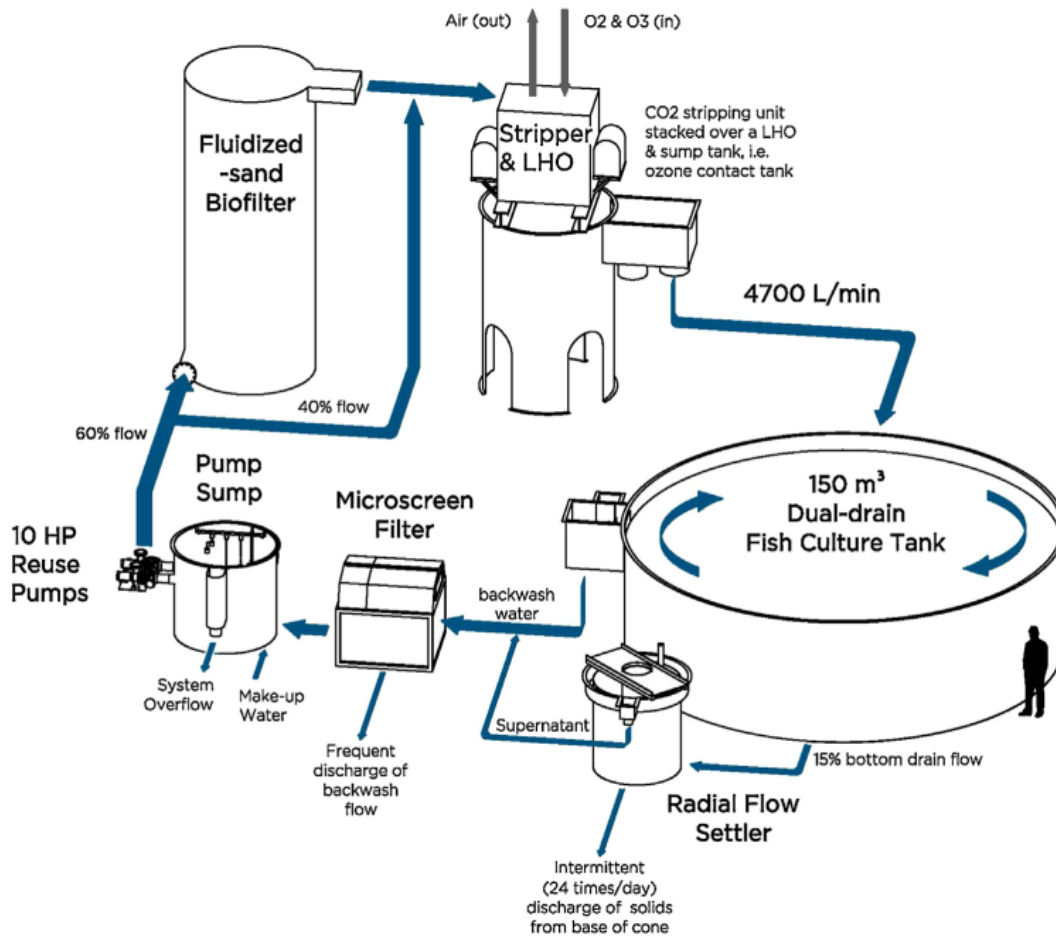


Figure 3.1-5. Reference Facility RAS Components, Freshwater Institute, West Virginia.

Table 3-2. Comparison of CTFC RAS system components to reference facility components (Freshwater Institute, West Virginia).

Component	Freshwater Institute RAS	CTFC RAS Demonstration Project
Circular Tank	Fish culture tank is 150 m ³	Fish culture tank would be 600 m ³
Radial Flow Separator	Radial separator is used to remove larger fecal particles from the water.	No radial separator. Most commercial RAS rely on drum filters rather than radial separators.
Drum Filter	A drum filter is used to remove solids, reducing TSS down to less than 2.5 ppm.	A drum filter would remove solids in a manner similar to FWI. The same screening system would keep TSS to less than 2.5 ppm, compared to 5 ppm under the 2016 GP.
Sump Pump	A sump pump is used to pump water into a fluidized sand filter (biofilter)	Biofilter would operate under the same principles as the FWI fluidized sand filter, but would use plastic media for its nitrification process. Lower operating costs due to low head requirements.
CO ² Stripper and Low-Head Oxygenator	CO ² stripper is used to reduce CO ² and LHO is used to increase oxygen content in the water.	Design would use aeration to reduce CO ² . LHO to increase oxygen would be designed into the system.

3.1.3.3 Fish Feeding Methods

Feeding will be conducted in a manner that ensures maximum consumption of fish food, minimum wastage, and minimum release of uneaten food. Fish will be fed from once to several times per day. Fish feed typically contains 40% to 53% protein and 18% to 32% fat. Feed size, amount, and percent fed to each population of fish will be recorded daily. This information will be used with accurate weight samples to properly calculate feed conversion ratios and to determine appropriate feeding rates to meet production goals. Feed companies develop the strategy for feed size relative to fish size.

Three Arvo-Tec feeders with 150-liter hoppers will be mounted on the concrete fish tank. The amount of feed fed per day will be regulated through a computer-controlled feeding system. The system will be programmed to distribute feed every half hour into the tank, 24 hours per day. The system will use the temperature and oxygen level of supply water, the species, number and average weight of fish as its initial data. A mathematical energy demand model then calculates the feeding level on the basis of the input data; this level can be adjusted if necessary.

Oxygen levels will be checked three times per day with a minimum outflow oxygen level of 70% saturation (7 ppm). Incoming water will be aerated to 120% (12 ppm) to maintain optimum levels. If outflow levels drop below 70% saturation, aeration of incoming water will be increased.

Unopened bags of feed will be stored in designated areas that are dry, maintained at room temperature or refrigerated, and away from direct sunlight. Feed bags will be stored on a pallet or other raised structure, at least 6 inches away from walls. Opened feed bags or feed removed from bags will be stored in a secondary container so the feed will remain dry and inaccessible to rodents. Spilled feed will be promptly removed and discarded. Only fresh feed will be given to the fish.

3.1.3.4 *Disease Treatment and Vaccinations*

Disease control medications and chemicals approved for aquaculture use will be used under the direction of a certified Fish Health Specialist, Pathologist, or Doctor of Veterinary Medicine.

Immersion vaccine may be required at times to create resistance to *Flavobacterium columnare*. The first immersion is a two-step process where 2.5 grams of fish are dehydrated in a 25 ppt salt bath for 1 minute and then transferred to a vaccine solution for an additional minute until the group in its entirety is vaccinated. The adipose fin may be clipped to improve vaccine uptake. The same process will be followed for the second immersion vaccine as the fish are placed into a 3 ppt salt bath raceway after being clipped, then vaccinated for 1 minute. Normally fish are vaccinated at the 15 to 20-gram size.

3.1.3.5 *Outside Tanks*

Once the fish are greater than 20 grams in size, they will be transferred to outside tanks and raceways using totes with oxygenated water to move them.

3.1.3.6 *Mortalities*

Fish mortalities (“morts”) occur naturally as the fish are raised. Fish that die will be collected and removed in a manner to avoid discharges into waters of the State. As described above in Section 3.1.2, morts would be removed twice per day from the grating in front of the drum filter. Morts and dead, unfertilized, or culled eggs would be temporarily stored in a freezer for transport offsite to be disposed at an appropriate landfill.

3.1.3.7 *In-Water Discharges*

In-water discharges would include uneaten or regurgitated feed, fish feces, fish oil, and possibly other constituents associated with the Rainbow Trout recirculating aquaculture system. Maximum daily discharge from the outfall would be 55 to 110 gallons per minute (gpm),⁵ or 79,200 to 158,400 gallons per day (gpd). The maximum average monthly discharge is estimated to be 2.376 to 4.752 million gallons per month. Water quality constituents in process water estimated from the FWI reference facility previously described in Section 3.1.2.2 are shown in Table 3-3. Feeding occurs on a 24-hour-per-day basis in order to keep the biofilter operating in optimal condition. FWI uses Zielger feed. The CTFC RAS will use either EWOS or Skretting feed, as Zielger is not produced in the local area. All three feed companies produce an extruded pellet with similar protein and fat concentrations. Feed quantity used is based on biomass and biofilter size. While the CTFC RAS demonstration project will be larger than the FWI RAS therefore using more feed, the larger size of the CTFC RAS will compensate for the larger volumes of feed and biomass.

⁵ By comparison, a land-based fish-rearing facility not equipped with recirculating technology would discharge approximately 1,500 to 5,000 gpm of process water.

Table 3-3. Average water quality and concentration range during grow-out at a reference RAS facility operation (in mg/L unless otherwise labeled) (Freshwater Institute, West Virginia, 2016).

Water Quality Parameter	Mean Values		
	St. John	Cascade I	Cascade II
Alkalinity (as CaCO ₃)	212 ± 7	226 ± 3	209 ± 9
Carbon dioxide	9 ± 0	14 ± 1	13 ± 1
Dissolved oxygen	10.9 ± 0.0	11.3 ± 0.1	11.9 ± 0.1
Hardness	~300	~300	~300
Nitrite nitrogen	0.01 ± 0.00	0.01 ± 0.00	0.02 ± 0.01
Nitrate nitrogen	19 ± 2	19 ± 1	24 ± 3
Temperature (°C)	15.6 ± 0.0	15.6 ± 0.1	15.2 ± 0.0
Total ammonia nitrogen	0.11 ± 0.01	0.22 ± 0.01	0.30 ± 0.03
Total phosphorous	0.9 ± 0.1	0.7 ± 0.0	0.9 ± 0.1
Total suspended solids	1.2 ± 0.1	2.3 ± 0.2	2.5 ± 0.1

¹ St. John, Cascade I, and Cascade II are different strains of Atlantic Salmon raised at the same FWI RAS facility.

If chlorine is used to clean/disinfect the CTFC RAS at times, it would be dechlorinated with sodium thiosulfate before releasing the water to the discharge pipe.

Outfall discharges of process water would occur year-around. There are two options for disposal of solids screened from the process water discharge. This material may be trucked to area orchards for land application as fertilizer during the growing season (approximately April 1 through September 30), and/or it may be trucked to a solid waste landfill permitted to receive this type of waste.

3.1.4 Construction Proposal

Construction of the CTFC RAS demonstration project is estimated to take approximately 12 months, with a target date to begin in early 2023 (pending confirmation of funding and receipt of all required permits and approvals). If a decision is made to proceed with the full-scale RAS project at some future time, construction would be phased and could take several years. Additional property acquisition would be required for the full-scale facility. The rate of expansion would depend on the success of the project and available financing.

Preferred Site: Cassimer Bar Hatchery. As previously described in Section 3.1.1, some features of the former hatchery operation on the Cassimer Bar site have been vandalized and/or are currently in a state of disrepair. Unusable structures and debris would be demolished, removed from the site, and disposed at an approved solid waste landfill. Existing raceways would be refurbished, and the existing mobile home on the site would be replaced to provide a site manager residence. The proposed action would use the existing 4,000 sf building, six troughs within the building, two outdoor circular tanks and two raceways east of the building to grow fingerlings to the 600-gram (1.3-pound) size before moving them to the new RAS tank.

The first components of CTFC RAS demonstration project new construction would include building a 1,500 sf office (30 ft x 50 ft), a 6,000 sf steel building (60 ft by 100 ft), and the 600 cubic meter concrete tank and associated biofilter inside the steel building. The tank and biofilter section would be constructed below-grade, approximately 15 feet deep and 9 feet deep, respectively. Construction of these two buildings, the RAS tank and biofilter tank would take approximately 180 days to complete. The drum

filter, plastic biomed, low-head water pumps, blower, oxygen generators and the oxygenation system would be ordered as construction of the below-grade tanks began. This equipment would be installed after the fish culture tank is complete. Equipment and electrical installation is estimated to take approximately 30 days.

Following installation of the equipment, the culture tank would be filled with water from existing wells on the site. The tank and biomed would be inoculated with specialized bacteria to establish the biofilter. Bacteria on the biomed would be fed with ammonia to establish a vibrant nitrification colony. This process is estimated to take approximately 45 days.

Construction materials would be brought to the Cassimer Bar Hatchery site in containers transported by trucks. The containers would be off-loaded within a designated construction staging area. Primary construction equipment would include an excavator and a Skid Steer.

Alternative Site: Colville Tribal Trout Hatchery. Construction of the RAS prototype project on the Tribal Trout Hatchery site would be similar to that described above for the Cassimer Bar alternative, with two primary exceptions. It would not be necessary to construct an office at the Tribal Trout Hatchery site as an existing office building there could accommodate the administrative requirements for the RAS. It would be necessary to construct a new outfall a distance of approximately 678 feet from the RAS prototype building to the Columbia River shoreline. This would be open trench construction, requiring restoration of pavement, lawn areas, and shoreline stabilization (see Figure 3.1-6 in Section 3.2.1 below). Outfall construction work would require a Shoreline Substantial Development permit from the CCT Planning Department.

3.1.5 Permits and Approvals Required

Federal and Tribal process water discharge permits will be required to authorize the CTFC RAS demonstration project, and later to permit the full-scale project (if it proceeds). CTFC will apply to EPA for coverage under the NPDES General Permit (GP) for Discharges from Federal Aquaculture Facilities and Aquaculture Facilities Located in Indian Country in Washington (WAG130000). The 2016 General Permit expired on July 31, 2021, and was in the reissuance process at the time of this writing. It is expected that the CTFC RAS project will qualify for coverage under the GP when it is reissued in 2023. A pollution discharge permit will also be required from the CCT Office of Environmental Trust. The CTFC RAS would operate under the terms and conditions of this Tribal permit in a manner that would maintain compliance with Tribal surface water quality standards established for the Okanogan River or Columbia River (depending on the site selected). Table 3-4 provides a complete list of permit requirements known at this time.

Table 3-4. Permits and approvals required for the CTFC RAS demonstration project.

Permitting Agency	Permits and Approvals Required
U.S. Environmental Protection Agency	NPDES Waste Discharge Permit: Coverage under the General Permit for Discharges from Aquaculture Facilities Located in Indian Country within the State of Washington
U.S. Environmental Protection Agency	Compliance with the National Environmental Policy Act (NEPA)

Permitting Agency	Permits and Approvals Required
U.S. Environmental Protection Agency	Notice of Intent to comply with NPDES Construction Stormwater General Permit
CCT Office of Environmental Trust	Pollution Discharge Permit Chapter 4-8 Colville Tribal Law & Order Code (Water Quality Standards)
CCT	Fish transport permit for eggs or fingerlings entering the Colville Territory; Chapter 4-1 Colville Tribal Law & Order Code (Fish, Wildlife and Recreation)
CCT Office of Environmental Trust	Water rights approval for use of existing wells on the Cassimer Bar site; new well on the Colville Tribal Trout Hatchery site if this alternative were selected Chapter 4-10 Colville Tribal Law & Order Code (Water Resources Use and Permitting)
CCT Department of Planning	Shoreline Permit for construction of a new outfall to the Columbia River if the Colville Tribal Trout Hatchery site were selected
U.S. Army Corps of Engineers	Section 404 Permit for construction of a new outfall if the Colville Tribal Trout Hatchery site were selected
CCT Department of Planning	Conditional Use Permit Chapter 4-3 Colville Tribal Law & Order Code (Land Use and Development)
CCT Department of Planning	Building Permit Chapter 4-3 Colville Tribal Law & Order Code (Land Use and Development)
CCT Water Quality Department	On-site Wastewater Treatment and Disposal Permit Chapter 4-5 Colville Tribal Law & Order Code (On-site Wastewater Treatment and Disposal)
CCT Water Quality Department	Off-site disposal/land application of sludge from the RAS wastewater collection and filtering process
U.S. Fish and Wildlife Service	Inspection of brood stock for the presence of Washington State-regulated viral pathogens (50 CFR Subpart B Section 14.21)
Washington Department of Fish and Wildlife	Aquatic Farm Registration RCW 77.115.040, WAC 220-370.060
Washington Department of Fish and Wildlife	Fish Transport Permit

3.2 ALTERNATIVE SITES CONSIDERED

3.2.1 Colville Tribal Trout Hatchery

The Colville Tribal Trout Hatchery site (downriver from the City of Bridgeport) is one of the properties for which CCT entered into a Memorandum of Agreement with the Bonneville Power Administration (BPA) for acquisition and management of habitat for the benefit of resident and anadromous fish (CCT Resolution 2008-032). The Tribal Trout Hatchery site is 16.24 acres, purchased in November 2010 (previously operated by BPA from 1989). The Tribe's Fish and Wildlife Program raises Steelhead Trout on the property. It is a relatively small operation (less than 100,000 pounds of fish per year). This hatchery has existing NPDES coverage under Administrative continuation of the 2016 GP while the permit is undergoing reissuance, but did not undergo individual NEPA environmental review.

Figure 3.1-6 shows the location where a RAS prototype facility could be located on the Colville Tribal Trout Hatchery site. The existing office building (south of the prototype building) would have adequate capacity in which to perform the administrative functions for the RAS without constructing an additional office. This site would, however, require construction of a new outfall. Resident site managers on the Trout Hatchery site would reduce new staffing requirements for the RAS from six new positions at Cassimer Bar to five new positions.

The Colville Tribal Trout Hatchery site would require completely new construction of a prototype RAS facility, compared to restoration of existing troughs, tanks, and raceways at the Cassimer Bar Hatchery site. Either site would require new construction of a 6,000 sf steel building to house the RAS system, the 600 cubic meter concrete tank, biofilter, and associated water treatment facilities. Lacking the existing system of troughs, tanks, and raceways on the Cassimer Bar Hatchery site, the Tribal Trout Hatchery site could only produce approximately 108,000 pounds of fish per year in a RAS demonstration project unless other tanks could be obtained to grow fingerlings to the 600-gram size before moving them to the RAS tank.

Water supply conditions would be less favorable at the Tribal Trout Hatchery site compared to Cassimer Bar. Constructing the CTFC RAS demonstration project at this location would require drilling an additional well to provide adequate water supply. However, groundwater temperatures at this location are warmer in the summer (up to 58°F, 14.4°C) compared to the Cassimer Bar Hatchery site, which would require cooling incoming water to offset the operational increase in water temperature caused by the high level of water recirculation within a RAS facility. The existing well also has high nitrogen content and low dissolved oxygen (DO). Packed columns and/or low head oxygenation systems are used to manage dissolved nitrogen levels below 100% saturation and to increase DO levels to at least 95%.

The outfall that serves the existing Tribal Trout Hatchery, and the settling ponds that receive hatchery solids are limited in size to serve the existing Steelhead Trout operation on the site. Constructing the RAS demonstration project at this location would require a new outfall that would also maintain clear distinction between the effluent discharged by each operation.

CCT owns a 16-acre parcel north of the existing Tribal Trout Hatchery; however, this parcel is currently being considered as a location on which to expand the fish rearing potential of the existing Steelhead Trout hatchery. This could limit expansion opportunities for a full-scale CTFC RAS project at this location in the future.



Figure 3.1-6. Possible CTFC RAS Demonstration Project Location on the Colville Tribal Trout Hatchery Site.

3.2.2 Alternative Sites Considered and Eliminated from Detailed Evaluation

Chief Joseph Salmon Hatchery. The CCT Fish and Wildlife Department operates the Chief Joseph Salmon Hatchery on the downstream side of Chief Joseph Dam, on the right bank of the Columbia River. This hatchery has existing NPDES coverage under Administrative continuation of the 2016 GP, and underwent environmental review as an element of the *Chief Joseph Hatchery Program Final Environmental Impact Statement* (BPA, CCT, and USACE 2009). Adding the CTFC RAS demonstration project to this site would require EPA to find “no material change” to the existing environmental review or authorized process water discharge constituents, and would require continuing to abide by the reporting requirements of the General Permit if the CTFC RAS were added. The feasibility of adding the CTFC RAS demonstration project to this site was reviewed with the CCT Hatchery Manager.

The Bonneville Power Administration (BPA) funds a Chinook Salmon production program and hatchery at Chief Joseph Hatchery. The purpose of the program is to assist in the protection and mitigation of summer/fall Chinook Salmon populations affected by the Federal Columbia River Power System by increasing abundance, distribution, and diversity of naturally spawning summer/fall Chinook within their historical Okanogan subbasin habitat, and in the Columbia River between the Okanogan River and Chief Joseph Dam.

The hatchery site is owned by and leased from the U.S. Army Corps of Engineers (USACE). Dam operations were factored into hatchery design and production program considerations in collaboration with USACE to ensure that the hatchery does not interfere with dam operations. If the CTFC RAS demonstration project were added to this site, it would require amending the lease agreement with USACE.

Water is supplied to the Chief Joseph Hatchery from three sources: Rufus Woods Lake, a relief tunnel that collects seepage from the Chief Joseph Dam abutment, and a well field. There are water supply constraints to operate the existing Salmon hatchery. Adding the CTFC RAS demonstration project to this site would require obtaining additional water supply. CCT was engaged in negotiations with the Bonneville Power Administration at the time of this writing on water volume and water temperature issues to serve the existing hatchery operation, and would not consider it credible to identify a need for an additional 100 gpm to serve the CTFC RAS demonstration project on the Salmon hatchery site.

Omak Acclimation Pond Site. The Omak acclimation pond is one of two new ponds constructed for final rearing, acclimation, and release of summer/fall Chinook Salmon and spring Chinook Salmon incubated and reared at the Chief Joseph Salmon Hatchery. The Omak Acclimation Pond was constructed on property owned by CCT. It presently operates under Administrative Authorization while the 2016 GP is in the reauthorization process, and has environmental review coverage under the NEPA EIS that was prepared for the Chief Joseph Salmon Hatchery project.

The Omak Acclimation Pond site was briefly considered as a possible location for the CTFC RAS demonstration project. Constraints include water supply, authorized maximum annual aquatic animal production, and location within the floodplain of the Omak River. The existing well does not have the capacity to serve the 100 gpm needs of the CTFC RAS in addition to the existing flow-through acclimation pond use. The Omak pond is designed to rear 400,000 yearlings with a maximum annual production of 50,715 pounds per year (NPDES ID No. WAG130024). The CTFC RAS demonstration project is expected to produce approximately 214,000 pounds of fish per year. The Omak Acclimation Pond Site has flooded three times in the past 10 years, making this site unsuitable for construction of the 6,000sf building and 600 cubic meter fish culture tank required for the CTFC RAS demonstration project.

3.3 NO ACTION ALTERNATIVE

If the No Action Alternative were selected, no land-based Rainbow Trout rearing facility would be constructed on the CCT Reservation at this time. Existing hatchery facilities on the Cassimer Bar site would remain in a vandalized and unused condition, and no new jobs would be created for CCT members. There would be no augmentation of the supply of U.S.-produced aquaculture Trout from this facility. While the proposed demonstration project is small compared to world supply of these fish,⁶ failing to construct and operate the prototype would delay or defeat the full-scale CTFC RAS project described in the Feasibility Study for the project.

⁶ In 2007, Americans consumed a total of nearly 5 billion pounds of seafood, which equates to approximately 16 pounds per person per year. The U.S. is the third largest consumer of seafood in the world. Demand exceeds domestic supply from wild stocks. Currently, the U.S. imports 84% of its seafood, and about half of those imports are from aquaculture in other countries. The current trade deficit in seafood is approximately \$9 billion (U.S. Department of Commerce Aquaculture Policy, February 2011).

4.0 EXISTING ENVIRONMENT AS IT PERTAINS TO THE PROJECT

4.1 AQUATIC ENVIRONMENT

Information used to describe existing conditions of the aquatic environment in the vicinity of the Cassimer Bar site was derived primarily from the following sources: *Chief Joseph Hatchery Program Final Environmental Impact Statement* (BPA, CCT, and USACE 2009); *Biological Assessment and Essential Fish Habitat Assessment for the Repair of the Cassimer Bar Dikes near the Confluence of the Okanogan and Columbia Rivers* (Douglas County PUD 2014a); *SEPA Checklist: Cassimer Bar Dike Breaching* (Douglas County PUD 2014b); *Cassimer Bar Hatchery Assessment* (McMillen Jacobs Associates 2015); *Priority Habitats and Species Database Search in the Vicinity of T30R25E Section 21* (Washington Department of Fish & Wildlife 2022); and a site inspection conducted by the authors of the NEPA EA on November 10, 2021. Information used to describe existing conditions of the aquatic environment in the vicinity of the Colville Tribal Trout Hatchery was derived primarily from the resident fish hatchery manager; a November 10, 2021 site inspection; *Chief Joseph Hatchery Program Final Environmental Impact Statement* (BPA, CCT, and USACE 2009); and *Priority Habitats and Species Database Search in the Vicinity of T29R25E Section 10* (Washington Department of Fish & Wildlife 2022).

4.1.1 Fish and Aquatic Habitat

The Washington State list of priority species includes species that do not have a Federal listing under the Endangered Species Act: Dolly Varden Trout, Kokanee, Pygmy Whitefish, Rainbow Trout, and Sockeye Salmon. Dolly Varden are listed because they are visually difficult to distinguish from Bull Trout. Kokanee are a lake-dwelling life form of the Sockeye Salmon species requiring habitat that does not exist in the project vicinity. The Pygmy Whitefish has been identified as occurring at several locations within the upper Columbia River a substantial distance from the CTFC RAS demonstration project alternative sites. Pygmy Whitefish occur in deep-water lake habitat of which there is none in the project vicinity. No Pygmy Whitefish have been identified in the Columbia River in the vicinity of its confluence with the Okanogan River. Rainbow Trout are hatchery-reared in large numbers and planted in hundreds of lakes in Washington, including many in Okanogan County. None of these are within the vicinity of the alternative sites.

Priority fish species that could potentially be affected by the proposed project are identified by the Washington Department of Fish and Wildlife (Table 4-1). Also included are ESA-listed species that occur in the Okanogan and Columbia Rivers in the general vicinity of Cassimer Bar. Those marked with an asterisk (*) also occur in the Columbia River near the Colville Tribal Trout Hatchery site.

Table 4-1. Washington state priority fish species that occur in the upper Columbia and/or Okanogan River and vicinity (WDFW 2022), and Federally-listed fish species.

Common Name	Scientific Name	State Priority Species	State Status ¹	Federal Status ¹
Spring Chinook*	<i>Oncorhynchus tshawytscha</i>		None	Endangered ²
Summer Chinook*	<i>O. tshawytscha</i>	Yes	None	Depressed ³
Bull Trout*	<i>Salvelinus confluentus</i>		Candidate	Threatened
Dolly Varden*	<i>S. malma</i>		None	None
Kokanee	<i>O. nerka</i>		None	None
Pygmy Whitefish	<i>Prosopium coulterii</i>	Yes	Sensitive	None
Rainbow Trout*	<i>O. mykiss</i>	Yes	None	None
Sockeye Salmon*	<i>O. nerka</i>	Yes	Candidate	None
Summer Steelhead	<i>O. mykiss</i>	Yes	Candidate	Threatened ⁴

¹ State and Federal listing status indicated in this table are according to WDFW (2021) except as noted.

² Upper Columbia River spring run, Okanogan River, experimental population.

³ Source: BPA, CCT, USACE 2009.

⁴ Upper Columbia River, Okanogan hatchery program.

Preferred Site: Cassimer Bar Hatchery. Aquatic habitat that supports fish species in the general vicinity of the Cassimer Bar site includes the Okanogan River and the Columbia River downstream from its confluence with the Okanogan River. The backwater slough habitat into which the CTFC RAS demonstration project outfall would discharge does not provide habitat characteristics in which any of the Federal- or State-listed fish species are likely to occur. Bull Trout, for example, spawn in small streams with very cold clear water with clean gravel substrates – conditions that are not present in the project vicinity.

Alternative Site: Colville Tribal Trout Hatchery. The Colville Tribal Trout Hatchery site is within the general vicinity of Cassimer Bar and therefore could be assumed to support essentially the same fish populations in the Wells Pool.

4.1.2 ESA-Listed Fish Species

Preferred Site: Cassimer Bar Hatchery. Three Federally-listed species of salmon (Chinook, Sockeye, and Steelhead) occur in stream or reservoir habitats in the general vicinity of the CTFC RAS demonstration project alternative sites (see Table 4-1). Each of these species potentially uses the Okanogan River as a migratory corridor to spawning habitat in the upstream reach of the river or its tributaries. None of these salmon species are likely to use the backwater slough habitat that would receive the outfall discharge from the CTFC RAS demonstration project if it were constructed on the Cassimer Bar site.

Alternative Site: Colville Tribal Trout Hatchery. The WDFW PHS database report identifies two of the same Federally-listed species of salmon (Chinook and Sockeye) in stream or reservoir habitats in the general vicinity of the Tribal Trout Hatchery site (Table 4-1).

4.1.3 Hydrology, Water Quality, Floodplains

Surface Water.

The Columbia River is the largest North American river flowing to the Pacific Ocean, and is the fourth largest river in the United States in terms of discharge. Approximately 500 miles of its 1,240-mile length lies in Canada, between the headwaters in British Columbia and the U.S. border. A total of 14 mainstem dams were constructed across the river between the 1930s and 1980s for hydropower generation, navigation, irrigation, and flood control. This converted extensive upstream habitat from riverine to reservoir habitat, resulting in lost access to large quantities of salmonid spawning, rearing, and migratory habitat.

The Okanogan River originates in the Cascade Mountains north of the international border between British Columbia and Washington State. The Okanogan River is characterized by a series of lakes north of the international boundary, and a free-flowing river below Lake Osoyoos, which straddles the boundary. The primary tributary to the Okanogan River is the Similkameen River, for which the confluence is 5 miles south of Lake Osoyoos. The Similkameen River normally contributes three-quarters of the combined flow in the Okanogan River (Washington Department of Ecology 2004).

Preferred Site: Cassimer Bar Hatchery. There is no surface water on the Cassimer Bar Hatchery site. The Columbia River is approximately 0.25 mile (1,320 feet) overland south of existing structures (see Figure 1.3-1 in Chapter 1), and 15 feet lower in elevation. The outfall from the former hatchery operation discharged to a backwater slough of the Okanogan River approximately 200 feet south of the existing hatchery building on the site (see Figure 3.1-4 in Chapter 3). The slough (when it flows) discharges to the Okanogan River approximately 1.25 miles to the northwest.

Alternative Site: Colville Tribal Trout Hatchery. Similarly, there is no surface water on the Colville Tribal Trout Hatchery site. The footprint of the RAS prototype building would be approximately 678 feet east of the Columbia River. Construction of a new outfall would be required to serve the RAS on this site if this alternative were selected.

Groundwater.

Preferred Site: Cassimer Bar Hatchery. Three production wells were developed on the Cassimer Bar Hatchery site in the early 1990s by Douglas County PUD. Each is equipped with a line shaft turbine pump and flow switches. Each well head discharge is above grade and includes a check valve, isolation valve, air release valve, and drain valve. Downstream of the valves, the steel supply piping from each well is routed underground into a transmission piping network that supplied the existing hatchery building. Well #1, located northeast of the hatchery site, has a 12-inch diameter casing and a 20 horsepower (hp) pump. Well #2, located in a shed on the east side of the site, has an 8-inch diameter casing and is equipped with a 5 hp pump. Well #3 is located southwest of the existing hatchery building, and has a 12-inch diameter casing with a 15 hp pump. Wells #1 and #2 were the primary sources of up to 1,000 gallons per minute (gpm) of groundwater supplied to former hatchery operations. Well #3 was used primarily as a back-up source. No well logs or water right information was found. The wells draw from a shallow productive aquifer, roughly 10 feet below grade, that appears to be surface water-influenced and subject to seasonal variations as a result (McMillen Jacobs Associates 2015). Prospects are thought to be good for developing additional wells if needed (Associated Earth Sciences, Inc. 2012).

Alternative Site: Colville Tribal Trout Hatchery. Well logs were found for two production wells on the Colville Tribal Trout Hatchery site. Well #4 is 12 inches in diameter and was completed to a depth of 170

feet in 1988. It produces 1,000+ gallons per minute. Groundwater was found in the well logs ranging from approximately 46 to 185 feet. Well #A6 is also 12 inches in diameter, completed to a depth of 144 feet in 1988, and also produces 1,000+ gallons per minute. Groundwater was found in the well logs ranging from approximately 34 to 190 feet.

Onsite Water Quality and Treatment.

Preferred Site: Cassimer Bar Hatchery. Historical records from previous hatchery operations on the Cassimer Bar site show that groundwater temperatures vary seasonally between 12 and 13.75° C, indicating potential surface water influence from the nearby Columbia and Okanogan Rivers. Well water quality is sufficient for rearing fish. No water chemistry or temperature data was provided (Associated Earth Sciences 2012). Degassing/aeration columns were used to treat well water prior to use in the hatchery building and in outdoor rearing units.

Alternative Site: Colville Tribal Trout Hatchery. Groundwater temperatures at the Tribal Trout Hatchery location are warmer in the summer (up to 58°F, 14.4°C) compared to the Cassimer Bar Hatchery site, which would require cooling incoming water to offset the operational increase in water temperature caused by the high level of water recirculation within a RAS facility. The existing well also has high nitrogen content and low dissolved oxygen (DO).

Hydraulic Profile.

Preferred Site: Cassimer Bar Hatchery. Cassimer Bar site groundwater is pumped from a shallow aquifer via the onsite wells to packed column aerators located at outdoor rearing units, and to a central packed column headbox assembly that was used to treat the hatchery building water supply. The 24-inch diameter packed column has a theoretical capacity of more than 2,000 liters (approximately 530 gallons) per minute (Lpm). The highest point in the hydraulic profile is the 6-inch steel supply pipe that feeds into the top of the central packed column at an elevation roughly 20 feet above the finished grade of the existing hatchery building. The aerated and gas-stabilized water is fed by gravity flow from the central headbox to various points inside the existing hatchery building via an overhead 12-inch diameter PVC piping system.

The proposed CTFC RAS system, if constructed on Cassimer Bar, would not require an aerated gas supply or central headbox. It will have its own water supply: 100 gpm make-up water will be added directly to the biofilter from the existing well water supply.

During a site reconnaissance by Associated Earth Sciences, Inc. in December 2011, it was only possible to measure depth to groundwater in one of the three Cassimer Bar site wells. The water level in Well No. 1 in the northeast corner of the hatchery site was approximately 10 feet below grade at that time (AESI 2012).

Alternative Site: Colville Tribal Trout Hatchery. Well logs indicate that the depth to groundwater ranges from 34 to 190 feet on the Tribal Trout Hatchery site.

Okanogan River Water Quality.

CCT has jurisdiction over water quality on Reservation lands. The Okanogan River is designated by the Tribal Code of Laws (Chapter 4-8 Water Quality Standards) as Class II waters, which is CCT's "excellent" designation. This compares to the Washington State (Department of Ecology) Class A water quality standard. Class II waters meet or exceed the requirements for all (or substantially all) characteristics, which include: domestic and other water supply; salmonid and other fish migration, rearing, spawning, and harvesting; wildlife habitat; recreation (swimming, boating, fishing, and aesthetic enjoyment); commerce

and navigation; and ceremonial and religious water use (Chapter 4-8, Section 4-8-6[b]). CCT water quality criteria for Class II waters are shown in Table 4-2.

Table 4-2. Class II water quality standards applicable to the Okanogan River and Columbia River (Wells Pool): Tribal Code of Laws Chapter 4-8, Section 4-8-6(b).

Water Quality Parameter	Class II Water Quality Criteria
Fecal coliform organisms – freshwater	Shall not exceed a geometric mean value of 100 organisms/100 mL, with not more than 10% of samples exceeding 200 organisms/100 mL.
Dissolved oxygen – freshwater	Shall exceed 8.0 mg/L.
Total dissolved gas	Shall not exceed 110% of saturation at any point of sample collection.
Temperature – freshwater	Shall not exceed 18.0°C due to human activities. Temperature increases shall not, at any time, exceed $t=28/(T+7)$ where “t” represents the permissive temperature change across the dilution zone, and “T” represents the highest existing temperature in this water classification outside of any dilution zone.
pH – freshwater	Shall be within the range of 6.5 to 8.5 with a man-caused variation within a range of less than 0.5 units.
Turbidity	Shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10% increase in turbidity when the background turbidity is more than 50 NTU.
Toxic, radioactive, or deleterious material concentrations	Shall be below those of public health significance, or which may cause acute or chronic toxic conditions to the aquatic biota, or which may adversely affect any water use.
Aesthetic values	Shall not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste.

The Okanogan River is on Ecology’s Clean Water Act 303(d) list of impaired and threatened water bodies requiring additional pollution controls for failure to meet water quality standards. In 2009, the *Chief Joseph Hatchery Program Final Environmental Impact Statement* (BPA, CCT, and USACE 2009) reported historical water quality violations for temperature, dissolved oxygen, and pH. Fecal coliform bacteria, nutrient, and turbidity levels were reportedly generally at acceptable levels for most of the year, but excursions beyond criteria did occur (Ecology 2009 in BPA, CCT, USACE 2009).

The Washington Department of Ecology noted consistent late summer water temperature exceedences of maximum criteria from 1983-1993 in the Okanogan River. The 2004 303(d) list noted that Malott station (approximately 8 miles north of Cassimer Bar) exceeded the State (and CCT) maximum standard of 18°C thirteen of fifty-five times for samples taken between 1993 and 2001 with high temperatures usually occurring in July, August, and September. One excursion from criteria was also noted in 2002. These occurrences reportedly result from natural phenomena (low gradient and solar radiation on upstream lakes) exacerbated by summer low flows caused by irrigation withdrawals, poor riparian conditions, and increased temperatures in water released from dams (Entrix, Inc., Golder Associates, and Washington Conservation Commission 2004 in BPA, CCT, USACE 2009).

A review of Ecology’s TMDL website on May 9, 2022, identified only one publication for the lower Okanogan River: *Lower Okanogan River Basin DDT and PCBs Total Maximum Daily Load: Submittal Report* (October 2004). Under Section 303(d) of the Federal Clean Water Act, the Okanogan River and several tributaries have been listed by Washington State for non-attainment of the EPA human health

criteria for DDT and PCB⁶ in edible fish tissue, and for non-attainment of Washington State chronic criteria for DDT in water. The source of these contaminants appears to be the legacy from historic agricultural and industrial activities common throughout the Okanogan River watershed. Substantial mitigation, both direct and indirect, has already occurred. Direct actions include the banning of these materials from use. Indirect actions include irrigation improvements that have reduced the loss of agricultural topsoil that potentially could carry pesticide residues to the Okanogan River and associated waterbodies.

Columbia River Water Quality, Wells Pool.

The Columbia River from Chief Joseph Dam to Wells Dam is also designated as Class II “excellent” by the Tribal Code of Laws. Immediately upstream and downstream of Chief Joseph Dam, the TMDL 303(d) listing is for elevated water temperature conditions only (Ecology 2009 in BPA, CCT, and USACE 2009). Water temperature data is collected in the tailrace of Chief Joseph Dam at station CHQW (Rivermile 545). River temperature exceeded the Tribal water quality standard of 18°C by a mean of 0.7° and a maximum of 2.1° on an average of 50 days per year between 2011 and 2016 (EPA 2021).

Floodplains.

CCT has codified the language of the FEMA National Flood Insurance Program into CCT Tribal Code Chapter 4-20. Outside the City of Omak, no known Federal Emergency Management Agency (FEMA) floodplains exist within the unincorporated boundaries of the Reservation (Colville Confederated Tribes, September 2000).

The Okanogan River floodplain in the vicinity of the Cassimer Bar site is mapped only above the SR-97 bridge (FEMA Flood Insurance Rate Map 5301171225C). The backwater slough that conveys the outfall discharge from the former Cassimer Bar Hatchery enters the Okanogan River below the mapped floodplain, essentially at the confluence of the Okanogan River with the Columbia River (see Figure 1.3-1 in Chapter 1). There is no mapped floodplain of the Columbia River through the Wells Pool (Lake Pateros) because water levels are controlled by the operation of Wells and Chief Joseph Dams (BPA, CCT, USACE 2009). Both the Cassimer Bar and Colville Tribal Trout Hatchery sites are located on properties adjacent to the Wells Pool.

4.2 TERRESTRIAL ENVIRONMENT

Information used to describe existing conditions of the terrestrial environment in the vicinity of the Cassimer Bar Hatchery site was derived primarily from the following sources: *Chief Joseph Hatchery Program Final Environmental Impact Statement* (BPA, CCT, and USACE 2009); *Priority Habitats and Species Database Search in the Vicinity of T30R25E Section 21* (Washington Department of Fish & Wildlife 2022); the *Rufus Woods Lake Site #3 Steelhead Trout Net Pen Aquaculture Draft NEPA Environmental Assessment* (Vicki Morris Consulting Services, et al., 2011); and a site inspection conducted by the authors of the NEPA EA on November 10, 2021. Information used to describe existing conditions on the Colville Tribal Trout Hatchery site was obtained from the resident fish hatchery manager, and from a *Priority Habitats and Species Database Search in the Vicinity of T29R25E Section 10* (Washington Department of Fish & Wildlife 2022).

⁶ The chemical characteristics of DDT and PCBs cause them to be classified as persistent, bioaccumulative toxins. Their use has been banned in both the United States and Canada for more than 25 years.

4.2.1 Wildlife and Terrestrial Habitat

The general area is characterized by semi-arid habitat types typical of northeastern Washington State. The most common habitats are shrub-steppe⁷ and agricultural. Open water and riparian habitats occur along the Okanogan and Columbia Rivers. Orchards and pasture lands comprise the agricultural habitats.

Preferred Site: Cassimer Bar Hatchery. The Cassimer Bar Hatchery site is disturbed rangeland, having been previously developed with various hatchery operations as described in Chapter 3, Section 3.1.1. The site is almost completely cleared, with a few willow trees in the western portion (see Figure 4.2-1). Since discontinuation of hatchery operations in 2013, sparse sage brush vegetation and weeds have grown on the site. Evidence was observed during a November 10, 2021 site inspection of cows having grazed within and adjacent to the fenced portion of the property.

Small mammals and reptiles are probably present on both alternative sites, and large mammals such as coyotes may be present sporadically. Swallows and bats most likely forage for insects over the open water and grasslands. Belted kingfishers, red-winged blackbirds, warblers, and other songbirds occur in willow habitats similar to those near the fenced edge of the Cassimer Bar Hatchery property (BPA, CCT, USACE 2009).

Culturally important wildlife species that may occur in the general area include Mule Deer, White-tailed Deer, beaver, rabbits, rodents, eagles, hawks, owls, upland game birds, waterfowl, Great Blue Heron, scavenger birds, snakes, lizards, river mussels and, to a lesser extent, Black Bear and Gray Wolf (BPA, CCT, USACE 2009).

A search of the Washington State Department of Fish & Wildlife Priority Habitats and Species database was requested for the Cassimer Bar Hatchery site and within approximately a 1.5-mile radius.⁸ Regular concentrations of Mule Deer, Chukar, Common Loon, American White Pelican, and waterfowl (diving ducks, dabbling ducks, and geese) are reported, as are breeding occurrences of waterfowl and cavity-nesting ducks (WDFW 2022). Within a 0.5-mile radius of existing hatchery structures on the site, regular occurrences of the species listed in Table 4-3 were reported. Several decades ago (1986), a Burrowing Owl nest location was reported on Cassimer Bar more than 1,000 feet north of the hatchery site. Burrowing Owl is a State candidate for listing, but has no Federal listing status.

Table 4-3. Washington state priority bird species in the vicinity of the Cassimer Bar site (WDFW 2022).

Common Name	Scientific Name	State Priority Species	State Status	Federal Status
American White Pelican: up to about 200 birds	<i>Pelecanus erythrorhynchos</i>	Yes	Threatened	None
Wigeon: fall/winter 5,000 to 15,000 birds	<i>Anas</i> sp.	Yes	None	None
Mallards: fall/winter 500 to 10,000 birds	<i>Anas platyrhynchos</i>	Yes	None	None
Scaup: fall/winter 100 to 12,000 birds	<i>Aythya</i> sp.	Yes	None	None

⁷ The WDFW Priority Habitats and Species database search indicated no presence of shrub-steppe priority habitat on either alternative site (WDFW 2022).

⁸ The WDFW PHS database search for the Cassimer Bar site was for the vicinity of Section 21, Township 30, Range 25 E, Okanogan County.

Common Name	Scientific Name	State Priority Species	State Status	Federal Status
Redhead: fall/winter 500 to 10,000 birds	<i>Aythya americana</i>	Yes	None	None
Canvasback: fall/winter 500 to 4,000 birds	<i>Aythya valisineria</i>	Yes	None	None
Canada Goose: fall/winter 100 to 3,000 birds	<i>Branta canadensis</i>	Yes	None	None

Alternative Site: Colville Tribal Trout Hatchery. Similarly, a search of the Washington State Department of Fish & Wildlife Priority Habitats and Species database was requested for the Colville Tribal Trout Hatchery site and within approximately a 1.5-mile radius.⁹ No priority terrestrial habitats or terrestrial species were identified in proximity to the existing hatchery or the alternative site for the RAS prototype construction/operation. The Colville Tribal Trout Hatchery resident manager reports observations of osprey, kingfisher, gray heron, green heron, gulls, ducks, and killdeer (pers. comm. with J. Phillips, December 1, 2021).

4.2.2 Vegetation

The project area is within the Okanogan Highlands and Columbia Basin physiographic provinces (Franklin and Dyrness 1973), characterized by semi-arid plant communities typical of northeastern Washington State.

Preferred Site: Cassimer Bar Hatchery. The Cassimer Bar Hatchery site is in a rangeland area, with a sparse assemblage of sage brush-type species and weeds. A few Siberian elm, willow trees, and one small pine tree appear to have been planted around the mobile home on the site formerly used as the hatchery manager's residence.

Two ponds east of the fenced perimeter of the former hatchery were excavated for use as rearing ponds associated with one of the historical hatchery operations on the site. They are relatively uniform in size and unlike any other features in the natural landscape of Cassimer Bar. Riparian edge vegetation now includes at least one obligate wetland species (cattail). The regulatory status of these ponds is unknown.

Alternative Site: Colville Tribal Trout Hatchery. The alternative location for the RAS prototype building on the Tribal Trout Hatchery site is vacant land within the developed complex of the existing Steelhead Trout hatchery. Existing vegetation is also a sparse assemblage of sage brush-type species and weeds at this location (see Figure 3.1-6 in Chapter 3).

⁹ The WDFW PHS database search for the Colville Tribal Trout Hatchery site was for the vicinity of Section 10, Township 290, Range 25 E, Okanogan County.



**Okanogan
County**

Washington

Self Service Government **MapSifter**

Search

Examples:

Parcel: 1250110000

Address: 149 3rd Ave

Owner: Jackson

MAP IS FOR INFORMATIONAL PURPOSES
ONLY. DATA MAY NOT BE CURRENT.



Figure 4.2-1. Existing Site Habitat Characteristics.

4.2.3 ESA-Listed Terrestrial Species

Preferred Site: Cassimer Bar Hatchery. Of the birds and wildlife on the WDFW Priority Habitats and Species list for the area around the Cassimer Bar Hatchery site (described in Section 4.2.1 above), none have a Federal listing under the Endangered Species Act.

A rare plant survey of the Wells Reservoir (Lake Pateros) was conducted in 2016 (EDAW, Inc.). None were found. The *Chief Joseph Hatchery Project EIS* (BPA, CCT, USACE 2009) describes four Federally-listed endangered, threatened, and species of concern plants that occur in Okanogan County: Ute ladies'-tresses, triangular-lobed moonwort, crenulate moonwort, and two-spiked moonwort. All occur at elevations and in habitat types that are not present on the Cassimer Bar Hatchery site.

Alternative Site: Colville Tribal Trout Hatchery. Similarly, the WDFW PHS database search for the area that includes the Tribal Trout Hatchery site did not identify any Federally-listed birds or wildlife on the right bank of the Columbia River where this site is located. A rare plant survey was not conducted for this property due to the degree of disturbance from the past gravel extraction operation and existing site development for the Steelhead Trout hatchery use.

4.2.4 Air Quality and Climate Change

Air Quality.

U.S. Environmental Protection Agency (EPA) Region 10 promulgated rules under the Clean Air Act (CAA) within the region and specific to the Colville Reservation in June 2005. These rules, Federal Air Rules for Reservations (FARR) (40 CFR Parts 9 and 49), created basic Federally-enforceable air quality regulations on thirty-nine Indian reservations in Idaho, Oregon and Washington in order to protect human health and the environment. The FARR rules fill the regulatory gap so that Reservation residents have air quality protections similar to those that exist outside Indian reservations. The Rules apply to all persons and businesses located within the Federally-recognized exterior boundaries of the CCT Reservation. In Subpart M – Implementation Plan for the Confederated Tribes of the Colville Reservation, Washington – specific rules and measures are described that apply to this Reservation.

The Washington State Department of Ecology (Ecology) does not have regulatory authority or jurisdiction over air quality within the exterior boundaries of the Reservation.

The CCT Reservation is unclassified for inhaleable particulate matter – PM_{2.5}. Particulate matter consists of fine particles (2.5 micrometers or smaller in diameter) of vehicle exhaust emissions, woodstove emissions, industrial emissions, wildfire smoke, windblown dust, and other materials that remain suspended in the atmosphere for a substantial period of time. The Washington Department of Ecology monitors PM_{2.5} at a mobile site in Brewster.¹⁰ As of May 9, 2022, the pollution index for this parameter was 8, well within the “Good” range of 0 to 50.

Generally, terrain and wind patterns result in optimum conditions for maintaining high air quality through the Okanogan Valley.

Preferred Site: Cassimer Bar Hatchery. Neither odors or particulate matter were apparent in the vicinity of the Cassimer Bar Hatchery during a November 10, 2021 site inspection by the authors of this NEPA EA.

¹⁰ <https://fortress.wa.gov/ecy/enviwa/Default.htm>.

Alternative Site: Colville Tribal Trout Hatchery. Similarly, neither odors or particulate matter were apparent in the vicinity of the Tribal Trout Hatchery site during a November 10, 2021 site inspection.

Climate Change.

A project contributes to global climate change through its incremental effects combined with the cumulative increase of all other sources of greenhouse gas emissions in the world. From a qualitative perspective, the small-scale RAS hatchery project in a rural area of Okanogan County would not be expected to be a significant or large contributor to global GHG emissions in its operational condition on either site. The project would result in incremental contributions to suspended particulates in the local area (e.g., dust and vehicle exhaust emissions) during construction. There are no known pathways by which a changing climate may adversely impact the proposed action.

4.2.5 Land Use

The CCT Reservation was established by Presidential Executive Order on April 9, 1872, and was originally twice as large as it is today. The Reservation land base now covers 1.4 million acres (2,187 square miles) in North Central Washington, primarily in Okanogan and Ferry Counties. The Reservation consists of Tribally-owned lands held in Federal Trust status for the Confederated Tribes; land owned by individual CCT members, most of which is held in Federal Trust status; and land owned by others as fee property, taxable by Counties. CCT Reservation lands are diverse with natural resources that include standing timber, streams, rivers, lakes, minerals, varied terrain, native plants and wildlife.

Both alternative sites are mapped within a Special Requirement District (SRD) on the CCT Reservation. Areas with this designation exhibit the widest range of disparate, inconsistent existing uses, and are expected to have the largest amount of future growth. Until further study and planning can be accomplished, any use within this designation shall be considered a conditional use subject to the requirements of CCT Code of Laws Chapter 4-3, Land Use and Development, Sections 4-3-118 to 4-3-122. CCT has authority over land use and construction permitting for projects on Tribal Trust lands.

Preferred Site: Cassimer Bar Hatchery. The Cassimer Bar site is owned by CCT. Adjacent lands on Cassimer Bar are owned by Douglas County Public Utility District (PUD).

Existing structures and former hatchery operations on the Cassimer Bar site are described in Chapter 3, Section 3.1.1. Characteristics of adjacent lands are described in the Wildlife Habitat and Vegetation sections above (Sections 4.2.1 and 4.2.2, respectively). The only developed land use in the vicinity is a Tribal smoke shop at the intersection of SR-97 and the Cassimer Bar Access Road, approximately 0.6 mile north of the hatchery site (see Figure 1.3-1). This intersection is approximately 3.75 miles north of the town of Brewster.

Alternative Site: Colville Tribal Trout Hatchery. The Tribal Trout Hatchery is on Tribal Trust Land. A privately-owned orchard borders the site to the northeast, and the U.S. Army Corps of Engineers owns property to the south adjacent to the Columbia River. Existing development on the site is shown on Figure 3.1-6 in Chapter 3. The Tribal Trout Hatchery is approximately 2.5 miles north of the City of Bridgeport on the right bank of the Columbia River, adjacent to the Wells Pool.

4.3 HUMAN ENVIRONMENT

Information used to describe existing conditions of the human environment in the vicinity of the Cassimer Bar and Tribal Trout Hatchery sites was derived primarily from the *Chief Joseph Hatchery Program Final Environmental Impact Statement* (BPA, CCT, and USACE 2009); the *Rufus Woods Lake Site #3 Steelhead Trout Net Pen Aquaculture Draft NEPA Environmental Assessment* (Vicki Morris Consulting Services, et al., 2011); personal communications and site-specific sources as noted.

4.3.1 Cultural Resources

Cultural resources include prehistoric and historic archaeological sites, historic structures, and traditional cultural properties (places that may or may not have human alterations, but are important to the cultural identity of a community or Indian tribe). The National Historic Preservation Act of 1966, as amended, requires that these resources be inventoried and evaluated for eligibility for listing in the National Register of Historic Places (NRHP) and that project effects be determined. Laws and regulations protecting cultural resources are described in NEPA EA Chapter 6.

The Confederated Tribes of the Colville comprise descendants of 12 different aboriginal groups: the Wenatchee, Chelan, Entiat, Methow, Okanogan, Nespelem, San Poil, Lakes, Colville, Moses-Columbia, Palus, and Chief Joseph Band of the Nez Perce. Archaeological evidence from Reservation sites suggest that the area has been occupied for approximately 7,000 years (CTRC 2000).

Family groups of the Middle Columbia Salish peoples typically dispersed from winter villages in the spring when root crops matured. Salmon fishing spanned May to August, and people tended to gather in fishing camps. Dispersal to hunting grounds began in late summer. Winter villages were constructed in October and November, typically in the lowlands along major rivers and near firewood. Historically, the Okanogan River provided an important subsistence fishery for the Confederated Tribes of the Colville. To take advantage of fish and water, most permanent tribal villages were established along the river (CCT 2004).

Preferred Site: Cassimer Bar Hatchery. The Tribal Historic Preservation Officer (THPO) of the Confederated Tribes of the Colville Reservation reports that Cassimer Bar is covered in sensitive sites (archaeological sites, traditional places, historic area allotments), but not at the hatchery location (pers. comm. with Guy Moura, Manager, CCT History/Archaeology Program, March 24 and April 11, 2022). The site was surveyed by Dr. Sean Hess in 2007. His report could not be located, but there are no entries on the CCT History/Archaeology Program site list, which the THPO interpreted as an indication that nothing was found.

Alternative Site: Colville Tribal Trout Hatchery. The THPO reports that the Colville Tribal Trout Hatchery located in T29N R25E in the NE ¼ of the NE ¼ of Section 9 was built within an area excavated as a gravel pit many years ago. No cultural resource sites are located in or near the pit, and the pit itself has no historical significance. The CCT History and Archaeology Department determined there are no historic properties present (pers. comm. with Guy Moura, Manager, CCT History/Archaeology Program, August 8, 2022).

4.3.2 Socioeconomics

The Confederated Tribes of the Colville (CCT) Reservation covers about 2,100 square miles in Okanogan and Ferry Counties. CCT is a Federally-recognized American Indian Tribe and Sovereign Nation.

Okanogan County per capita income is low compared to the State of Washington in general. The main income and employment sectors are farms and food processing, local public utility district hydroelectric projects, and Tribal forest product and gaming industries (BPA, CCT, USACE 2009). Throughout the 2010s, there was a gradual uptick in median income in the counties surrounding the CCT Reservation, as well as in the State and the U.S. as a whole. A 2015 salary survey conducted by CCT identified an 8.78% increase in median wage between 2014 and 2017, the most recent year for which salary data are available (CCT Planning Department, April 11, 2022).

The unemployment rate of the Confederated Tribes of the Colville Reservation has historically been greater than that in the surrounding counties (Ferry and Okanogan), and higher than in Washington State as a whole. However, in each of these jurisdictions, the unemployment rate does mimic trends seen elsewhere, with the overall rate dropping in junction with surrounding communities. The CCT Tribal Government is the largest employer in the region.

The total labor force peaked in 2010, at a time when CCT was at its zenith in terms of internal manufacturing and construction efforts. There were two sawmills in operation and a construction company. With the collapse of the economy in 2008, these enterprises were not sustainable, and these labor force numbers have not recovered. Food Stamp/SNAP (Supplemental Nutrition Assistance Program) benefits were utilized by 25% to 28% of CCT members throughout the period 2010-2018, compared to 12.2% nationally and 12.5% in the State of Washington in 2018 (CCT Planning Department, April 11, 2022).

Changes from 2010 to 2018 reflect a changing dynamic in the types of occupations that exist on the Reservation. Management/business/science/arts was the largest share in 2010 and remained so in 2018. A major shift occurred in the area of sales and office occupations, which dropped from 23.8% in the area in 2010 to 16.5% in 2018. The most significant increase in jobs percentage occurred in the Government sector, from 1,066 jobs (32.6%) in 2010 to 1,483 jobs (55.2%) in 2018 (CCT Planning Department, April 11, 2022).

The Colville Tribal Trout Hatchery employs six full-time staff. There are no employees on the Cassimer Bar site at the time of this writing.

4.3.3 Transportation

General transportation patterns in the Okanogan Valley are typical of lightly populated rural agricultural communities in central and eastern Washington. Passenger vehicles account for about 80% to 90% of the total road use. Commercial trucks and farm machinery account for the remainder. Traffic volumes are higher near larger communities compared to more rural locations. Truck traffic is seasonally highest during agricultural harvesting and transport to warehouses and markets (BPA, CCT, USACE 2009).

The Washington State Department of Transportation (WSDOT) monitors traffic volumes on SR-97 and SR-17 in the vicinity of the two alternative sites. Annual average daily traffic (AADT) reported along SR-97 in 2021 was 5,034 vehicles, and along SR-17 was 2,626 vehicles (WSDOT 2022a and 2022b).

4.3.4 Noise

Okanogan County has adopted Washington State regulations for maximum environmental noise levels (WAC 173-60). The Washington Administrative Code establishes three environmental districts for noise abatement. Class A applies to residential areas; Class B applies to commercial areas; and Class C applies to industrial areas. Noise originating from temporary construction sites is exempt from these regulations except where the noise affects Class A receptors at night. No baseline for existing background noise levels has been established for Okanogan County.

There are no known environmental noise regulations on the CCT Reservation. The CTFC RAS demonstration project would likely be considered a commercial use. There are no residential or commercial uses adjacent to either alternative site boundary, and therefore no sensitive receivers (see Figures 1.3-1 and 1.3.2 in NEPA EA Chapter 1).

4.3.5 Aesthetics

Preferred Site: Cassimer Bar Hatchery. The Cassimer Bar Hatchery site is essentially flat, having been graded for construction of former hatchery operations. Views across the property are to the shrub-steppe non-irrigated side slopes of the Columbia Basin in the distance. There are no distinctive natural landscape or geological features on or near the site.

Existing structures and equipment on the property have been vandalized since the CCT Steelhead program was discontinued in 2013, giving the site the appearance of being in disarray. The site is not visible to any occupied properties or from any public roadways in the area. The elevation of the site is approximately 15 feet above the Columbia River level, and approximately 0.25-mile north. The single-story structures of the former hatchery operation are probably minimally visible to vessels using Lake Pateros, given the size of boats that are likely used in the reservoir.

Alternative Site: Colville Tribal Trout Hatchery. The Colville Tribal Trout Hatchery site is similarly essentially flat and located on the right bank of the Columbia River, closer in proximity to the river than the Cassimer Bar site and not visible from SR 17. Views from the site include the non-irrigated side slopes of the Columbia Basin and adjacent orchards. This is an operating hatchery, in well-maintained condition and appearance. Most structures are single-story of wood or metal construction.

4.3.6 Recreation

The most popular recreational activities in Okanogan County are sightseeing, picnicking, driving for pleasure, hunting and fishing. Recreation resources in the vicinity of the confluence of the Okanogan River with the Columbia River include developed facilities, use areas, and boat ramps along the Columbia River from Pateros to Chief Joseph Dam and near the mouth of the Okanogan River (BPA, CCT, USACE 2009). There are no wild and scenic rivers or other special recreational land designations.

Salmonid fishing opportunities are limited due to Federal listing status and limited populations. Fishing for trout is not permitted. Recreational salmon fishing has been closed or highly restricted in most years (NPCC 2004). The Washington Department of Fish and Wildlife does, however, allow salmon fishing in the lower one-half mile of the Okanogan River, downstream from the SR-97 bridge (see Figure 1.3-1 in Chapter 1). Steelhead fishing is limited to only hatchery-origin fish in the Okanogan River, and seasonal openings are highly unpredictable. Fishing for other game and non-native species is permitted, although some restrictions apply (BPA, CCT, USACE 2009).

4.3.7 Public Services

Numerous Tribal, Federal, State, County and City agencies provide public health and safety resources in the Okanogan Valley. The Okanogan County Sheriff's office serves as the communications link between public and emergency service providers (Okanogan County 2005). CCT provides law enforcement, fire protection, public health and medical treatment services on the Reservation. CCT services are coordinated with County services as appropriate.

Available health, medical, and emergency room services within the County are provided by the North Valley Hospital in Tonasket, Mid-Valley Hospital in Omak, and the Okanogan Douglas Hospital in Brewster. The Okanogan Douglas Hospital is closest to the two alternative sites.

4.3.8 Utilities

Nespelem Valley Electric provides electrical service to both alternative sites. Colville Confederated Tribes Disposal provides garbage collection services to Cassimer Bar, and Zippy Disposal Services is the garbage collection provider for the Colville Tribal Trout Hatchery site. Domestic and hatchery water supply on both sites is provided by private wells. Sewage treatment for each site manager's residence and hatchery worker restrooms is provided with on-site sewage disposal systems, developed under the regulations of the CCT Tribal Code of Laws. Zippy Fiber (Frontier) provides telephone service to the Colville Tribal Trout Hatchery site, and NCIDATA provides internet service. The Cassimer Bar site relies on cellular telephone service.

5.0 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

5.1 AQUATIC ENVIRONMENT

Regulatory constraints due to concerns about environmental risk have been reducing the feasibility of traditional in-water salmon net pen culture in Washington State. Land-based culture has the potential to enhance biological controls and sustainability to address these concerns, as described in Table 5-1 below.

Table 5-1. Issues of concern with in-water net pen aquaculture, and how these issues would be addressed by a land-based recirculating aquaculture system (RAS).

Issue	Benefits of a Recirculating Aquaculture System
Fecal wastes	Fecal wastes can be collected and used as organic fertilizer on local farmland.
Healthy fish	RAS fish would not be exposed to communicable diseases or parasites from wild fish, and therefore would not need to receive antibiotic treatments.
Fish handling	Interconnected systems minimize fish handling that would otherwise occur with transport between a hatchery and a net pen site, or between a net pen and processing plant for harvesting.
Escapement	Risk of escapement to open water would be reduced for fish reared in an enclosed system not subject to a net breach.
Carbon footprint	Fish produced locally would have reduced transportation impacts compared to fish raised internationally and flown to U.S. markets.
Receiving water impact	Process water would undergo water quality treatment to minimize organic waste products (fish feces and uneaten food) prior to discharge.

5.1.1 Fish and Aquatic Habitat

ENVIRONMENTAL CONSEQUENCES

The CTFC RAS demonstration project will have no effect on extensive fish and aquatic habitat in the Okanogan River or Columbia River due to the reuse of rearing water, and the location of alternative sites downstream from Chief Joseph Dam which blocks migratory access to much of the upper Columbia River habitat.

Preferred Site: Cassimer Bar Hatchery. There would be no in-water work during construction to generate noise, vibration, or turbidity in the aquatic environment. In the developed condition of the project, the aquatic environment that may be affected by the CTFC RAS demonstration project would be a backwater slough of the Okanogan River that received the discharge from the former Cassimer Bar Hatchery outfall, and the Okanogan River mainstem to the northwest. Process water would be discharged from the CTFC RAS year around using the existing outfall. The slough is seasonally dry and vegetated, and would provide a biofiltration function. Solids (fecal matter and unconsumed feed removed by the drum filter) would be trucked to nearby orchards for use as land-applied fertilizer, and/or disposed at a solid waste landfill permitted to receive this type of waste.

Alternative Site: Colville Tribal Trout Hatchery. If the Colville Tribal Trout Hatchery site were selected for the RAS demonstration project, construction of a new outfall to the Columbia River would be

required. Construction activity in the shoreline environment would be regulated by a permit from the CCT Planning Department. In the operational condition of the RAS, solids would also be disposed by trucking to nearby orchards for land application, and/or transported to a solid waste landfill permitted to receive this type of waste.

No Action Alternative. There would be no in-water work with the No Action Alternative, and no operational condition of a RAS demonstration project. Therefore, there would be no new effluent discharged to the aquatic environment, and no change in potential effects to fish or aquatic habitat.

MITIGATION MEASURES

Mitigation measures described below under Water Quality (Section 5.1.3) would also be beneficial for fish and the aquatic environment.

5.1.2 ESA-Listed Fish Species

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. There would be no reasonable risk of interaction between fish to be reared in the CTFC RAS demonstration project and ESA-listed fish species that occur in the Okanogan River or Columbia River Wells Pool system. The connection between the CTFC RAS fish culture tank and the biomedica filter would be screened to prevent fish from becoming entrapped in the filtration system. This screen would be checked at least twice per day to remove mortalities (see NEPA EA Chapter 3, Section 3.1.3.6). If for any other reason fish were to escape during transport and handling, they would be incapable of interbreeding with ESA-listed fish in the Okanogan and Columbia River systems due to their triploid chromosomal (sterile) condition. Fish reared in a controlled hatchery environment also tend to have a reduced survival capability when faced with having to forage and survive on their own (Johnson et al. 2019).

Alternative Site: Colville Tribal Trout Hatchery. The same “no reasonable risk of interaction” conclusion would be true if the CTFC RAS demonstration project were located at the Colville Tribal Trout Hatchery site.

No Action Alternative. Under the No Action Alternative, there would be no change in potential effects to ESA-listed fish species in the Wells Pool reach of the Columbia River.

MITIGATION MEASURES

Facility design and the proposal to rear all-female triploid Rainbow Trout in the CTFC RAS demonstration project would substantially mitigate any potential for interaction with ESA-listed fish species in the Okanogan and Columbia River systems.

Hatchery employees would be trained in the safe Fish Handling Practices listed in the SOPs.

Troutlodge has been producing mono-sex (all-female) populations of Rainbow Trout eggs since the mid-1990s. The all-female (XX only) ova are subsequently fertilized with X-only mono-milt. Triploidy is induced by mechanical pressure shock. For a short period of time, a high-pressure hydrostatic shock is applied to the newly fertilized eggs at a specified time point post-fertilization. The post-fertilization pressure treatment forces the fertilized egg to retain the third set of chromosomes that is normally ejected at this time. Pressure is then released and the triploid (3N) eggs are allowed to continue

development. Ploidy is confirmed using a fluorescent nucleic acid label on either embryo or blood tissue using a flow cytometer at the Washington State University School of Veterinary Medicine. Thorgaard Lab testing results of Troutlodge triploid fish and eggs over a period of five (5) years (from 2013 to 2018) demonstrate a high rate of success in triploid induction (99.84% – 2,950 of 2,955 fish and/or eggs sampled). A combination of physical constraints in the CTFC RAS system together with the extremely low probability (less than 0.1%) of fertility in any potential escapee produces a low probability of an escapee successfully reproducing within the wild population of Rainbow Trout in the upper Columbia River area.

5.1.3 Water Quality

ENVIRONMENTAL CONSEQUENCES

Average water quality constituents and concentration range during grow-out are shown in NEPA EA Chapter 3, Section 3.1.3.7, Table 3-3 based on the FWI reference facility operation. FWI process water constituents include total suspended solids (TSS) well within the discharge limits in the 2016 GP (see Table 5-2). There would be essentially no particulate organic waste in the outfall discharge due to screening down to 60 µm by the proposed drum filter. The proposal includes removing solids from the drum filter, loading this material into a tank comparable to a septic tank pump-out truck, and transporting the sludge to area orchards for land application as fertilizer during the growing season (approximately April 1 through September 30). During the winter months, solids would be trucked to a landfill authorized to accept this type of waste.

Table 5-2. Discharge limits from outfalls authorized under the 2016 General Permit for Discharges from Federal Aquaculture Facilities and Aquaculture Facilities Located in Indian Country in Washington (Washington Hatchery General Permit No. WAG130000).

Effluent Limitations for Hatchery Discharges¹			
Pollutant	Average Monthly Limit	Maximum Daily Limit	Instantaneous Maximum
Net Total Suspended Solids ²	5 mg/L	–	15 mg/L
Net Settleable Solids ²	0.1 ml/L	–	–
Total Residual Chlorine ³ – into fresh water	9.0 µg/L	18.0 µg/L	–
Total Residual Chlorine ³ – into marine water	6.1 µg/L	12.3 µg/L	–

¹ Excluding discharges from separate off-line settling basins (OLSBs) and from r12.3 µg/raceways or pond systems during drawdown; see Washington Hatchery General Permit No. WAG130000 Table 2 for limits on those discharges.

² Net concentration = effluent concentration – influent concentration. Net TSS and settleable solids determinations will require influent analysis in addition to effluent analysis unless the permittee chooses to assume that the pollutant concentration in the influent is zero. Influent samples must be collected prior to collection of effluent samples; and net TSS and settleable solids will be determined by subtracting the influent concentrations from the effluent concentrations (see Washington Hatchery General Permit No. WAG130000 Appendix B). The EPA may require additional sampling to prove substantial similarity between influent and effluent solids, where indicated. All influent and effluent samples and flow measurements must be taken on the same day.

³ Chlorine limits only apply when chlorine or Chloramine-T is being used. The Permittee will be in compliance with the effluent limits for total residual chlorine, provided the total residual chlorine residual levels are at or below the compliance evaluation level of 50 µg/L. Chlorine monitoring is not required if chlorine is allowed to dry at the location of use.

Preferred Site: Cassimer Bar Hatchery. There would be no direct effects to the aquatic environment during construction of the CTFC RAS demonstration project, as no in-water work or shoreline work is proposed at the Cassimer Bar site. The area of construction disturbance would be approximately 200 feet from the nearest receiving water (a backwater slough of the Okanogan River), with vegetative cover of grasses and sparse sage brush species that would serve a biofiltration function. The site is approximately 15 feet higher in elevation than the slough. Depending on the season of the year when construction occurs, subsurface excavation for construction of the below-grade tanks may encounter groundwater.

The estimated quantity of discharge from the CTFC RAS demonstration project (55 to 110 gpm, or 79,200 to 158,400 gpd) would be relatively minor, less than 10% of the former discharge from the Cassimer Bar Hatchery outfall compared to previous operating years when it was used to rear Sockeye Salmon and Steelhead Trout. The CTFC RAS demonstration project discharge would contain primarily nutrients, in quantities that would be challenging to detect even during low flow periods in the backwater slough of the Okanogan River into which the outfall discharges after passing through the slough. These constituents would also likely be minor in relation to existing Okanogan River conditions during much of the year. Outfall discharges of process water would occur year-around.

The temperature range in the effluent discharge, based on data collected at the FWI reference facility (Table 3-3 in Chapter 3, Section 3.1.3.7), would be well below water quality temperatures recorded for the Okanogan River, and well below the 18°C Tribal water quality standard for the Class II receiving water.

The CTFC RAS demonstration project would not be a source of DDT or PCBs, and therefore would not exacerbate the 303(d) non-attainment status of these persistent toxins in the lower Okanogan River basin if the project were located at the Cassimer Bar site.

Alternative Site: Colville Tribal Trout Hatchery. There would be potential water quality effects to the Columbia River as a result of constructing a new outfall to serve the RAS prototype project if the Tribal Trout Hatchery site were selected. In the operational condition, the effluent discharge to the Columbia River if the RAS were located on this site would be the same as described above for the operational condition of the project at Cassimer Bar. The temperature range in the effluent discharge would be well below the 18°C Tribal water quality standard for the Class II Columbia River Wells Pool receiving water.

No Action Alternative. Under the No Action Alternative, there would be no renewed effluent discharge from the existing outfall on the Cassimer Bar site, or no additional effluent discharged from a new RAS outfall on the Colville Tribal Trout Hatchery site.

MITIGATION MEASURES

During Construction.

Site work would comply with EPA construction stormwater management regulations under the Construction Stormwater General Permit. Either project site is essentially flat and in an arid region with average annual precipitation of 10 to 14 inches. Best Management Practices (such as silt fencing) would be installed between ground-disturbing activities and receiving waters.

Preferred Site: Cassimer Bar Hatchery. If groundwater seepage were to occur during construction of below-grade tanks on the Cassimer Bar site, the excavation may be dewatered by pumping groundwater to the man-made ponds east of existing outdoor rearing facilities (see Figure 3.1-4 in Chapter 3). Silt-laden water would be allowed to infiltrate and evaporate in one pond at a time.

Alternative Site: Colville Tribal Trout Hatchery. Depth to groundwater on the Tribal Trout Hatchery site would preclude the need for dewatering the construction site at that location.

During Operations.

The operational condition of the CTFC RAS demonstration project at either alternative site would comply with the hatchery effluent monitoring requirements and discharge limits in the reissued GP, whether these limits are the same as or different from those in the 2016 GP. Best Management Practices for operation of the CTFC RAS demonstration project are described in detail in the *Cassimer Bar Land-based Trout Farm Standard Operating Procedures and Quality Assurance Plan* (J. Bielka, Catchy Marine, May 2022). These proposed practices are summarized below.

Prevention and Control. Employees will be trained in safe handling measures, and measures to prevent and respond to accidental spills and discharges of potentially hazardous materials that may be stored and use on the site. These measures are described in detail in the *Cassimer Bar Land-Based Trout Farm Standard Operating Procedures and Quality Assurance Plan* (SOPs).

Medications, medicated feed, therapeutants, pesticides, and laboratory chemicals will be stored away from drains and away from public access. Fish therapeutants will be stored in dry cabinets. Laboratory chemicals will be kept on-hand in small quantities. Miscellaneous substances such as solvents, resins, and cleaners will be kept in well-labeled, leak-proof containers inside a lockable, inflammable cabinet. Absorbents, spills kits, and Personal Protective Equipment (PPE) will be stored in the maintenance area to use in case of spills. No outdoor chemical storage is anticipated.

Material Safety Data Sheets (MSDS) for all chemicals used at the facility will be readily available to all personnel. Proper precautions and actions to be taken in the event of a spill are outlined in each MSDS. Colville Confederated Tribes, State and Federal agency spill notifications lists will be maintained in the SOP Plan available to all personnel.

Diesel fuel to be used for the onsite generator will be stored in above-ground, double-walled fuel tanks surrounded by containment. Smaller quantities of petroleum products will be stored in durable, impervious containers, clearly labeled as to their contents (such as gas cans and motor oil). These will be stored in lockable, inflammable storage cabinets inside the hatchery buildings.

Bio-Security Practices. Proper bio-security practices will be carried out every day to reduce the risk of disease occurrence and to help prevent the spread of disease. Representative practices include:

- Use of healthy fish stocks (disease-free certifications, routine disease surveillance, limiting live fish transfers from one area to another, and identification of stress and/or disease in the captive fish stocks).
- Isolated hatchery facilities (protected water sources, restricted access, disinfection, and bio-security barriers).
- Foot baths, footwear, and other bio-security barriers for hatchery personnel and visitors.
- A fish mortality tote storage area established in an isolated area where cross-contamination with stored products, equipment or hatchery personnel can be avoided. The fish mortality tote storage

area will be routinely sanitized using buffered iodophores,¹¹ bleach, or a similarly-effective disinfectant.

- Mortality removal procedures and equipment that contain fish in leak proof containers. Additional plastic tote liners available at all times.
- Fish mortality totes and lids will be washed and disinfected at mortality disposal locations before being returned to the hatchery site. Secondary disinfection of the returning totes will occur before leaving the support facility if necessary.

Operational Practices.

- Staff certification in EPA training on NPDES permit conditions and associated report writing.
- SOP Plan and NPDES General Permit available to all personnel for access to detailed instructions.
- General Area Management principles, including regular equipment maintenance using a power washer, hand tools, food-grade grease and gear lubrication oil.
- Collection and analysis of influent water, effluent water samples and Total Suspended Solids (TSS) in compliance with NPDES General Permit conditions.

5.2 TERRESTRIAL ENVIRONMENT

The terrestrial environment that may be affected by the CTFC RAS demonstration project would encompass the existing Cassimer Bar Hatchery site (approximately 3 acres total), and a radius of approximately 500 feet from the area of disturbance. At the Colville Tribal Trout Hatchery site, the area of disturbance would be contained within the boundaries of this 16.24-acre site. Construction effects to the terrestrial environment at either site would include excavations for below-grade installation of the 15-ft deep fish culture tank and 9-ft deep biomedial filter. Site clearing would occur around these excavations for construction of the 6,000 sf steel building that would house the CTFC RAS equipment, and for the 1,500 sf office on the Cassimer Bar site. New outfall construction at the Tribal Trout Hatchery site would require open trenching for a distance of approximately 678 feet from the RAS building to and including the Columbia River shoreline.

5.2.1 Wildlife and Terrestrial Habitat

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. Terrestrial wildlife that use the site would be temporarily displaced from this area during construction, predominantly during daytime hours when workers are present. In the completed condition of the project, more area of the 3-acre site would be covered by structures, and 5 to 6 employees would be present again to operate the CTFC RAS facility. As with past hatchery operations on this site, there would be one resident hatchery manager.

Construction of the proposed office and steel building to house the fish culture tank and biofilter is proposed within the area of the site that is presently fenced and previously disturbed.

¹¹ An iodophor is a disinfectant that contains iodine in combination with a surfactant.

Alternative Site: Colville Tribal Trout Hatchery. Terrestrial wildlife is less likely to use the Tribal Trout Hatchery site, and/or is habituated to the human presence and daily activity that occurs with the existing hatchery operation. For this reason, no significant adverse effects to wildlife would be expected to occur during construction or in the operational condition of a RAS prototype if this alternative site were selected.

No Action Alternative. There would be no change in wildlife or terrestrial habitat effects in the vicinity of either alternative site attributable to the No Action Alternative.

MITIGATION MEASURES

No mitigation measures are proposed for wildlife or wildlife habitat since no significant or high-value wildlife habitat would be affected by the proposed action on either alternative site.

5.2.2 Vegetation

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. Construction of the proposed 1,500 sf office and 6,000 sf steel building of the site will cover an additional 0.2-acre of rangeland-type grasses on the site.

In the process of restoring the site to an operational condition, weeds that have invaded within the fenced area of the property would be removed. Based on the footprint of the steel building proposed to house the fish culture tank and biofilter, it appears that it would be unnecessary to remove any existing trees from the site (see Figure 3.1-1 in Chapter 3).

Alternative Site: Colville Tribal Trout Hatchery. No significant vegetation would be disturbed by construction of the RAS prototype building or new outfall if the Tribal Trout Hatchery site were selected for the project.

No Action Alternative. Under the No Action Alternative, there would be no alteration to existing site vegetation. Weedy conditions would remain of either alternative site.

MITIGATION MEASURES

No mitigation measures are proposed for vegetation since no significant or high-value vegetation would be affected by the proposed action.

5.2.3 ESA-Listed Terrestrial Species

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. There are no ESA-listed terrestrial species on or near the Cassimer Bar Hatchery site; therefore, there would be no adverse environmental consequences to these species.

Alternative Site: Colville Tribal Trout Hatchery. There also are no ESA-listed terrestrial species on or near the Tribal Trout Hatchery site.

No Action Alternative. Given the absence of ESA-listed terrestrial species on either alternative site, the environmental consequences of the No Action Alternative would be the same as the action alternatives for this element of the environment.

MITIGATION MEASURES

No mitigation measures are proposed for ESA-listed terrestrial species.

5.2.4 Air Quality and Climate Change

The CTFC RAS demonstration project would have a negligible effect on climate change factors because it would operate inside an environmentally-controlled building. Well water will be of a sufficient temperature to cool the fish tank, thereby minimizing the need for electrical cooling. There is no expected requirement for building heating because the structure would be highly insulated, and heat generated by pumps and motors would be sufficient for interior heating requirements. The proposed use of low-head (propeller-type) water pumps to lift water to serve the CTFC RAS tank would be energy-efficient in relation to alternative designs. Electrical energy from a sustainable hydroelectric source would be provided by Nespelem Valley Electric Cooperative to heat the new office and new site manager's residence on the Cassimer Bar site.

Fish provided to western Washington and British Columbia markets by the CTFC RAS would have a minor beneficial effect on climate change by minimizing vehicle exhaust emissions due to reduced transport distances (see NEPA EA Chapter 1, Section 1.2).

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. Temporary, localized emissions of fugitive dust and vehicle emissions (particulates, carbon monoxide, carbon dioxide, volatile organic compounds, and nitrogen oxide) would occur during the estimated 12-month construction period. In the operational condition of the project, there would be vehicle exhaust emissions associated with trips to/from the site by 5 to 6 hatchery workers, trips to transport sludge for disposal in orchards or at an approved landfill, trips to transport feed and supplies to the CTFC RAS site, and trips to transport fish to market (see Table 5-3 in Section 5.3.3 below).

Columbia River water levels in the Wells Pool reach are controlled by the operation of Wells and Chief Joseph Dams. The water level in the Wells Pool (Lake Pateros) influences the water level of the Okanogan River at its confluence with the Columbia River. The existing outfall that would be used to convey the discharge from the CTFC RAS demonstration project on the Cassimer Bar Hatchery site is approximately 15 feet above the elevation of the Columbia River, and is not dependent on an in-water discharge. For this reason, if there were receiving water level fluctuations in the future, this would not adversely affect the function of the outfall.

Alternative Site: Colville Tribal Trout Hatchery. Similar to the Cassimer Bar Hatchery alternative, air quality effects during construction on the Tribal Trout Hatchery site (particulates, carbon monoxide, carbon dioxide, volatile organic compounds, and nitrogen oxide) would occur during the estimated 12-month construction period. There would be a larger area of construction disturbance on this site due to the need to construct a new outfall to serve the RAS. In the operational condition of the RAS prototype project, there would be vehicle exhaust emissions associated with trips to/from the site by up to 5 new hatchery workers, trips to transport sludge for disposal in orchards or at an approved landfill, trips to transport feed and supplies to the CTFC RAS site, and trips to transport fish to market. The RAS

demonstration project itself would have a negligible effect on climate change factors because it would operate inside an environmentally-controlled building.

No Action Alternative. There would be no activity on either site under the No Action Alternative, and therefore no change in effect on air quality or climate change.

MITIGATION MEASURES

Representative measures that could be implemented during construction to minimize emissions to the air (to the extent practicable) include the following:

- Use only equipment and trucks that are maintained in good operational condition.
- Restrict idling of construction equipment and vehicles when turning off such equipment would not damage the equipment or excessively delay related activities.
- Implement a dust control plan.

5.2.5 Land Use

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. The proposed action will require a Conditional Use Permit for authorization to modify and expand hatchery operations on the Cassimer Bar site to create the CTFC RAS demonstration project. CTFC will be allowed to make use of the property in accordance with the requirements of Chapter 4-3 of the CCT Code of Laws, subject to any additional requirements that may be imposed by the Review Board or Planning Director. CTFC will apply to the CCT Planning Department for the required Conditional Use Permit and Building Permit.

Alternative Site: Colville Tribal Trout Hatchery. If this site were selected for the CTFC RAS demonstration project, new construction would require the same Conditional Use and Building Permits from the CCT Planning Department. It would also require a Shoreline Substantial Development Permit for construction of a new outfall.

No Action Alternative. There would be no change in land use at either alternative site and no permits required under the No Action Alternative.

MITIGATION MEASURES

CTFC will comply with the conditions of permits and approvals required from the CCT Planning Department.

5.3 HUMAN ENVIRONMENT

There are no occupied properties adjacent to either alternative site being considered for the location of the CTFC RAS demonstration project.

Preferred Site: Cassimer Bar Hatchery. The human environment in which the Cassimer Bar site is located broadly includes SR-97 from approximately Wenatchee to the gravel road turn-off to Cassimer Bar, and the gravel road corridor itself. With the exception of the Chief Joseph Smoke Shop at the intersection of the gravel road with SR-97, there is no apparent employment or residential use of adjacent

properties that would be affected by construction or operation of the CTFC RAS demonstration project. The site has a history of use as various types of hatchery operations with no known adjacent land use incompatibility issues. Transportation corridors that would be used for the delivery of construction materials, construction workers, transport of eggs to initiate the CTFC RAS demonstration project, and transport of fish to seafood processors may extend north and south on Highway 97 to other State or interstate highways; however, the percentage of project traffic would be insignificant in relation to average weekday traffic volumes along these routes, as reported in NEPA EA Chapter 4, Section 4.3.3.

Alternative Site: Colville Tribal Trout Hatchery. The Colville Tribal Trout Hatchery site is located downslope from SR 17, a distance of approximately 0.5 mile and therefore not visible from the highway. It is surrounded by vacant land on the south and east, an orchard on the north, and the Columbia River on the west (see Figure 1.3-2 in Chapter 1). The human environment consists of the existing trout hatchery operation on the site that includes three homes for resident site operators.

5.3.1 Cultural Resources

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. In the opinion of the CCT Tribal Historic Preservation Officer (THPO), there is little chance of cultural resource problems in the location identified for new construction of a 1,500sf office and 6,000sf steel building that will house the CTFC RAS tank and associated biofilter (pers. comm. with Guy Moura, April 12, 2022). If CTFC decides to proceed with the full-scale RAS project at some future time, additional cultural resources investigation may be required in the larger area of disturbance.

Alternative Site: Colville Tribal Trout Hatchery. There would be no risk of encountering cultural resources on the Tribal Trout Hatchery site as this property was formerly excavated as a gravel pit (pers. comm. with Guy Moura, August 8, 2022).

No Action Alternative. Under the No Action Alternative, there would be no new ground disturbance on either alternative site, and therefore no potential to damage cultural resources if any are present.

MITIGATION MEASURES

In order to minimize the potential to affect cultural resources as a result of constructing new buildings on the Cassimer Bar Hatchery site, the CCT THPO has offered the services of a Tribal Historic/Archaeology Program staff member to observe test pit excavations between 10 and 16 feet deep to look for archaeological materials in the area where excavations are proposed to construct the in-ground CTFC RAS tank and biofilter (pers comm. with Guy Moura, Manager, CCT History/Archaeology Program, April 12, 2022). Inadvertent discovery procedures would be implemented in the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered during construction.

5.3.2 Socioeconomics

ENVIRONMENTAL CONSEQUENCES

In its completed, operational condition, the CTFC RAS demonstration project is projected to create 5 or 6 jobs: 2 or 3 hatchery jobs, 2 office personnel to monitor the funding and reporting requirements, and 1 consultant to oversee technical operations. It is expected that 5 of these positions would be filled by CCT members. In addition, local area jobs would be created through maintenance agreements, trucking fish food, and trucking fish to market.

If the full-scale CTFC RAS project is developed at some future time, it would create temporary construction employment, and approximately 50 to 75 jobs in its fully operational condition. Approximately 60% of these jobs would likely be filled by Tribal members.

The *Colville Tribe Land-Based Trout Farm Preliminary Engineering Report* provides an estimate of construction costs, operating costs, and total operating profit for the CTFC RAS demonstration project. The objective for operating this “proof of concept” project for a minimum of 2 years is to help refine the economic model for a full-scale CTFC RAS facility.

Preferred Site: Cassimer Bar Hatchery. Construction of the CTFC RAS demonstration project on the Cassimer Bar Hatchery site would create approximately 10 to 20 jobs for skilled and unskilled laborers over the 12-month construction period, and 5 to 6 jobs in its operational condition.

Alternative Site: Colville Tribal Trout Hatchery. If the Colville Tribal Trout Hatchery site were selected for the CTFC RAS demonstration project, a larger number of construction workers would likely be required due to site work to construct a new outfall in addition to the RAS prototype building. Fewer new jobs would likely be created in the operational condition. Existing resident hatchery managers and office personnel could likely provide some portion of the requirements related to adding the RAS to the existing Steelhead Trout hatchery operation.

No Action Alternative. No additional jobs or economic development opportunity would be created for CCT with the No Action Alternative.

MITIGATION MEASURES

No mitigation is required for the beneficial socioeconomic effects of the CTFC RAS demonstration project. It would support innovative workforce development and create a revenue-generating enterprise on the Confederated Tribes of the Colville Reservation.

5.3.3 Transportation

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. The operational condition of the project would generate trips to/from the site by 5 to 6 hatchery workers, trips to transport sludge for disposal in orchards or at an approved landfill, trips to transport feed and supplies to the CTFC RAS site, and trips to transport fish to market (see Table 5-3). This number of trips would constitute a negligible addition to AADT on SR-97 (approximately 5,034 vehicles in 2021). No roadway or intersection improvements would be needed.

Table 5-3. Estimated number of vehicle trips to/from the CTFC RAS in the operational condition.

Trip Purpose	Trip Frequency
Workers ¹	5 round trips per day ²
Sludge and morts	1 or 2 round trips per month
Fish feed	2 round trips per month
Fish to market	Less than one round trip per month

¹ These trips do not include the resident site manager who would not commute from offsite each day, or a consultant who would only visit the site periodically.

² Round trips = one trip into the site and one trip out.

Alternative Site: Colville Tribal Trout Hatchery. Similarly, the number of trips generated by RAS workers and support services indicated in Table 5-3 would constitute a negligible addition to AADT on SR-17 (approximately 2,626 vehicles in 2021). No roadway or intersection improvements would be needed.

No Action Alternative. With the No Action Alternative, there would be no project-related trips to/from either alternative site.

MITIGATION MEASURES

No mitigation measures are proposed for transportation.

5.3.4 Noise

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. Construction equipment noise would be generated on the site during excavations and building structures. The recirculating aquaculture system would be housed within a new proposed steel building, which would have a noise reduction effect in the surrounding area. In the absence of any neighboring development, there would be no adverse effect to sensitive receptors either during construction or operation of the proposed project.

Alternative Site: Colville Tribal Trout Hatchery. The noise impacts of constructing and operating the RAS prototype project on the Tribal Trout Hatchery site would be comparable to those described above for the Cassimer Bar site. The only difference would be noise associated with open trench construction of a new outfall to serve the RAS at this location. There are also no sensitive offsite receptors near this property.

No Action Alternative. There would be no project-related change in the noise environment at either alternative site under the No Action Alternative.

MITIGATION MEASURES

No mitigation measures are proposed for noise.

5.3.5 Aesthetics

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. Restoration of the Cassimer Bar site to create the CTFC RAS would substantially improve its appearance as a result of removing vandalized structures and equipment, and constructing a new steel building and office. However, these effects and project improvements would not be visible from area roadways, and there would be no observers on adjacent undeveloped properties. Similar to existing single-story structures on the site, the new steel building and office would likely be minimally visible to vessels on Lake Pateros.

Alternative Site: Colville Tribal Trout Hatchery. The Tribal Trout Hatchery site is not visible from SR-17, and adjacent properties are undeveloped. The existing Steelhead Trout operation on this site is in a well-maintained condition, and would be insignificantly altered by the developed condition of the RAS prototype building if this site were selected. For this reason, there would be no adverse aesthetic impacts if this alternative site were to be selected for the CTFC RAS demonstration project.

No Action Alternative. Under the No Action Alternative, there would be no new or expanded hatchery facility operation on either alternative site. Unsightly vandalized structures and debris would remain on the Cassimer Bar site, potentially creating a nuisance for further illegal activity.

MITIGATION MEASURES

No mitigation measures are proposed for aesthetics.

5.3.6 Recreation

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. Construction and operation of the CTFC RAS demonstration project on the Cassimer Bar Hatchery site would have no effect on developed recreational facilities, recreational use areas, fishing areas, or boat ramps in the vicinity of the confluence of the Okanogan River with the Columbia River.

Alternative Site: Colville Tribal Trout Hatchery. Similarly, construction and operation of the CTFC RAS demonstration project on the Tribal Trout Hatchery site would have no effect on developed recreational facilities, recreational use areas, fishing areas, or boat ramps in the Columbia River Wells Pool below Chief Joseph Dam.

No Action Alternative. Similarly, the No Action Alternative would result in no change to existing recreation areas or recreational uses in the vicinity of either alternative site.

MITIGATION MEASURES

No mitigation measures are proposed for recreation.

5.3.7 Public Services

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. Restoration of existing hatchery facilities on the site and construction of additional improvements for the CTFC RAS demonstration project may somewhat increase the need for law enforcement, fire protection, and emergency medical aid to serve this property.

Alternative Site: Colville Tribal Trout Hatchery. Similarly, construction and operation of the CTFC RAS demonstration project on the Tribal Trout Hatchery site (if selected) might somewhat increase the need for law enforcement, fire protection, and emergency medical aid to serve the property.

No Action Alternative. The present vandalized condition of the Cassimer Bar site likely has some potential effect on the need for law enforcement, fire protection, and emergency medical aid. It is unlikely that this effect would change under the No Action Alternative.

MITIGATION MEASURES

Resident site manager(s) would provide a full-time presence on either alternative site. The SOP and QA Plan provide emergency contact numbers that would be available to any CTFC RAS worker.

5.3.8 Utilities

ENVIRONMENTAL CONSEQUENCES

Preferred Site: Cassimer Bar Hatchery. Construction and operation of the CTFC RAS demonstration project would reactivate the need for electrical and garbage collection services on the Cassimer Bar site. Water supply and sewage disposal would be provided with on-site systems. The contractor would comply with EPA regulations for stormwater management during construction. CCT would comply with EPA regulations for stormwater management in the completed, operational condition of the CTFC RAS.

Alternative Site: Colville Tribal Trout Hatchery. Construction and operation of the CTFC RAS demonstration project on the Tribal Trout Hatchery site (if selected) would somewhat increase the need for electrical and garbage collection services on this site. Water supply and sewage disposal would require new on-site systems. The contractor would comply with EPA regulations for stormwater management during construction. CCT would comply with EPA regulations for stormwater management in the completed, operational condition of the CTFC RAS.

No Action Alternative. There would be no change in public utility service requirements at either alternative site under the No Action Alternative.

MITIGATION MEASURES

The steel building that will house the CTFC RAS will be highly insulated. Heat generated by pumps and motors will be sufficient for interior heating requirements. The proposed use of low-head (propeller-type) water pumps to lift water to serve the CTFC RAS tank would be energy-efficient in relation to alternative designs. Nespelem Valley Electric Cooperative service to the site uses a sustainable hydroelectric energy source.

5.4 INDIRECT EFFECTS

Indirect effects are those that would be caused by the proposed action, later in time or farther removed in distance, but still reasonably foreseeable.

No reasonably foreseeable indirect effects of the CTFC RAS demonstration project have been identified at either site.

5.5 REASONABLY FORESEEABLE FUTURE ACTIONS

The purpose of the CTFC RAS demonstration project is to confirm the function and viability of the RAS technology on the CCT Reservation, and to provide the foundation for the economic infrastructure necessary for future jobs creation and further investment in a commercial-scale RAS project. The commercial-scale RAS project would employ 50 to 75 people on a full-time basis (including fish processing labor). It is estimated that approximately 60% of these jobs would likely be filled by Tribal members.

The full-scale project would consist of twelve 600 cubic meter (m³) tanks and forty 1,300 m³ tanks, plus an on-site processing plant. Fish culture tanks in the RAS demonstration project would be used in the full-scale project. Existing raceways and ponds on the Cassimer Bar site would be removed. Fish would be hatched inside existing tanks, grown to 40 grams, and moved to the 600 m³ tanks. When fish reach the 600-gram size, they would be pumped to the 1,200 m³ tanks for final grow-out to 2.5 kg. From the large tanks, the fish would be pumped into the processing facility for evisceration or filleting before ship-out.

The commercial-scale RAS is projected to produce approximately 13.4 million pounds (approximately 6 million tons per year). Total pounds of food to be fed is estimated to be 1.7 million pounds (7,800 million tons) per year. Maximum daily and long-term average flow from the outfall is projected to range from 3,300 to 6,600 gpm. Because RAS technology is a closed, recirculating system, full-scale operation would produce only a minor increase in consumption of water resources and discharge of waste with no change in the characteristics of effluent constituents.

If CTFC decides to proceed with the full-scale RAS project at some future time, it will require adjacent property acquisition, a separate NPDES permit application, and independent NEPA analysis. Acquisition of vacant land adjacent to the Cassimer Bar Hatchery site has not yet been discussed with the property owner. CTC would prefer to use land adjacent the Colville Tribal Trout Hatchery site for expansion of the existing Steelhead Trout operation.

5.6 CUMULATIVE EFFECTS

A cumulative effect is an effect on the environment that results from the incremental effects of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. There are no known applications pending for other projects in the vicinity that would affect or be affected by the CTFC RAS demonstration project, either at the prototype scale or at the full build-out commercial scale described in Section 5.5 above. If a decision is made to proceed with a full-scale RAS at some future time, the larger size of project components would be expected to require new construction rather than conversion of demonstration project components.

6.0 CROSS-CUTTER ENVIRONMENTAL LAWS, COORDINATION AND CONSULTATION

6.1 APPLICABLE FEDERAL REGULATIONS AND EXECUTIVE ORDERS

6.1.1 Archaeological and Historic Preservation Act, National Historic Preservation Act, and Native American Graves Protection and Repatriation Act

The purpose of the Archaeological and Historic Preservation Act (16 USC 3501) is to protect archaeological resources and sites on Indian lands from vandalism and unauthorized collection. The purpose of the National Historic Preservation Act is to protect historic and cultural properties within the United States (16 USC 470 et seq.). This Act sets forth procedures for Federal agencies to follow in consulting with Indian Tribes for the identification, evaluation, and protection of historic properties.

The Tribal Historic Preservation Officer (THPO) of the Confederated Tribes of the Colville Reservation reports that Cassimer Bar is covered in sensitive sites (archaeological sites, traditional places, historic area allotments), but not at the hatchery location (pers. comm. with Guy Moura, Manager, CCT History/Archaeology Program, March 24 and April 11, 2022). The site was surveyed by Dr. Sean Hess in 2007. His report could not be located, but there are no entries on the CCT History/Archaeology Program site list, which the THPO interpreted as an indication that nothing was found. Mr. Moura indicated that there is little chance of cultural resource problems in the location identified for new construction of a 1,500 sf office and 6,000 sf steel building that will house the RAS tank and associated biofilter. In order to minimize the potential to encounter cultural resources, he offered the services of a Tribal Historic/Archaeology Program staff member to observe test pit excavations between 10 and 16 feet deep to look for archaeological materials in the area where excavations are proposed to construct the in-ground RAS tank and biofilter (pers comm. with Guy Moura, Manager, CCT History/Archaeology Program, April 12, 2022). If CTFC decides to proceed with the full-scale RAS project at some future time, additional cultural resources investigation may be required in the larger area of disturbance.

There would be no risk of encountering cultural resources on the Tribal Trout Hatchery site as this property was formerly excavated as a gravel pit (pers. comm. with Guy Moura, August 8, 2022).

The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 provides a process for museums and Federal agencies to return certain Native American cultural items – human remains, funerary objects, sacred objects, and objects of cultural patrimony – to lineal descendants, culturally-affiliated Indian tribes, and Native Hawaiian organizations (25 USC 3001 et seq.). The RAS demonstration project is proposed by the Tribe, on the Colville Reservation; therefore, 25 USC 3001 is not applicable to the proposed action. The THPO could require implementing inadvertent discovery procedures in the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered during construction.

6.1.2 Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into waters of the United States and establishing surface water quality standards (33 USC 1251 et seq.). Several permitting and licensing programs to protect water quality were established under CWA Sections 401, 402, and 404, described below.

Section 401. Section 401 of the Clean Water Act establishes that any applicant for a Federal or Federally-delegated license or permit that may result in any discharge into the navigable waters of the United States must provide the licensing or permitting agency with a certification from the appropriate agency that any such discharge will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of CWA. Sections 301, 302, 303, 306, and 307 establish, respectively: effluent limitations, water quality-related effluent limitations, water quality standards and implementation plans, national standards of performance, and toxic and pretreatment effluent standards. The U.S. Environmental Protection Agency (EPA) will consult with the Colville Confederated Tribes (CCT) and perform the Section 401 certification for the Section 402 permit discussed below.

Section 402. Section 402 of the Clean Water Act establishes the regulatory program called the National Pollutant Discharge Elimination System (NPDES). The NPDES program, administered by EPA on the Colville Reservation, is intended to limit the amount and type of pollutants discharged into navigable waters so that fish, shellfish, wildlife, and recreational uses are protected. A NPDES permit sets conditions and limits on the discharge of pollutants that, as long as the conditions are met, makes the discharge of these pollutants legal. CCT will apply for coverage under the NPDES General Permit for Discharges from Federal Aquaculture Facilities and Aquaculture Facilities Located in Indian Country in Washington. This GP was in the reissuance process at the time of this writing. CCT will also require a separate Pollution Discharge Permit under Colville Tribal Law and Order Code Title 4, Chapter 4-8 (discussed in *NEPA Environmental Assessment* Section 6.2.4, below).

Section 404. Section 404 of the Clean Water Act, jointly administered by EPA and the U.S. Army Corps of Engineers, prohibits the discharge of dredged or fill material into waters of the United States without a permit. The excavation of sand, gravel, or other materials from waters of the U.S. is broadly defined and includes essentially all waterbodies, including intermittent streams, mudflats, sandflats, wetlands, shellfish beds, and wet meadows. There would be no excavation or fill in waters of the U.S. associated with construction of the RAS demonstration project on the Cassimer Bar site. A Section 404 permit would be required for construction of a new outfall to the Columbia River if the Colville Tribal Trout Hatchery site were selected.

6.1.3 Council on Environmental Quality (CEQ) Regulations

The Council on Environmental Quality (CEQ) was created in 1970 when the National Environmental Policy Act (NEPA) was signed into law (40 CFR parts 1500–1508). CEQ was given responsibility for developing environmental policy and overseeing Federal agencies that implement NEPA. CEQ was made a part of the Executive Office of the President to ensure that environmental policy receives high-level consideration within the Federal government. CEQ’s NEPA responsibilities focus on advising Federal agencies on both a national basis and an action-by-action basis regarding appropriate NEPA compliance procedures. However, CEQ does not have the authority to specifically review NEPA documents.

NEPA is the basic Federal charter for protection of the environment. It establishes an environmental policy for the nation, provides an interdisciplinary framework for environmental planning by Federal agencies, and contains action-forcing procedures to ensure that Federal agency decision makers take environmental factors into account. NEPA procedures must ensure that environmental information is available to Tribes, public officials and citizens before decisions are made and before actions are taken. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and to take actions that protect, restore, and enhance the environment. This *NEPA Environmental Assessment* was prepared to fulfill the requirements of the National Environmental Policy Act, under the direction of U.S. Environmental Protection Agency, Region 10.

6.1.4 Endangered Species Act

The Endangered Species Act (ESA) prohibits unauthorized “take” of listed species (16 USC 1531 et seq.). “Take” means to harm, harass, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Habitat modification that actually injures or kills a listed species through impairment of essential behavior is considered a “take.” Where otherwise lawful activity will result in a “take” of a listed species, an incidental take permit must be obtained. The application for an incidental take permit must be accompanied by a conservation plan, often referred to as a Habitat Conservation Plan (HCP). The National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) will consult with the U.S. Environmental Protection Agency (USEPA) on USEPA’s proposal to reissue the NPDES General Permit for Federal Aquaculture Facilities and Aquaculture Facilities located in Indian Country in Washington (WAG130000). Aquaculture facilities that receive coverage under the GP (including the CTFC RAS demonstration project) will be required to comply with avoidance, minimization, and mitigation measures for potential impacts to ESA-listed species identified in the programmatic consultation on the GP.

6.1.5 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (16 USC § 1801 et seq.) governs marine fisheries management in the United States. The Act mandates the identification of Essential Fish Habitat (EFH) for Federally-managed species as well as the development of measures to conserve and enhance the habitat necessary for fish to carry out their life cycles. The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) requires Federal agencies to consult with the National Marine Fisheries Service (NMFS) before authorizing, funding, or conducting an activity that may adversely affect EFH.

Under MSFCMA, EFH has been defined for certain salmon (Chinook, coho, and pink), pelagic, and groundfish species that are managed under the jurisdiction of this Act. These anadromous and marine species are not present in the upper Columbia River system where the CTFC RAS demonstration project is proposed. Therefore, EFH is not applicable to this project.

6.1.6 National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) requires Federal agencies to evaluate the environmental impacts associated with major actions they fund, permit, or implement (42 USC 4321 et seq.). NEPA requires Federal agencies to prepare an Environmental Assessment (EA) to determine whether a Federal undertaking would significantly affect the quality of the human environment. If the answer is no, the agency issues a Finding of No Significant Impact (FONSI). The FONSI may address measures that an agency will take to reduce (mitigate) potentially significant impacts. If the EA determines that the environmental consequences of a major action may be significant, an Environmental Impact Statement (EIS) will be prepared. An EIS or EA is developed by bringing into the decision-making process appropriate and careful consideration of both the environmental impacts of proposed actions, and measures to avoid or minimize the potential adverse effects of these actions. NEPA requires Federal agencies to consider five aspects of planned major actions: 1) the environmental impact of the proposed action; 2) adverse impacts that cannot be avoided with proposed project implementation; 3) alternatives to the proposed action; 4) the relationship between short-term and long-term effects; and 5) any irreversible and irretrievable commitment of resources associated with a proposed action.

New effluent limitation guidelines and new source performance standards for Concentrated Aquatic Animal Production facilities became effective on September 22, 2004. Aquaculture facilities constructed after promulgation of these new source performance standards are considered *new sources* under 40 CFR 122.29. In accordance with Section 511 (c)(1) of the CWA and EPA's regulations for implementing the procedural provisions of NEPA at 40 CFR Part 6, issuance of NPDES permits for *new sources* are considered major Federal actions subject to NEPA review. EPA has determined the CTFC RAS is a new source. As a new source, coverage of the project's discharge under the reissued General Permit for Discharges from Aquaculture Facilities Located in Indian Country in Washington is subject to NEPA review. EPA has prepared this *NEPA Environmental Assessment* (EA) in compliance with the CEQ NEPA regulations at 40 CFR Part 1500 and EPA's regulations for implementing the procedural provisions of NEPA at 40 CFR Part 6.

6.1.7 Executive Order 11514, Protection and Enhancement of Environmental Quality

In furtherance of the purpose and policy of the National Environmental Policy Act of 1969, Executive Order 11514 directs the heads of Federal agencies to monitor, evaluate, and control on a continuing basis, their agencies' activities so as to protect and enhance the quality of the environment (3 CFR 1970 Comp., page 104). Such activities shall include those directed to control pollution and enhance the environment, and those designated to accomplish other program objectives that may affect the quality of the environment. Agencies shall develop programs and measures to protect and enhance environmental quality, and shall consult with appropriate Tribal, Federal, State and local agencies in carrying out their activities as they affect the quality of the environment. The relationship of this *NEPA Environmental Assessment* to the National Environmental Policy Act is described in Section 6.1.6 above.

6.1.8 Executive Order 11593, Protection and Enhancement of the Cultural Environment

Also in furtherance of the purposes and policies of the National Environmental Policy Act of 1969, Executive Order 11593 directs the Federal government to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation (3 CFR 1971 Comp., page 154). Federal agencies shall: 1) administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations; 2) initiate measures necessary to direct their policies, plans and programs in such a way that Federally-owned sites, structures, and objects of historical, architectural or archaeological significance are preserved, restored, and maintained for the inspiration and benefit of the people; and 3) in consultation with the Advisory Council on Historic Preservation, institute procedures to assure that Federal plans and programs contribute to the preservation and enhancement of non-Federally owned sites, structures and objects of historical, architectural or archaeological significance.

The CTFC RAS demonstration project is proposed by the Colville Confederated Tribes within the boundaries of the Reservation. Communications with the Tribal Historic Preservation Officer confirmed no known archaeological sites at either alternative location in the area where construction of the RAS demonstration project would occur (see Section 6.1.1 above). Mitigation measures that could be implemented in the event of an inadvertent discovery during construction are described in Chapter 5, Section 5.3.1 of this *NEPA Environmental Assessment*.

6.1.9 Executive Order 11988, Floodplains

Executive Order 11988 of May 24, 1977 requires Federal agencies to recognize the significant value of floodplains and to consider the public benefits that would be realized from restoring and preserving floodplains (3 CFR 1977 Comp., page 117). The objective of Executive Order 11988 is avoidance, to the extent possible, of long- and short-term adverse impacts associated with occupancy and modification of

the base floodplain (100-year floodplain), and the avoidance of direct and indirect support of development in the base floodplain wherever there is a practicable alternative. Federal agencies are directed to take action to:

- Avoid development in the base floodplain unless it is the only practicable alternative
- Reduce the hazard and risk associated with floods
- Minimize the impact of floods on human safety, health, and welfare
- Restore and preserve the natural and beneficial values of the base floodplain.

As reported in *NEPA Environmental Assessment* Chapter 4, Section 4.1.3, there is no Federal Emergency Management Agency (FEMA) floodplain adjacent to either alternative site because water levels of the Columbia River are controlled by the operation of Wells and Chief Joseph Dams.

6.1.10 Executive Order 12898, Environmental Justice

Executive Order 12898 of February 11, 1994 requires Federal agencies to achieve environmental justice by addressing “disproportionately high and adverse human health and environmental effects on minority and low-income populations” (3 CFR 1994 Comp., page 859). The impacts of the project, both negative and positive, on minority and low-income populations must be analyzed. Environmental justice issues include potential impacts on the physical and natural environment, as well as social, cultural, and economic effects of the project.

Environmental justice considerations related to constructing the proposed RAS demonstration project on the Colville Indian Reservation are discussed in *NEPA Environmental Assessment* Chapter 4 Section 4.3.2, and Chapter 5 Section 5.3.2. The project would create jobs and an operating profit for CCT.

6.1.11 Executive Order 13175, Consultation and Coordination with Indian Tribal Governments

The purpose of Executive Order 13175 of November 6, 2000 is to establish regular and meaningful consultation and collaboration with Tribal officials in the development of Federal policies that have Tribal implications, to strengthen the U.S. government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes.

EPA has an established procedure for consultation with Tribal officials when actions by EPA will affect the natural or human environment of a Native American Tribe. EPA will conduct Government-to-Government consultation with the Colville Confederated Tribes during the public comment period on the draft *NEPA Environmental Assessment*.

6.2 RELATIONSHIP TO CONFEDERATED COLVILLE TRIBES CODE OF LAWS

The RAS demonstration project is reviewed below in relation to relevant regulations contained in the Confederated Colville Tribes (CCT) Code of Laws. Portions of Title 4, Natural Resources and Environment; and Title 10, Employment and Contracting were identified as the applicable regulations.

6.2.1 Title 4, Chapter 4-1: Fish, Wildlife and Recreation

Chapter 4-1 of the CCT Code of Laws is known as the Colville Tribal Hunting and Fishing chapter of the CCT Code of Laws. It is CCT’s policy to restore, preserve, protect and perpetuate the fish and game resources (wildlife) on the Colville Indian Reservation, the North Half, and areas off the Colville

Reservation to the extent that wildlife passes through or would pass through the usual and accustomed fishing grounds and stations, hunting areas, or aboriginal lands of the Tribes. The Business Council intends that Tribal members shall be afforded the greatest possible freedom to use and enjoy these resources consistent with the preservation and improvement of these resources for future generations. All wildlife found on the Reservation, whether resident or migratory or introduced, is the property of the membership of the Colville Tribes, shall be regulated by the Tribes, and may be taken only at such times, in such places, and in such a manner as provided by Tribal law. Of secondary importance is the policy of permitting the limited use of the Reservation's wildlife and recreation resources by non-members for the economic benefit of the Tribes as a whole, and for the promotion of intercultural education and goodwill.

The RAS demonstration project does not involve hunting, fishing, wildlife restoration or enhancement. Therefore, Chapter 4-1 is not applicable to the proposed action.

6.2.2 Title 4, Chapter 4-3: Land Use and Development

The legislative intent of the CCT Law and Order Code Land Use and Development Chapter is to preserve and protect the political integrity, economic survival, health and welfare of present and future members of the Confederated Tribes of the Colville Reservation; to exercise the Tribes' powers of self-government and self-determination over all lands of the Colville Indian Reservation; and to implement the Tribes' Comprehensive Land Use Policy Guidelines. The Land Use and Development Chapter applies to all lands established by zoning districts or other property uses of the Colville Reservation.

The CCT Zoning Map (approved April 5, 2007 by Resolution 2007-201) shows both alternative sites within the Special Requirement zoning district (SRD). The purpose and function of the SRD is to freeze all existing uses and require a Conditional Use Permit for any and all uses, including any modifications, additions, change or expansion of existing uses pending detailed study by the Colville Tribes to determine an appropriate use designation (CCT Title 4, Chapter 4-3, Section 4-3-51). Areas designated SRD exhibit the widest range of disparate, inconsistent existing uses on the Reservation, and are expected to experience the largest amount of future growth.

CTFC will prepare and submit an application for Conditional Use Permit to the CCT Planning Department. Issuance of the permit will be considered at a hearing before the CCT Land Use Review Board, subject to the Board's confirmation that the development will comply with the provisions of the Land Use and Development Chapter if completed as proposed (CCT Title 4, Chapter 4-3, Section 4-3-118).

6.2.3 Title 4, Chapter 4-4: Cultural Resources Protection

Chapter 4-4 of the CCT Code of Laws is known as the Colville Cultural Resources Protection Chapter. Under the National Historic Preservation Act (NHPA) of 1979 (16 USC § 470 cc[c]), the responsible Federal official must notify the Tribes whenever a permit application is being considered which might adversely affect any religious or cultural off-Reservation site. The NHPA declares a national policy to work in partnership with Indian Tribal governments to protect cultural resources, and provides a mechanism by which Tribal governments may carry out the provisions of the Act. The Colville Cultural Resources Board is authorized and directed to review any proposed undertaking that might adversely affect any on-Reservation archaeological resource or historic property included on or eligible for inclusion on the Colville Register or National Register.

The RAS demonstration project is a Tribal proposal within the boundaries of the Reservation. USEPA will consult with the Tribal Historic Preservation Officer during the comment period on the *Draft*

NEPA Environmental Assessment. The THPO has indicated that, to his knowledge, there are no archaeological sites, traditional places, or historic area allotments within the area of disturbance for the proposed project at either alternative site. He has offered to have a Tribal Historic/Archaeology Program staff member observe test pit excavations at the location where excavations are proposed to construct the in-ground RAS tank and biofilter on Cassimer Bar if this site is selected (pers comm. with Guy Moura, Manager, CCT History/Archaeology Program, April 11 and 12, 2022). See Section 6.1.1 above.

6.2.4 Title 4, Chapter 4-8: Water Quality Standards

CCT has a primary interest in the protection, control, conservation, and utilization of the water resources of the Colville Indian Reservation. It is the purpose of this Chapter to establish Tribal Water Quality Standards for the surface waters and ground waters located within the exterior boundaries of the Colville Indian Reservation. The quality of all surface and groundwater on the Reservation shall be protected to ensure the health, economic, aesthetic and cultural well-being of all people residing on the Colville Indian Reservation. CCT has jurisdiction to enforce Tribal Water Quality Standards in order to protect the economy, health, safety and welfare of the Reservation community. The CCT Hydrology Department administers this Chapter.

The water quality classification of the Okanogan River within the boundaries of the Reservation, and the Columbia River from Chief Joseph Dam to Wells Dam is Class II Excellent, for which water quality criteria are described in NEPA Environmental Assessment Chapter 4, Section 4.1.3. The relationship of the RAS demonstration project to existing water quality conditions in the receiving waters of either river is discussed in *NEPA Environmental Assessment* Chapter 5 (Section 5.1.3). CTFC will obtain and comply with the conditions of a Colville Tribal Pollution Discharge Permit for operation of the RAS demonstration project, in addition to the terms and conditions of the USEPA GP.

6.2.5 Title 10: Tribal Employment and Contracting

Tribal members and other Indians have suffered discrimination in employment on and near the Colville Reservation. The Tribal Employment Rights Chapter 10-1 of the CCT Law and Order Code was established to ensure that discrimination does not continue to occur, and that Tribal members and other Indians on the Colville Reservation have an opportunity to participate in the work opportunities that arise on and near the Reservation, and may benefit from the unique rights that flow to Tribal members and other Indians. It is the intent of this chapter to ensure (among other things) that no employer covered by this chapter will discriminate against any Indian in any aspect of employment; to require that all covered employers give preference to Indian-preference-eligible individuals in all aspects of employment; and to require that all entities awarding contracts give preference to Indian Business Enterprises for contract work on the Reservation. All covered employers operating within the lands and territories of the Colville Reservation are required to give preference in all aspects of employment to Indian-preference-eligible individuals in the following order: Colville Tribal member, local Indian, or non-local Indian. Covered employers shall not hire any non-Indian-preference-eligible individual if an Indian-preference-eligible individual meeting the minimum threshold requirements of the job has applied for the position. The Director of the Tribal Employment Rights Office (TERO) may approve exemptions from this requirement.

CTFC manages its workforce under an Employee Policy Manual, Salary Wage Policy, and TERO in an effort to create consistency, Indian preference in hiring, and employing the most qualified individuals for its enterprises.

The RAS demonstration project is projected to create 5 to 6 jobs: 2 or 3 hatchery jobs (depending on the alternative site selected), 2 office personnel to monitor the funding and reporting requirements, and 1 consultant to oversee technical operations. It is expected that all but the consulting position would be filled by Tribal members. In addition, local area jobs would be created through maintenance agreements, trucking fish food, and trucking fish to market. If the full-scale RAS project is developed at some future time, it is expected to create approximately 50 to 75 jobs for Tribal members.

6.3 AGENCIES AND PERSONS CONSULTED, CORRESPONDENCE RECEIVED

Agencies and persons consulted and correspondence received during preparation of this *NEPA Environmental Assessment* are described below.

Colville Confederated Tribes (CCT) History/Archaeology Program

A project description and aerial photo site plans were provided to the Tribal Historic Preservation Officer with a request to confirm whether there is any cultural resources documentation for the Cassimer Bar hatchery site or the Colville Tribal Trout Hatchery site. The THPO was familiar with both sites, and confirmed that Cassimer Bar had been surveyed, with no sensitive sites identified at the hatchery location. The Tribal Trout Hatchery was constructed in an excavated gravel pit. No cultural resource sites are located in or near the pit, and the pit itself has no historical significance. Information provided by the CCT THPO was used to prepare the Cultural Resources sections of *NEPA Environmental Assessment* Chapters 4 and 5, as well as to describe the relationship of the proposal to Federal regulations and Executive Orders that pertain to archaeological and historic preservation (see Section 6.1.1 above).

Colville Confederated Tribes (CCT) Planning Department

An e-mail request was sent to William Marchand, CCT Planning Department, to request current economic development statistics that contrast CCT with surrounding communities and the State. The request was sent on April 11, 2022, and the response was received the same date. This information was used in the Socioeconomics section of *NEPA Environmental Assessment* Chapter 4 (4.3.2).

Washington Department of Fish & Wildlife (WDFW)

A Priority Habitats and Species (PHS) Information public data request was sent to the Washington Department of Fish & Wildlife (WDFW) in Olympia, Washington on January 31, 2022. The following results were received on February 25 and February 28, 2022:

- Priority Habitats and Species (PHS) database maps for the vicinity of T30R25E Section 21, and T29R25E Section 10 (the Cassimer Bar and Colville Tribal Trout Hatchery sites, respectively).
- PHS Polygon Reports for species and habitats within these areas that are considered by WDFW to be priorities for conservation and management (birds, mammals, and fish).

This information was used to prepare the Fish, Wildlife, Vegetation, and ESA-Listed Species sections in Chapters 4 and 5 of this *NEPA Environmental Assessment*.

Washington Department of Transportation (WSDOT)

The WSDOT Transportation Data and GIS Office, Travel Data and Analysis Branch, was contacted on April 10, 2022 to request recent traffic data on SR 97 that provides primary access to the Cassimer Bar

hatchery site. WSDOT was contacted again on August 7, 2022 to request 2021 traffic data for SR 17 that provides primary access to the Colville Tribal Trout Hatchery site. Responses to these requests received on May 9, 2022 and August 8, 2022 (respectively) were used to prepare the *NEPA Environmental Assessment* Chapter 4 Transportation section (4.3.3).

7.0 SUMMARY OF MITIGATION MEASURES

Table 7-1 summarizes proposed mitigation measures to avoid or minimize direct impacts associated with construction and operation of the CTFC RAS demonstration project. The full text of Environmental Consequences and Mitigation Measures is provided in NEPA EA Chapter 5.

Table 7-1. Summary of proposed mitigation measures for the CTFC Recirculating Aquaculture System (RAS) demonstration project.

NEPA EA Section	Element of the Environment	Proposed Mitigation Measures	Timeframe for Implementation
AQUATIC ENVIRONMENT			
5.1.1	Fish and Aquatic Habitat	Mitigation measures described below under Water Quality would also be beneficial for Fish and the Aquatic Environment.	Construction and Operation
5.1.2	ESA-Listed Fish Species	Same as above.	Same as above
5.1.3	Water Quality	<ul style="list-style-type: none"> • The contractor would comply with U.S. EPA regulations for stormwater management during construction. • CCT would comply with U.S. EPA regulations for stormwater management in the completed, operational condition of the CTFC RAS. • The CTFC RAS demonstration project would comply with the hatchery effluent monitoring requirements and discharge limits in the General Permit for Discharges from Federal Aquaculture Facilities and Aquaculture Facilities Located in Indian Country in Washington. • CTFC RAS employees will be trained in the Bio-Security and Best Management Practices described in detail in the <i>Cassimer Bar Land-Based Trout Farm Standard Operating Procedures and Quality Assurance Plan</i> (SOPs), as summarized in NEPA EA Section 5.1.3. 	Construction Operation Operation Operation
TERRESTRIAL ENVIRONMENT			
5.2.1	Wildlife and Terrestrial Habitat	No mitigation measures are proposed for Wildlife or Wildlife Habitat since no significant or high-value wildlife habitat would be affected by the proposed	

NEPA EA Section	Element of the Environment	Proposed Mitigation Measures	Timeframe for Implementation
		action.	
5.2.2	Vegetation	No mitigation measures are proposed for Vegetation since no significant or high-value vegetation would be affected by the proposed action.	
5.2.3	ESA-Listed Terrestrial Species	No mitigation measures are proposed for ESA-listed Terrestrial Species since none have been identified on or near the alternative sites.	
5.2.4	Air Quality	<ul style="list-style-type: none"> • Use only equipment and trucks that are maintained in good operational condition. • Restrict idling of construction equipment and vehicles when turning off such equipment would not damage the equipment or excessively delay related activities. • Implement a dust control plan. 	<p>Construction</p> <p>Construction</p> <p>Construction</p>
5.2.5	Land Use	<ul style="list-style-type: none"> • CTFC will comply with the conditions of permits and approvals required from the CCT Planning Department. 	
HUMAN ENVIRONMENT			
5.3.1	Cultural Resources	<ul style="list-style-type: none"> • A Tribal Historic/Archaeology Program staff member would observe test pit excavations between 10 and 16 feet deep on the Cassimer Bar site to look for archaeological materials in the area where excavations are proposed to construct the in-ground RAS tank and biofilter. • Inadvertent discovery procedures would be implemented in the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered during construction. 	<p>Construction</p> <p>Construction</p>
5.3.2	Socioeconomics	No mitigation is required for Socioeconomics due to only beneficial effects of the CTFC RAS demonstration project.	
5.3.3	Transportation	No mitigation measures are proposed for Transportation due to the small	

NEPA EA Section	Element of the Environment	Proposed Mitigation Measures	Timeframe for Implementation
		number of site-generated trips in proportion to AADT on State routes that serve the project area.	
5.3.4	Noise	No mitigation measures are proposed for Noise due to the absence of sensitive receivers in the vicinity of either alternative site.	
5.3.5	Aesthetics	No mitigation measures are proposed for Aesthetics due to the absence of adjacent development or site visibility from area roadways or Lake Pateros.	
5.3.6	Recreation	No mitigation measures are proposed for Recreation due to the absence of effect on existing recreation areas or recreational uses.	
5.3.7	Public Services	<ul style="list-style-type: none"> • A resident site manager would provide a full-time presence on the property. • The SOP and QA Plan provide emergency contact numbers that would be available to any RAS worker. 	<p>Operation</p> <p>Operation</p>
5.3.8	Utilities	<ul style="list-style-type: none"> • The proposed design includes insulation and energy-efficient operational features that will minimize energy requirements. • Electrical energy conveyed to either alternative site by Nespelem Valley Electric Cooperative is provided from a sustainable hydroelectric energy source. 	<p>Operation</p> <p>Operation</p>

8.0 PUBLIC PARTICIPATION

EPA will follow the public notice/public comment protocols set forth in the Code of Federal Regulations (CFR) for the National Environmental Policy Act (NEPA), for EPA permit actions, and for the Council on Environmental Quality (CEQ), all of which are contained within Title 40: Protection of Environment. These protocols are cited below.

40 CFR Part 6.203 – NEPA

The NEPA Responsible Official will, to the greatest extent possible, give notice to any State or local government, or Federally-recognized Indian tribe that, in the Official's judgment, may be affected by an action for which EPA plans to prepare an Environmental Assessment (EA). *40 CFR Part 6.203(a)(4)*

The Responsible Official must make reasonable efforts to involve the potentially affected communities where the proposed action is expected to have environmental impacts or where the proposed action may have human health or environmental effects in any communities, including minority communities, low-income communities, or Federally-recognized Indian tribal communities. *40 CFR Part 6.203(a)(5)*

At least thirty (30) calendar days before making the decision on whether, and if so how, to proceed with a proposed action, the Responsible Official must make the EA and preliminary Finding of Non-Significance (FONSI) available for review and comment to the interested Federal agencies, State and local governments, Federally-recognized Indian tribes and the affected public. The Responsible Official must respond to any substantive comments received and finalize the EA and FONSI before making a decision on the proposed action. *40 CFR Part 6.203(b)(1)*

40 CFR 124, Subpart A – EPA Permit Actions

The Director shall give notice that an NPDES new source determination has been made under Section 122.29. *40 CFR 124, Subpart A (a)(vi)*

Public notice of a draft permit shall allow at least 30 days for public comment. *40 CFR 124, Subpart A, Section 124.10(b)*

Public notice shall be given by the following methods: *40 CFR 124, Subpart A, Section 124.10(c)*

By mailing a copy of the notice to:

- The applicant.
- Any other agency which the Director knows has issued or is required to issue a Section 404 permit for the same facility or activity.
- Federal and State agencies with jurisdiction over fish, shellfish, and wildlife resources and over coastal zone management plans, the Advisory Council on Historic Preservation, State Historic Preservation Officers, including and affected Indian tribes.
- Any State agency responsible for plan development under the Clean Water Act (CWA) Section 208(b)(2), 208(b)(4) or 303(e) and the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.
- Any user identified in the permit application of a privately-owned treatment works.

- Any unit of local government having jurisdiction over the area where the facility is proposed to be located.
- Persons who request in writing to be on the mailing list.

Soliciting persons for “area lists” from participants in past permit proceedings within the project area.

Notifying the public of the opportunity to be put on the mailing list through periodic publication in the public press.

40 CFR Part 1500, Section 1506.6 – CEQ Regulations

Agencies shall:

- (a) Make diligent efforts to involve the public in preparing and implementing their NEPA procedures.
- (b) Provide public notice of NEPA-related hearings, public meetings, and the availability of environmental documents so as to inform those persons and agencies who may be interested or affected.
 - (1) In all cases the agency shall mail notice to those who have requested it on an individual action.
 - (3) In the case of an action with effects primarily of local concern the notice may include:
 - (i) Notice to State and area-wide clearinghouses pursuant to OMB Circular A-95 (Revised).
 - (ii) Notice to Indian tribes when effects may occur on reservations.
 - (iii) Following the affected State’s public notice procedures for comparable actions.
 - (iv) Publication in local newspapers (in papers of general circulation rather than legal papers).
 - (v) Notice through other local media.
 - (vi) Notice to potentially interested community organizations including small business associations.
 - (vii) Publication in newsletters that may be expected to reach potentially interested persons.
 - (viii) Direct mailing to owners and occupants of nearby or affected property.
 - (ix) Posting of notice on and off site in the area where the action is to be located.
- (c) Hold or sponsor public hearings or public meetings whenever appropriate or in accordance with statutory requirements applicable to the agency.

9.0 LIST OF PREPARERS

The consultant team responsible for preparing the *CTFC RAS Demonstration Project NEPA Environmental Assessment* was Vicki Morris, BA Ed, and Don Weitkamp, PhD. Members of this team have worked together on environmental documents since 1974. Brief biographical sketches are provided below.

The applicant's authorized agent, John Bielka, P.E., Consultant, provided information and responded to questions regarding the description of the proposed action, and mitigation measures that will be provided through the *Cassimer Bar Land-Based Trout Farm Standard Operating Procedures & Quality Assurance Plan*.

Vicki Morris, BA Ed, Vicki Morris Consulting Services

Vicki Morris is a SEPA/NEPA and permit assistance specialist, self-employed since 1991. She has more than 40 years of experience as project manager and primary author of Environmental Impact Statements, expanded Environmental Checklists, and Environmental Assessments, and more than 20 years of concurrent experience assisting clients with the acquisition of aquatic environment and land use permits. She has prepared more than 200 environmental compliance documents under the Washington State Environmental Policy Act (SEPA), and several Environmental Assessments under the National Environmental Policy Act (NEPA). Projects have included aquatic development projects for finfish and shellfish clients; habitat restoration and enhancement; commercial, industrial, residential, and recreational development proposals; utility extensions and rehabilitations; and programmatic actions: comprehensive land use plan updates, land use code amendments, and annexations. Ms. Morris was the primary author of the *Rufus Woods Lake Steelhead Trout Net Pen Aquaculture Site #3 NEPA Environmental Assessment* prepared for Pacific Aquaculture, Inc. in 2011.

Donald E. Weitkamp, PhD

Dr. Weitkamp is an aquatic biologist and water quality expert who has been working as a consultant since the 1970s. Early projects involved shoreline redevelopment issues and special studies for Puget Sound areas in the 1970s and 1980s. He began his scientific career working with shellfish industry issues as a research associate with the Fisheries Research Institute of the University of Washington. His master's thesis was prepared on research dealing with a parasite of cultured mussels and oysters. His initial research on finfish dealt with dissolved gas supersaturation and its effects on riverine and hatchery fish throughout the Columbia River basin. This work investigated the prevalence of supersaturation, its causes, control measures, and biological effects. He designed and directed research sampling in river populations, controlled populations in live cages, and conducted a mobile live cage experiment. He has provided services in program management, permitting, ESA compliance, NEPA/SEPA document preparation, water quality, habitat restoration, regulatory compliance, and interagency coordination for port districts, irrigation districts, the US Army Corps of Engineers, dam operators, and aquaculture clients.

Don has conducted numerous projects dealing with both hatchery and net pen techniques of finfish aquaculture. His hatchery experience has dealt with the genetics of hatchery populations, the strategic program issues of accelerated rearing, and hatchery effluents. It also includes a 15-year study of fall Chinook Salmon spawning in the Hanford Reach and its relation to hatchery practices, for an area strongly influenced by dam operation. Don has directed studies of migration timing and survival of hatchery populations of Columbia River salmonids.

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