

# QUALITY ASSURANCE PROJECT PLAN FOR THE UPPER WENATCHEE BASIN ACCLIMATION PROGRAM

MARCH 2020

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**March 2020**

**Prepared for**
Washington State Department of Ecology, Central Region
Union Gap, Washington

**Prepared by**
Four Peaks Environmental Science & Data Solutions
Wenatchee, Washington

and

Yakama Nation Fisheries
Peshastin, Washington

# APPROVAL PAGE

**Quality Assurance Project Plan for the Upper Wenatchee Basin Acclimation Program**

**NPDES Waste Discharge Permit No. WA0991018**

**March 2020**

**Approved by:**

Signature: _____ Date: 04/01/2020
Marcia Porter, Water Quality General Permits Manager,
Washington State Department of Ecology, Central Region

Signature: _____ Date: 3/27/2020
Cory Kamphaus, Program Manager,
Yakama Nation Fisheries

Signature: _____ Date: 3/27/2020
Pradeep Mugunthan, Water Quality Lead,
Four Peaks Environmental Science & Data Solutions

Signature: _____ Date: 3/27/2020
Sam Haffey, QA/QC Coordinator,
Four Peaks Environmental Science & Data Solutions

Signature: _____ Date: 3/27/2020
Aaron Young, Laboratory Manager,
AmTest, Inc.

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# ACRONYMS AND ABBREVIATIONS

| Acronyms or Abbreviation | Defined |
|---|---|
| BPA | Bonneville Power Administration |
| COC | chain-of-custody |
| DO | dissolved oxygen |
| Ecology | Washington State Department of Ecology |
| MCCRP | Mid-Columbia Coho Restoration Program |
| MQO | measurement quality objectives |
| MS | matrix spike |
| MSD | matrix spike duplicate |
| NPDES | National Pollutant Discharge Elimination System |
| QA | quality assurance |
| QAPP | Quality Assurance Project Plan |
| QC | quality control |
| RPD | relative percent difference |
| S.U. | standard unit |
| TMDL | total maximum daily load |
| TN | total nitrogen |
| TP | total phosphorus |
| TSS | total suspended solids |
| WAC | Washington Administrative Code |

# 1. BACKGROUND

## 1.1 Introduction

The Washington State Department of Ecology (Ecology) has issued a National Pollutant Discharge Elimination System (NPDES) permit (No. WA0991018) that authorizes discharges from existing and new salmonid acclimation sites used in the Upper Wenatchee Basin Acclimation Program. The NPDES permit requires influent, effluent, and ambient water quality monitoring at the acclimation sites. Furthermore, the NPDES permit requires the preparation of a Quality Assurance Project Plan (QAPP) to establish the quality assurance (QA) and quality control (QC) procedures for the monitoring program, and a site-specific Facility Sampling Plan. This document has been prepared to meet these requirements in the NPDES permit. It follows the guidelines provided in Ecology's guidance document on preparing QAPP for environmental studies (Lombard and Kirchmer, 2004).

## 1.2 Project and Study Area Background

The Mid-Columbia Coho Restoration Program (MCCRP) is sponsored by the Yakama Nation and funded by Bonneville Power Administration (BPA) and the Chelan, Grant, and Douglas County Public Utility Districts to help mitigate for impacts of the Federal and Public Utility Districts' Columbia River Power System dams on anadromous fish (BPA, 2012). The MCCRP uses several acclimation sites in the Wenatchee and Methow river basins. In addition to restoration of Coho salmon under the MCCRP, the Upper Wenatchee Basin Acclimation Program includes steelhead and spring Chinook salmon acclimation at Powerline and Trinity Acclimation Sites respectively. The acclimation sites in the Wenatchee River Basin that are authorized under the NPDES permit are summarized in Table 1-1 and shown in Figure 1-1.

**Table 1-1. Upper Wenatchee Basin Acclimation Program Sites**

| Acclimation Site | Outfall(s) | Receiving Stream | No. of Fish and Species | Latitude | Longitude |
|---|---|---|---|---|---|
| Rohlfing | 001 | Nason Creek | 105,000 coho salmon | 47.785286 | -120.879258 |
| Butcher | 002 | Nason Creek | 105,000 coho salmon | 47.769506 | -120.802314 |
| Coulter | 003 | Nason Creek | 105,000 coho salmon | 47.764444 | -120.802778 |
| Powerline | 004 | Nason Creek | 75,000 steelhead | 47.786433 | -120.875208 |
| Trinity | 005, 006 | Phelps Creek/ Chiwawa River | 100,000 coho salmon and 50,000 Chinook salmon | 48.073611 | -120.851944 |
| Clear Creek | 007 | Clear Creek/ Chiwawa River | 250,000 coho salmon | 47.79789 | -120.63266 |
| Beaver Creek | 008 | Beaver Creek/ Wenatchee River | 100,000 coho salmon | 47.768214 | -120.648158 |
| White River Springs | 009 | White River | 50,000 coho salmon | 47.8467 | -120.835719 |
| White River Bridge | 010 | Dirty Face Creek/ White River | 60,000 coho salmon | 47.887397 | -120.872497 |

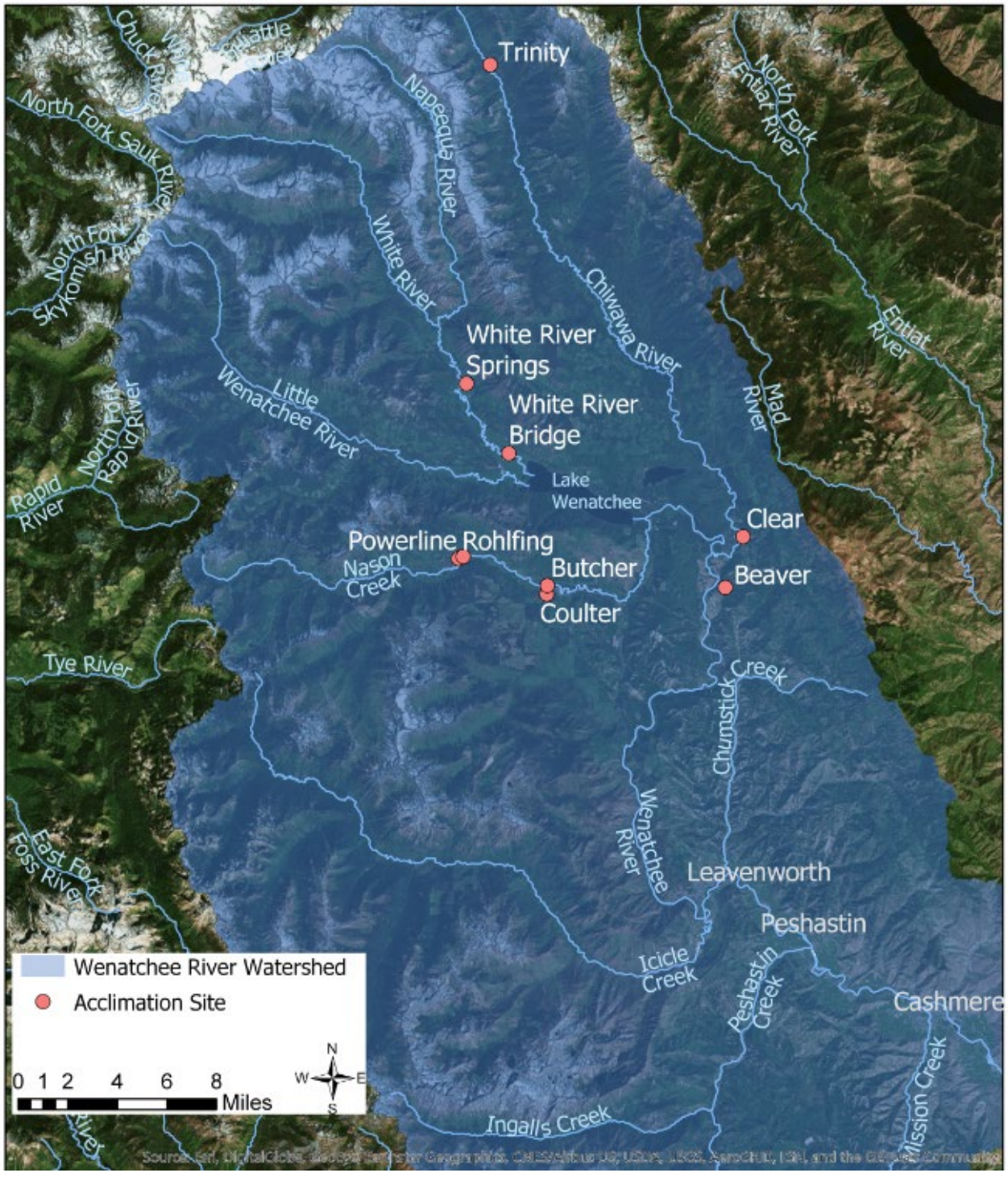


**Figure 1-1. Map of Acclimation Sites**

With the exception of Trinity Acclimation Site, acclimation is proposed to occur from March through June of each year, with feeding ceasing in May. At the Trinity Acclimation Site, acclimation activity will occur from October through May with minimal feeding during overwinter acclimation. Feeding in the acclimation sites is expected to be minimal during March and April and will peak prior to release. Fish release will be volitional at all sites except the White River Bridge Acclimation Site where temporary above ground circular tanks will be used for acclimation and fish will be released directly into the White River through a pipe.

## 1.3 Wenatchee River Basin Water Quality

Washington Administrative Code (WAC) 173-201A-602 designates the Upper Wenatchee River Basin above the Chiwawa River confluence to support aquatic life use of char spawning (Nason Creek, White River, Chiwawa River mainstem and its tributaries including Clear Creek), and to support core summer salmonid on the Wenatchee River mainstem below the Chiwawa River confluence through river mile 27.1 and its tributaries therein (including Beaver Creek). The water quality criteria associated with these aquatic life use designations are summarized in Table 1-2. In addition, the Upper Wenatchee River Basin including all tributaries above river mile 27.1 are also designated to support primary contact recreation, water supply, and other miscellaneous uses (WAC 173-201A-602).

**Table 1-2. Applicable Water Quality Standards for the Upper Wenatchee River Basin**

| Parameter | Core Summer Salmonid Habitat[1] | Char Spawning Habitat[2] |
|---|---|---|
| Temperature (°C) | 1. 7-day average of the daily maximum (7-DADMax) less than or equal to 16°C | 1. 7-day average of the daily maximum (7-DADMax) less than or equal to 12°C |
| | 1. Human-caused change less than or equal to 0.3°C when 7-DADMax is greater than the criteria above<br>2. Human-caused change when background 7-DADMax is less than the criteria above:<br>a. For individual point sources less than 28/(T+7); T is in °C<br>b. Cumulative change for all non-point sources less than 2.8°C | |
| DO (milligrams per liter; mg/L) | 1. Daily minimum DO greater than or equal to 9.5 mg/L<br>2. Human-caused change less than or equal to 0.2 mg/L when minimum DO is 9.5 mg/L | |
| Turbidity (Nephelometric Turbidity Units; NTU) | 1. Change less than or equal to 5 NTU, when background less than or equal to 50 NTU<br>2. Change less than or equal to 10% of background, when background greater than 50 NTU | |
| pH (standard units; S.U.) | 1. pH shall be within the range of 6.5 to 8.5<br>2. Human-caused variation within the range above less than or equal to 0.2 units | |
| Total Dissolved Gas (%) | 1. Saturation less than or equal to 110% | |
| General Criteria | 1. Toxic substances shall not be introduced above natural background levels at levels that adversely affect designated uses as specified in WAC 173-201A-240<br>2. Free of deleterious concentrations of radioactive materials as defined in WAC 173-201A-250<br>3. Aesthetic values must 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 | |

Notes:

1. Wenatchee River mainstem and its tributaries (including Beaver Creek) below Chiwawa River confluence and above river mile 27.1
2. Wenatchee River and its tributaries (including Chiwawa River, Nason Creek, Clear Creek, and White River) above Chiwawa River confluence

A summary of key 303(d) listings (as of December 2016) in the tributaries of the Upper Wenatchee River where discharges from the project acclimation sites are permitted is shown in Table 1-3. In addition, the lower Wenatchee River and tributaries therein are also currently on the Washington State's 303(d) list for dissolved oxygen (DO) and/or pH excursions.

**Table 1-3. 303(d) Listings in the Upper Wenatchee River Basin Tributaries**

| Tributary | Listings and Category | Location | Remarks |
|---|---|---|---|
| White River | DO (Category 2), pH (Category 2) | Forest Road 6500 at 1/2 mile to White River bridge | Several sections are listed for temperature (Category 2) |
| Little Wenatchee River | DO (Category 4A) | Little Wenatchee River near mouth | The same reach is also listed for temperature (Category 2) |
| Chiwawa River | DO (Category 2), pH (Category 4A) | Chiwawa River near mouth | Also listed for temperature (Category 2) |
| Nason Creek | DO (Category 2) | Nason Creek near mouth | Many listings for temperature (Category 4A) |
| Beaver Creek | DO (Category 2) | Beaver Creek near mouth | |

In order to restore the DO and pH, the Wenatchee River has an active total maximum daily load (TMDL) allocation for total phosphorus (TP) (Carroll and Anderson, 2009; Ecology, 2012). The TMDL provides no allocation for TP loading from new sources in the lower Wenatchee River below the city of Leavenworth during the critical periods of March through May and July through October. The TMDL also requires a load reduction of 25% from the upper watershed. Furthermore, to improve temperature in the Wenatchee River Basin, a temperature TMDL is also in effect (Cristea and Pelletier, 2005).

# 2. MONITORING PROGRAM OBJECTIVES AND FACILITY SAMPLING PLAN

## 2.1 Water Quality Data Collection Objectives

### *2.1.1 Scope of Data Collection*

The primary objective of the water quality data collection is to comply with the NPDES permit requirements for the following:

1. Provide a periodic record of settleable and total suspended solids (TSS) in the effluent resulting from the fish acclimation activities
2. Characterize nutrient levels in the effluent, specifically the total nitrogen (TN) and TP, to provide an indication of the extent of nutrient loading from the outfalls
3. Collect TN and TP data in the receiving stream to support an assessment of changes to the ambient nutrient levels

Effluent discharge requirements for upland fin-fish facilities in Washington Administrative Code (WAC) 173-221A-110(4) have been included in this permit. This requires monitoring of TSS and settleable solids . The NPDES permit also includes in-stream monitoring requirements to assess nutrient impacts associated with this project. Ecology's indicated goal in the individual NPDES permit is *de minimis* (i.e., no measurable) impact from the discharges on ambient (receiving stream) nutrient concentrations. To this end, it is important to characterize the effluent nutrients in the discharges as well as assess the effects in the receiving streams above and below the outfalls.

The NPDES permit requires the submission of quarterly and annual discharge monitoring reports for the acclimation sites, which will include the parameters listed in Table 2-1 as well as the effluent characterization samples and in-stream nutrient samples for TN and TP. In addition, at the end of each acclimation season the NPDES permit requires the submission of an annual in-stream nutrient monitoring compliance report.

**Table 2-1. NPDES Permit Limits on pH and Settleable and Total Suspended Solids**

| Parameter | Acclimation Phase | Average Monthly | Maximum Daily | Sampling Point | Sampling Frequency | Type of Sample |
|---|---|---|---|---|---|---|
| Settleable Solids (milliliters per liter) | Routine | 0.1 | Not applicable | Effluent[1] | 1/week | Grab |
| | Release | Not applicable | 1.0 | Effluent[2] | 1/event | Grab |
| TSS (milligrams per liter) | Routine | 5.0 | 15.0 | Effluent[1] | 1/month | Composite[3,4] |
| | Release | Not applicable | 100.0 | Effluent[2] | 1/event | Grab |
| pH (standard units) | Routine | At all times between 6.0 and 9.0 | | Effluent[2] | 1/month | Grab |

Notes:

1. Net concentration applies when a paired influent sample is also obtained, otherwise influent will be assumed to be zero.
2. Concentration prior to mixing with any other flows/waters.

3. Composite sample should comprise equal volumes of at least six representative grab samples collected throughout a normal working day with at least one of the six samples collected when fish are fed. Alternatively, an automatic sampler capable of taking one discreet sample per hour may also be used.
4. The same set of composite samples may be used to calculate the average monthly and the maximum daily concentrations.

## *2.1.2 Decisions Made Using Water Quality Data*

The monitoring program will be used to inform the following assessments.

### *2.1.2.1 Compliance with Effluent Solids and pH*

Samples collected from the outfalls will be used to evaluate whether the discharges meet the permit conditions for settleable solids, TSS, and pH (Table 2-1). The NPDES permit also has effluent limitation on total residual chlorine if chlorine or chloramine-T is used for treatment. Since, none of the acclimation sites will use chlorine or chloramine-T, evaluation of total residual chlorine is not required and will not be assessed in the monitoring program.

### *2.1.2.2 Assessment of Ambient Water Quality Impact*

Ambient nutrient data will be used to assess whether nutrient concentrations in the receiving stream downstream of the outfall are significantly greater than those upstream of the outfall. Ambient monitoring is required at all the outfalls except those on the White River. At a minimum, five sets of upstream and downstream samples will be collected during each acclimation season, with one set of samples collected immediately before fish are brought on station, one set within 1 week of fish release and three sets when fish are on stations. At the Trinity Acclimation site an additional set of samples will be collected over the winter.

The NPDES permit allows the use of standard statistical methodology for determining whether the downstream concentrations are statistically significantly different from the upstream concentrations. Even though each set of upstream and downstream samples will be collected within a short period of time (typically within an hour) they cannot be considered strictly "paired" in the statistical sense because the downstream conditions are not identical to upstream conditions due to the influence of inflow from the creeks that carry the discharges from the acclimation site (see Figure 2-1).

Given the above, a single-tailed, two-sample t-test would be an appropriate statistical test to assess whether the population mean concentration of a random sample at the downstream location is statistically greater than the population mean concentration of a random upstream sample. The following statistical hypothesis testing will be conducted:

Null Hypothesis: $\mu_{D/S} = \mu_{U/S}$

Alternate Hypothesis: $\mu_{D/S} > \mu_{U/S}$

where:

$\mu_{D/S}$ is the mean concentration at the downstream location

$\mu_{U/S}$ is the mean concentration at the upstream location

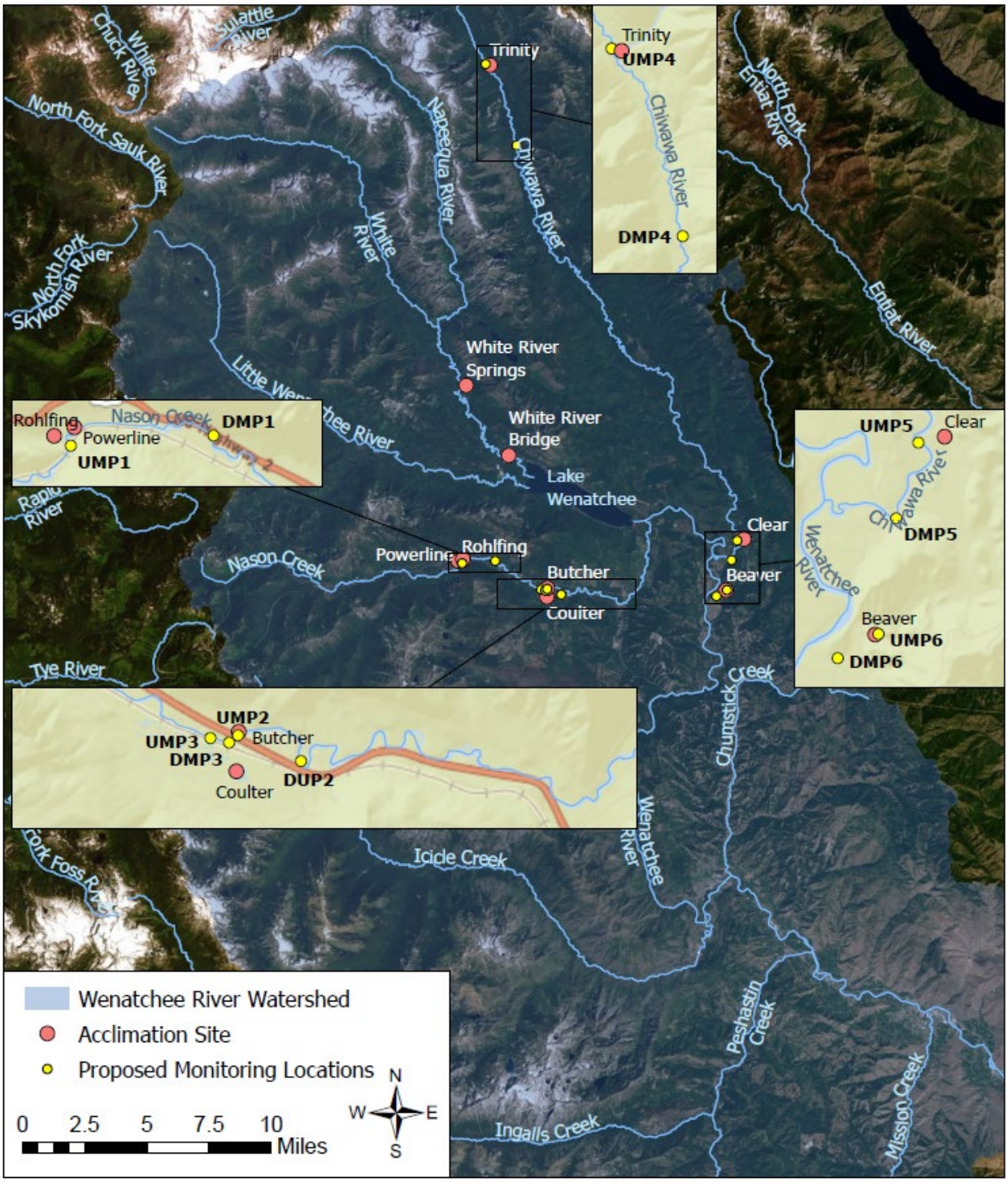


**Figure 2-1. Ambient In-Stream Nutrient Compliance Monitoring Locations**

Variance will be pooled if an f-test determines that the upstream and downstream population variances are equal. In the event the samples exhibit substantial deviation from normality[1], the non-parametric Mann-Whitney test will be conducted in place of the two-sample t-test. The acceptance criteria for the test are discussed in Section 4.1 and follows the guidance proposed in U.S. Environmental Protection Agency's Data Quality Objectives guidance document (USEPA, 2006).

## 2.2 Facility Sampling Plan

### *2.2.1 Ambient In-Stream Monitoring*

The ambient stream monitoring locations for each acclimation site are summarized in Table 2-2 and shown in Figure 2-1. TN and TP will be sampled at all sites at the frequency described in Section 2.1.2.2.

**Table 2-2. Ambient In-Stream Nutrient Compliance Monitoring Points**

| Acclimation Site(s) | Outfall(s) | Monitoring Location ID | Monitoring Stream | Latitude | Longitude |
|---|---|---|---|---|---|
| Rohlfing, Powerline | 001, 004 | UMP1 | Nason Creek | 47.78396667 | -120.8759167 |
| Rohlfing, Powerline | 001, 004 | DMP1 | Nason Creek | 47.78532778 | -120.8473639 |
| Butcher | 002 | UMP2 | Nason Creek | 47.769049 | -120.802463 |
| Butcher | 002 | DMP2 | Nason Creek | 47.765749 | -120.790463 |
| Coulter | 003 | UMP3 | Nason Creek | 47.76900556 | -120.8085139 |
| Coulter | 003 | DMP3 | Nason Creek | 47.76825278 | -120.8041639 |
| Trinity | 005, 006 | UMP4 | Chiwawa River | 48.07418889 | -120.8557528 |
| Trinity | 005, 006 | DMP4 | Chiwawa River | 48.02696667 | -120.8289556 |
| Clear | 007 | UMP5 | Clear Creek | 47.79698889 | -120.6385111 |
| Clear | 007 | DMP5 | Clear Creek | 47.78563611 | -120.6434694 |
| Beaver | 008 | UMP6 | Beaver Creek | 47.7683 | -120.6474278 |
| Beaver | 008 | DMP6 | Beaver Creek | 47.764679 | -120.656541 |

### *2.2.2 Site-Specific Influent and Effluent Monitoring Locations*

#### *2.2.2.1 Nason Creek Acclimation Sites*

The influent and effluent monitoring locations for Nason Creek sites are summarized in Table 2-3 and shown in Figures 2-2 through 2-5. In all sites except Coulter, the inflow and outflow locations from the acclimation pond are easily accessible and will be sampled as indicated in Table 2-3. The outlet of the Coulter acclimation pond flows into a wetland complex, which is difficult to access through the pond. Therefore, effluent samples will be collected at the mouth of wetland complex from where the pond outflow eventually drains into Nason Creek. Influent samples will be collected at the pond inflow.

[1] Deviation from normality will be determined graphically from a quantile-quantile plot or using a standard statistical test such as Shapiro-Wilk or Kolmogorov-Smirnov test.

**Table 2-3. Influent and Effluent Monitoring Locations for the Nason Creek Acclimation Sites**

| Outfall | Monitoring Location | Monitoring Location ID | Site Identifier | Latitude[1] | Longitude[1] |
|---|---|---|---|---|---|
| 001 (Rohlfing) | Influent | RO1 | Pond inflow | 47.785456 | -120.879299 |
| | Effluent | RO2 | Pond outflow | 47.785021 | -120.878567 |
| 002 (Butcher) | Influent | BU1 | Pond inflow | 47.769985 | -120.803227 |
| | Effluent | BU2 | Pond outflow | 47.769506 | -120.802027 |
| 003 (Coulter) | Influent | CO1 | Pond inflow | 47.764280 | -120.803122 |
| | Effluent | CO2 | Mouth of unnamed wetland | 47.768496 | -120.807605 |
| 004 (Powerline) | Influent | PL1 | Pond intake | 47.786422 | -120.875078 |
| | Effluent | PL2 | Pond return | 47.786353 | -120.875004 |

Note:

1. Latitude and longitude are estimated from Google Earth based on site drawings and aerial imagery. Actual monitoring locations may vary depending on site constraints and logistics but will be approximately close to the locations above. GPS coordinates of actual monitoring locations will be recorded during the first sampling event.

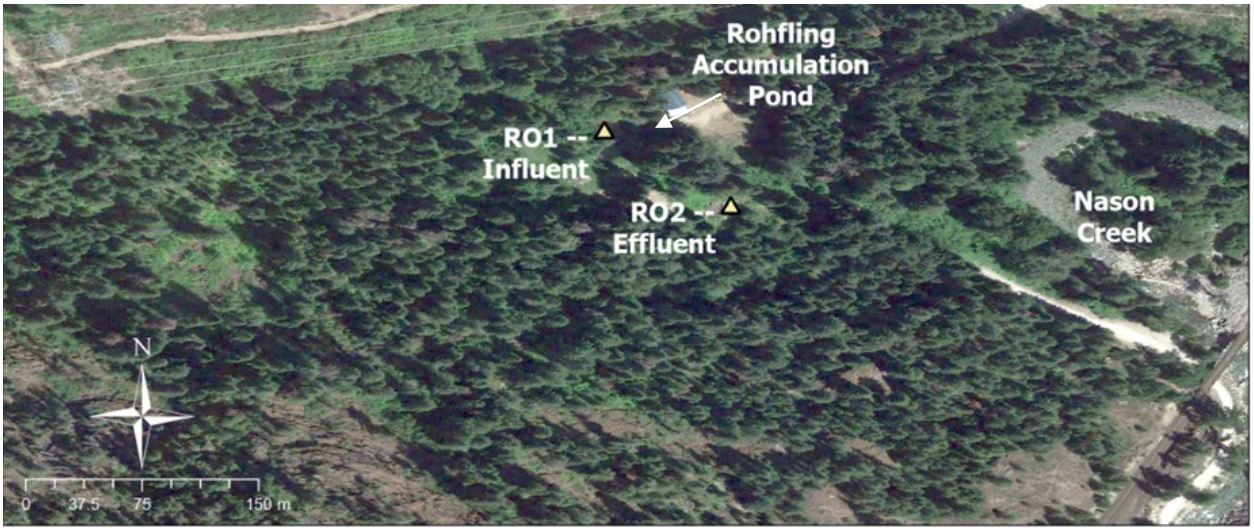


**Figure 2-2. Influent and Effluent Sampling Locations for the Rohlfing Acclimation Site**

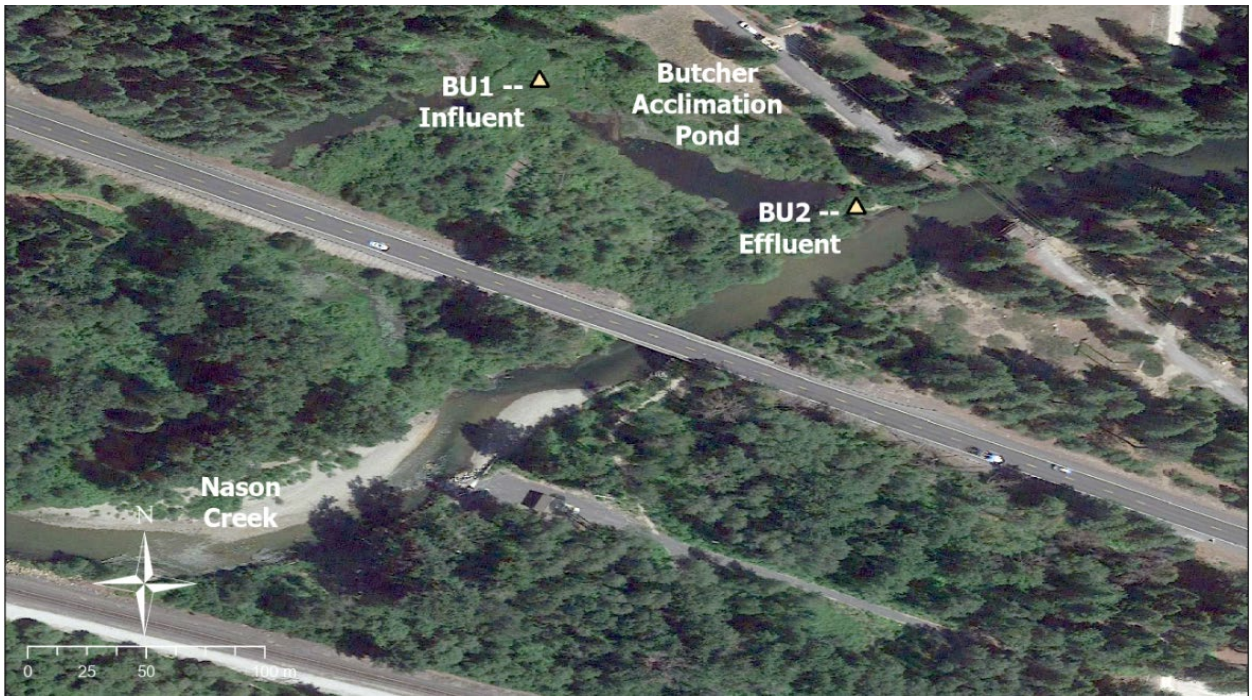


**Figure 2-3. Influent and Effluent Sampling Locations for the Butcher Acclimation Site**


**Figure 2-4. Influent and Effluent Sampling Locations for the Coulter Acclimation Site**

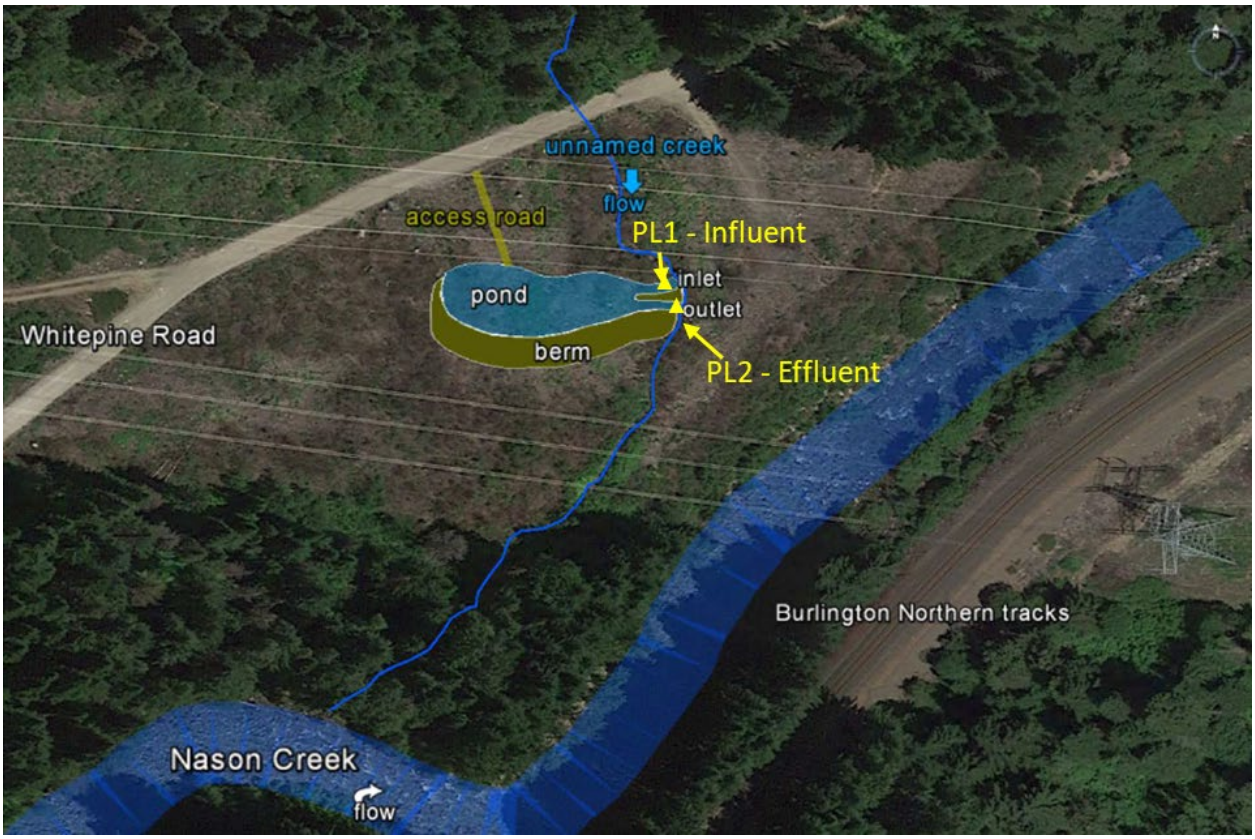


**Figure 2-5. Influent and Effluent Sampling Locations for the Powerline Acclimation Site**

### *2.2.2.2 Trinity Acclimation Site*

The influent and effluent monitoring locations for Trinity Acclimation Site outfalls are summarized in Table 2-4 and shown in Figure 2-6. For Outfall 005, which drains into the Chiwawa River, effluent samples will be collected at the existing Chinook salmon acclimation pond outlet, and the corresponding influent samples will be collected at the water supply line adjacent to the archaeological building on site (see Figure 2-6).

The coho salmon acclimation pond and circular tanks are yet to be constructed. The coho acclimation pond will utilize water from a new discharge pipeline from the Powerhouse that will discharge water to an open channel and then onto Phelps Creek. The open channel bifurcates into two sections, both of which discharge to Phelps Creek. The pond will discharge into upper (eastern) of the two open channels (Figure 2-6). Influent samples to the pond will be collected at the powerhouse headbox and effluent samples will be collected at the upper open channel before it enters Phelps Creek (Figure 2-6).

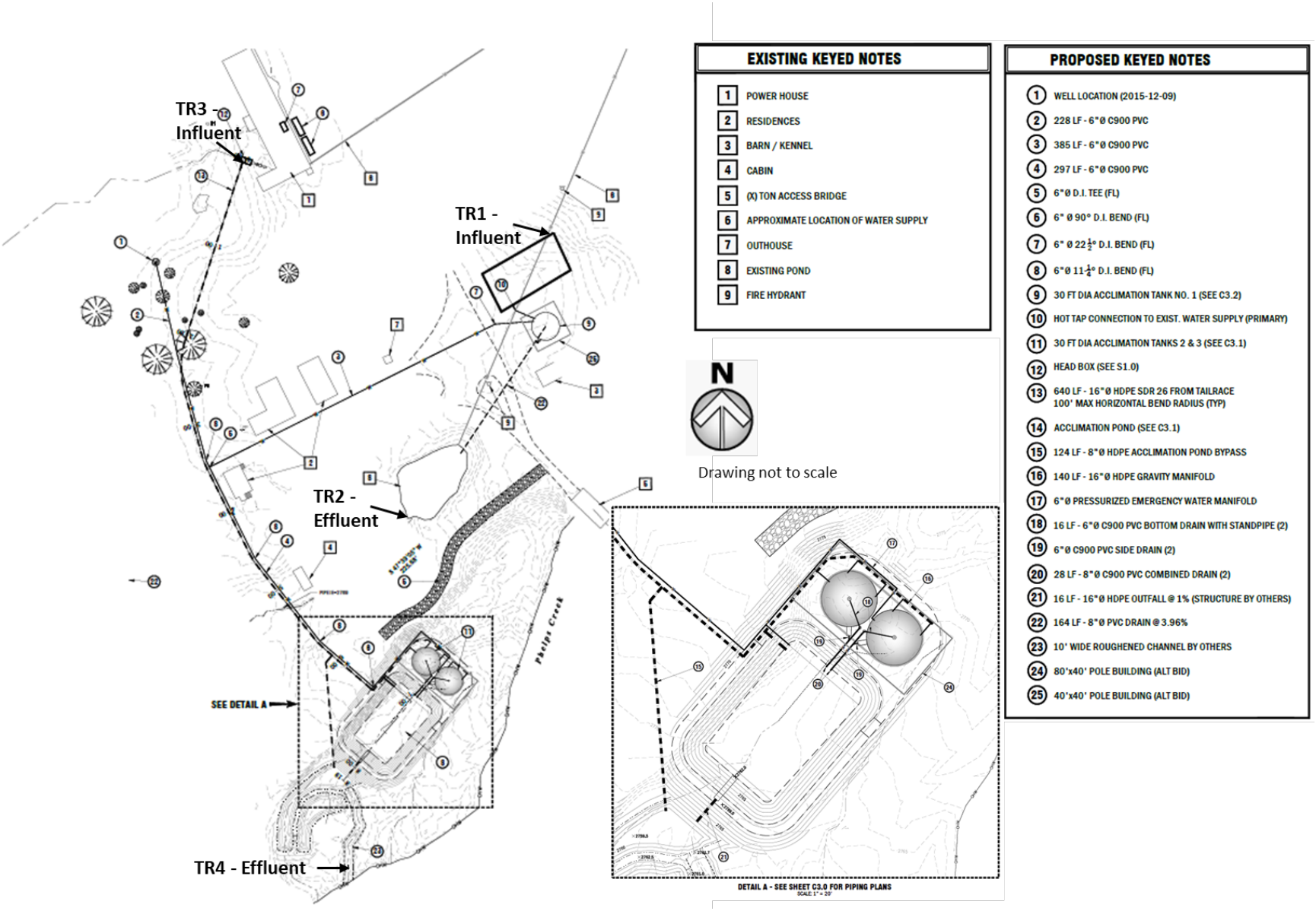


**Figure 2-6. Influent and Effluent Sampling Locations for the Trinity Acclimation Site**

**Table 2-4. Influent and Effluent Monitoring Locations for the Trinity Acclimation Site**

| Outfall | Monitoring Location | Monitoring Location ID | Site Identifier | Latitude[1] | Longitude[1] |
|---|---|---|---|---|---|
| 005 | Influent | TR1 | Water supply line | 48.073864 | -120.851047 |
| | Effluent | TR2 | Pond outlet | 48.073293 | -120.851863 |
| 006 | Influent | TR3 | Powerhouse headbox | 48.074428 | -120.852447 |
| | Effluent | TR4 | Outflow canal | 48.072244 | -120.852182 |

Note:

1. Latitude and longitude are estimated from Google Earth based on-site drawings. Actual monitoring locations may vary depending on site constraints and logistics but will be approximately close to the locations above. GPS coordinates of actual monitoring locations will be recorded during the first sampling event.

### *2.2.2.3 Clear Creek Acclimation Site*

The influent and effluent monitoring locations for Clear Creek Acclimation Site are summarized in Table 2-5 and shown in Figure 2-7. Influent samples will be obtained at the pond inlet, which is fed by another pond that derives water from Clear Creek. The effluent samples will be collected at the pond outlet channel that conveys the pond outflow back to Clear Creek.

**Table 2-5. Influent and Effluent Monitoring Locations for the Clear Creek Acclimation Site**

| Outfall | Monitoring Location | Monitoring Location ID | Site Identifier | Latitude[1] | Longitude[1] |
|---|---|---|---|---|---|
| 007 | Influent | CL1 | Pond inlet | 47.798961 | -120.632465 |
| | Effluent | CL2 | Pond outlet | 47.797977 | -120.631867 |

Note:

1. Latitude and longitude are estimated from Google Earth based on aerial imagery. Actual monitoring locations may vary depending on site constraints and logistics but will be approximately close to the locations above. GPS coordinates of actual monitoring locations will be recorded during the first sampling event.


**Figure 2-7. Influent and Effluent Sampling Locations for the Clear Creek Acclimation Site**

### *2.2.2.4 Beaver Creek Acclimation Site*

The influent and effluent monitoring locations for Clear Creek Acclimation Site are summarized in Table 2-6 and shown in Figure 2-8. The influent samples will be collected from Beaver Creek approximately 100 feet above the pond inlet where Beaver Creek is accessible from a pathway adjacent to the access road. Beaver Creek continues from the pond outlet. The effluent samples will be collected from Beaver Creek on the other side of the access road to the pond outlet (see Figure 2-8).

**Table 2-6. Influent and Effluent Monitoring Locations for the Beaver Creek Acclimation Site**

| Outfall | Monitoring Location | Monitoring Location ID | Site Identifier | Latitude[1] | Longitude[1] |
|---|---|---|---|---|---|
| 008 | Influent | BC1 | Beaver Creek above Pond Inlet | 47.768220 | -120.647535 |
| | Effluent | BC2 | Pond Outlet Past Access Road | 47.768064 | -120.648418 |

Note:

1. Latitude and longitude are estimated from Google Earth based on aerial imagery. Actual monitoring locations may vary depending on site constraints and logistics but will be approximately close to the locations above. GPS coordinates of actual monitoring locations will be recorded during the first sampling event.


**Figure 2-8. Influent and Effluent Sampling Locations for the Beaver Creek Acclimation Site**

### *2.2.2.5 White River Acclimation Sites*

The influent and effluent monitoring locations for White River Springs and White River Bridge Acclimation sites are summarized in Table 2-7 and shown in Figures 2-9 and 2-10, respectively. Sampling at White River Springs will occur in the combined spring that feeds water into the acclimation ponds and at the mouth of Dirty Face Creek through which fish will enter the White River during release. Sampling at the White River Bridge Acclimation Site will occur in the intake and return lines, which would withdraw from and return to the White River in the general vicinity of the project site (see Figure 1-1). The return line will be approximately 20 feet downstream of the intake.

**Table 2-7. Influent and Effluent Monitoring Locations for the White River Acclimation Sites**

| Outfall | Monitoring Location | Monitoring Location ID | Site Identifier | Latitude[1] | Longitude[1] |
|---|---|---|---|---|---|
| 009 (White River Springs) | Influent | WS1 | Combined spring channel above Upper Pond | 47.887007 | -120.872598 |
| | Effluent | WS2 | Mouth of Dirty Face Creek | 47.887072 | -120.875892 |
| 010 (White River Bridge) | Influent | WB1 | Intake line[2] | To be determined | To be determined |
| | Effluent | WB2 | Return line[2] | To be determined | To be determined |

Notes:

1. Latitude and longitude are estimated from Google Earth based on aerial imagery. Actual monitoring locations may vary depending on site constraints and logistics but will be approximately close to the locations above. GPS coordinates of actual monitoring locations will be recorded during the first sampling event.
2. The intake and return location may vary slightly each year depending on where the temporary tanks are installed but would generally be in the vicinity of the project site (see Figure 1-1). The return line will be placed approximately 20 feet downstream of the intake.


**Figure 2-9. Influent and Effluent Sampling Locations for the White River Springs Acclimation Site**


Note: Influent and effluent sampling will occur along the approximate tank area where the intake and return pipes will be located

**Figure 2-10. White River Bridge Acclimation Site Potential Sampling Areas**

## 2.3 Practical Constraints on Study Design

The proposed study design above could have some field constraints. Some sites may have access limitations in winter months. In particular, accessing the Trinity Acclimation Site during overwinter acclimation can be difficult. To overcome this limitation, the first sampling event may occur in mid-fall soon after fish are brought on station. This would also be a more critical time because the ambient waters will be warmer than during peak winter. Another potential issue is being able to complete sampling from remote locations and ship samples to the laboratory within the allowable hold times. To overcome this limitation, a laboratory that is located in Wenatchee, Washington, has been selected, which should make it feasible to meet the hold times.

# 3. PROJECT MANAGEMENT, ORGANIZATION, AND SCHEDULE

## 3.1 Project Organization and Management

The project team organization and the roles and responsibilities of each individual are listed in Table 3-1.

## 3.2 Project Schedule

### *3.2.1 Monitoring Schedule*

The overall monitoring program will begin from approximately 1 week before fish are brought on site to the time fish are released. For all sites except Trinity Acclimation Site, fish will be brought on station in March and released in mid-May to early June. At the Trinity Acclimation site, fish will be brought on station in October.

- TSS, settleable solids and pH samples will be collected from influent and effluent at the schedule shown in Table 2-1.
- Effluent nutrient sampling will occur once per acclimation season within the last 2 weeks before fish are released.
- In-stream monitoring will occur five times per season (six times per season at Trinity Acclimation Site) as required in the NPDES permit (see Section 2.1.2.2).

### *3.2.2 Reporting Schedule*

Water quality data collected in this monitoring will be reported to Ecology in quarterly and annual discharge monitoring reports. The reports will be filed on Ecology's on-line reporting portal. The quarterly discharge monitoring reports are to be filed by the 15th day of the month following each quarter, with quarters determined on a calendar year basis. The annual discharge monitoring report is to be filed by January 31 of the following year.

An in-stream nutrient monitoring annual compliance report is to be submitted by July 31 of each year of the permit term. This report will provide the statistical analyses and conclusions on in-stream nutrient compliance.

**Table 3-1. Project Staff Organization**

| Staff and Contact Information | Title | Responsibility |
|---|---|---|
| Marcia Porter<br>509-454-7864<br>Mpor461@ecy.wa.gov<br>Ecology Water Quality Program<br>Washington State Department of Ecology | NPDES Permit Lead | Reviews and approves the draft and final QAPP; ensures the QAPP and the monitoring program complies with the terms of the NPDES permit. |
| Cory Kamphaus<br>509-548-9413 x102<br>kamc@yakamafish-nsn.gov<br>Yakama Nation Fisheries Resource Management | Client/Program Manager | Responsible for overseeing Upper Wenatchee Basin Acclimation Program and ultimately accountable for compliance with the terms of the NPDES permit and will serve as administrator of Ecology's reporting portal and signer of all DMR submittals; provides site coordination with field personnel and acclimation site staff to ensure site access for collection of samples; reviews and approves the QAPP; responsible for all project costs. |
| Greg Wolfe<br>509-548-9413 x104<br>wolg@yakamafish-nsn.gov<br>Yakama Nation Fisheries Resource Management | Project Manager | Responsible for overseeing acclimation program operations; will serve as the back-up signer of DMR submittals |
| Pradeep Mugunthan, Ph.D., P.E.<br>773-505-4450<br>pmugunthan@fourpeaksenv.com<br>Four Peaks Environmental Science & Data Solutions | Water Quality Lead and Project Manager | Responsible for overall water quality monitoring program for the project; designs the program and responsible for all planning and reporting documents required under the NPDES permit; prepares the QAPP; coordinates with the rest of the project team to ensure adherence to the QAPP; interprets and provides final reporting of water quality data; may prepare DMRs on the reporting portal |
| Samuel Haffey, P.E.<br>206-428-3077<br>shaffey@fourpeaksenv.com<br>Four Peaks Environmental Science & Data Solutions | QA/QC Coordinator | Provides QA oversight for field and laboratory data; coordinates with the laboratory manager to ensure data quality and takes any corrective actions; bring QA/QC issues to the project manager in a timely manner so that appropriate corrective actions can be taken; reviews laboratory data to ensure appropriate qualifiers are used; prepares a final data validation report. |
| Aaron Young,<br>425-885-1664<br>aarony@amtestlab.com<br>AmTest, Inc. | Laboratory Project Manager | Serves as the point of contact for all laboratory analyses; reviews and approves the QAPP; responsible for ensuring laboratory procedures adhere to the QAPP; oversees/prepares final electronic data report and data deliverable for each sampling event. |

# 4. DATA QUALITY OBJECTIVES

## 4.1 Decision Quality Objectives

Decision quality objectives establish error tolerances at each level of decision making needed to support data objectives (discussed in Section 2.1.2.2). Two typical acceptance criteria used in statistical decision making are the probability of false positives[2] (Type-I errors) and false negatives[3] (Type-II errors). The NPDES permit does not provide specific Type-I and II criteria guidance other than deferring to the Ecology guidance document on preparing QAPPs (Lombard and Kirchmer, 2004). The Ecology QAPP document in turn refers to the U.S. Environmental Protection Agency's Data Quality Objective guidance document (USEPA, 2006), which recommends using a value of 0.01 for the probabilities of both Type-I and Type-II errors. However, the document also indicates that these are the most stringent limits and may not be warranted in all situations and must be balanced against project objectives, effects on human and ecological health, and monitoring costs.

A comprehensive evaluation of the water quality impacts in the upper and lower Wenatchee River basins was undertaken during the environmental review for the Mid-Columbia Coho Acclimation Program (BPA, 2012). The review concluded that the acclimation activity is unlikely to result in a measurable impact on DO and pH. The current monitoring program is intended to provide verification that the acclimation activity will not result in any measurable impacts. If impacts are identified, Ecology could require the implementation of nutrient control practices during acclimation. Given that the acclimation activity is unlikely to have major ecological consequences (BPA, 2012), and will not affect human health in any way (no toxic chemicals or contaminants in the effluents), selection of highly stringent acceptance criteria is not warranted. Therefore, it is proposed that the probabilities of Type-I and Type-II errors be set to 5% and 20%, respectively, based on the examples provided in the Data Quality Objective guidance document (USEPA, 2006).

Another facet of the decision quality objective is the collection of sufficient number of samples to meet the error tolerances for acceptance criteria. The number of samples can be determined once the variance of the ambient nutrient concentrations is known. However, the variance of the nutrient concentrations is unknown at this time.

The NPDES permit requires collecting five (or six in the case of the Trinity Acclimation Site) samples at each upstream and downstream monitoring location. It is proposed that the first 2 years of monitoring data at each location be used to determine an appropriate variance in the TP and TN concentrations, which can then be used in a power analysis for evaluating whether the number of in-stream samples at each location requires any modification during subsequent years of sampling.

[2] The probability of incorrectly concluding that the TN or TP levels downstream of an outfall is greater than the corresponding upstream location when they are not, i.e. the probability of incorrectly rejecting the null hypothesis in Section 2.1.2.2

[3] The probability of incorrectly concluding that the TN or TP levels downstream of an outfall is not greater than the corresponding upstream location when they are, i.e. the probability of incorrectly accepting the null hypothesis in Section 2.1.2.2

## 4.2 Measurement Quality Objectives

The measurement quality objectives (MQO) determine how good the data must be in order to meet the data collection objectives discussed in Section 2.1. An MQO is established through accuracy (precision and bias) and the sensitivity of the analytical methods and field measurement instruments.

### *4.2.1 Laboratory Samples*

Laboratory analysis will be conducted for TSS, settleable solids, TP, and TN. TN will be determined as the sum of total Kjeldahl nitrogen and nitrate plus nitrate nitrogen. The NPDES permit specifies the target reporting limit[4] for these parameters, which are summarized in Table 4-1. The analytical methods are also shown in Table 4-1.

**Table 4-1. Analytical Methods and Quantitation Limits Required by the NPDES Permit for Laboratory Samples**

| Parameter | Analytical Method[1] | Quantitation Level |
|---|---|---|
| Total Phosphorus[2] | SM4500/ SM4500-PE/PF | 10 micrograms per liter |
| Total Kjeldahl Nitrogen[3] (as N) | SM4500-NorgB/C and SM4500NH3-B/C/D/EF/G/H or EPA 351.2 | 300 micrograms per liter |
| Total Ammonia[3] (as N) | SM4500NH3-B and C/D/EF/G/H or EPA 350.1 | 20 micrograms per liter |
| Nitrite + Nitrate (as N) | SM4500-NO3- E/F/H or EPA 353.2 | 100 micrograms per liter |
| Total Suspended Solids | SM2540-D | 5 milligrams per liter |
| Settleable Solids | SM2540-F | 0.1 milliliters per liter |

Notes:

1. Any of the methods listed here are acceptable to comply with the NPDES permit. For TKN, Ammonia and Nitrite + Nitrate, the EPA methods listed in the table above are not in the NPDES permit, but Ecology has approved[5] the use of these methods in place of the methods in the NPDES permit so long as the quantitation levels are met.
2. In addition, a detection limit of 3 micrograms per liter is also required for TP; detection limit is defined as the minimum concentration of an analyte that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero.
3. Quantitation level for ammonia determined as part of the total Kjeldahl nitrogen test is lower.

Accuracy will be determined in the laboratory by analyzing matrix spikes (MS), matrix spike duplicates (MSD), field duplicates, method blanks, and control samples. MS and MSD provide an indication of the extraction efficiency and precision of the analytical method, respectively. Method blanks will be used to assess contamination in the laboratory. To maintain calibration of the analytical equipment, laboratory control samples will be used. The frequency at which duplicate measurements or laboratory control procedures will be performed is discussed in Section 5.2.

Bias will be expressed as the percent recovery of the measured value relative to the true or expected value. Deviation outside the expected range of percent recovery will indicate bias. Precision will be

[4] The target reporting limit is specified through the quantitation level, also known as the minimum level of quantitation. This is the lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is the smallest detectable concentration of the analyte greater than the detection limit where the accuracy (precision and bias) requirements of this QAPP are met.

[5] Email from Marcia Porter. Washington Department of Ecology to Pradeep Mugunthan, Four Peaks Environmental Science and Data Solutions, sent on 11/20/2019

determined through the relative percent difference (RPD) between the replicates (field or laboratory). The percent recovery and RPD limits for this monitoring program are shown in Table 4-2 and were derived based on past experience and examples provided in the Ecology's QAPP guidance document (Lombard and Kirchmer, 2004).

**Table 4-2. Measurement Quality Objectives for Analytical Samples**

| Parameter | Laboratory Control Sample (% recovery limits) | Laboratory Control Sample Duplicates (RPD) | Matrix Spikes (% recovery limits) | Matrix Spike Duplicates (RPD) | Field Duplicates (RPD) |
|---|---|---|---|---|---|
| Total Phosphorus | 80-120 | 20 | 75-125 | 20 | 20 |
| Total Kjeldahl Nitrogen | 80-120 | 20 | 75-125 | 20 | 20 |
| Total Ammonia | 80-120 | 20 | 75-125 | 20 | 20 |
| Nitrite + Nitrate | 80-120 | 20 | 75-125 | 20 | 20 |
| Total Suspended Solids | N/A | N/A | N/A | N/A | 25 |
| Settleable Solids | N/A | N/A | N/A | N/A | 25 |

Notes:
N/A = not applicable
RPD = relative percent difference

Completeness will be assessed as the proportion of valid analytical measurements relative to the total number of measurements. The MQO for all components of this monitoring program is 90%. Data qualified as estimated during validation will be considered as valid for the purpose of evaluating completeness. Only data qualified as rejected during data validation will be excluded when evaluating completeness.

### *4.2.2 Field Measurements*

The NPDES requires measurement of pH in the field using SM4500 -H+B. A field pH probe that is certified for this method will be used for these measurements. The probe will have a minimum resolution of 0.01 standard units (S.U.) and will have an accuracy of ±0.2 S.U. One field duplicate per acclimation location will be collected. The precision and bias targets for field pH measurements are 10% and 5%, respectively. Completeness will be targeted at 90% similar to the analytical samples. pH standard solutions provided by the equipment manufacturer will be used to assess instrument calibration at the start and after the completion of each day of sampling, and will be used to calculate the bias (as discussed in Section 5.2).

# 5. SAMPLING, ANALYSIS, AND QUALITY CONTROL PROCEDURES

## 5.1 Procedure for Collecting Laboratory Samples

Collection of laboratory samples will follow Ecology's stream sampling protocols (Ecology, 2001) and standard operating procedures (Ecology, 2017). Field samples will be collected from a representative section of the stream or acclimation pond influent/effluent where there is sufficient flow. Where necessary an extension pole may be used to dip a sampling jar into the stream to obtain representative grab samples, which will then be transferred into sampling bottles provided by the laboratory. Sampling bottles will be stored in a cooler with ice and delivered to the laboratory within 24 hours of collection. Bottle requirements, preservation, and hold times for field samples are shown in Table 5-1.

**Table 5-1. Container, Preservation, and Hold Time Requirements for Analytical Samples**

| Parameter | Container | Preservation | Holding Time |
|---|---|---|---|
| Total Suspended Solids | 1,000-milliliter wide mouth poly | Cool to less than 4°C | 7 days |
| Settleable Solids | 1,000-milliliter wide mouth poly | Cool to less than 4°C | 48 hours |
| Total Phosphorus | 250-milliliter clear wide-mouth poly (for in-stream) or 1,000-milliliter wide mouth poly (for effluent composites) | Acidify with sulfuric acid to pH less than 2 and cool to less than 4°C | 28 days |
| Total Kjeldahl Nitrogen and Nitrite plus Nitrite | 250-milliliter clear wide-mouth poly (for in-stream) or 1,000-milliliter wide mouth poly (for effluent composites) | Acidify with sulfuric acid to pH less than 2 and cool to less than 4°C | 28 days |

Sample containers will be shipped from the laboratory with labels that provide sample ID, parameter, and preservative information (if applicable). The labels will also include enough space to record sampling date and time and sampler's initials in the field after the sample is collected. The sample ID will be provided to the laboratory ahead of time. Field duplicate sample labels will include "-DUP" at the end of the sample ID. A non-erasable marker and/or indelible printed labels will be used on sample bottles so that markings remain legible during transport and handling.

Field sampling will occur at sites with active ongoing acclimation at the frequency listed in Table 2-1. The following schedule and procedures will be followed:

1. Influent and effluent TSS samples will be collected once each month when acclimation is ongoing, and once during fish release. At the Trinity Acclimation Site an additional overwinter sample will be collected in late October or early November soon after fish are brought on site. TSS samples collected during non-release events will be composites collected over a normal working day (typically 8 AM to 4 PM). Each subsample of the composite will comprise an equal volume (at least 125 milliliters) of water collected from the corresponding location (influent or effluent). In all, at least six subsamples will be collected through the course of a day, with at least one subsample collected when fish are fed.
2. Settleable solids will be collected once per week when fish are on station.

3. Effluent nutrient characterization samples will be collected once per season during the last two weeks of acclimation. These samples will be composites collected over a normal working day following the same procedures as outlined for TSS.
4. In-stream nutrient samples will be collected as grab samples. Five samples will be collected, one before fish are brought on-site, four during acclimation with one of the four taken within 1 week of fish release. At the Trinity Acclimation Site one additional overwinter sample will be collected in late October or early November soon after fish are brought on site.
5. For each sampling event, one field duplicate will be collected over all 10 outfalls. For nutrients, a separate duplicate sample will be collected at one influent or effluent location, and one separate sample will be collected at an upstream or downstream in-stream monitoring location.

A chain-of-custody (COC) form will be used to document sample collection, analytical requirements, and custody information. The COC form will provide contact information for the Yakama Nation, sampling date and time, sampling matrix, requested analytes, and a tracking record for custody of the samples including during shipping. A sample COC form from the analytical laboratory is shown in Appendix A.

Field forms will be used to document field conditions including weather, site access limitations (if any), feeding conditions for acclimation pond and ambient stream conditions on the day of sampling, and any deviations from the QAPP in collection of samples. A sample field form is shown in Appendix A.

## 5.2 Sampling Procedures for Field Parameters

Collection of field pH measurements will follow Ecology's protocols (Ecology, 2018). pH measurements will be made at influent and effluent of each acclimation pond once per month when acclimation is ongoing. pH sampling will be scheduled to coincide with the TSS sampling event.

Field measurements will be conducted by immersing the probe into the measurement cup provided with the pH meter. The water sample for pH will be collected similar to the method described above for collection of analytical samples. Deionized water will be used to rinse the electrode after sampling.

Calibration checks will be conducted at the beginning and end of each sampling day using the pH standard buffer solutions (pH of 4, 7, and 10). If the difference is greater than 0.1 S.U. then the pH meter will be recalibrated as per manufacturer instructions. If a deviation from calibration of 0.15 S.U. or greater is determined at the end of a sampling event then all samples collected during the event will be flagged as "J". A calibration log will be maintained to record all the pre- and post-event calibration data.

## 5.3 Quality Control

Several QC steps will occur during field data collection and laboratory analysis. Field QC will include adherence to this QAPP and will follow manufacture recommendations and Ecology's SOP for operation of pH meters (Ecology, 2018) and field water quality sampling (Ecology, 2001, 2017). Field equipment will be kept in calibration as outlined in Section 5.2.

During the first sampling event, the water quality lead and/or the client manager will accompany the field technician to ensure the correct locations are being sampled and the proper protocols are being followed. Prior to each sampling event, the water quality lead will coordinate with the field technician to review procedures and sampling plan.

### *5.3.1 Field and Laboratory Quality Control*

Field QC for pH and analytical samples will include collection of field duplicates as outlined in Table 5-2. Field contamination is not anticipated because extensive field processing and/or sample handling is not anticipated for routine water quality sampling. Therefore, field blanks will not be collected. Laboratory QC will include analysis of MS, MSD, method blanks, and laboratory control samples and will be collected at the frequencies indicated in Table 5-2. Sufficient volumes of sample will be collected at each location to support analysis of MS and MSD.

**Table 5-2. Quality Control Samples, Types and Frequency**

| Parameter | Field Duplicates[1] | Laboratory Control Samples | Matrix Spikes | Duplicates | Method Blanks |
|---|---|---|---|---|---|
| Total Suspended Solids | 1/event | N/A | N/A | N/A | N/A |
| Settleable Solids | 1/event | N/A | N/A | N/A | N/A |
| Total Phosphorus[2] | 1/event | 1/batch | 1/batch | 1/batch | 1/batch |
| Total Kjeldahl Nitrogen and Nitrite plus Nitrite[2] | 1/event | 1/batch | 1/batch | 1/batch | 1/batch |
| pH[3] | 1/event/site | N/A | N/A | N/A | N/A |

Notes:

1. One field duplicate will be collected for each sampling event. The field duplicates will be rotated between the acclimation sites at random such that a duplicate sample is collected at as many acclimation sites as possible over each acclimation season. A site selected for duplicate during an event will be excluded in subsequent events if other sites with no duplicates are still available; if not all sites are active in a season and a site without a duplicate measurement is not available more than one duplicate may be collected at a site in a given acclimation season.
2. A separate field duplicate sample will be collected per event for effluent characterization samples, and for in-stream samples if both occur on the same date. For effluent characterization samples, a duplicate sample will be obtained from the acclimation pond effluent; for in-stream samples, a duplicate sample may be collected at the upstream or downstream location (as determined randomly on the day of sampling).
3. Duplicate pH measurements will be collected at all acclimation sites at each sampling event

N/A = Not applicable

### *5.3.2 Corrective Actions*

If the pH instrument is out of calibration, the field technician will record the post-calibration check data and report to the water quality lead for further guidance. Laboratory analyses that do not meet QC criteria will follow standard protocols outlined for the corresponding analytical method to determine whether a reanalysis is necessary. The laboratory manager will be responsible for determining reanalysis of laboratory samples. All QC data will be reported to meet the requirements in Section 6.2.

The water quality lead will ultimately be responsible for reviewing field and laboratory reports to assess whether field and laboratory data meet the MQOs and QC criteria (Tables 4-1 and 4-2). In the event of any deviation from the QAPP, the water quality lead will make a determination on whether

additional sampling will be necessary or whether data qualified with appropriate flags are useable to meet the study objectives in Section 2.1. If additional sampling events are necessary, and if acclimation activity is still ongoing, then the water quality lead will consult with the client to plan out an additional event, which will adhere to this QAPP.

# 6. DATA MANAGEMENT, VERIFICATION, AND VALIDATION

## 6.1 Data Recording

### *6.1.1 Field Data*

The field data form in Appendix A will be used to record field conditions and field data. A field sample ID that is consistent with the location and duplicate naming convention discussed in Section 5.1 will be used. Any deviations from QAPP will be noted in the field forms. Field data forms will be stored electronically as spreadsheet tables or in a relational database for the project.

### *6.1.2 Laboratory Data*

Analytical laboratory results will be provided as electronic data deliverables and a narrative data report. The narrative data report will identify any issues pertinent to QC, transportation, storage, and analytical methods and include a discussion on how these issues were resolved. The laboratory report will also include the COC record.

Sample results will include the following information: a sample identifier for tracking the sample in the laboratory along with the corresponding field sample identifier provided to the laboratory; date and time of analysis; weight/volume of sample used for analysis; dilution volumes and/or concentration factor; analytical method; method quantitation limit; detection limit; reporting unit; data qualifiers including definitions of qualifiers; and any remarks specific to the sample. In addition to the regular results, the laboratory report will also include a QA/QC summary providing the same information as above for MS, MSD, and method blanks. In addition, percent recoveries for matrix spikes and laboratory control samples and RPD for analytical duplicates will be reported in the electronic data report.

Sample results will be included as tables with the electronic data report (either in Microsoft Word or Adobe Portable Document Format). In addition, analytical results will also be provided as a Microsoft Excel or a delimited text file (e.g., comma separated values). Results will be delivered to the Yakama Nation project manager and to the water quality lead by electronic mail. A record of all original data will be kept at the laboratory for at least 10 years.

## 6.2 Audits and Reports

Field and laboratory audits may be conducted if significant deviations in quality are discovered. The QA/QC coordinator will determine any deficiency in field or laboratory performance. In the event any QC issues or deviation from the QAPP is discovered in the field or laboratory data, the QA/QC coordinator will inform the water quality lead of the issue, who will in turn determine appropriate corrective actions as discussed in Section 5.3.2. The field technician will implement any corrective actions for field measurements. The laboratory manager will implement any corrective actions for any deviations from the QAPP in laboratory analyses.

The in-stream nutrient monitoring report that will be prepared at the end of each acclimation season (Section 3.2.2) will include a section or an appendix that provides a QA/QC summary noting any specific issues and deviations from this QAPP and the corrective actions, if any, that were taken.

## 6.3 Data Verification

Field data will be examined by the QA/QC coordinator for any errors or omissions and compliance with the QAPP after each sampling event. Laboratory data deliverables and reports will be reviewed by the QA/QC coordinator upon receipt to identify any potential issues with analytical methods used. The verification will evaluate the completeness of the data and conformance of the operating procedures (field parameters) or the analytical methods (for laboratory analytes) required under this QAPP.

## 6.4 Data Validation

The QA/QC coordinator will conduct a detailed validation to assess whether:

- Data quality objectives for precision, bias, and sensitivity were met for field and laboratory samples through:
    - Laboratory QA summaries for blanks, MS, MSD, and/or laboratory duplicates
    - Pre- and post-calibration logs and field duplicate measurements for field parameters
- Hold times were met for laboratory samples
- Reporting limits for laboratory samples met the QAPP requirements
- Appropriate qualifiers were used for the laboratory data and whether any additional qualifiers are necessary; assign qualifiers for field data if necessary

A data validation report will be included as an appendix to the annual in-stream nutrient monitoring report (Section 3.2.2).

## 6.5 Data Usability Assessment

The verified and validated data will be assessed for completeness of field measurements and analytical results based on the targets established in Section 4.2. If sufficient data are not available to meet the MQOs at the end of each sampling event, the water quality lead may consult with Ecology and the Yakama Nation project manager and make a determination on whether additional data collection is necessary and feasible (i.e., if fish are still on station). In the event the data usability assessment determines that verified and validated data do not meet the completeness requirements after the acclimation season is complete, then the water quality lead will document these in the final data report for the season and highlight limitations, if any, of the decisions made with the data.

# 7. REFERENCES

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# APPENDIX A

# AmTest Chain of Custody Record

13600 NE 126th PL, Suite C, Kirkland, WA 98034
Ph (425) 885-1664 Fx (425) 820-0245
www.amtestlab.com

Chain of Custody No._____

| Client Name & Address: | Invoice To: |
|---|---|
| Contact Person: | Invoice Contact: |
| Phone No: | PO Number: |
| Fax No: | Invoice Ph/Fax: |
| E-mail: | Invoice E-mail: |
| Report Delivery: (Choose all that apply)<br>Mail / Fax / Email / Posted Online | Data posted to online account: YES / NO<br>Web Login ID: |
| Special Instructions: | |
| Requested TAT: **(Rush must be pre-approved by lab)**<br>Standard RUSH ( 5 Day / 3 Day / 48 HR / 24 HR ) | Temperature upon Receipt: |

| Project Name: | | Date Sampled | Time Sampled | Matrix | No. of containers | Analysis Requested | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project Number: | | | | | | | | | | | | | | | |
| AmTest ID | Client ID (35 characters max) | | | | | | | | | | | | | | **QA/QC** |
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| Collected/Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|
| Relinquished By: | Date | Time | Received By: | Date | Time |
| Relinquished By: | Date | Time | Received By: | Date | Time |

COMMENTS:

## A-2. Field Form for Water Quality Monitoring

**Project:** Upper Wenatchee Basin Acclimation Program

**Sampled by:** _____

| Site | Sampling Location | Sample ID | Depth (feet) | Date | Time | Parameter | Field Measurement | | Bottle Type (Lab Samples) | Sample Type | Site Conditions/Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Unit | Value | | | |
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**General comments:** _____

**Completed by:** _____