Commissioners:
RONALD E. SKAGEN
MOLLY SIMPSON
AARON J. VIEBROCK

General Manager:
GARY R. IVORY

Public Utility District No. 1 of Douglas County

1151 Valley Mall Parkway • East Wenatchee, Washington 98802-4497 • 509/884-7191 • FAX 509/884-0553 • www.douglaspud.org

Via Electronic Filing

Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 1st Street N.E.
Washington, D.C. 20426

February 24, 2021

Subject: 2021 Gas Abatement Plan and Bypass Operating Plan – Wells Hydroelectric Project No. 2149 – FERC License Article 401(a)

Dear Secretary Bose:

Pursuant to Article 401(a) of the license for the Wells Hydroelectric Project (Wells Project), the Public Utility District No. 1 of Douglas County (Douglas PUD) hereby submits for approval the 2021 Total Dissolved Gas Abatement Plan (GAP) and the 2021 Bypass Operating Plan (BOP) for the Wells Project.

Article 401(a) requires Douglas PUD to file a GAP approved by the Washington State Department of Ecology (Ecology) by February 28th during each year of the license. The final GAP is attached as Appendix A to this letter and was reviewed and approved by all of the parties to the Aquatic Settlement Agreement (ASA) and Habitat Conservation Plan (HCP) including Ecology, the National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS), Washington State Department of Fish and Wildlife (WDFW), the Confederated Tribes of the Colville Reservation (CCT) and the Confederated Tribes and the Bands of the Yakama Nation (YN).

The enclosed 2021 GAP is consistent with (1) the Water Quality Management Plan that is contained within the ASA and Condition 6.7(2)(a) of Ecology's Clean Water Act section 401 Water Quality Certification (401 Certification) and (2) the NMFS Endangered Species Act Incidental Take Statement (ITS) Reasonable and Prudent Measure No. 2 for the Wells Project.

Article 401(a) also requires Douglas PUD to file a BOP that has been approved by the NMFS within year one of the new license. The Wells HCP requires Douglas PUD to annually submit the BOP to the HCP Coordinating Committee (HCP CC) for review and approval. Section 6.7(2)(d) of the 401 Certification requires Douglas PUD to closely coordinate the content and

review processes for the GAP and BOP. The final 2021 BOP is attached within Appendix A to this letter. The 2021 GAP and BOP were reviewed by all of the agencies and tribes participating in the HCP process, including the NMFS. The 2021 GAP and BOP were distributed to the HCP CC on January 8, 2021 and was approved by the HCP CC on February 23, 2021. The HCP CC consultation and approval process is attached in Appendix B.

A draft copy of the 2021 GAP and BOP was provided to the Aquatic Settlement Work Group (Aquatic SWG) on January 8, 2021 to ensure close coordination between the review of the BOP and the GAP. No additional comments on the 2021 GAP and BOP were received by the end of the comment deadline. Ecology, in accordance with the requirements of the 401 Certification, section 6.7 [2][d]), and the remaining Aquatic SWG members approved the 2021 GAP and BOP via conference call on February 10, 2021. The Aquatic SWG's consultation and approval process specific to the 2021 GAP and BOP is attached as Appendix C.

Douglas PUD respectfully requests that the FERC approve the enclosed GAP and BOP for the Wells Project prior to the start of the fish spill season that begins on April 1, 2021. If you have any questions or require further information regarding the enclosed plans or the consultation record supporting the approval and coordination of these plans, please feel free to contact Tom Kahler at (509) 881-2322, tomk@dcpud.org.

Sincerely,

Andrew Gingerich
Natural Resources Supervisor

Enclosure:

1) Appendix A – 2021 Total Dissolved Gas Abatement Plan and Bypass Operating Plan – Wells Project

2) Appendix B – HCP Coordinating Committee Pre-filing Consultation Record for the 2021 Gas Abatement Plan and Bypass Operating Plan

3) Appendix C – Aquatic SWG Pre-filing Consultation Record for the 2021 Gas Abatement Plan and Bypass Operating Plan

Cc: Wells HCP Coordinating Committee
Wells Aquatic Settlement Work Group
Mr. Chas Kyger – Douglas PUD
Mr. Tom Kahler – Douglas PUD
Mr. Shane Bickford – Douglas PUD

APPENDIX A

2021 TOTAL DISSOLVED GAS ABATEMENT PLAN AND BYPASS OPERATING PLAN FOR THE WELLS HYDROELECTRIC PROJECT

Document Accession #: 20210224-5173 Filed Date: 02/24/2021

2021 TOTAL DISSOLVED GAS ABATEMENT PLAN

WELLS HYDROELECTRIC PROJECT

FERC PROJECT NO. 2149

Prepared by:

Public Utility District No. 1 of Douglas County
East Wenatchee, Washington

Prepared for:

Washington Department of Ecology
Water Quality Program
Central Regional Office
1250 West Alder Street
Union Gap, WA 98903-0009

And

Aquatic Settlement Work Group

February 2021

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EXECUTIVE SUMMARY

Washington State Water Quality Standards (WQS) are defined in Washington Administrative Code (WAC) Chapter 173-201A, and are administered by the Washington Department of Ecology (Ecology). Compliance with the total dissolved gas (TDG) standard requires that TDG not exceed 110% at any point of measurement in any state water body. A dam operator is not held to the TDG standards when the river flow exceeds the seven-day, 10-year-frequency flood (7Q-10). In addition to allowances for natural flood flows, Ecology has approved a TDG exemption for Columbia and Snake River dams on a per-application basis (WAC 173-201A-200(1)(f)(ii)). The exemption allows for the TDG criteria to be adjusted to allow spill for juvenile fish passage at hydroelectric dams when consistent with an Ecology-approved Gas Abatement Plan (GAP).

Prior to 2020, a project operator providing anadromous fish passage might apply for modifications to the 110% TDG standard on the Columbia and Snake rivers that would allow for the employment of three separate standards during the fish migration period: 1) TDG shall not exceed 125% in the tailrace of a dam, as measured in any one-hour period; 2) TDG shall not exceed 120% in the tailrace of a dam; and 3) shall not exceed 115% in the forebay of the next dam downstream. Compliance with the latter two standards is determined using an average of the 12 highest consecutive hourly readings in any 24-hour period. The increased levels of spill, resulting in elevated TDG levels, are intended to allow increased fish passage with less harm to anadromous fish populations than what would be caused by turbine fish passage. Ecology's scientific basis for the TDG exemption is a risk analysis conducted by the National Marine Fisheries Service (NMFS; NMFS 2000).

Beginning in 2020, Ecology's TDG rules allow for the employment of a simplified TDG criteria for the spring migration period (generally defined as April through June). Dam operators providing anadromous fish passage on the mainstem Columbia and Snake Rivers may apply for new spring TDG criterion, whereby TDG may not exceed 126% in the tailrace of dams as measured by the average of the two highest consecutive hourly readings in a day, nor have any TDG values above 125% as measured as the 12 highest hourly values in a day. Further, the traditional 120% tailrace and 115% forebay standards do not apply during this spring migration period. Applicants intending to use this modified rule must develop an Ecology approved GAP and a biological monitoring plan that examines both salmonids and resident fish species (beginning in 2021).

The goal of the 2021 Wells Total Dissolved GAP is to implement a long-term strategy to achieve compliance with the Washington State WQS criteria for TDG in the Columbia River at the Wells Hydroelectric Project (Wells Project) while continuing to provide safe passage for downstream migrating juvenile salmonids. Public Utility District No. 1 of Douglas County, which owns and operates the Wells Project, is submitting this GAP to Ecology as required for receipt of a TDG exemption at Wells Dam.

1.0 INTRODUCTION AND BACKGROUND

The 2021 Wells Hydroelectric Project (Wells Project or Project) Gas Abatement Plan (GAP) provides details on operational and structural measures to be implemented by Public Utility District No. 1 of Douglas County, Washington (Douglas PUD) at Wells Dam under the Federal Energy Regulatory Commission (FERC) license for Project No. 2149. These measures are intended to result in compliance with the modified Washington State water quality standards (WQS) for total dissolved gas (TDG) allowed under the TDG exemption, provided incoming water to the Project is in compliance and flows are below the seven-day, 10-year-frequency flood levels (7Q-10: 246 kcfs).

The goal of the 2021 GAP is to implement a long-term strategy to achieve compliance with the Washington State WQS for TDG in the Columbia River at the Wells Project, while continuing to provide safe passage for downstream migrating juvenile salmonids via spill. Douglas PUD is the owner and operator of the Wells Project and is submitting this GAP to the Washington Department of Ecology (Ecology) for approval as required for receipt of a TDG exemption for fish passage.

Since 2003, Ecology has approved GAPs and issued TDG exemptions for the Wells Project on an annual basis. The 2021 GAP contains the following information: Section 1.0 summarizes the background regulatory and project-specific TDG information at the Wells Project. Section 2.0 contains proposed Wells Project operations and activities related to TDG management. Section 3.0 provides a summary of compliance and physical monitoring plans, quality assurance and quality control procedures, and reporting. Section 4.0 provides conclusions of the GAP.

1.1 Project Description

The Wells Project is located at river mile (RM) 515.6 on the Columbia River in the State of Washington (Figure 1). Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (USACE); and 42 miles upstream from the Rocky Reach Hydroelectric Project owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from Wells Dam.

The Wells Project is the chief generating resource for Douglas PUD. It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The spillway consists of eleven spill gates that are capable of spilling a total of 1,180 thousand cubic feet per second (kcfs). The crest of the spillway is approximately five and a half feet above normal tailwater elevation and two feet below tailwater elevation when plant discharge is 219 kcfs (the hydraulic generating capacity of the Wells Project, see Section 1.3.2.3). The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides of the hydrocombine, which is 1,130 feet long, 168 feet wide, with a dam top elevation of 795 feet above mean sea level (msl).

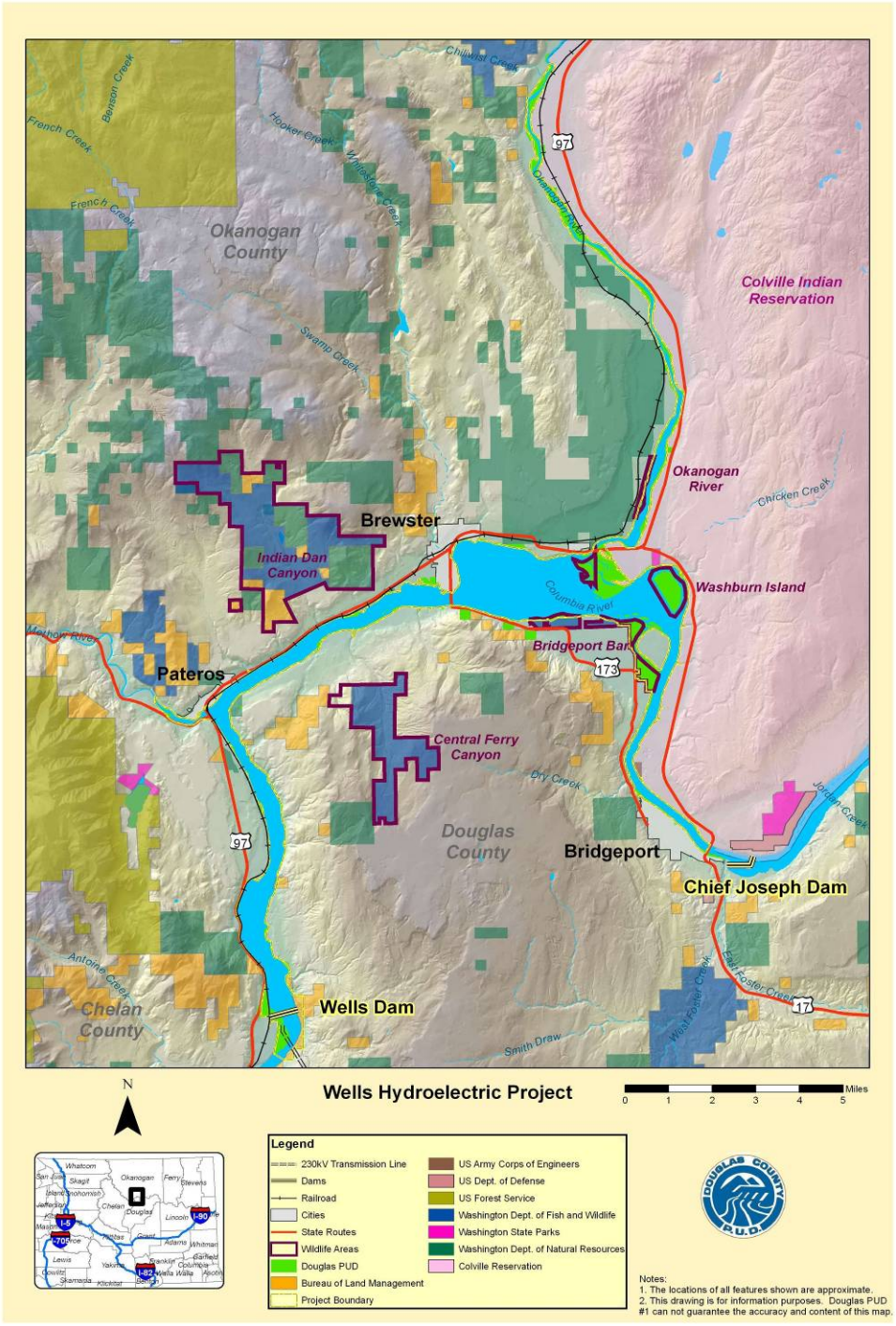

Figure 1. Map of the Wells Hydroelectric Project in Central Washington.

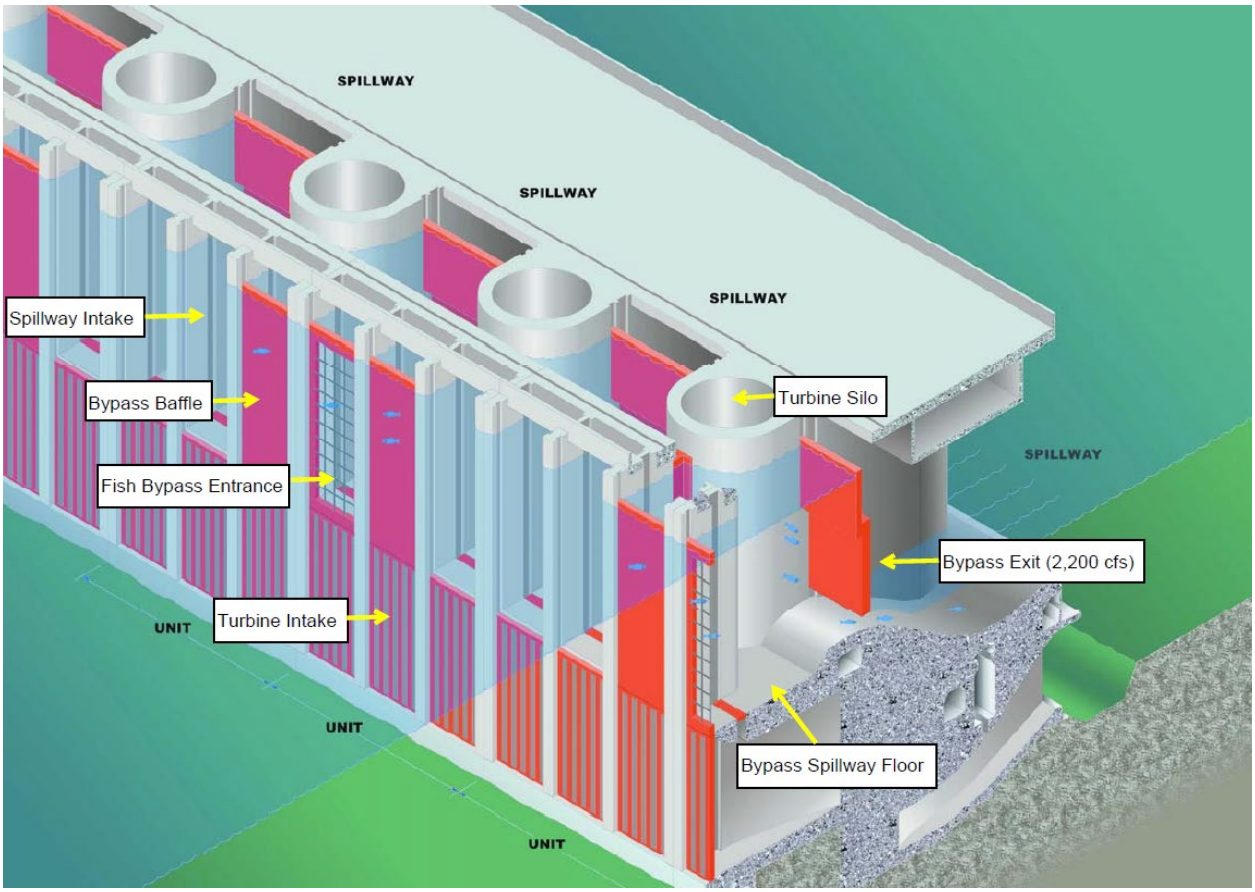

Figure 2. Artistic depiction of Wells Dam illustrating its hydrocombine design and Juvenile Bypass System.

The Juvenile Bypass System (JBS) was developed by Douglas PUD and uses a barrier system to modify the intake velocities on all even-numbered spillways (2, 4, 6, 8 and 10). Figure 2 illustrates the hydrocombine and JBS, as described below (italicized terms are identified in the figure). Ten *Turbine Silos* are straddled by 11 spillways, five of which are operated to function as the JBS. During juvenile salmon migration, *Spillway Intakes* for each even-numbered spillway are modified by the insertion of *Bypass Baffles* on either side of *Fish Bypass Entrances* to constrict surface flows and direct fish towards the *Bypass Exit* (which is the spillway gate). *Fish Bypass Entrances* provide 64, 4x4-foot openings in the first 75 feet of the water column and extend to the *Bypass Spillway Floor*. *Turbine Intakes* are located approximately 75 feet below the water surface, and extend to the forebay floor at a depth of approximately 130 feet.

The Wells Project is considered a "run-of-the-river" project due to its relatively limited usable storage capacity. As a run-of-river project, the daily average volume of water discharged from Wells Dam equals the daily average volume of water received into the project from the upstream federal storage dams plus small inputs of water from the Methow and Okanogan rivers. During most of the year, more than 95% of the water entering the Wells Project originates from Chief Joseph Dam with only 5% of the flow being sourced from these two tributaries. The only exception occurs in the spring (May and June) when tributary flows can contribute upwards of 20% of the flow passing the Wells Project.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre-feet at the normal maximum water surface elevation of 781 feet.

1.2 Regulatory Framework

Article 401(a) of the FERC license for the Wells Project requires that the GAP be developed in consultation with the United States Fish and Wildlife Service (USFWS), Washington State Department of Fish and Wildlife (WDFW), Ecology, Confederated Tribes of the Colville Reservation (Colville Confederated Tribes), Confederated Tribes and Bands of the Yakama Nation, United States Bureau of Land Management, and United States Bureau of Indian Affairs. The GAP must also be developed in consultation with the National Marine Fisheries Service (NMFS) where the Wells Bypass Operating Plan (BOP) is integrated with the GAP in order to minimize TDG production during periods of JBS operation. The Ecology-approved GAP must then be submitted to the FERC for approval by February 28 of each year as required by the Wells Project license (FERC license article 401[a]). The GAP is also due to Ecology by February 28 each year (401 Certification 6.7[2][a][i]).

Under the WQS [WAC Chapter 173-201A, Section 200(1)(f)], TDG shall not exceed 110% at any point of measurement in any state water body. However, the standards exempt dam operators from this TDG standard when the river flow exceeds the 7Q-10 flow. The 7Q-10 flow is the highest calculated flow of a running seven consecutive day average, using the daily average flows that may occur in a 10-year period. The 7Q-10 total river flow for the Wells Project was computed using the hydrologic record from 1974 through 1998, coupled with a statistical analysis to develop the number from 1930 through 1998. These methods follow the United States Geological Survey (USGS) Bulletin 17B, "Guidelines for Determining Flood Flow Frequency" and determined that the 7Q-10 flow at Wells Dam is 246,000 cfs (WDOE et. al. 2004).

In addition to allowances for natural flood flows, historically Ecology allowed adjustment to the TDG criteria to aid fish passage over hydroelectric dams when consistent with an Ecology-approved GAP (as defined in subsection ii of Section 200(1)(f)). Such a plan must have been accompanied by fisheries management and physical and biological monitoring plans. Ecology approved, on a per application basis, an exemption to the TDG standard (110%) that allowed Columbia and Snake River dam operators to spill water at projects that often increase TDG beyond 110%, but allow for safe juvenile fish passage through non-turbine passage. The Ecology-approved TDG exemption comprises three separate criteria:

1. TDG shall not exceed 125% in any one-hour period in the tailrace of a dam;
2. TDG shall not exceed 120% in the tailrace of a dam; and
3. Shall not exceed 115% in the forebay of the next dam downstream.

Compliance criteria 2 and 3 above were measured as an average of the 12 highest consecutive hourly readings (12C-High). Ecology's scientific basis for the TDG exemption at Columbia and Snake River hydroelectric projects was based on a risk analysis conducted by the NMFS (NMFS 2000). However, in 2019 Ecology modified this rule to be the average 12 highest hourly readings in a calendar day. This new calculation was used in 2020 compliance monitoring and reporting and is being proposed for the 2021 GAP per Ecology's rule making.

On July 31, 2019, Ecology proposed amendments to Chapter 173-201A Washington Administrative Code (WAC) WQS for Surface Waters of the State of Washington (AO # 19-02). The proposed amendments considered during rulemaking included amending the numeric criteria for TDG in the Snake and Columbia rivers at WAC 173-201A-200(1)(f)(ii). The goal of this amendment was to improve fish passage for salmon and steelhead migrating downstream in the Snake and Columbia rivers (Ecology, 2019). On December 30, 2019, Ecology adopted the new WQS (WSR 20-02-091) with minor revisions to the draft. The new rule allows dam operators on the Columbia River that provide anadromous fish passage as of 2020 to implement one of two WQS during the spring bypass period. Option A is largely a preservation of the existing WQS (prior to 2020), with some subtle changes to calculations (See footnotes below). Option B is a reduction from three standards to two tailrace standards, with additional biological monitoring requirements. The final rule with options A and B described is provided below:

The TDG criteria may be adjusted to aid fish passage over hydroelectric dams that spill for anadromous juvenile fish as of the 2020 spill season. The elevated TDG levels are intended to allow increased fish passage without causing more harm to fish populations than caused by turbine fish passage. The following special fish passage exemptions for the Snake and Columbia rivers apply when spilling water at dams is necessary to aid fish passage:

(A) TDG must not exceed:

- An average of one hundred fifteen percent as measured in the forebays of the next downstream dams and must not exceed an average of one hundred twenty percent as measured in the tailraces of each dam (these averages are calculated as an average of the twelve highest hourly readings[1] in a calendar day[2], relative to atmospheric pressure); and
- A maximum TDG saturation level of one hundred twenty-five percent calculated as an average of the two[3] highest hourly TDG measures in a calendar day during spillage for fish passage.

OR

(B) To further aid fish passage during the spring spill season (generally from April through June), spill may be increased up to the following levels as measured at the tailrace fixed site monitoring location:

- A maximum TDG saturation level of one hundred twenty-five percent calculated as an average of the twelve highest hourly TDG measures in a calendar day; and

[1] Used to be 12 highest *consecutive* hours.
[2] Used to allow for spanning *multiple* days.
[3] Used to be highest *single* hourly value

- A maximum TDG saturation level of one hundred twenty-six percent calculated as an average of any two consecutive hourly TDG measures.

These TDG criteria may be applied in place of (f)(ii)(A) of this subsection during spring spill operations when applied in accordance with the following conditions:

- In addition to complying with the requirements of this chapter, the tailrace maximum TDG criteria at hydropower dams shall be applied in accordance with Endangered Species Act (ESA) consultation documents associated with spill operations on the Snake and Columbia rivers, including operations for fish passage. The ESA consultation documents are those by which dams may legally operate during the time that the adjusted criteria in (f)(ii)(B) of the rule subsection are in use.
- Application of the tailrace maximum TDG criteria must be accompanied by a department (Ecology) approved biological monitoring plan designed to measure impacts of fish exposed to increased TDG conditions throughout the spring spill season. Beginning in the year 2021, plans must include monitoring for nonsalmonid fish species and must continue for a minimum of five years, and thereafter as determined by the department.
- TDG must be reduced to allowances specified in (f)(ii)(A) of this subsection if the calculated incidence of gas bubble trauma (GBT) in salmonids (with a minimum sample size of fifty fish required weekly) or nonsalmonids (with a minimum sample size of fifty fish required weekly) exceeds:
    - GBT in nonpaired fins of fifteen percent; or
    - GBT in nonpaired fins of five percent and gas bubbles occlude more than twenty-five percent of the surface area of the fin.

If GBT exceeds these biological thresholds, additional monitoring must demonstrate the incidence of GBT below biological thresholds before TDG can be adjusted to allowances specified in this subsection. GBT monitoring data shall be excluded from comparison to biological thresholds when higher than normal river flow contributes to excess spill above the ability to meet (f)(ii)(B) of this subsection. This monitoring data exclusion shall apply for one full calendar day after reduced river flow allows attainment of (f)(ii)(B) of this subsection.

For the 2021 Bypass Season, Douglas PUD will request to implement WAC 173-201A-200(1)(f)(ii)(B) from April through June and WAC 173-201A-200(1)(f)(ii)(A) from July through August as changed by rule on December 30, 2019.

1.2.1 Federal Columbia River Power System

A significant portion of the Wells Reservoir occupies lands within the boundaries of the Colville Indian Reservation. Wells Project operations do not affect TDG levels in tribal waters, where the Colville Confederated Tribes' TDG standard is a maximum of 110%, year-round, at all locations. This TDG standard is also the U.S. Environmental Protection Agency's (EPA) standard for all tribal waters on the Columbia River, from the Canadian border to the Snake River confluence. TDG levels on the Colville Reservation portion of the mainstem Columbia River within Wells Reservoir result from the operations of upstream federal dams but in particular, the USACE's Chief Joseph Dam, located approximately 30 miles upstream of Wells

Dam, and Grand Coulee Dam operated by the U.S. Bureau of Reclamation (Reclamation) and located approximately 52 miles upstream of Chief Joseph Dam.

In 2004, Ecology, the Spokane Tribes of Indians, and the U.S EPA developed a Total Maximum Daily Load (TMDL) report for TDG in the Mid-Columbia and Lake Roosevelt (Pickett et al. 2004). The document indicates that compliance in the Chief Joseph Dam tailrace is regulated by Ecology, the Colville Confederated Tribes and EPA. Ecology's standards differ between Phase I and Phase II of implementation of the TMDL with Phase I having identical WA State WQS TDG criteria during fish passage periods (i.e., TDG exemption criteria) and Phase II being 73 mm of Hg (or 110% TDG) in the tailrace of Chief Joseph up to the mouth of the Okanogan River (Pickett et al. 2004). In addition, TDG standards in the tailrace of Chief Joseph Dam are enforced by the Colville Confederated Tribes, whereby standards are 110% as measured at any time of year along the reservation boundary, including the Chief Joseph tailrace, and as an instantaneous measurement (Pickett et al. 2004; Colville Confederated Tribes 2010).

Since 2016 the TDG standard in the Chief Joseph and Grand Coulee tailraces was expected to be 110% year round because Phase I of the TMDL is complete and Phase II of the TMDL is officially being implemented. A spill plan filed by the USACE in July 2015, for the purposes of modifying the TDG standards to facilitate fish passage at the federal Columbia River dams, did not include Chief Joseph or Grand Coulee dams as it had in years before 2015. As such, incoming water and subsequent TDG concentration entering the Wells Project is expected to be ≤110% year round. However, the USACE should be consulted for updated Spill Priority lists and their performance around the state water quality standard for TDG.

In 2017, Bonneville Power Administration (BPA) and the USACE attempted to spill up to the "gas caps" (TDG limits) at the four lower Columbia and four lower Snake River Projects in order to meet judiciary obligations associated with the Biological Opinion for those Projects. In December 2018, a new agreement was reached between stakeholders, which prevented ongoing legal action against operators in favor of accommodating higher spill volumes at these eight projects. More detail about the Spill Agreement is found in Section 1.2.4 below.

In December 2018 the State of Oregon (Oregon), the State of Washington (Washington), the Nez Perce Tribe, the USACE, Reclamation, and BPA entered into a Spill Agreement for 2019-2021 in response to ongoing litigation between the NMFS and the National Wildlife Federation et al., and related to the protection of ESA listed salmonids on the Snake and Columbia Rivers. The agreement was put in place with the assumption that both Oregon and Washington would have their respective state agencies provide a temporary 125% TDG standard, thereby allowing for large spill volumes at USACE projects in the spring of 2020 and 2021. In order to facilitate higher spill volumes at mainstem Columbia River Projects, in July of 2019 Ecology proposed draft language that would modified the TDG standards, thereby allowing increased spill volumes (See 1.2 above). Final rule modification occurred December 30, 2019.

While it is unknown how new spill environments in the lower Snake and Columbia River will effect Mid-Columbia TDG concentrations, one might predict that if spill volumes are increased at the USACE projects in the lower Columbia and Snake Rivers, less forced spill events may occur at Grand Coulee Dam and Chief Joseph Dam than what has been observed in previous

years. For example, BPA might favor shifting generation to the upper Columbia and maintain power sales while spilling larger volumes at lower Columbia River and Snake River Projects. However, the shape and volume of the flow year will ultimately determine incoming TDG and flows into the Wells Project, and Douglas PUD will track flow and incoming TDG carefully in 2021.

1.2.2 7Q-10 Flood Flows

The 7Q-10 flood flow at the Wells Project is 246.0 kcfs. TDG values are not considered in the context of WQS compliance when flows at the Project are at or above the 7Q-10 value.

1.2.3 Fish Passage Season and Spill

The juvenile fish passage season as defined in the Wells Habitat Conservation Plan (HCP) runs from the first of April through to the end of August. Juvenile fish spill at the Wells Project is a defined action implemented by the HCP Coordinating Committee (CC) and juvenile fish spill at the Project during the fish passage season results in an increase in the survival of downstream migrating juvenile salmonids by passing fish over the spillways instead of through the turbines. The HCP requires that fish spill occur during at least 95% of the migration of juvenile salmonids, and normally fish spill is implemented such that those spill operations have provided non-turbine passage for the middle 99% of the spring and summer migration of juvenile salmonids. Outside the juvenile fish passage season (i.e., September 1st to March 31st), Douglas PUD intends to remain in compliance with the 110% TDG standard. During the juvenile fish passage season, Douglas PUD operates within Project constraints toward compliance with the TDG exemption criteria as detailed in Section 1.2 above. Nothing in these special conditions allows an impact to existing and characteristic uses.

1.2.4 Incoming TDG Levels

During the juvenile fish spill season, TDG concentrations in the Wells Project forebay are primarily determined by the USACE's upstream water management activities at Chief Joseph Dam and Reclamation's activities at Grand Coulee Dam.

Since the completion of spill deflectors at Chief Joseph Dam in 2008, there has been a significant increase in the amount of spill at the Chief Joseph Project resulting from wind integration and transmission congestion issues and operational constraints on the other dams in the Federal Columbia River Power System (FCRPS). Increases in the amount of spill at Chief Joseph Dam have resulted in a dramatic rise in the volume of supersaturated water entering the Wells Project. For example, in 2012, Wells Dam received non-compliant water (>110% [EPA and Colville Confederated Tribes standard]) on 125 days of the 133-day juvenile fish passage season. This mass influx of supersaturated water has resulted in significantly higher TDG concentrations observed in the forebay of Wells Dam that often exceeded TDG values of 115%. Since 2017 Chief Joseph appears to be lower on the FCRPS' spill priority list; however, in both 2017 and 2018 TDG concentrations above 110% and 115% were observed in the Wells Project forebay over an extended period of time. When incoming TDG concentrations are non-compliant, it is impossible for Douglas PUD to operate the JBS and remain complaint with WQS. However, currently there is no Washington State standard that addresses receiving non-complaint water.

In 2020, the Wells Dam forebay (WEL) TDG station observed hourly TDG values that were consistently (most days had an exceedance) above the 110% WQS from May 30 to August 11 (Figure 3). Receiving water that enters the Wells Forebay that is already out of compliance with Washington (WA) State Water Quality Criteria complicates Douglas PUD's ability to meet WQS, particularly during July and August when the Rocky Reach 115% 12-C High compliance metric is in place. Although the FCRPS above Wells Dam is required to meet these WA State WQS, Douglas PUD continues to receive non-complaint water from these Projects.

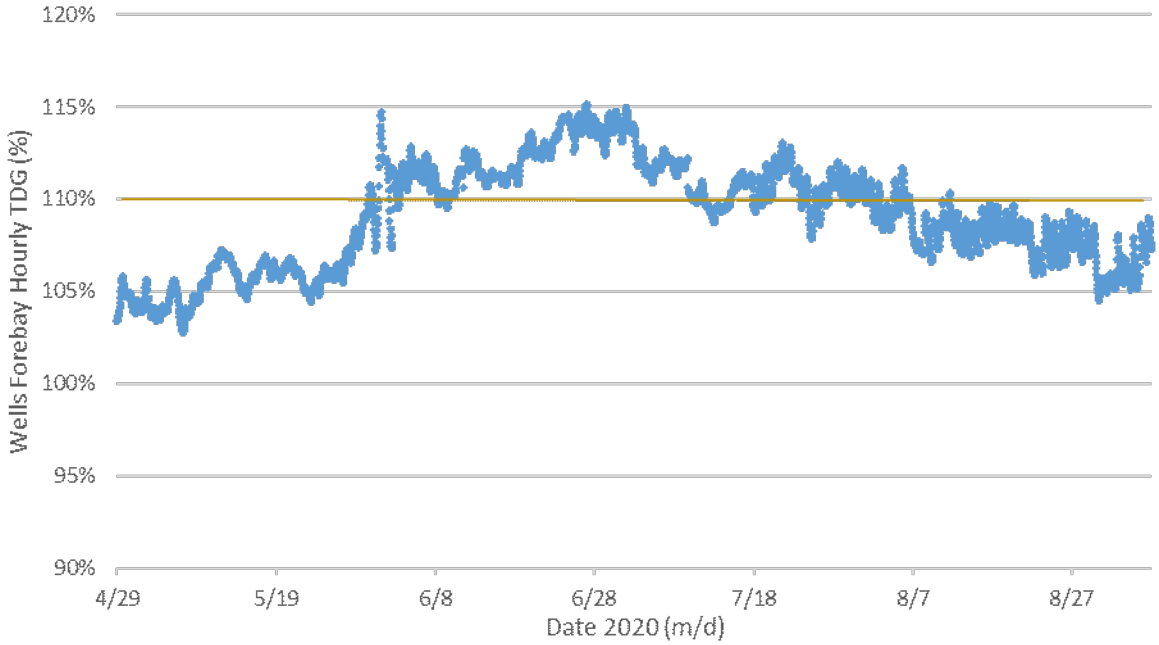

Figure 3. Hourly TDG values observed in the Wells Dam Forebay during a portion of the 2020 calendar year showing hourly TDG values above the WA WQS on most days between May 30 and August 11.

1.2.5 Additional 401 Certification Requirements

On May 27, 2010 Douglas PUD filed an application for a new license with the FERC for the Wells Project. On September 30, 2010, Ecology received an application for a 401 Certification from Douglas PUD, requested pursuant to the provisions of 33 USC §1341 (§401 of the Clean Water Act). On September 12, 2011, Douglas PUD withdrew its request and reapplied. On February 27, 2012, Ecology concluded that the Wells Project, as conditioned by its 401 Certification/Order No. 8981, would comply with all applicable provisions of 33 USC 1311, 1312, 1313, 1316, 1317 and appropriate requirements of Washington State law. The 401 Certification general conditions that are relevant to the GAP and the abatement of TDG under the TDG exemption are as follows:

- Douglas PUD shall consult with Ecology before it undertakes any change to the Project or Project operations that might significantly and adversely affect compliance with any applicable water quality standard (including designated uses) or other appropriate requirement of state law.
- Copies of the Wells Project 401 Certification and associated permits, licenses, approvals and other documents shall be kept on site and made readily available for reference by Douglas PUD, its contractors and consultants, and by Ecology.
- Douglas PUD shall allow Ecology access to inspect the Project and Project records required under the 401 Certification for the purpose of monitoring compliance with conditions of the 401 Certification. Access will occur after reasonable notice, except in emergency circumstances.
- Douglas PUD shall, upon request by Ecology, fully respond to all reasonable requests for materials to assist Ecology in making determinations under the 401 Certification and any resulting rulemaking or other process.
- Douglas PUD shall operate the Wells Project in compliance with a GAP approved by Ecology. By February 28 of each year, Douglas PUD shall submit a GAP to Ecology for approval. Pending Ecology's approval of each subsequent GAP, Douglas PUD shall continue to implement the activities identified within the previously approved plan.
- The GAP will include the Spill Operations Plan and will be accompanied by a fisheries management plan (section 2.2.1) and physical (section 4.1.1) and biological (section 2.2.2) monitoring plans. The GAP shall include information on any new or improved technologies to aid in the reduction in TDG.
- Commencing one year after issuance of a new FERC license, Douglas PUD shall monitor and report spills and TDG during non-fish spill season to determine TDG compliance with the 110% standard (see section 4.1.1). The non-fish spill season (generally September to the end of March) is defined as the times of the year that are not considered the fish spill season (generally April to end of August).
- If Douglas PUD, at any point, considers modifying any of the measures identified in the Spill Playbook, they will immediately develop proposed alternative(s) that will produce levels of TDG equal to or less than those estimated to be produced by the measures to be replaced. These measures should be implementable in a similar timeframe and must be submitted to Ecology for review and approval prior to implementation.
- The Project shall be deemed in compliance with the TMDL for TDG as long as it remains in compliance with the terms of the 401 Certification. The certification, including the GAPs and the Water Quality Attainment Plan (section 2.2.4), is intended to serve as the Project's portion of the Detailed Implementation Plan for the TDG TMDL.

Specific 401 Certification conditions that are relevant to the GAP and the abatement of TDG under the TDG exemption are as follows:

- Commencing one year after issuance of the new license, Douglas PUD shall monitor and report spills and TDG during non-fish spill season to determine compliance with the 110% standard. *(Note. Douglas PUD began collecting the required TDG data toward determining compliance with the 110% standard during the non-fish spill season starting in August 2013).*

- Douglas PUD shall maintain a TDG monitoring program at its Fixed Monitoring Locations in the forebay and tailrace of Wells Dam and/or at other locations as determined by Ecology, in order to monitor TDG and barometric pressure. Douglas PUD shall monitor TDG hourly throughout the year. *(Note. Since the early 2000s, Douglas PUD has maintained fixed monitoring stations in the forebay and tailrace of Wells Dam. Since 2013, data has been collected hourly and year round)*.
- The TDG monitoring program shall conform to the Ecology Quality Assurance Project Plan (QAPP) requirements per Section 6.7 (f) of the [license] order and the procedures shall be at least as stringent as the quality assurance/quality control calibration and monitoring procedures developed by the USGS for the Columbia River. *(Note. In 2013, Douglas PUD worked with Ecology and filed with the FERC a QAPP for TDG and water temperature monitoring. The FERC issued an Order approving the QAPP on August 8, 2013)*.
- Douglas PUD shall provide an annual TDG report to Ecology for review and approval by February 28 of each year. *(Note. Since license issuance, Douglas PUD has submitted a TDG Annual Report to Ecology on or before February 28th of each year)*.
- Within one year of issuance of the new license, Douglas PUD shall coordinate the annual HCP Project Fish Bypass/Spill Operations Plan with the GAP, using best available information to minimize the production of TDG. This coordination shall be accomplished in consultation with the Wells HCP Coordinating Committee (HCP CC) and the Aquatic Settlement Work Group (Aquatic SWG). *(Note. Since 2013, Douglas PUD has annually worked with Ecology and the HCP CC to develop the GAP and Bypass Operation Plan concurrently. Once developed these documents are approved by Ecology, the Aquatic SWG and HCP CC before being filed and approved by the FERC)*.
- Within one year of license issuance, Douglas PUD shall submit a TDG Water Quality Attainment Plan (WQAP) to Ecology for review and approval. The plan shall include a detailed schedule to ensure compliance with the TDG water quality criteria within 10 years of approval of the WQAP. *(Note. In 2013, Douglas PUD, in consultation with Ecology, developed a TDG WQAP and filed it with the FERC. The FERC filing date was October 21st, 2013. FERC subsequently reviewed and approved the WQAP in an order issued on December 20, 2013. See section 2.2.4 below for additional detail on the WQAP).*
- Douglas PUD shall manage spill toward meeting water quality criteria for TDG during all flows below 7Q-10 by minimizing voluntary spill through operations, including scheduling maintenance based upon predicted flows, avoiding spill by coordinating operations with upstream dams to the extent that it reduces TDG, maximize generation discharge, especially during periods of high river flows, and manage voluntary spill in real time in an effort to continue to meet TDG numeric criteria consistent with the GAP. *(Note. Wells Dam operations continue to manage spill via an annually updated Spill Playbook and GAP)*.

1.2.6 Additional Requirements of the FERC Operating License

Article 401(a) of the FERC operating license for Project No. 2149 requires that the GAP be filed with the FERC for approval following the approval of the GAP by NMFS, USFWS and Ecology. Article 401(b) requires the TDG report be submitted to the FERC by February 28 of each year. Article 401(c) requires FERC authorization of an application to amend the license, prior to the implementation of measures to address non-compliance with numeric water quality criteria.

1.3 History of Operations and Compliance

1.3.1 Historical Project Operation Flows

The Columbia River originates in the headwaters of the Canadian Rockies and receives snow melt from tributary streams as it travels over 1,243 miles before emptying into the Pacific Ocean. There are 85,300 square miles of drainage area above Wells Dam. The historic natural hydrograph had low flows in November through January with high flows in May through July. Storage dams on the Columbia River and its tributaries upstream of the Wells Project in the U.S. and Canada capture high spring and summer flows to hold for release in the fall and winter months (Table 1; Figure 4). The current hydrograph of the Columbia River is controlled by upstream, federally managed storage and release regimes and typically mimics historical flow regimes, in terms of the highest flows being observed from May through July (Figure 4). Juvenile anadromous salmonid migration occurs within a regime of reduced high flows during the spring migration period.

Table 1. Recent and Average Monthly Flows (kcfs) at Wells Dam.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
2020	100.4	116.6	80.8	83.6	117.9	202.5	154.2	116.1	70.2	67.0	100.4		115.4
Average since 1969	108.7	108.5	106.6	118.3	153.7	163.7	133.9	105.6	74.4	74.5	88.1	100.6	111.2
Minimum since 1969	67.4	69.9	56.0	51.9	55.2	73.7	53.4	63.9	53.3	55.4	63.8	72.6	
Maximum since 1969	159.2	180.7	193.9	203.8	266.3	348.7	253.8	181.3	123.0	108.9	110.0	149.0	
10YR mean (2011-2020)	110.1	109.9	110.2	138.3	184.2	176.8	148.2	113.6	68.5	66.3	90.1	99.3	118.0

Note. December data for the current calendar year was not available during drafting of this document

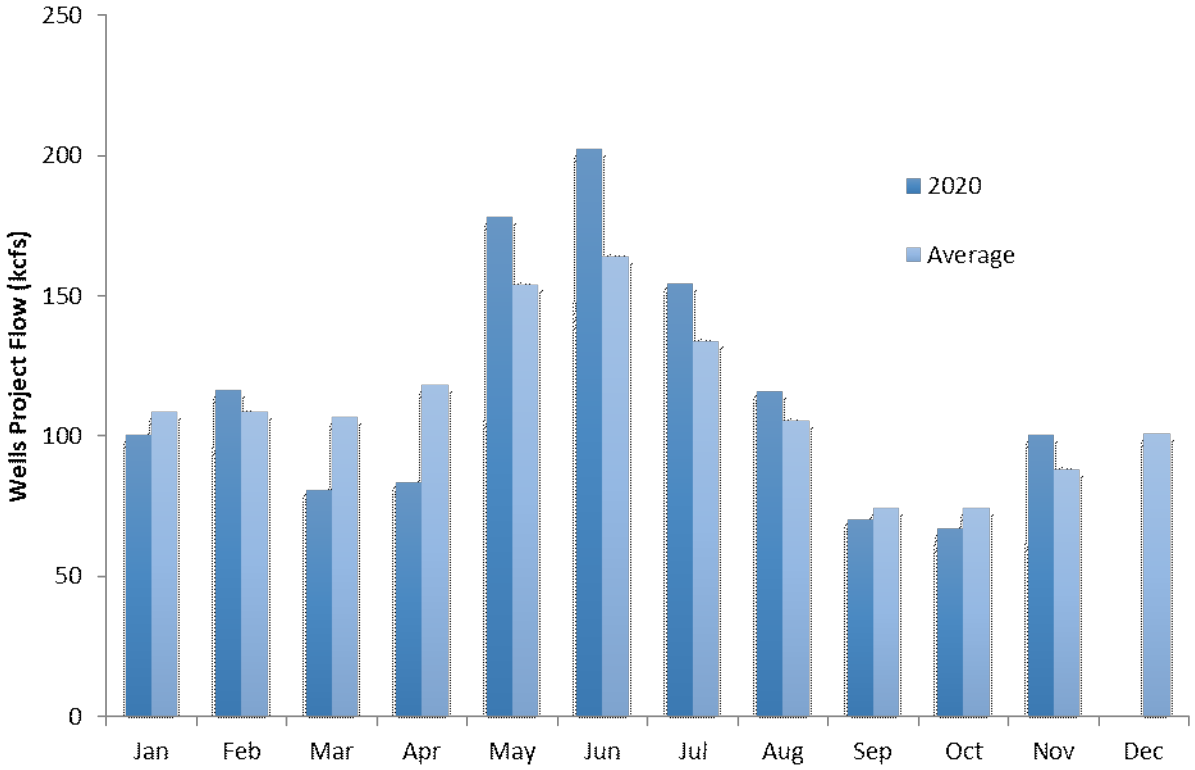

Figure 4. **2020 and average hydrograph observed at Wells Dam. Note. December data for the current calendar year was not available during drafting of this document.**

In general, the hydropower system and reservoir operations in the Columbia River are coordinated through a set of complex agreements and policies that are designed to optimize the benefits and minimize the adverse effects of project operations. The Wells Project operates within the constraints of the Pacific Northwest Coordination Agreement, Columbia River Treaty, the Hanford Reach Fall Chinook Protection Program and the FERC regulatory and license requirements.

1.3.2 Spill Operations

1.3.2.1 General Operation

Douglas PUD receives discharge estimates from BPA for the immediately upstream project, Chief Joseph Dam, and these estimates include values for the next day and proceeding three to four days. Discharge estimates are used to inform inflow into the Wells Project. When inflow values are expected to exceed turbine discharge, or when the District has reason to believe that spill is likely, the District institutes minimum generation requirements on all participants (purchasers) of the Wells Project. Douglas PUD has the ability to put minimum generation requirements on the Wells Project directly, as well as enforce and control these requirements. Douglas PUD will generate to whatever minimum requirement(s) is/are on the Wells Project and without regard to the signals it receives from its participants, should those signals be less than the

required minimum project generation. Finally, to aid in the minimization of TDG production at downstream projects, the District also sends its Wells Project discharge estimates to the immediately downstream project, Rocky Reach, operated by Chelan PUD.

1.3.2.2 Spill for Fish

Wells Dam is a hydrocombine design (see Figure 2) where the spillways are situated above the generating units. Research at Wells Dam in the mid-1980s showed that a modest amount of spill effectively guided 92.0-96.2% of the spring and summer downstream migrating juvenile salmonids through the JBS (Skalski et al. 1996; Table 2). The operation of the Wells JBS utilizes the five even-numbered spillways. These spillways have been modified with constricting barriers to improve the attraction flow while using modest levels of water (see Section 1.1). These modified spillways are used to provide a non-turbine passage route for downstream migrating juvenile salmonids from April through August. Normal operation of the JBS uses 10 kcfs. During periods of extreme high flow, one or more of the JBS barriers will be removed to provide adequate spill capacity to respond to an emergency plant load rejection. Spill barriers may also be removed to minimize TDG production during high spill events, or when flood flows are forecast. Bypass gates are opened when adjacent turbines are operating.

Typically, the JBS will use approximately 6% to 8% of the total river flow for fish guidance. Between the years 1997 and 2004, the volume of water dedicated to JBS operations ranged from 1.5 to 3.2 million acre-feet annually. The operation of the JBS adds a small amount of TDG while meeting a very high level of fish guidance and survival. This high level of fish survival at Wells Dam has met the approval of the fisheries agencies and tribes and is vital to meeting the survival performance standards contained within the FERC-approved HCP. The Wells Project JBS is the most efficient bypass system on the mainstem Columbia River.

Table 2. Wells Hydroelectric Project Juvenile Bypass System Efficiency.

Species	% JBS Passage
Yearling (spring) Chinook	92.0
Steelhead	92.0
Sockeye	95.7
Subyearling (summer/fall) Chinook	96.2

The JBS is used to protect downstream migrating juvenile salmonids. Fish passage operations at Wells Dam originally fell into two seasons, Spring Bypass and Summer Bypass, but those two seasons are now merged into a single season. For 21 years, the status of the fish migration for both spring and summer periods was monitored by an array of hydroacoustic sensors placed in the forebay of Wells Dam, with species composition verified by fyke netting. That monitoring data was used to establish that the operation period for the juvenile bypass begins in April and ends in August. Annual start and stop dates within that period are set by the HCP CC based on annually updated long-term monitoring, to bracket the run timing of at least 95% of both the spring and summer migrants. Up to thirteen million juvenile salmonids annually migrate downstream over Wells Dam.

1.3.2.3 Flows in Excess of Hydraulic Capacity

The forebay elevation at Wells Dam is maintained between 781.0 and 771.0 msl. The Wells Project has a hydraulic generating capacity of 219 kcfs (ASL 2007) and a spillway capacity of 1,180 kcfs. In recent years however the Wells Project has had less than 200 kcfs generating capacity due to ongoing generator and turbine rebuild projects.

The Wells Project is a run-of-the-river project with relatively small usable storage capacity (~98,000 acre ft.). By comparison, Grand Coulee Dam, two projects upstream of Wells Dam, has a reservoir with 58 times the storage capacity of the Wells Reservoir. River flows in excess of the hydraulic generating capacity at Wells Dam must be passed over the spillways.

1.3.2.4 Flow in Excess of Power Demand

Spill may occur at flows less than the Wells Project hydraulic generating capacity when the volume of water is greater than the amount required to meet electric power system loads. This may occur during temperate weather conditions and when power demand is low, or when non-power constraints on river control result in water being moved through the Mid-Columbia at a different time of day than when power is required (i.e. off-peak periods). Spill in excess of power demand provides benefit to migrating juvenile salmonids because fish passing through the spillways survive at a higher rate relative to fish passaging through a turbine. Turbulence in the tailrace generated by spill in excess of power demand increases tailrace velocities and reduces tailrace egress times. The reductions in tailrace egress time and increases in water turbulence and velocity is expected to reduce predation on juvenile salmonids attempting to migrate through the Wells Project.

1.3.2.5 Gas Abatement Spill

Gas Abatement Spill is used to manage TDG levels throughout the Columbia River Basin. The Technical Management Team (including NMFS, USACE, and BPA) implements and manages this spill. Gas Abatement Spill is requested by dam operators at other projects in the Columbia and Snake rivers where gas levels are high and the spill is occurring past unloaded turbine units. A trade of power generation for spill is made between operators, providing power generation in the river with high TDG and trading that energy for an equivalent amount of spill from a project or river where TDG is well below standards. Historically, Douglas PUD accommodated requests to provide Gas Abatement Spill. However, in an effort to limit TDG generated at the Wells Project, Douglas PUD has adopted a policy of only accepting Gas Abatement Spill at Wells Dam when it can be demonstrated that it will not result in a violation of the WQS for TDG.

1.3.2.6 Other Spill

Other spill includes spill as a result of maintenance or plant load rejection. A load rejection occurs when the generating plant is forced off-line by an electrical fault, which trips breakers and shuts off generation. At a run-of-the-river hydroelectric dam, if water cannot flow through operating turbines, then the river flow that was producing power has to be spilled until turbine

operation can be restored. These events are extremely rare, and would account for approximately 10 minutes in every ten years.

Maintenance spill is utilized for any activity that requires spill to assess the routine operation of individual spillways and turbine units. These activities include checking gate operation, conducting index and generator load testing and all other maintenance activities that would require spill to pass water or debris. The FERC requires that all spillway gates be operated once per year. To control TDG levels associated with maintenance spill, Douglas PUD limits, to the extent practical, maintenance spill during periods of peak flow and high TDG.

1.3.3 Compliance Activities in Previous Year

1.3.3.1 Operational

Since the Wells Project is a run-of-the-river project with a relatively small storage capacity, river flows in excess of the ten-turbine hydraulic capacity must be passed over the spillways. Minimization of involuntary spill has primarily focused on minimizing TDG production dynamics of water spilled based upon a reconfiguration of spillway operations. The 2009 Wells Project GAP (Le and Murauskas, 2009) introduced the latest numerical model developed by the University of Iowa's IIHR-Hydroscience and Engineering Hydraulic Research Laboratories. The two-phase flow computational fluid dynamics tool was used to predict hydrodynamics of TDG distribution within the Wells Dam tailrace and further identify operational configurations that would minimize TDG production at the Project. In an April 2009 report, the model demonstrated that Wells Dam can be operated to meet the TDG exemption criteria during the passage season at flows up to 7Q-10 levels provided the forebay TDG levels are below 115%. Compliance was achieved through the use of a concentrated spill pattern through Spillway 7 and surplus flow volume through adjacent odd numbered spillways in a defined pattern and volume. These preferred operating conditions create surface-oriented flows by engaging submerged spillway lips below the ogee, thus increasing degasification at the tailrace surface, decreasing supersaturation at depth, and preventing high-TDG waters from bank attachment. These principles were the basis of the 2009 Wells Project Spill Playbook and were fully implemented for the first time during the 2009 fish passage (spill) season with success. Overall, no exceedances were observed in either the Wells Dam tailrace or the Rocky Reach forebay in 2009.

In 2010, the concepts from the 2009 Spill Playbook were integrated into the 2010 Wells Project Spill Playbook, given their effectiveness in maintaining levels below TDG criteria during the previous year. High Columbia River flows in June, which exceeded the preceding 15-year average flow, resulted in several exceedances of the hourly (125% maximum) and 12C-High (120%) TDG limits in the Wells Dam tailrace, and Rocky Reach forebay (115%). In response, Douglas PUD implemented an in-season analysis of the 2010 Spill Playbook and determined that full implementation of the recommendations from IIHR Engineering Laboratory would require the removal of the juvenile fish bypass system flow barriers in one even numbered spillway. Following the in-season analysis and consultation with the HCP CC, changes were made to the 2010 Spill Playbook that allowed for the removal of the juvenile fish bypass system barriers in Spillway 6. Specifically, the Spill Playbook was modified to state that when spill levels approach the 53-kcfs threshold, the JBS barriers in Spillway 6 would be removed in order to

remain in compliance with the TDG criteria in the Wells Dam tailrace and Rocky Reach Dam forebay. When spill exceeded 53 kcfs, excess spill would be directed through Spillways 6 and 7 rather than through Spillways 5 and 7. This operational configuration resulted in a more compact spill pattern that reduced the air-water interface surface area between spillway flows and the subsequent potential for lateral mixing and air entrainment.

In February 2011, Douglas PUD conducted an additional technical analysis of the 2010 Spill Playbook (after in-season changes) and confirmed that continued implementation would be appropriate for 2011 with additional minor modifications. Following approval of the 2011 GAP by Ecology, the 2011 Spill Playbook was implemented. Only minor changes were made to the 2012 Spill Playbook as a result of high compliance during the 2011 spill season.

In December of 2012, the final GAP report was completed for the 2012 spill season. After analysis it was determined that the 2012 spill season had the 3rd highest average monthly flows since 1969 (April- August). In addition incoming flows from Chief Joseph Dam were consistently above 115%. Despite these conditions Wells Dam demonstrated high compliance with all standards aside from the Rocky Reach Forebay 115% 12C-High standard, since incoming flows to Wells Dam were above 115% for more than half the days in the spill season.

A Spill Playbook nearly identical to 2012 was employed in 2013-2014. One minor modification included the use of Spillways 5 and 6 when flows exceeded 40 kcfs instead of Spillway 7 since the prolonged rebuild of turbine-unit 7 precluded spilling over a loaded unit. Flows for the 2013 and 2014 fish passage season were lower compared to flows observed in the previous two years, which allowed Douglas PUD to reduce spill volumes and maintain normal bypass operations for greater lengths of time compared to 2011 and 2012. In addition this resulted in improved TDG performance. The 2015 – 2020 Spill Playbooks returned to concentrating spill over 40 kcfs through Spillway 7 rather than Spillway 5 since turbine unit 7 returned to service. The 2021 GAP and BOP will again use a concentrated spill pattern that was identified as having a preferred TDG abatement during relicensing studies. However, unlike 2015-2020, in 2021 the concentration if spill will occur over units 5, 6, and 4 (listed in priority order). This modification is being made to address spillway maintenance needs on bay 7. Maintenance is being completed at least partly due to the extra use spillway 7 has received over the last decade. As such, a modified Spill Playbook can be found attached at Appendix 1.

1.3.3.2 Structural and maintenance

No structural modifications to the spillways or bypass system were implemented (none were scheduled) during the 2020 fish passage season. Unit 10 at Wells is currently out of service for the long-term generator rebuild project. It is expected to be out of service until February of 2022. The ongoing turbine rebuild project at Wells Dam has already been captured within prior GAP/BOP and will not require any additional changes in the 2021 Spill Playbook or GAP implementation. No other structural modifications are expected in 2021.

Typically, in each spring and fall two units are taken out of service for what is called biannual maintenance. Under this schedule all ten of the units at Wells Dam are serviced at least every two and half years. Normal biannual maintenance is expect to occur in March and April of 2021 prior to the onset of the freshet and again in the fall when flows recede. Having increased

generation capacity allows the District to generate using water that would otherwise be spilled and therefore it is critical to be a 9 unit plant during peak flows that are normally observed in May through July of each year. Higher spill volumes lead to increase production of TDG. Table 1 (above in Section 1.3.1) that compares the ten year average to the historical average illustrates the high spring flows that have been observed at Wells Dam recently. As part of Douglas PUD's commitment to the 401 Certification, operational and maintenance issues like these are examined critically toward meeting compliance with the Washington State WQS.

1.3.4 Compliance Success in 2020

In 2020, five standards were monitored closely during the juvenile fish passage season towards determining effectiveness and developing the 2021 GAP. TDG compliance during the juvenile fish passage season was very good in 2020 (Table 3). A sixth standard is included in Table 3 below to provide comprehensive compliance reporting but is not related to fish passage season (<110% standard). Flows in April and early May were below seasonal average at Wells but were higher than season averages in June and July (Figure 4). Exceedances of TDG WQS were infrequent despite more restrictive standards beginning in July of 2020.

Table 3. 2020 TDG Compliance Summary.

		Compliance
April - June	**Wells Tailrace 125% - Mean 12 Highest Hourly / Day**	
	Non-compliant days	4*
	Total days	90
	DCPUD compliance	**95.6%**
	Wells Tailrace 126% - Two Consecutive Hourly Values	
	Non-compliant days	4*
	Total days	90
	DCPUD compliance	**95.6%**
July & August	**Wells Tailrace 125% Hourly Standard**	
	Non-compliant days	1
	Total days	61
	DCPUD compliance	**98.4%**
	Wells Tailrace 120% 12C-High Standard (one day)	
	Non-compliant days	3
	Total days	61
	DCPUD compliance	**95.1%**
	Rocky Reach Forebay 115% 12C-High Standard (one day)	
	Non-compliant days	10
	Total days	61
	DCPUD compliance	**83.6%**
Jan - Mar & Sept - Dec	**Wells Tailrace <110% Standard**	
	Non-compliant days	4
	Total days	211
	DCPUD compliance	**98.1%**

*7Q10 flows occurred on 1 day reducing non-compliant days from 5 to 4.

2.0 PROPOSED OPERATIONS AND ACTIVITIES

2.1 Operational Spill

Based on the Wells Project's improved TDG performance as a result of 2012-2020 operations implementing the Wells Project Spill Playbook, similar operating principles will be implemented for the 2021 juvenile fish passage season.

The 2021 Spill Playbook proposes to concentrate spill through Spillway 5, 6, and 4. Concentrated spill through Spillway 5 was selected because spill through this bay was maintains the concentrated spill pattern determined to produce the smallest increase in TDG per unit of water spilled and Spillway 7 is unavailable in 2021 due to maintenance. The turbine discharge from units 4 and 5 are also expected to reliably enhance the surface jet being spilled through Spillway 5. The 2021 Spill Playbook is attached as Appendix 1.

In addition to minimizing involuntary spill through the implementation of the Spill Playbook, Douglas PUD shall manage spill toward meeting water quality criteria for TDG during all flows below 7Q-10 as follows:

- Minimize voluntary spill through operations, including to the extent practicable, by scheduling biannual maintenance[4] based on predicted flows;
- Avoid spill by continuing to coordinate operations with upstream dams, to the extent that it reduces TDG;
- Maximize generation discharge, especially during periods of high river flows;
- During fish passage season, manage voluntary spill levels in real-time in an effort to continue to meet TDG numeric criteria; and
- Move the biannual maintenance of one of two units scheduled to be serviced in the spring to the fall biannual maintenance period, thereby servicing three units in the fall and one unit in the spring (See 1.3.3.2 above).

2.2 Implementation

2.2.1 Fisheries Management Plans

Juvenile salmon and steelhead survival studies conducted at the Wells Project in accordance with the HCP have shown that the operation of the Wells Project, of which the JBS is an integral part, provides an effective means for out-migrating salmon and steelhead to pass through the Wells Project with a high rate of survival (Bickford et al. 2001, Bickford et al. 2011, Gingerich et al. 2020) (Table 4). The Wells JBS is the most efficient juvenile fish bypass system on the mainstem Columbia River (Skalski et al. 1996). The Wells Anadromous Fish Agreement and HCP (Douglas PUD 2002) is the Wells Project's fisheries management plan for anadromous salmonids, and directs operations of the Wells Project (JBS, adult fishways) to achieve the No Net Impact (NNI) standard for HCP Plan Species. The Aquatic Resource Management Plans

[4] Biannual maintenance is the regularly scheduled maintenance that each unit receives, and does not include the long-term outage of the ten generating units that are being completely rebuilt one at a time.

(for white sturgeon, bull trout, Pacific lamprey, resident fish, water quality, and aquatic nuisance species) in the Wells Project's Aquatic Settlement Agreement (developed in support of the current Wells Project operating license) are the fisheries management plans for all other aquatic life designated uses.

Table 4. 1998 - 2000, 2010, and 2020 Wells Hydroelectric Project Juvenile Survival Study Results.

Species	% Project Survival
Yearling Chinook (2020)	95.7
Yearling Chinook (2010)	96.4
Yearling Chinook and Steelhead (1998-2000)	96.2

In spring 2010 and 2020, Douglas PUD conducted survival verification studies with yearling Chinook salmon. These studies were required as 10-year follow-up studies to confirm whether the Wells Project continues to achieve survival standards of the Wells Anadromous Fish Agreement and HCP. During these efforts, approximately 80,000-105,000 Passive Integrated Transponder (PIT)-tagged yearling summer Chinook were released over 30+ day periods in 15-16 replicates. Results showed that juvenile Chinook survival through the Wells Project from the mouth of the Okanogan and Methow rivers averaged 96.4% and 95.7% in 2010 and 2020, respectively (see Table 4). These recent results confirm results from the three previous years of study, and document that juvenile fish survival through the Wells Project continues to exceed the 93% Juvenile Project Survival Standard required by the HCP (Bickford et al. 2011; Gingerich et al. 2020).

The current phase designations (status of salmon and steelhead species reaching final survival determination) for the HCP Plan Species are summarized in Table 5. Specific details regarding survival study design, implementation, analysis, and reporting are available in annual summary reports prepared and approved by the Wells HCP CC.

Table 5. Wells Hydroelectric Project Habitat Conservation Plan Species Phase Designations.

Species	Phase Designation
Yearling Chinook	Phase III[5] – Standard Achieved (22-Feb-2005)
Steelhead	Phase III – Standard Achieved (22-Feb-2005)
Sockeye	Phase III – Additional Juvenile Studies (22-Feb-2005)
Subyearling Chinook	Phase III – Additional Juvenile Studies (22-Feb-2005)
Methow River Coho	Phase III – Standard Achieved (16-Dec-2015)

In 2021, Douglas PUD will continue to operate the Wells Dam adult fishways and the JBS in accordance with HCP operations criteria to protect aquatic life designated uses. Furthermore, all fish collection (hatchery broodstock and/or evaluation activities) or assessment activities that

[5] Phase III (Standards Achieved) = Juvenile Project Survival greater than or equal to 93%.

occur at Wells Dam will require approval by Douglas PUD and the Wells HCP CC to ensure that such activities protect aquatic life designated uses.

Douglas PUD shall continue to operate the Wells Project in a coordinated manner that reduces forebay fluctuations and maintains relatively stable reservoir conditions that are beneficial to multiple designated uses (aquatic life, recreation, and aesthetics). Coordinated operations with upstream projects reduce spill at Wells Dam and thus reduce the potential for exceedances of the TDG numeric criteria and impacts to aquatic life associated with TDG.

2.2.2 Biological Monitoring Plan

Pursuant to WAC 173-201A-200 operators applying for modification to TDG standards in order to protect downstream migrating salmon in April-June and July-August are required to provide a biological monitoring plan for both migrating salmonids and resident fishes (Ecology 2019).

NMFS has shown that GBT is low if the level of TDG can be managed to below 120% (NMFS 2000). They recommend that "the biological monitoring components will include smolt monitoring at selected smolt monitoring locations and daily data collection and reporting only when TDG exceeds 125% for an extended period of time." Since the early 2000's, Douglas PUD has monitored smolts at the Rocky Reach Juvenile Bypass Sample Site and Wells Dam adult fish ladders following exceedances in the Wells tailrace that are above 125%.

All monitoring for GBT will follow examination techniques as described in 2019 Gas Bubble Trauma Monitoring Protocol (FPC, 2019) and will focus on examining the eyes, unpaired fin, and caudal fin of all fishes. Ranks of GBT expression from 0-4 will be used per Fish Passage Center protocols.

Adult Salmonids
Adult salmonids may be sampled at the request of Ecology, but are generally expected to perform better than juvenile salmonids, as such juvenile salmonids will be the focus of biological monitoring on salmonids.

Juvenile Salmonids
The JBS at Wells Dam does not have facilities to allow for juvenile fish sampling and observation. To address GBT sampling for juvenile anadromous salmonids, if hourly TDG levels exceed 125% in the tailrace of Wells Dam, Douglas PUD will request biological sampling of migrating juveniles for symptoms of GBT at the Rocky Reach juvenile bypass sampling facility on the subsequent business day to the exceedance. Target species for juvenile GBT sampling will consist of Coho, Sockeye, yearling and subyearling Chinook, and steelhead. If flood flows above 7Q-10 persist for extended timeframes (more than one week), sampling effort will be reduced to one weekly sample. Any GBT monitoring results will be summarized in annual TDG reporting and provided to the Aquatic SWG during monthly calls. In the event that TDG values do not exceed 125% during calendar year 2021, a minimum of 50 salmonids will be examined weekly during the months of April, May, and June, regardless of TDG concentration.

Resident Fish

According to Ecology's rule change, beginning in 2021 non-salmonid fish should be collected in the fish bypass system, within distance of the next downstream TDG fixed monitoring site, or within 1 mile downstream from the hydropower project given that fish are not obtainable within the Wells Dam JBS. Three sources shall be considered acceptable sample locations to meet biological monitoring requirements for resident fishes, and are prioritized in order of preferred method to least preferred:

1. Below Wells within 5 miles of the project: boat electrofisher
2. Rocky Reach JBS[6]
3. Below Wells within 5 miles of the project: beach seine
4. Other location between Snake River and Columbia River Confluence and Chief Joseph tailrace in coordination with Chelan and/or Grant PUD

Biological monitoring will focus on relatively shallow areas of the river that have a higher likelihood of TDG related impacts due to limited depth compensation. Fish collected and monitored at the Rocky Reach JBS will be considered susceptible to TDG related effects due to the shallow waters in the bypass system.

A minimum of 50 juvenile non-salmonid resident fish will be sampled weekly at one or a combination of the sites listed above, depending on fish availability. An emphasis will be placed on examining native resident fishes including but not limited to Northern Pikeminnow (*Ptychocheilus oregonensis*), Mountain Whitefish (*Prosopium williamsoni*), Peamouth (*Mylocheilus caurinus*). If sample sizes do not meet the minimum requirements, surrogate non-native species may be substituted (bass [*Micropterus* sp.], Walleye [*Sander vitreus*]. All fish examined for GBT will be included in the assessment of compliance with biological thresholds, regardless of its applicability to the minimum count of 50 fish juvenile non-salmonid resident fish. Biologists will aim to collect three different resident fish species of similar age and size class with a target of ten per group. However, in the event that native fish sample sizes are impossible to attain, Ecology will be notified with the expectation that salmonids or non-native fishes can be used to meet minimum sample size targets. Biologists expect native resident fish availability to be a problem if juvenile fishes are not occupying shallow water littoral habitats at relevant times of the year.

Ecology's Implementation Plan allows for weekly sampling to occur at representative locations on the Columbia River, one of which is from the mouth of the Snake River to the tailrace of Chief Joseph Dam (Middle Columbia; Ecology, 2019). Data and sampling plans could be shared between Grant, Chelan, and Douglas PUDs. Alternative sampling sites may be used to meet sampling requirements. Further, data collected by Douglas PUD may be used to satisfy obligations for Grant and Chelan PUDs, if they also apply for the adjusted spring WQS.

[6] Bypass systems have been recognized as suitable sample locations in the Implementation Plan (Ecology, 2019); however, data collected from Chelan PUD suggests that necessary sample sizes for non-salmonid resident fish may be difficult to obtain *(Scott Hopkins, Chelan PUD Personal Communication)*.

2.2.3 Water Quality Forums

Douglas PUD actively participates in regional water quality forums including those that include other hydroelectric operators on the mainstem Snake and Columbia rivers. The USACE meets with PUD technical leads to review yearly data collections and completeness. In addition, Douglas PUD observes the Technical Management Team water management process, particularly in spring to understand river operations and actions designed to limit TDG production. Finally, Douglas PUD is involved in Columbia River Treaty actions that are dedicated to water quality considerations.

2.3 Water Quality Attainment Plan and Quality Assurance Project Plans

In November 2012, Douglas PUD received a new FERC operating license for the Wells Project. As required by Douglas PUD's Clean Water Act 401 Certification, a WQAP for TDG and a QAPP for water temperature and TDG were developed, approved by the Aquatic SWG and the HCP CC, and filed with the FERC for approval prior to Oct 31st of 2013 (within one year of license issuance). Both the WQAP and the QAPP were approved by the FERC in 2013.

The WQAP includes a compliance schedule to ensure compliance with TDG criteria within 10 years. The WQAP also allows time for the completion of the necessary studies or for the resolution of the issue of elevated incoming TDG from upstream projects through rule-making or other means. The WQAP was developed to meet the requirements of WAC 173-201A-510(5).

If implementing the compliance schedule does not result in compliance with TDG criteria at the time the compliance schedule expires, Douglas PUD may explore other alternative approaches available in the water quality standards, including a second compliance schedule or alternatives provided in WAC 173-201A-510(5)(g).

Specific measures in the WQAP that will be conducted in 2021 include:

1. Testing and modifying an adaptive Spill Playbook in and outside of fish passage season.
    - Douglas PUD will implement the Spill Playbook and track its progress towards improving TDG performance and assessing compliance capability.
2. Monitoring gas bubble presence in biota.
    - At TDG levels above 125 % in the Wells tailrace, Douglas PUD will initiate GBT monitoring. The collection of biological data serves two primary purposes. First, Douglas PUD is required to collect biological data to meet GAP requirements associated with the annual TDG adjustment for fish passage. Secondly, Douglas PUD's 401 Certification identifies potential alternative approaches (e.g., use attainability analysis and site specific variance) as part of implementing the TDG compliance schedule (WAC 173-201A-510(5)(g).
    - In 2021, GBT data collection will also include weekly sampling during the months of April, May and June for resident fish. This sampling can be conducted in concert with Grant and Chelan PUD per Ecology's draft Implementation Plan

developed during rule making (while this action was not identified in the approved WQAP, data collected during this action should serve to support the WQAP process and ten-year compliance report.

3. Employ the third year of a new energy accounting Wells Project Database towards improved Project operations that help limit TDG production.
4. Monitor and record spill-gate opening width through automation and SCADA towards using Project operation data to more closely understand TDG production at Wells Dam.

The employment of the new higher resolution Project operations database should better inform operations toward the improvement of TDG management. Operations and data parameters include spill-gate openings, unit megawatt production, unit outages, forebay/tailrace water-surface elevation, incoming TDG, and water temperature.

After two years of successful implementation of the new energy accounting database, Douglas PUD staff has determined that reducing spill volumes might be accommodated if operators had improved predictions of available water. If available water estimates could be further improved, operators and power marketers could more easily sell power in near real-time. In 2021, Douglas PUD will continue to put an emphasis on evaluating conditions, as they arise, which would lead to stringent minimum generation requirements at Wells in an effort to minimize unforced spill. . The installation of a forebay elevation sensor approximately 0.5 miles upstream of Wells Dam in 2019 is also expected to improve water forecasting and minimize unforced spill events.

3.0 COMPLIANCE AND PHYSICAL MONITORING

3.1 Monitoring Locations

TDG monitoring has been implemented in the Wells Dam Forebay since 1984. Douglas PUD began monitoring TDG levels in the Wells Dam tailrace in 1997 by collecting data from a boat and drifting through the tailrace at four points across the width of the river. During the transect monitoring, no TDG "hot spots" were detected; the river appeared completely mixed horizontally. A fixed TDG monitoring station was established in 1998. The placement of the fixed monitoring station was determined based upon the 1997 work and was further verified as collecting data representative of river conditions during a 2006 TDG assessment at Wells Dam (EES et al. 2007). Results of the 2008-2009 TDG numerical modeling activities conducted by University of Iowa/IIHR also confirmed that the tailrace monitoring station is located at a site representative of the mixed river flow, particularly during higher flows. Furthermore, locations of both forebay and tailrace sensors had to be protected to avoid sensor/data loss and damage and for safe accessibility during extreme high flows. The current locations of both the forebay and tailrace monitors took these criteria into consideration.

Prior to November 2012, TDG monitoring at the Wells Project typically commenced on April 1 and continued until September 15, annually. This monitoring period encompasses the juvenile fish migration, the operation of the Wells JBS, as well as when river flows are at their highest and when a majority of spill occurs. As of August 2013, Douglas PUD continued to collect TDG data following the completion of the bypass period towards monitoring TDG outside of the spill and fish passage season (as required by the Wells Project 401 Certification). Currently, year-

round data from both forebay and tailrace sensors are transmitted by radio transmitters to a master radio at Wells Dam. This system is checked and calibrated monthly or more frequently, as required. TDG data are sent to and logged at the Douglas PUD headquarters building in 15-minute intervals. Information on barometric pressure, water temperature, and river gas pressure is sent to the USACE on the hour over the Internet and uploaded in real-time to Douglas PUD's public website (www.douglaspud.org). The four data points (15 minute) within an hour are used in calculating the hourly compliance TDG values, the 24-hour TDG average, and the 12C-High readings in a day (24-hour period).

In 2014, Douglas PUD installed and began operating an additional TDG sensor station in the Wells Reservoir located several miles downstream of Chief Joseph Dam and upstream from the Okanogan River (Washburn Island). This new TDG sensor station provides reliable mixed flow measurements of TDG generated at Chief Joseph Dam (USACE studies show mixing of powerhouse and spill flows at least 7 miles from Chief Joseph Dam) before being diluted by degassing processing at the surface/water interface and diluted via tributary influence in the Okanogan River (Easthouse, 2012; *pers. comm.* with Mike Schneider, USACE). The current system operated by the USACE below Chief Joseph Dam collects TDG values primarily from the project's spillways and does not provide a reliable measure of mixed flow (powerhouse and spillway combined) TDG values and therefore does not provide a reliable estimate of TDG headed for the forebay of Wells Dam. In 2021, Douglas PUD will continue to monitor TDG at Washburn Island, and the forebay and tailrace stations located around Wells Dam.

3.2 Quality Assurance

The broad purpose of a well-designed QAPP is to obtain data of the type and quality needed to make future decisions surrounding the need, or lack thereof, for changes to project operation and construction related to compliance with TDG and temperature standards.

Douglas PUD developed a QAPP for TDG in 2013 in coordination with Ecology. The QAPP was filed on June 24, 2013 and approved by the FERC on August 8, 2013. An important part of Douglas PUD's Quality Assurance/Quality Control (QA/QC) program is the requirement that Douglas PUD's water quality consultant visit each of the TDG sensor sites monthly for maintenance and calibration of TDG instruments. Calibration follows criteria established by the USACE, with the exception of monthly rather than bi-weekly calibration of sensors. A spare probe is available and field-ready at all times in the event that a probe needs to be removed from the field for repairs.

Douglas PUD started collecting TDG data year round beginning April 1, 2013, but spill season data (April – August) will be reported separately in an annual GAP report submitted to Ecology and the FERC. Real-time data is available at www.douglaspud.org consistent with reporting requirements found in Douglas PUD's 401 Certification.

3.3 Reporting

Upon approval of the Wells GAP and issuance of a Wells Project TDG exemption, Douglas PUD will submit an annual report to Ecology no later than February 28 subsequent to each year that the TDG exemption is approved. The annual report will summarize all GAP activities conducted for the prior year (i.e., annual report filed by February 28, 2022 will be for all GAP activities conducted in 2021) as required by Ecology and the FERC. In addition to reporting on spill season compliance, the annual report will include TDG compliance outside the spill season (110%), per the 401 Certification Section (6.7)(2)(c)(iii). Results will be shared with the Aquatic SWG, Ecology, and within water quality forums (see Section 2.2.3).

4.0 CONCLUSIONS

Pending approval by Ecology, implementation of the measures identified within the 2021 GAP are intended to serve as a long-term strategy to maintain compliance with the Washington State WQS for TDG in the Columbia River at the Wells Project while continuing to provide safe passage for downstream migrating juvenile salmonids. In addition, the implementation of this GAP will be used as a tool to implement relevant measures identified in the Ecology-approved Wells Project WQAP.

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Appendices

Appendix 1 Wells Hydroelectric Project Spill Playbook

I. No Forced Spill

The Wells Dam Juvenile Bypass System (JBS) shall be operated continuously throughout the juvenile salmon outmigration (April 9 to August 9 for 2021). The standard Wells Habitat Conservation Plan (HCP) operating criteria, as described in Section 4.3.1 of the Wells HCP, will apply to the 2021 operating season. The operating criteria requires the operation of at least one bypass bay during the entire JBS season, requires that no turbine is operated without an adjacent bypass bay being open, and requires that all five bypass bays be operated continuously for 24 hours when the Chief Joseph Dam uncoordinated discharge estimate for that day is 140 kcfs or greater. The Wells JBS is normally operated with 1.7 kcfs passed through Spillway 2 (*S2*) and *S10*, and 2.2 kcfs through *S4*, *S6*, and *S8*. Figure 1 (below) assumes that the Chief Joseph Dam uncoordinated discharge estimate is greater than 140 kcfs or sufficient turbines units are operating that all five bypass bays are open.

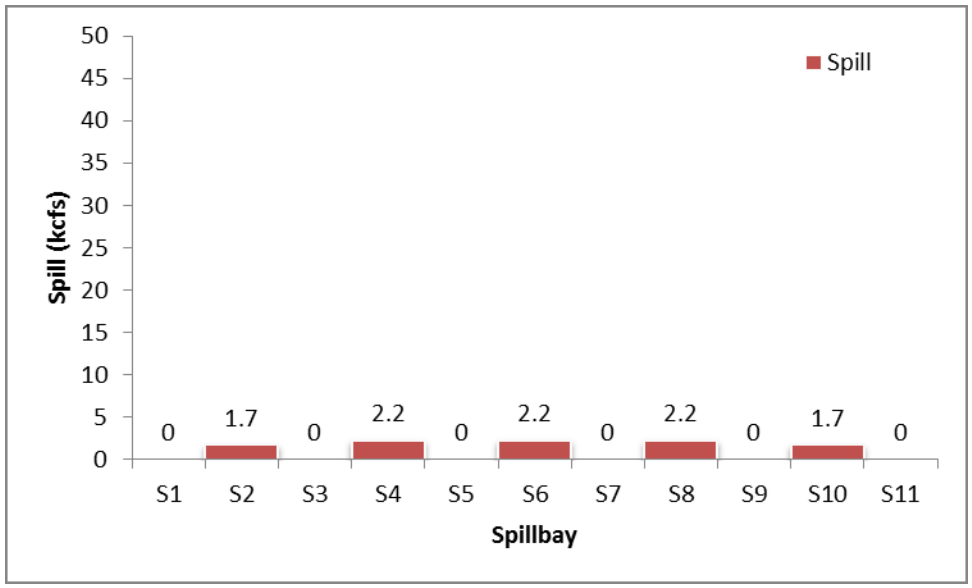

Figure 1. Operational configuration under no forced spill (JBS only).

II. Total Spill ≤ 53.0 kcfs, JBS Barriers in Place

As forced spill increases, Project Operators should allocate all spill through *S5* until the maximum capacity is reached through that spillbay (~43.0 kcfs). Note that *S5* spill requires support of generation flows from turbine units 4 and 5 to minimize total dissolved gas (TDG) production. This, along with the already established JBS spill (10.0 kcfs) would equal 53.0 kcfs (Figure 2). Over 90% of the spill events over the past decade could have been handled under this configuration.

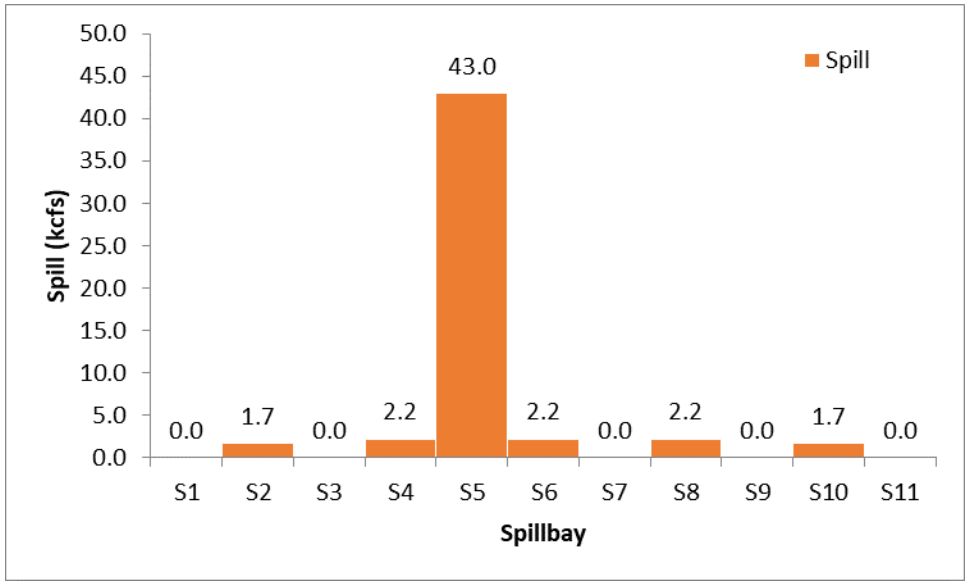

Figure 2. Operational configuration under spill ≤ 53.0 kcfs (including JBS).

III. JBS Barrier Removal Criteria

When either of the following occurs, remove the JBS barriers in *S6*:

Spill in *S5* reaches 30 kcfs and total spill is expected to exceed 40 kcfs for more than 8 hours, *or* total spill is expected to exceed 53 kcfs. After the JBS barriers are removed from *S6*, shift a minimum of 15 kcfs through *S6* (Figure 3) at all times until the JBS barriers are reinstalled (see IV and IX, below). It is best to have generating units 4, 5, and 6 operating to support this spill configuration. After at least 15 kcfs is being spilled through *S6*, additional spill can be allocated to *S5* up to and until 43.0 kcfs is reached. The 15 kcfs minimum spill through *S6* is necessary to provide attraction of fish away from generating units 5 and 6 and to maintain sufficient spillway flow to engage the spillway lip below the ogee which significantly attenuates TDG in the tailrace. The removal of the JBS barriers from *S6* reduces the flow net in the forebay that attracts fish away from generating units 5 and 6 to safely pass via *S6*. Increased flow through *S6* is necessary to restore the strength of that flow net.

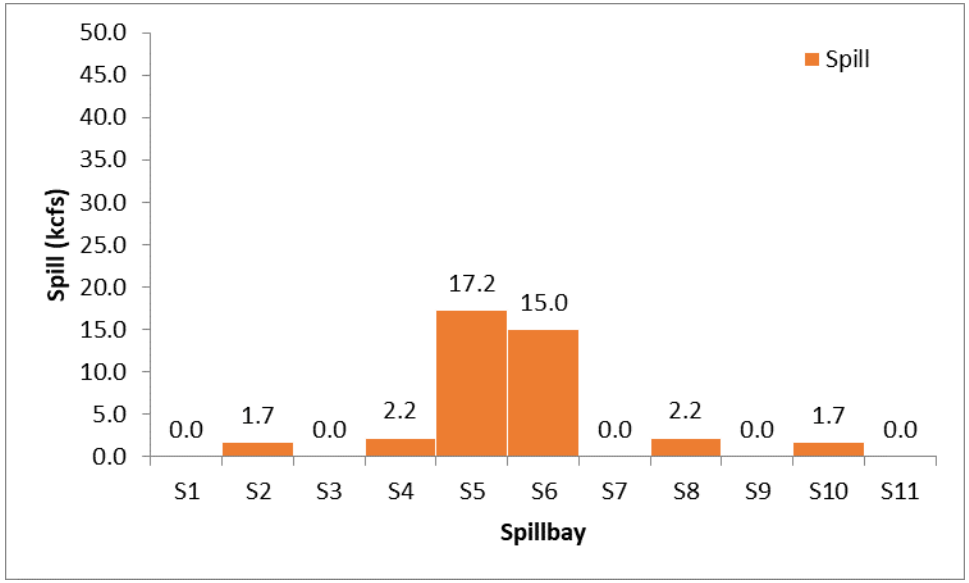

Figure 3. Operational configuration once spill reaches 30 kcfs in *S5* and is expected to be above 40 kcfs for more than 8 hours (JBS removed from *S6*). Shift sufficient spill from *S5* to maintain a minimum of 15 kcfs spill at *S6*.

IV. Short Duration Decreases in Forced Spill (<53.0 kcfs) and JBS Barriers in *S6* Removed

If after removal of JBS barriers in *S6*, total spill drops below 53 kcfs (between 10-53 kcfs), and is expected to stay in this range for only a short period (4 days or less), direct spill through *S6* up to 15 kcfs (total spill < 22.9 kcfs). When total spill exceeds 22.8 kcfs, direct the remainder of spill through *S5*.

V. Forced Spill (> 53.0 kcfs) and JBS Barriers in *S6* Removed

After *S5* reaches 43.0 kcfs, additional spill should be allocated to *S6* (*S6* is already spilling at least 15.0 kcfs). As flow increases, spill should continually increase through *S6* until paired with *S5* (e.g., 43.0 kcfs through *S5* and 26.0 kcfs through *S6*) (Figure 4). Eventually, *S6* will reach 43.0 kcfs (93.8 kcfs, Figure 5).

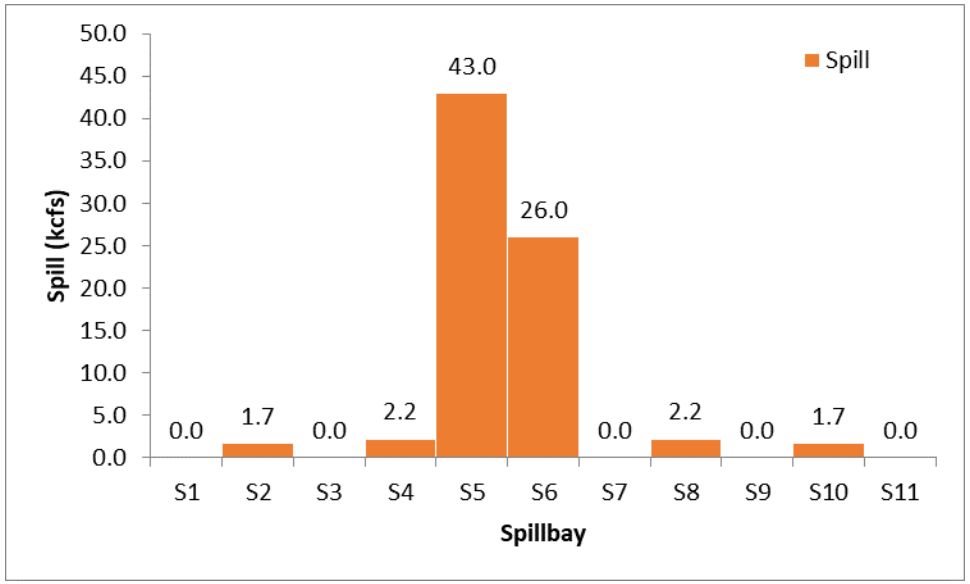

Figure 4. Operational configuration under forced spill > 53.0 kcfs (including JBS flow, with removal of JBS barriers in *S6*). In this instance spill has reached the 43.0 kcfs maximum in *S5* and additional spill is being allocated to *S6* (26.0 kcfs).

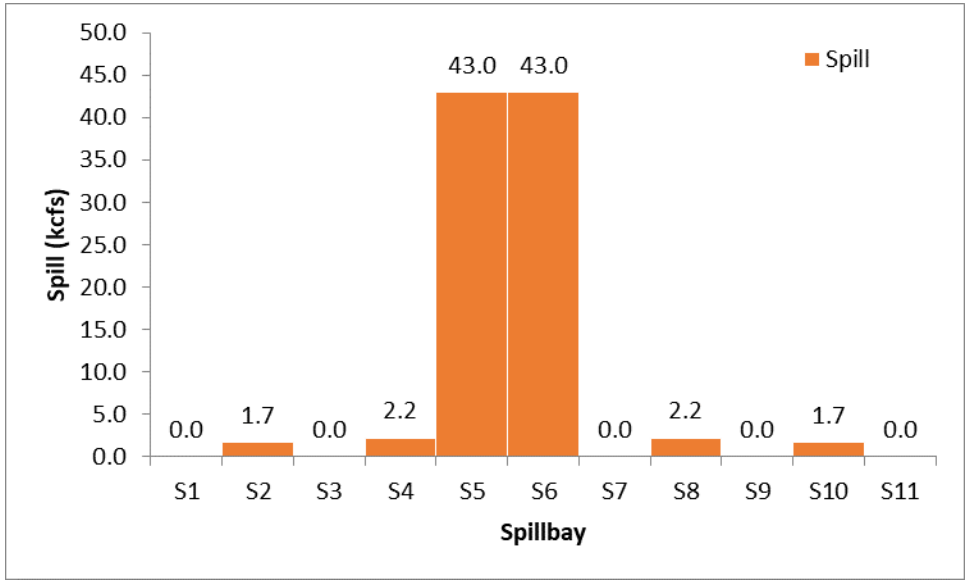

Figure 5. Operational configuration under forced spill > 53.0 kcfs (including JBS). In this instance (93.8 kcfs of spill), *S6* has been fully allocated and 43.0 kcfs is now allocated through both *S5* and *S6*.

VI. Forced Spill (> 93.8 kcfs) and JBS Barriers in *S6* Removed

After both *S5* and *S6* reach 43.0 kcfs, spill can also be allocated to *S4* (after removing the flow barriers). Since a minimum of 15.0 kcfs is needed to fully engage the submerged spillway lip below the ogee, some spill through *S5* should be relocated to *S4* (Figure 6). As flow increases, spill can be continually increased through *S4* until paired with *S5* (30.0 kcfs through *S5* and *S4*, while *S6* continues at 43.0 kcfs). After this point, both *S4* and *S5* can be increased until all three spillways have reached 43.0 kcfs (136.8 kcfs of spill, Figure 7).

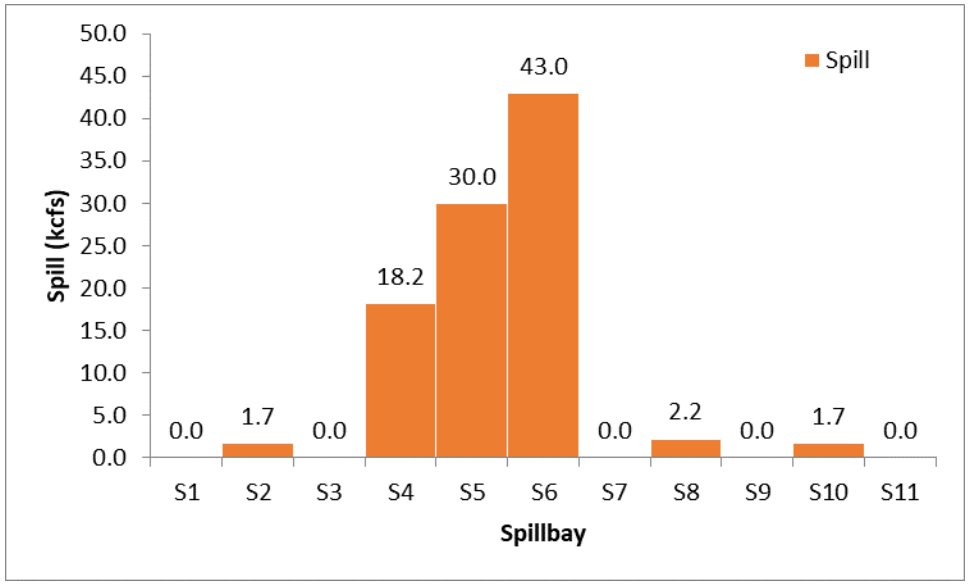

Figure 6. Operational configuration under forced spill > 96.0 kcfs. In this example (96.8 kcfs of total spill), spill from *S5* is relocated to *S4* to maintain concentrated flow and a minimum of 15 kcfs per spillway to engage the submerged spillway lip.

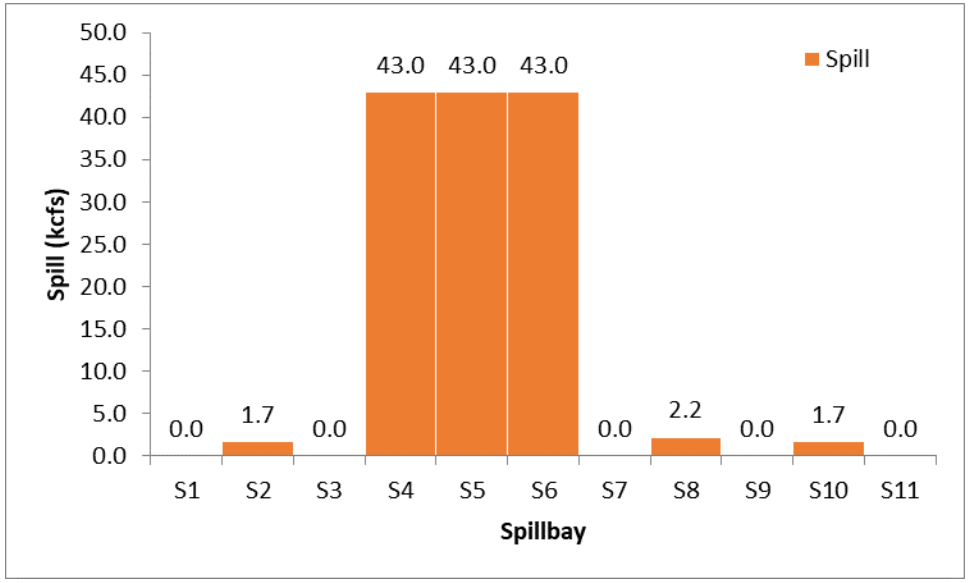

Figure 7. Operational configuration under forced spill > 96.0 kcfs (with removal of JBS barriers in *S6*). In this instance (134.6 kcfs of total spill), 43.0 kcfs is allocated through *S4*, *S5*, and *S6*.

VII. Forced Spill (> 136.8 kcfs)

Forced spill exceeding 136.8 kcfs rarely occurs (less than 0.5%). If these conditions arise and total river flow exceeds 246.0 kcfs, then 7Q-10 conditions are occurring and Wells Dam is exempt from the TDG standards. Under this situation, Project Operators may perform any combination of operations to ensure that flood waters are safely passed. Additionally, with a discharge forecast (Chief Joseph Dam discharge plus Okanogan and Methow rivers discharge) of greater than or equal to 240 kcfs, the JBS barriers will be removed from *S4* to fulfill the requirements of the FERC-approved Wells Emergency Action Plan for the availability of automatic gate-hoist capacity (see Table 1 of Appendix 2). Also, at this point, other JBS barriers will likely be removed allowing additional flexibility to spill up to 43 kcfs each through *S2*, *S4*, *S6*, and *S8*. Project Operators may pass spill through *S9* in a similar fashion to operations mentioned above (starting at a minimum of 15.0 kcfs to ensure that spillway lips are engaged).

VIII. JBS Re-Installment Criteria

Once spills of less than 40.0 kcfs are predicted for at least four days, JBS barriers should be re-installed in *S6*.

IX. Spill Lookup Table

Operation	Total Spill	Spillway Number										
		S1 -	*S2* JBS	*S3*	*S4* JBS	*S5*	*S6* JBS	*S7*	*S8* JBS	*S9*	*S10* JBS	*S11* -
I. No Forced Spill	10.0	0.0	1.7	0.0	2.2	0	2.2	0	2.2	0.0	1.7	0.0
II. Spill (≤ 53.0 kcfs), min.	11.0	0.0	1.7	0.0	2.2	1.0	2.2	0.0	2.2	0.0	1.7	0.0
II. Spill (≤ 53.0 kcfs), max.	53.0	0.0	1.7	0.0	2.2	43.0	2.2	0.0	2.2	0.0	1.7	0.0
III. Spill (> 53.0 kcfs, *S6* JBS out), min.	54.0	0.0	1.7	0.0	2.2	31.2	15.0	0.0	2.2	0.0	1.7	0.0
III. Spill (> 53.0 kcfs, *S6* JBS out), max.	93.8	0.0	1.7	0.0	2.2	43.0	43.0	0.0	2.2	0.0	1.7	0.0
IV. Spill (> 93.8 kcfs, *S6* JBS out), min.	96.8	0.0	1.7	0.0	18.2	30.0	43.0	0.0	2.2	0.0	1.7	0.0
IV. Spill (> 93.8 kcfs, *S6* JBS out), max.	134.6	0.0	1.7	0.0	43.0	43.0	43.0	0.0	2.2	0.0	1.7	0.0
V. Spill (>137.0 kcfs), min.	137.0	0.0	1.7	0.0	28.2	43.0	43.0	0.0	2.2	17.2	1.7	0.0
V. Total Flow (>246 kcfs), max.	-	*Operators may adjust as needed.* *TDG exemption in place when total river flows exceed 246.0 kcfs.*										

Notes: (1) No spill through *S1* and *S11* as to minimize interference with fish ladders. (2) Even-numbered spillways are designated as the Juvenile Bypass System (JBS). (3) Primary spillways for forced spill are *S6*, *S5*, *S4*, *S9*, and *S3*.

Appendix 2 Wells Bypass Operating Plan

Wells Hydroelectric Project

2021 Juvenile Fish Bypass Operating Plan

Approved February 23, 2021

Operation of the Wells Dam juvenile bypass system throughout the 2021 season will follow the criteria contained within the Wells Dam Juvenile Dam Passage Survival Plan found in Section 4.3 of the Wells Habitat Conservation Plan (HCP), which specifies a goal of providing bypass operations for at least 95 percent of both the spring and summer migrations of juvenile Plan Species.

Annual analyses of bypass performance indicate that the dates of bypass operations at Wells Dam provide bypass passage during 98 to 100 percent of the migrations of all Plan Species, exceeding the 95 percent bypass-passage criteria of the HCP. Indeed, analysis of the last nine years of run-timing data between 2012 and 2020 (Skalski and Townsend 2020) show that the bypass period ran 10-35 days longer than necessary to provide compliance with HCP bypass-passage criteria. Based upon this high level of compliance with the HCP bypass operating criteria, Public Utility District No. 1 of Douglas County (Douglas PUD) proposes to commence operation of the bypass system in 2021 starting at 00:00 on April 9, and to end operations at 24:00 hours on August 9.

Dam safety emergency action planning, as required by the Federal Energy Regulatory Commission (FERC), calls for Douglas PUD to operate Wells Dam with sufficient automatic-gate-opening capacity in the spillways to pass the flow from a plant load-rejection of up to 200 thousand cubic feet per second (kcfs), in addition to any concurrent initial spillway discharge. Of the 11 spillways at Wells Dam, only Spillways 3 through 9 have automated gate hoists. Thus, the seasonal installation of bypass barriers in Spillways 2, 4, 6, 8 and 10, substantially reduces the automatic-gate-opening capacity of Wells Dam by reducing the capacity of each bypass spillway to 8.6 kcfs. Consequently, Douglas PUD must remove bypass barriers systematically when discharge-volume estimates exceed certain thresholds, as per Table 1, sufficient to provide the necessary automatic-gate-opening flow capacity as described in Appendix I of the FERC-required Emergency Action Plan for the Wells Project. Douglas PUD will make decisions to remove bypass barriers for dam-safety considerations each Monday (or at other times as necessary) during the bypass period based on forecasts of combined discharge from Chief Joseph Dam and side-flows from the Okanogan and Methow rivers (from the National Weather Service Northwest River Forecast Center [NWRFC]).

Table 1. Schedule for removal of spillway flow-barriers (bypass barriers) to accommodate flood flows and load rejections.

Inflow Forecast (kcfs)	Bypass Barriers Removed
Up to 200	None
200 – 240	Spillway 6
240 – 275	Spillways 6, 4
275 – 310	Spillways 4, 6, 8
310 – 350	Spillways 4, 6, 8, 10, & preset gates 10, 11 to spill excess of 312 kcfs
350 – 400	Spillways 4, 6, 8,10, & preset gates 1, 10, 11 to spill excess of 312 kcfs
400 – 450	All Spillways (2, 4, 6, 8, 10)

Juvenile Fish Bypass Operations and Clean Water Act TDG Compliance

Seasonal bypass operations generally coincide with the spring freshet, an event during which operators of hydroelectric projects must cope with flows that often exceed the hydraulic capacity of their generators. During such events, project operators must pass water via the spillways as "involuntary spill," which increases the concentration of atmospheric gases in the water below hydroelectric projects, and can result in levels of total dissolved gas (TDG) that may injure fish. To minimize the potential for fish injury, the Washington Department of Ecology (Ecology) imposes TDG standards on operators of hydroelectric projects.

Extensive modeling and study of spill operations at Wells Dam provide the basis for the development of annual "spill playbooks" for dam operations aimed at achieving the Ecology standards for TDG. These spill playbooks prescribe spill-gate configurations to implement under various flow scenarios. From modeling and physical-spill studies, Douglas PUD determined that concentrating spill through the middle of the spillway and on top of turbine discharge results in the most effective minimization of TDG. The best TDG performance is achieved when concentrating involuntary spill through Spillway 7, and allocating additional spill, beyond the capacity of Spillway 7, to Spillways 6 and then 5, up to a maximum of 43 kcfs per spillway. Mechanical problems with the gates on Spillway 7 eliminate it from the suite of options for the at least the first part of the 2021 bypass season. Therefore, until the completion of repairs to the gates on Spillway 7, the spill pattern will shift to preferentially utilize Spillway 5, instead of Spillway 7.

To accomplish this TDG-minimizing pattern of concentrated spill requires the removal of the bypass barriers from at least one spillway during periods of excessive involuntary spill. The removal of the bypass barriers from one spillway takes approximately eight hours and requires the use of a four-man mechanical crew and the gantry cranes. To comply with the TDG standards below Wells, the bypass barriers must be removed from at least one spillway whenever involuntary spill exceeds 30 kcfs and one or both of the following conditions applies: 1) prolonged (> 8 hours) involuntary spill in excess of 40 kcfs is predicted (based on forecasted tributary inflows from the NWRFC and estimated discharge from Chief Joseph Dam provided by the US Army Corps of Engineers); or 2) total spill is predicted to exceed 53 kcfs, regardless of duration. Once involuntary spill of less than 40 kcfs, for a period of at least four days is predicted, the respective bypass barriers would be reinstalled. At river flows greater than 240 kcfs, bypass barriers would be removed from additional bypass bays as described above (see Table 1) and reinstalled sequentially as appropriate.

Juvenile Fish Bypass Contingency Plan

Following the failure of a gate-hoist cable in a bypass spillway at Wells Dam in late August 2010, Douglas PUD developed a contingency plan for bypass operations during an accident or unanticipated mechanical failure that would preclude normal bypass operations. High river discharge in 2011 and 2012 led to the incorporation of provisions for the management of TDG into the Bypass Contingency Plans in 2013. The 2021 Bypass Contingency Plan continues those provisions, as described below.

Section 4.3 of the Wells HCP directs Douglas PUD to shut down the turbine units adjacent to a bypass spillway that is not operating due to either low flow or an inability to operate the bypass spillway. Under the 2021 Bypass Contingency Plan, if shutting down the turbines would not threaten compliance with TDG standards, Douglas PUD would shut down the associated turbine units. However, if doing so would threaten compliance with TDG standards, Douglas PUD would not shut down the associated turbines but would instead direct spill through spillways adjacent to the affected turbine units in a manner that provides bulk flow for fish passage while minimizing TDG (Figure 1, Option 1). Douglas PUD would consult the Spill Playbook (see Appendix 1 of the Gas Abatement Plan, above) to select such spill configurations, and would spill at least 15 kcfs through each selected spillway to engage the submerged flip-lip as a TDG minimization measure and to provide bulk flow for fish attraction to the surface passage route. In circumstances where turbine shutdown would not jeopardize TDG compliance, Douglas PUD would shut down the associated turbine units to evaluate and repair the malfunction, but may then elect to move the bypass barriers from the inoperable bypass spillway to an adjacent, non-bypass spillway to obtain the use of an additional turbine unit (see Figure 1, options 2 and 3). The gate for that substitute bypass spillway would then be set at the standard one-foot opening for bypass spillways and the adjacent turbine unit(s) could be operated without constraints. This configuration would meet the intent of HCP Section 4.3 by providing bypass spill immediately adjacent to every operating turbine unit and would comply with the goal of the 2021 Gas Abatement Plan.

During the repair of a bypass malfunction, Douglas PUD would daily reevaluate forecasts of Chief Joseph Dam discharge, tributary inflows, and TDG conditions, as well as repair progress, and determine which bypass option to implement as per Figure 1.

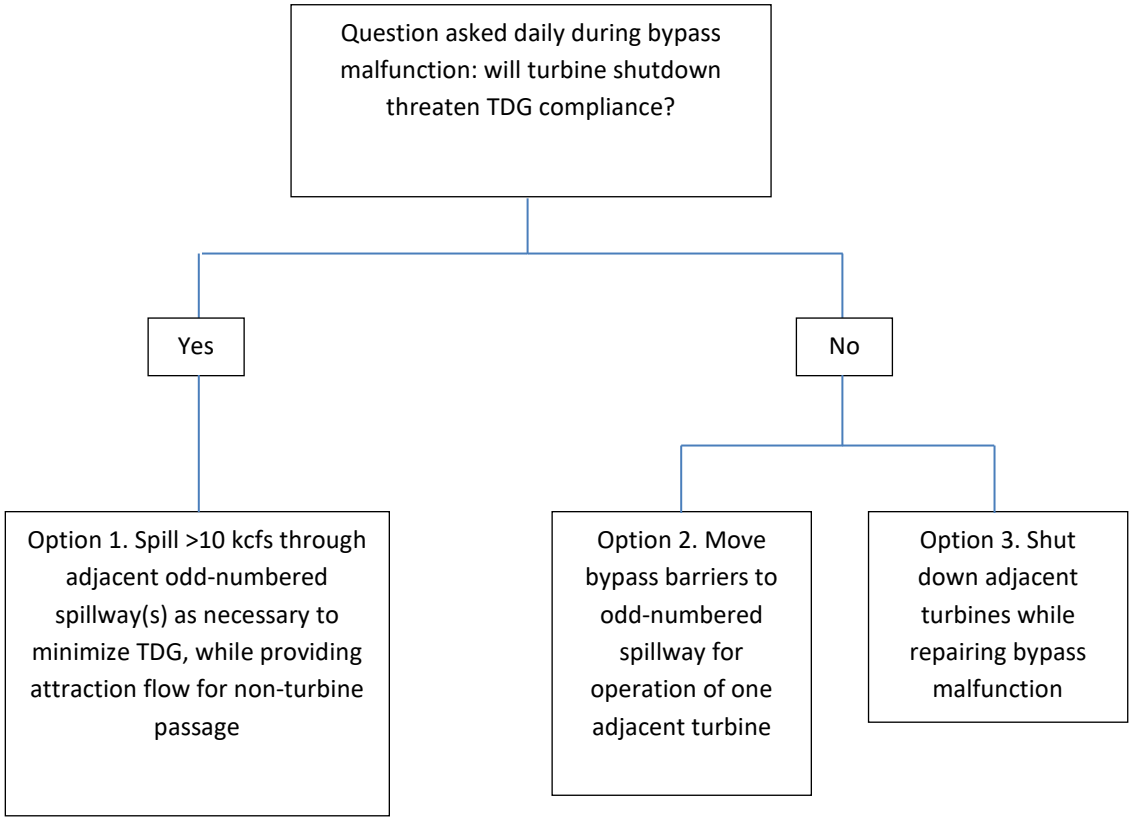

Figure 1. Evaluation flow chart for daily decisions regarding bypass, spill, and turbine operations during a bypass malfunction.

References:

Skalski, J.R., and R.L. Townsend. 2020. Analysis of Proportion of Outmigration Affected by Bypass Operations at Wells Dam in 2020. Douglas County Public Utility District. East Wenatchee, WA.

APPENDIX B

HCP COORDINATING COMMITTEE PRE-FILING CONSULTATION RECORD FOR THE 2021 GAS ABATEMENT PLAN AND BYPASS OPERATING PLAN

NOTICE TO HCP COORDINATING COMMITTEE TO REVIEW THE 2021 GAS ABATEMENT PLAN AND BYPASS OPERATING PLAN

From: Kristi Geris <kgeris@anchorqea.com>
Sent: Friday, January 8, 2021 11:52 AM
To: Jackson, Chad S (DFW); Jim Craig (jim_l_craig@fws.gov); John Ferguson; Keely Murdoch (murk@yakamafish-nsn.gov); Keller, Lance; Kirk Truscott; Kristi Geris; Scott Carlon; Tom Kahler
Cc: Towey, Bill <bill.towey@chelanpud.org>; Andrew Gingerich; Shane Bickford
Subject: FW: Draft GAP/BOP for CC review and draft SOA for adjusting bypass dates
Attachments: 2021_01_08 Douglas - Draft 2021 Wells Dam GAP and BOP for CC and Aquatic SWG Review.doc; 2021_01_08 Dougas - Draft SOA for Adjustment of Dates of Bypass Operations at Wells Draft.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Hi HCP-CC Reps: please see the email below from Tom and the attached—

- Draft 2021 GAP/BOP, available for a 30-day review with edits and comments due to Tom by Mon 2/8
- Draft SOA, for discussion and decision at the CC 1/26 conference call

The attached draft plan and draft SOA are also available for download from the HCP Coordinating Committees Extranet site under: Draft Documents > All by Mtg Date > 1/26/2021 (instructions below). Thanks! –kristi ☺

Instructions:

To gain access to the HCP Coordinating Committees Extranet Homepage, please use the following procedure:

* Visit: https://extranet.dcpud.net/sites/nr/hcpcc/
* Login using “Forms Authentication” (for non-Douglas PUD employees)

You should now be at the HCP CC homepage.

If you encounter problems, or need a login username and password to access the site:
Please feel free to contact me or Julene McGregor [jmcgregor@dcpud.org; (509) 881-2236] and we will gladly assist you with questions or issues.

Kristi Geris

ANCHOR QEA, LLC
kgeris@anchorqea.com
C 360.220.3988

From: Tom Kahler <tomk@dcpud.org>
Sent: Friday, January 8, 2021 11:14
To: Kristi Geris <kgeris@anchorqea.com>
Cc: Andrew Gingerich <andrewg@dcpud.org>; John Ferguson <jferguson@anchorqea.com>; Shane Bickford <ShaneB@dcpud.org>
Subject: Draft GAP/BOP for CC review and draft SOA for adjusting bypass dates

CAUTION – EXTERNAL EMAIL: This email originated from outside of Anchor QEA. Please exercise caution with links and attachments.

Hi Kristi,

Please distribute this draft GAP/BOP to the CC to kick off a 30-day review. Also, please distribute the draft SOA for discussion and decision at the CC meeting on January 26.

Thanks, and have a great weekend!

Tom Kahler
Fisheries Biologist
PUD No. 1 of Douglas County
East Wenatchee, WA 98802
509-881-2322 Work
509-679-1232 Cell

ACTION ITEMS FROM THE HCP COORDINATING COMMITTEE MEETING SHOWING APPROVAL OF THE 2021 GAS ABATEMENT PLAN AND BYPASS OPERATING PLAN

Document Accession #: 20210224-5173 Filed Date: 02/24/2021

FINAL

1201 3rd Avenue, Suite 2600
Seattle, Washington 98101
206.287.9130

ANCHOR QEA

Memorandum

To: Wells, Rocky Reach, and Rock Island HCP Coordinating Committees

Date: February 23, 2021

From: John Ferguson, HCP Coordinating Committees Chairman

cc: Kristi Geris

Re: Final Action Items of the February 23, 2021 HCP Coordinating Committees Conference Call

[redacted] Attendees are listed in Attachment A to this memorandum.

Action Item Summary

- Chelan PUD will continue providing Rocky Reach Dam and Rock Island Dam turbine unit maintenance updates as information becomes available (Item I-C).
- Chelan PUD and the Colville Confederated Tribes (CCT) will further discuss the protocols for selecting study fish for the 2021 Rock Island Dam Survival Confirmation Study, specifically regarding rejecting fish based on fish condition, and will report back to the HCP Coordinating Committees about what was discussed (Item III-B).
- Chelan PUD will distribute the draft *2021 Rock Island Confirmation Survival Study Tagging and Fish Husbandry QAQC Plan* (*Tagging and Fish Husbandry QAQC Plan*) for Rock Island HCP Coordinating Committee review and will include notes about which components of the draft plan are still under internal revision (Item III-B).
- Chelan PUD will review field logs from previous Rock Island Dam Survival Studies to try to determine the number of fish rejected as potential study fish based on fish condition and the criteria used in making these determinations (Item III-B).
- Chelan PUD will provide the schedule for when power outages for the left fish ladder (5- to 10-minute duration) and center fish ladder (4- to 8-hour duration) at Rock Island Dam will occur to install new power and fiber optic conduit, when the schedules are available; and will provide a summary of the actual power outages once the installation is complete (Item III-I).
- Chelan PUD will provide the repair schedule for the crack at spillway pier 1 at Rock Island Dam when the schedule is available (Item III-I).
- Anchor QEA, LLC (Anchor QEA) will add discussion of the Fish Passage Center (FPC) memorandum, *Eliminating Rock Island from the regional Smolt Monitoring Program*, to the agenda for the HCP Coordinating Committees conference call on June 22, 2021; and HCP

Coordinating Committees representatives will contact Chelan PUD if they would like to discuss the memorandum sooner (Item III-J). *(Note: Kristi Geris added this topic to the HCP Coordinating Committees June 22, 2021 conference call agenda, as discussed.)*

- Anchor QEA will coordinate to add Andrew Gingerich (Douglas PUD Natural Resources Supervisor) to the HCP Hatchery Committees email distribution list (Item IV-E). *(Note: Kristi Geris notified Tracy Hillman, Larissa Rohrbach, and Sarah Montgomery to add Gingerich to this list, as discussed.)*
- Chelan PUD, Douglas PUD, and Anchor QEA will discuss possible adjustments to the timing of review and approval of HCP documents for implementation in 2022 (Item VI-B). *(Note: these discussions are underway and will be further discussed during the HCP Coordinating Committees conference call on March 23, 2021.)*
- The HCP Coordinating Committees meeting on March 23, 2021, will be held at 9:00 a.m., by conference call (Item VI-D).

Decision Summary

- Rocky Reach and Rock Island HCP Coordinating Committees representatives present approved the *2021 Rocky Reach and Rock Island HCP Action Plan* (Item III-C).
- Wells HCP Coordinating Committee representatives present approved the *2021 Wells HCP Action Plan* (Item IV-A).
- [redacted]

Agreements

- There were no HCP Agreements discussed during today's conference call.

Review Items

- The draft *Study Plan to Measure Yearling Chinook Survival through the Rock Island Hydroelectric Project in 2021* (2021 Rock Island Dam Survival Confirmation Study Plan) was distributed to the Rock Island HCP Coordinating Committee by Kristi Geris on January 21, 2021. Chelan PUD will request approval of this plan during the HCP Coordinating Committees conference call on March 23, 2021 (Item III-A).
- The draft *Statistical Plan for the 2021 Yearling Chinook Salmon Survival Study at Rock Island Dam* was distributed to the Rock Island HCP Coordinating Committee by Geris on January 25, 2021. Chelan PUD will request approval of this plan during the HCP Coordinating Committees conference call on March 23, 2021 (Item III-A).

- The draft 2020 Wells HCP Annual Report was distributed to the Wells HCP Coordinating Committee by Kristi Geris on February 5, 2021, and is available for a 30-day review with edits and comments due to Geris by March 5, 2021.
- The draft *2018 Public Utility District No. 1 of Douglas County Northern Pikeminnow Removal and Research Program* was distributed to the Wells HCP Coordinating Committee by Kristi Geris on February 12, 2021, and is available for a 30-day review with edits and comments due to Tom Kahler by March 12, 2021 (Item IV-C).
- The draft *2019 Public Utility District No. 1 of Douglas County Northern Pikeminnow Removal and Research Program* was distributed to the Wells HCP Coordinating Committee by Kristi Geris on February 12, 2021, and is available for a 30-day review with edits and comments due to Tom Kahler by March 12, 2021 (Item IV-C).
- The *Northern Pikeminnow Predator Control Program Rocky Reach and Rock Island Hydroelectric Projects Draft Summary Report 2019* (2019 Northern Pikeminnow Annual Report) was distributed to the Rocky Reach and Rock Island HCP Coordinating Committees by Kristi Geris on February 16, 2021, and is available for a 30-day review with edits and comments due to Lance Keller by March 16, 2021 (Item III-D).
- The *Northern Pikeminnow Predator Control Program Rocky Reach and Rock Island Hydroelectric Projects Draft Summary Report 2020* (2020 Northern Pikeminnow Annual Report) was distributed to the Rocky Reach and Rock Island HCP Coordinating Committees by Kristi Geris on February 16, 2021, and is available for a 30-day review with edits and comments due to Lance Keller by March 16, 2021 (Item III-D).
- The *2020 Rock Island Dam Smolt Monitoring Program and Gas Bubble Trauma Evaluation Draft Report* (2020 Rock Island Smolt and Gas Bubble Trauma Evaluation Report) was distributed to the Rocky Reach and Rock Island HCP Coordinating Committees by Kristi Geris on February 16, 2021, and is available for a 30-day review with edits and comments due to Lance Keller by March 16, 2021 (Item III-E).
- The *2020 Biological Evaluation of the Rocky Reach Juvenile Fish Bypass System Draft Report* (2020 Rocky Reach Juvenile Fish Bypass System Report) was distributed to the Rocky Reach and Rock Island HCP Coordinating Committees by Kristi Geris on February 16, 2021, and is available for a 30-day review with edits and comments due to Lance Keller by March 16, 2021 (Item III-E).
- The draft 2020 Rock Island HCP Annual Report and draft 2020 Rocky Reach HCP Annual Report were distributed to the Rock Island and Rocky Reach HCP Coordinating Committees by Kristi Geris on February 17, 2021, and are available for a 30-day review with edits and comments due to Geris by March 18, 2021.
- The draft *Rock Island Dam Smolt Monitoring and Gas Bubble Trauma Evaluation Plan 2021* (2021 Rock Island Bypass Monitoring Plan) was distributed to the Rock Island HCP

Coordinating Committee by Kristi Geris on February 19, 2021, and is available for a 30-day review with edits and comments due to Lance Keller by March 19, 2021 (Item III-E).

- The draft *2021 Rocky Reach Juvenile Fish Bypass System Operations Plan* was distributed to the Rocky Reach HCP Coordinating Committee by Kristi Geris on February 19, 2021, and is available for a 30-day review with edits and comments due to Lance Keller by March 19, 2021 (Item III-E).
- The draft *2021 Fish Spill Plan, Rock Island and Rocky Reach Dams Public Utility District No. 1 of Chelan County* (2021 Rock Island and Rocky Reach Fish Spill Plan) was distributed to the Rock Island and Rocky Reach HCP Coordinating Committees by Kristi Geris on February 23, 2021, and is available for a 30-day review with edits and comments due to Lance Keller by March 23, 2021 (Item III-F).
- The FPC memorandum, *Eliminating Rock Island from the regional Smolt Monitoring Program*, was distributed to the HCP Coordinating Committees by Kristi Geris on February 23, 2021. Chelan PUD will further discuss this memorandum during the HCP Coordinating Committees conference call on June 22, 2021 (Item III-J).

Finalized Documents

- The final *2021 Wells HCP Action Plan* was distributed to the Wells HCP Coordinating Committee by Kristi Geris following the HCP Coordinating Committees conference call on February 23, 2021 (Item IV-A).

Attachment A
List of Attendees

Name	Organization
John Ferguson	Anchor QEA, LLC
Kristi Geris	Anchor QEA, LLC
Tracy Hillman†	BioAnalysts
Lance Keller*	Chelan PUD
Tom Kahler*	Douglas PUD
Andrew Gingerich*	Douglas PUD
Scott Carlon*	National Marine Fisheries Service
Jim Craig*	U.S. Fish and Wildlife Service
Chad Jackson*	Washington Department of Fish and Wildlife
Kirk Truscott*	Colville Confederated Tribes
Keely Murdoch*	Yakama Nation

Notes:

* Denotes HCP Coordinating Committees member or alternate

† Joined for the HCP Hatchery and Tributary Committees Update

APPENDIX C

AQUATIC SETTLEMENT WORK GROUP PRE-FILING CONSULTATION RECORD FOR THE 2021 GAS ABATEMENT PLAN AND BYPASS OPERATING PLAN

NOTICE TO AQUATIC SETTLEMENT WORK GROUP TO REVIEW THE 2021 GAS ABATEMENT PLAN AND BYPASS OPERATING PLAN

From: Kristi Geris <kgeris@anchorqea.com>
Sent: Friday, January 8, 2021 11:57 AM
To: Andrew Gingerich; Chas Kyger; Donella Miller (mild@yakamafish-nsn.gov); Jason McLellan; John Ferguson; Kristi Geris; Laura.Heironimus@dfw.wa.gov; Mark Peterschmidt (mape461@ecy.wa.gov); Patrick Verhey (Patrick.Verhey@dfw.wa.gov); Ralph Lampman (lamr@yakamafish-nsn.gov); Sean Goudy (gous@yakamafish-nsn.gov); 'Steve Lewis'; Zimmerman, Breean (ECY)
Cc: Tom Kahler; Shane Bickford
Subject: FW: 2021 Gas Abatement Plan, Spill Playbook and Bypass Operating Plan
Attachments: 2021_01_08 Douglas - Draft 2021 Wells Dam GAP and BOP for CC and Aquatic SWG Review.doc

Follow Up Flag: Follow up
Flag Status: Flagged

Hi ASWG Reps: please see the email below from Andrew and the attached Draft 2021 GAP/BOP, which is available for a 30-day review with edits and comments due to Andrew by **Monday, February 8, 2021**, and decision during the ASWG 2/11 conference call.

The attached draft plan is also available for download from the Aquatic SWG Extranet Site, under: Documents > All by Mtg Date > 1/13/2021 (instructions below). Thanks! –Kristi 😊

Instructions:

To gain access to the Aquatic SWG Extranet Homepage, please use the following procedure:

* Visit: https://extranet.dcpud.net/sites/nr/aswg/
* Login using "Forms Authentication" (for non-Douglas PUD employees)

You should now be at the Aquatic SWG homepage.

If you encounter problems, or need a login username and password to access the site:
Please feel free to contact me, Andrew Gingerich, or Julene McGregor [jmcgregor@dcpud.org; (509) 881-2236] and we will gladly assist you with questions or issues.

Kristi Geris

ANCHOR QEA, LLC
kgeris@anchorqea.com
C 360.220.3988

From: Andrew Gingerich <andrewg@dcpud.org>
Sent: Friday, January 8, 2021 11:52
To: Kristi Geris <kgeris@anchorqea.com>
Subject: 2021 Gas Abatement Plan, Spill Playbook and Bypass Operating Plan

CAUTION – EXTERNAL EMAIL: This email originated from outside of Anchor QEA. Please exercise caution with links and attachments.

Kristi, please find attached Douglas PUD's 2021 Gas Abatement Plan, Spill Playbook and Bypass Operating Plan. Every year at this time we provide this package to the Aquatic SWG. Our Section 401 Water Quality Certification as issued by

the Washington Department of Ecology requires these documents be vetted together with coordination with the Wells HCP Coordinating Committee. As such, they are subject to concurrent review with that committee.

It would be much appreciated if Aquatic SWG membership could provide comments to this document on or before the 8th of February 2021, towards approving this package by the Feb. 11th, 2021 Aquatic SWG call.

As per usual, please let me know if there are questions.

Thanks.

Andrew Gingerich
Senior Aquatic Resource Biologist
Douglas County Public Utility District
1151 Valley Mall Parkway
East Wenatchee, WA 98802
andrewg@dcpud.org
https://www.linkedin.com/in/andrewjgingerich/
O: (509) 881-2323

FINAL AQUATIC SETTLEMENT WORK GROUP ACTION ITEMS SHOWING APPROVAL OF THE 2021 GAS ABATEMENT PLAN AND BYPASS OPERATING PLAN

Document Accession #: 20210224-5173 Filed Date: 02/24/2021

FINAL

Conference Call Action Items

Aquatic Settlement Work Group

To: Aquatic SWG Parties

Date: February 12, 2021

From: John Ferguson, Chair (Anchor QEA, LLC)

Re: Final Action Items of the February 10, 2021 Aquatic SWG Conference Call

[redacted]

Attendees are listed in Attachment A. These action items include the following:

I. Summary of Action Items

1. Douglas PUD will distribute the dimensions (width and thickness) of the metal plating installed to minimize gaps throughout the Wells Dam fishways (Item VI-7).
2. Aquatic SWG members will review the presentation titled, *Summary of Douglas PUD Adult Lamprey Passage Studies 2007-2020*, in preparation to further discuss next steps during the Aquatic SWG conference call on March 10, 2021 (Item VI-9).
3. The Aquatic SWG meeting on March 10, 2021, will be held by conference call (Item VII-1).

II. Summary of Decisions

1. Aquatic SWG members present approved the study plan, *Bull Trout Passage and Take Monitoring at Wells Dam and Twisp River Weir* (2021–2022 Bull Trout Radio Telemetry Study Plan), as revised (Item VI-3).
2. Aquatic SWG members present approved the report, *2020 Annual Report Total Dissolved Gas Abatement Plan* (2020 TDG/GAP Annual Report) (Item VI-4).
3. [redacted]
4. Aquatic SWG members present approved the *2021 Aquatic Settlement Agreement and Workgroup Action Plan* (2021 ASA Action Plan), as revised (Item VI-5).

III. Agreements

1. There were no agreements discussed during today's conference call.

Document Accession #: 20210224-5173 Filed Date: 02/24/2021

FINAL

IV. Review Items

1. The presentation titled, *Summary of Douglas PUD Adult Lamprey Passage Studies 2007-2020*, was distributed to the Aquatic SWG by Kristi Geris on February 10, 2021, and is available for review in preparation for further discussion during the Aquatic SWG conference call on March 10, 2021 (Item VI-9).

V. Documents Finalized

1. The final 2021–2022 Bull Trout Radio Telemetry Study Plan, as revised, was distributed to the Aquatic SWG by Kristi Geris on February 10, 2021 (Item VI-3).
2. The final 2021 ASA Action Plan, as revised, was distributed to the Aquatic SWG by Kristi Geris on February 10, 2021 (Item VI-5).

Document Accession #: 20210224-5173 Filed Date: 02/24/2021

FINAL

Attachment A – List of Attendees

Name	Role	Organization
John Ferguson	Aquatic SWG Chairman	Anchor QEA, LLC
Kristi Geris	Administration/Technical Support	Anchor QEA, LLC
Andrew Gingerich	Aquatic SWG Technical Representative	Douglas PUD
Chas Kyger	Aquatic SWG Technical Alternate	Douglas PUD
Steve Lewis	Aquatic SWG Technical Representative	U.S. Fish and Wildlife Service
RD Nelle	Aquatic SWG Technical Support	U.S. Fish and Wildlife Service
Breean Zimmerman	Aquatic SWG Technical Representative	Washington State Department of Ecology
Patrick Verhey	Aquatic SWG Technical Representative	Washington Department of Fish and Wildlife
Laura Heironimus	Aquatic SWG Technical Alternate	Washington Department of Fish and Wildlife
Monica Blanchard*	Aquatic SWG Technical Support	Washington Department of Fish and Wildlife
Ralph Lampman	Aquatic SWG Technical Representative	Yakama Nation
Jason McLellan	Aquatic SWG Technical Representative	Colville Confederated Tribes

Notes:
* Joined conference call at the end of the *Pacific Lamprey – Past Studies, Translocation, and Study Plan Development* discussion.

Document Content(s)

Final Wells 2021 GAP and BOP.PDF.....1