

Form 2C NPDES

SECTION 12.1 ATTACHMENTS

(Column I - associated attachments list)

Section 7: Effluent and Intake Characteristics

Attachment 2 – Sampling Plan

RECEIVED

SEP 19 2019

Dept of Ecology
Central Regional Office

SAMPLING PLAN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

**ROCKY REACH HYDROELECTRIC PROJECT
FERC Project No. 2145**

September 19, 2019



RECEIVED

SEP 19 2019

Dept of Ecology
Central Regional Office

**Public Utility District No. 1 of Chelan County
Wenatchee, Washington**

TERMS AND ABBREVIATIONS

Chelan PUD	Public Utility District No. 1 of Chelan County
CWA	Clean Water Act
Douglas PUD	Public Utility District No. 1 of Douglas County
DQOs	Data Quality Objectives
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
kcfs	thousand cubic feet per second
MQOs	measurement quality objectives
MW	megawatts
NPDES	National Pollutant Discharge Elimination System
Project	Rocky Reach Hydroelectric Project
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan

TABLE OF CONTENTS

1.0	Introduction.....	1
1.1	Project Description.....	1
2.0	Outfall Locations	4
3.0	Sampling and Analysis Plan	6
4.0	Laboratory Identification and Accreditations	8
5.0	Data Quality Objectives.....	8
5.1	Representativeness	9
5.2	Completeness	9
6.0	Documentation and Records	9
7.0	Sample Design	9
7.1	Sample Types	9
7.2	Sample Containers and Equipment	10
7.3	Sample Event Preparation	10
7.4	Sampling Procedures.....	10
8.0	Reporting.....	11
9.0	List of Literature	12

LIST OF FIGURES

Figure 1-1 Location and Vicinity Map of the Rocky Reach Project on the Columbia River	3
Figure 2-1 Rocky Reach Dam Water Discharge Locations	5

LIST OF TABLES

Table 3-1 Rocky Reach Dam Sample Locations	6
Table 3-2 Pollutants/Parameters Sampled for the NPDES Permit at Rocky Reach Dam.....	7

1.0 Introduction

Public Utility District No. 1 of Chelan County, Washington (Chelan PUD) owns and operates the Rocky Reach Hydroelectric Project (Project). The Project is licensed as Project No. 2145 by the Federal Energy Regulatory Commission (FERC, 2009). A Clean Water Act (CWA) Section 401 water quality certification (WQC) for the operation of the Project was issued by the Washington State Department of Ecology (Ecology) on March 17, 2006 (Ecology, 2006).

Chelan PUD is applying for a National Pollutant Discharge Elimination System (NPDES) permit for Rocky Reach Dam to address potential discharges of pollutants at the dam, including potential discharges from powerhouse drainage sumps, unwatering sumps, oil-water separators, turbines, wicket gate bearings, and discharges of cooling water systems. This NPDES sampling plan (sampling plan) will guide the collection of water samples as required by the NPDES permit application, and will provide details on the following components of the sampling plan:

- Outfall Locations
- Sampling Locations
- Pollutant(s) to be sampled
- Lab identification and accreditations
- Quality Objectives
- Documentation and Records
- Sampling Methods

Once a NPDES permit is issued, a more formal Quality Assurance Protection Plan (QAPP) may be developed dependent on monitoring requirements contained within the permit.

1.1 Project Description

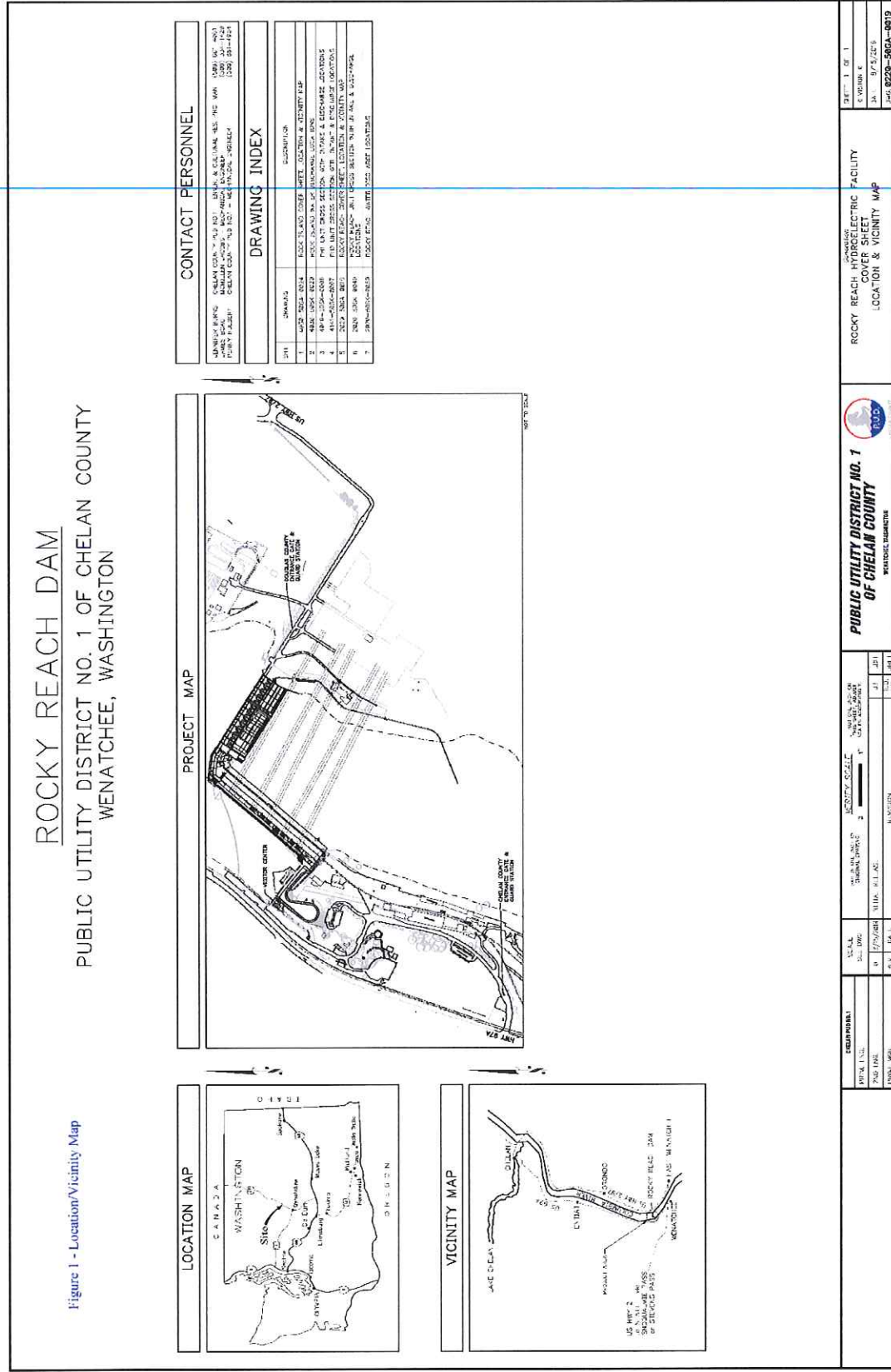
The Rocky Reach Hydroelectric Project (Project), owned and operated by the Public Utility District No. 1 of Chelan County (Chelan PUD), is located on the Columbia River in Chelan County, Washington, approximately seven miles upstream of the City of Wenatchee, Washington (See Figure 1-1 Location and Vicinity Map of the Rocky Reach Project). The Project utilizes the waters of the Columbia River, whose drainage basin extends over substantial portions of northern Washington, Idaho, Montana, and into Canada. The Project reservoir (Lake Entiat) extends 43 miles to Public Utility District No. 1 of Douglas County's (Douglas PUD's) Wells Dam. The Project consists of a reservoir with a surface area of approximately 8,235 acres and a concrete-gravity dam approximately 130 feet high and about 2,847 feet long (including the powerhouse) that spans the river. The dam consists of:

- a forebay wall, which is integral with the dam and is formed by 10 blocks of various heights and widths between the powerhouse and west abutment;

- a powerhouse approximately 1,088 feet long, 206 feet wide and 218 feet high that includes 11 generating units and a service bay;
- a spillway that is integral with the dam and consists of twelve 50-foot-wide bays separated by 10-foot-wide piers, with flow through each bay controlled by a 58-foot-high radial gate;
- two non-overflow east abutment blocks that are integral with the dam, each 125 feet high by 60 feet wide;
- an east bank seepage cutoff, which is a buried structure that extends roughly 2,000 feet from the east end of the concrete portions of the dam and has a maximum depth of about 200 feet and;
- Dryden weir and Tumwater dams' fish ladders and trapping facilities. (These facilities are located some distance away from the Project on the Wenatchee River).

The Project includes passage facilities for upstream and downstream migrating fish. The upstream migrant fishway has three main entrances. One entrance is located between spillway bays 8 and 9, a second entrance is at the center of the dam adjacent to powerhouse unit 11, and a third entrance is at the powerhouse service bay between turbine unit 1 and the west shoreline. Fish pass from the entrances into fish collection and transportation channels, which converge to guide fish to a pool and weir fish ladder. There is a counting station at the fishway exit located near the west shoreline. Attraction water for the powerhouse fishway entrances is provided by three hydraulic turbine-driven pumps with a total capacity of 3,500 cubic feet per second (cfs). A gravity intake provides additional attraction water for the spillway entrance. Downstream migrating juvenile fish utilize the JBS which includes a surface collection system, turbine intake screens and collection system for turbines 1 and 2, a bypass conduit to the tailrace, and a fish sampling facility.

Figure 1-1. Location of the Rocky Reach Project on the Columbia River



2.0 Outfall Locations

Rocky Reach Dam has 21 outfalls (Figure 2-1). Three of these outfall locations have the potential to collect pollutants such as oil and grease which could be inadvertently discharged to the Columbia River. These distinct outfalls (RR01-RR21) are described below:

RR01-RR07 – Discharges water from units C1-C7 generator and thrust cooling water thru 6” lines into the respective unit draft tubes. Note that these discharges are very similar in configuration to RR08-RR11 but have a slightly different equipment and/or configurations for cooling. Thrust cooling water and generator cooling water combine prior to discharging into draft tube.

RR08-RR11 – Discharges water from units C8-C11 generator and thrust cooling water thru 6” lines into the respective unit draft tubes. Note these discharges are very similar in configuration to RR01-RR07 but have a slightly different equipment and/or configurations for cooling. Thrust cooling water and generator cooling water combine prior to discharging into draft tube.

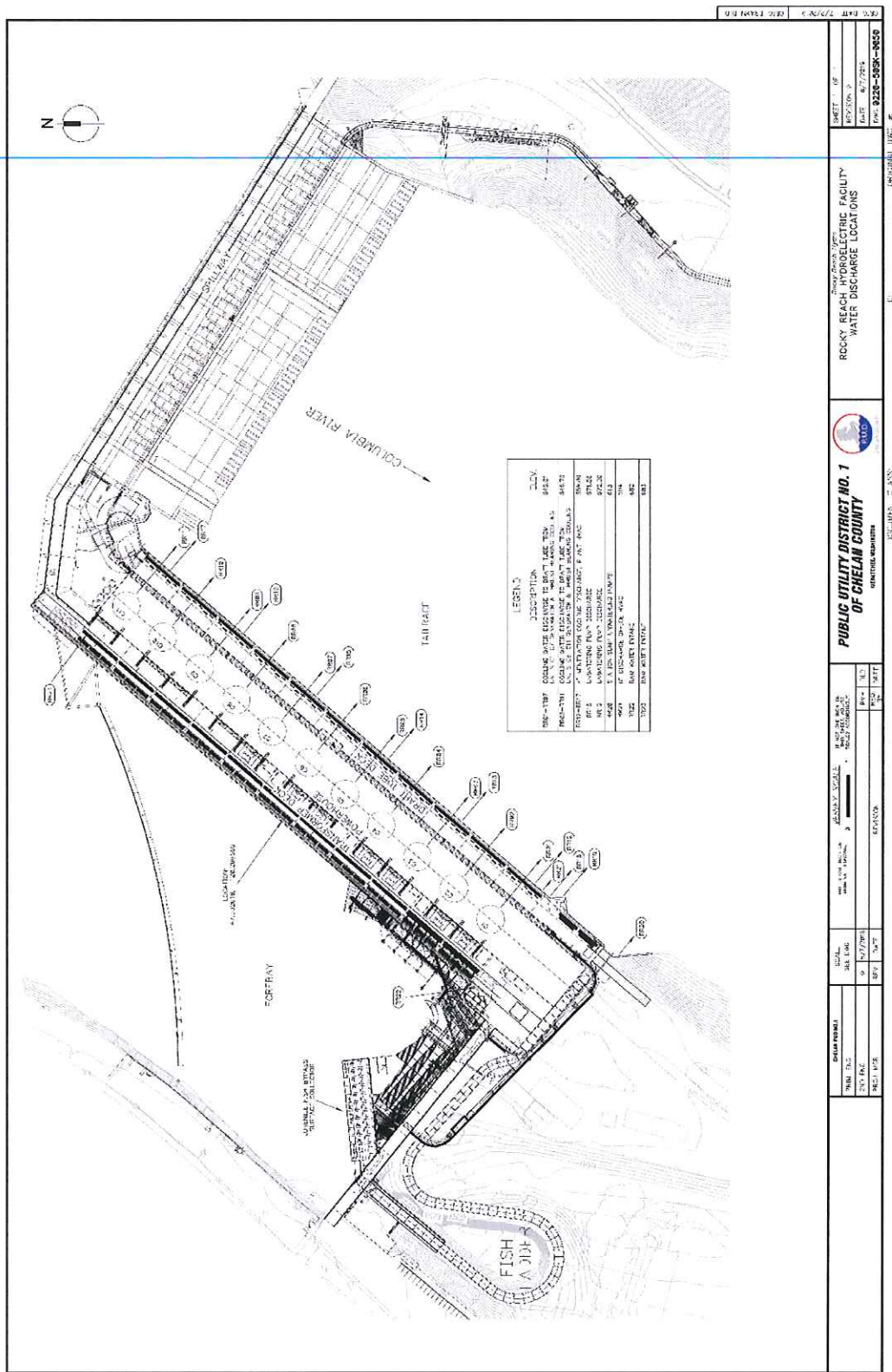
RR12-RR17 – Discharges ventilation cooling water from the Plant HVAC (S1-4, S15, and S16) thru a 4” line to the tailrace. This discharge is only used in warmer months when the system is in cooling mode. In cooler months, water discharges back to generator return header. Discharges located at C1,3,5,7,9 & 11.

RR18 & RR19 – Discharges water from the large unwatering sump via unwatering pumps into the tailrace of the powerhouse thru 24 inch lines south of Unit C-1 at elevations 571.5 and 572.5 respectively. Note that the unwatering pumps are generally only used when a unit or the fishway is unwatered for maintenance or in case the station sump pumps cannot handle flows to the station sump.

RR20 – Discharges water from the station sump thru two station sump pumps, whose discharges combine into one 10” discharge to tailrace just south of the powerhouse at elevation 613’.

RR21 – Discharges ventilation cooling water from the Offices HVAC (S5-S6) thru a 4” line at elevation 594.25’.

Figure 2-1. Rocky Reach Dam Water Discharge Locations



3.0 Sampling and Analysis Plan

Included in Table 3-1 is a list of sample locations for each type of outfall. One sample location was chosen to represent outfalls with similar features. For the non-contact cooling water discharge outfalls, only water temperature and pH will be sampled. Two outfalls were chosen to represent the unwatering and station sump outfalls. Table 3-2 contains the list of pollutants/parameters that will be sampled for the NPDES permit application from the sump outfalls. These pollutants/parameters will be sampled in accordance with the U.S. Environmental Protection Agency (EPA) form 2C and in consultation with Ecology.

Table 3-1 - Rocky Reach Dam Sample Location

Discharge Name	Primary Feature	Avg. GPD	Max. GPD	Sample Port Physical location
RR01	Unit C-1 (Thrust and Generator Cooling)	1,419,002	3,024,480	Unit C-5 Southside Generator/thrust cooler discharge, Elev. 630'
RR02	Unit C-2 (Thrust and Generator Cooling)	1,419,002	3,024,480	
RR03	Unit C-3 (Thrust and Generator Cooling)	1,419,002	3,024,480	
RR04	Unit C-4 (Thrust and Generator Cooling)	1,419,002	3,024,480	
RR05	Unit C-5 (Thrust and Generator Cooling)	1,419,002	3,024,480	
RR06	Unit C-6 (Thrust and Generator Cooling)	1,419,002	3,024,480	
RR07	Unit C-7 (Thrust and Generator Cooling)	1,419,002	3,024,480	
RR08	Unit C-8 (Thrust and Generator Cooling)	1,064,542	2,536,286	Unit C-8 Southside Generator/thrust cooler discharge, Elev. 630' (this discharge was not sampled because unit was down for maintenance)
RR09	Unit C-9 (Thrust and Generator Cooling)	1,064,542	2,536,286	
RR10	Unit C-10 (Thrust and Generator Cooling)	1,064,542	2,536,286	
RR11	Unit C-11 (Thrust and Generator Cooling)	1,064,542	2,536,286	
RR12	Plant HVAC S1	288,000	470,880	West side of C-3, Generator Floor, Elev. 648' (this discharge was not sampled because it is seasonal and the HVAC was not in use)
RR13	Plant HVAC S2	288,000	470,880	
RR14	Plant HVAC S3	288,000	470,880	
RR15	Plant HVAC S4	288,000	470,880	
RR16	Plant HVAC S15	288,000	470,880	
RR17	Plant HVAC S16	288,000	470,880	
RR18	Unwatering Sump Pump 1	96,000	96,000	Unwatering Pump Room, Discharge of Pump 1, Elev. 611' - normally only used when unwatering units or fishway
RR19	Unwatering Sump Pump 2	96,000	96,000	
RR20	Station Sump Unwatering Pump Discharge	876,228	1,457,143	Dewatering tunnel, prior to flow into station sump, Elev. 564'
RR21	Office HVAC	136,945	164,160	Downstream wall, service bay, Elev. 630'

Unit flows were averaged between units of same type (C1-C7, C8-C11).

Note: Station Sump Pump Calculations from calendar year 2018

Office HVAC - averaged over 1 year

Table 3-2. Pollutants/parameters sampled for the NPDES permit at Rocky Reach Dam

Part	Pollutant	Method
A	BOD	SM5210-B
	COD	SM522-D
	TOC	SM5310-B/C/D
	TSS	SM2540-D
	Ammonia (N)	SM4500-NH3-B and C/D/E/G/H
	Flow	Calibrated Device
	Temperature (Summer) Max7DayAvg	Analog or thermistor
	Temperature (Winter) Max7DayAvg	Analog or thermistor
	pH	SM4500-H+B
B	Antimony	200.8
	Arsenic	200.8
	Beryllium	200.8
	Cadmium	200.8
	Chromium	200.8
	Copper	200.8
	Lead	200.8
	Mercury	1631E
	Nickel	200.8
	Selenium	200.8
	Silver	200.8
	Thallium	200.8
	Zinc	200.8
B	PCB-1242	608.3

	PCB-1254	608.3
	PCB-1221	608.3
	PCB-1232	608.3
	PCB-1248	608.3
	PCB-1260	608.3
	PCB-1016	608.3
	Toxa-phene	608.3
C	Chlorine	SM4500 CI G
C	Oil and Grease (HEM)	1664 A or B
C	Surfactants	5440 C
E	2,3,7,8-Tetrachlorodibenzo-P Dioxin	1613B

Both temperature and pH will be collected and noted in the field via grab sample and reported with the other information. All other agents listed above will be tested for by the Ecology accredited laboratory noted below in Section 4.0.

4.0 Laboratory Identification and Accreditations

An Ecology accredited laboratory, Cascade Analytical, Inc. (accreditation #C564) has been selected to perform the sample analyses of the aforementioned parameters. Cascade Analytical is able to satisfy the analytical protocol, detection level, and quantitation level of this sampling plan for the parameters noted above in Table 3-2.

5.0 Data Quality Objectives

Data Quality Objectives (DQOs) for this sampling plan are necessary to ensure that the data reported meets the goals of the sampling plan, which is to collect a sufficient sample from each outfall location to make up a representative sample for analysis of selected pollutants from a Ecology accredited lab to support the submittal of a NPDES permit application.

Ecology's quality assurance guidelines (2004, revised 2016) indicate that when data will be used to determine compliance with a standard, quality objectives need to be specified at two levels: decision DQOs and measurement quality objectives (MQOs). DQOs are needed to determine the number of samples needed to meet the objectives/goals. For this sampling plan, data quality objectives will be measured by the data representativeness and completeness. These are discussed in more details in the sections below.

5.1 Representativeness

Representativeness is the degree to which the sample data accurately represent the entirety of the process water supply. For this sample plan, representativeness is a qualitative parameter that is primarily concerned with proper design of the sampling plan as a whole, and will be met by ensuring that the monitoring locations are properly located with a sufficient number of sample data collected. For the sample plan, samples will be taken throughout a pump cycle to form a sample for the locations noted in Section 2.0 that will provide sufficient information on the current water quality conditions at the outfall locations, which will assist Ecology in processing the NPDES permit application.

5.2 Completeness

Completeness is the comparison between the amount of useable data collected and the amount of data identified in the monitoring plan. Completeness is measured as the percentage of total samples collected and analyzed as a whole and for individual parameters and sites as compared to the goals established in the sampling plan. For this sampling plan, completeness will constitute getting composite water quality samples from each of the outfall locations, as described in Section 2.0, that will provide sufficient information on the current water quality conditions at the outfall locations, which will assist Ecology in processing the NPDES permit application.

6.0 Documentation and Records

All sample data taken in the field will be recorded on-site on a field log books at the time of sampling event. Recordings from the field instruments (i.e. temperature and pH) will be transferred to a spreadsheet for the specific monitoring location.

Laboratory results associated with each sample location will be maintained electronically. The laboratory will provide results electronically. All data will be saved in the appropriate format and with the appropriate file name that links it to the specific sample location.

7.0 Sample Design

The design for the sampling plan is discussed in more details in the sections below.

7.1 Sample Types

Samples will be obtained for each of the unwatering and station sump locations, taken throughout a pump cycle and sent to the lab noted in Section 4.0 for analyses of the parameters noted in Table 3-2 with the exception of the cooling water discharges, for which grab sample temperature and pH data will be obtained from pre-calibrated temperature probes (see Section 7.2).

7.2 Sample Containers and Equipment

All sampling equipment and sample containers will be cleaned according to the equipment specifications and/or the laboratory. Bottles supplied by the laboratory for sample analysis will be pre-cleaned and setup according to their procedures. These will only be used for samples and will not be pre-rinsed. Sample equipment will be pre-cleaned and cleaned between sample locations.

Samples collected in the field for laboratory analysis will be collected as described in Section 7.1, labeled as described below, and will be packed into insulated ice chests to keep the samples cool until delivered to the laboratory. A chain of custody form will be completed for each packed ice chest, will be placed in a plastic zip-locked bag, and placed in the ice chest. All samples will be under control by a Chelan PUD employee or contractor until they are delivered in a timely manner to the laboratory.

The equipment used for the temperature and pH grab-samples will be a VWR Symphony multi-probe.

7.3 Sample Event Preparation

Prior to a sampling event the following preparation will be completed by a Chelan PUD employee or contractor:

- All sample containers, ice chest, freezer packs and chain of custody forms are on site.
- Communications with the laboratory to ensure samples will be analyzed within the applicable hold time.
- Internal communications/planning made with Chelan PUD staff to ensure entry into confined space areas where samples will be taken from within the Dam.
- Temperature collection device fully cleaned and calibrated.

7.4 Sampling Procedures

Each sample collected at a specific location will consist of a grab sample, sampled throughout a pump cycle. The appropriate amount of water collected from each sample location will be gathered and used to make up the sample to be analyzed by the laboratory. Samples will be tested for all parameters noted above in Section 4.0. The samples will be provided to the lab within the required holding time. Temperature and pH will be noted in the field from the same grab sample. Sample bottles will consist of inert materials so as to not affect the sample quality.

7.4.1 Unique Sample Identification Numbers

Each sample will receive a unique sample number. The sample number will include a location identifier code and the date and time. The date and time of the sample collection will be recorded in the chain of custody form as well.

7.4.2 Sample Labels

Each sample transported to the laboratory will have a label with generally the following information:

- 1). Location
- 2). Date
- 3). Time
- 4). Analyses required
- 5). Preservation (if any)
- 6). Initials of sampler

7.4.3 Chain of Custody Forms

Chain of custody forms provided by the laboratory will be used for samples submitted for analysis. The chain of custody form will generally contain the following information for each sample:

- 1). Type of sample (e.g. water)
- 2). Sample location
- 3). Date and time sample collected (using 24-hour clock)
- 4). Analyses required by analyte name and method number
- 5). Printed name of person collecting sample
- 6). Printed name and signature of person with responsibility for custody of samples until receipt by the laboratory
- 7). Printed name and signature of laboratory person with responsibility for ensuring custody of samples.

8.0 Reporting

All data recorded and collected internally, or supplied electronically from the accredited lab will be supplied with the NPDES permit application.

9.0 List of Literature

Federal Energy Regulatory Commission. 2009. Order Issuing New License for Public Utility District No. 1 of Chelan County, 126 FERC ¶ 61,138, Washington, D.C.

Washington State Department of Ecology. 2006. Water Quality Certification for the Rocky Reach Project. Order No. 3155 dated March 17, 2006.

Washington State Department of Ecology (Ecology). 2004, revised December 2016. Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies. Publication number 01-03-030. Olympia, WA.