


Evaluation and Findings Report Section 401 Water Quality Certification for the North Umpqua License Amendment (FERC Project Number 1927)

Submitted to: PacifiCorp

By: Chris Stine

July 2022 (Updated November 2022)

A stylized, monochromatic illustration of a landscape. It features a sun with rays in the upper left, rolling hills or mountains in the middle ground, and a winding river or stream in the foreground. The style is minimalist and uses solid gray shapes against a white background.

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DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.



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Exhibit A: Public Comments

1.0 Introduction

PacifiCorp owns and operates the North Umpqua Hydroelectric Project (“Project”) located on the North Umpqua River and two of its tributaries, primarily within the Umpqua National Forest in eastern Douglas County, Oregon. On November 18, 2003, the Federal Energy Regulatory Commission (FERC) issued PacifiCorp a new 35-year Federal Power Act license for the Project (FERC Project No. 1927). In conjunction with the relicensing of the Project the Oregon Department of Environmental Quality issued a conditional water quality certification on June 28, 2002, pursuant to Section 401 of the Clean Water Act and the certification’s conditions are included in the License as Appendix A. A site location map is presented as Figure 1.

In February 2022, PacifiCorp filed with FERC an Application for Non-Capacity-Related Amendment of License for Major Project—Existing Dam (“license amendment application”) to allow the construction, operation, and maintenance of new pumped storage facilities connecting the existing Toketee and Fish Creek Developments (the “Pumped Storage Project”). The new infrastructure will create pumped storage system utilizing the existing Toketee Reservoir as the source of water and the existing Fish Creek forebay as the upper, or storage, reservoir. Pumped and stored water would subsequently be used to generate up to approximately 11 megawatts (MW) of electricity through the existing Fish Creek powerhouse.

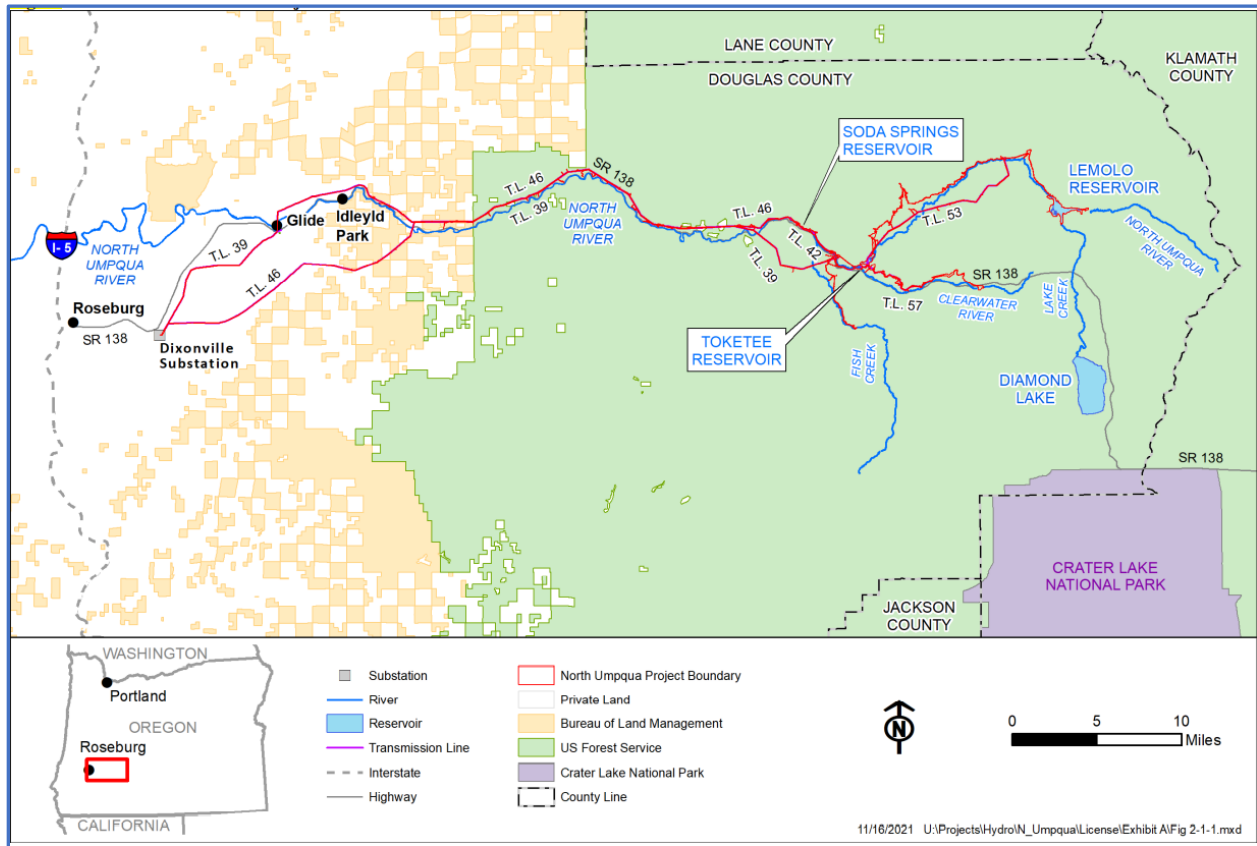
In response to the 401 WQ application for proposed license amendment and the Federal Notice, and consistent with ORS 468B.045(2)¹ and OAR 340-048-0042(2)², DEQ evaluated the potential effects of the proposed Pumped Storage Project on water quality.³ This report presents the findings of that evaluation.

¹ ORS 468B.045(2) (“The director shall: (a) Solicit and consider the comments of all affected state agencies relative to adverse impacts on water quality **caused by changes in the project, * * * (2)** Approve or deny a certification *of the proposed change* after making findings that the approval or denial is consistent with * * *.”) (emphasis added).

² OAR 340-048-0042(2) (“The department must evaluate *whether the activity for which certification is sought* will comply with * * *.”) (emphasis added).

³ The Department acknowledges there is some confusion as to applicable statutes and rules governing DEQ’s water-quality evaluation. Comments received during a public comment period in June-July 2022 assert that the Department’s evaluation must be consistent with ORS 468B.045. See Exhibit A, Public Comments. In addition, PacifiCorp questioned what rules were applicable in this particular instance, citing to DEQ’s rule related to modification of a previously issued 401 certification initiated by the Director of the Department. See 401 WQ application for proposed license amendment, at 9-10, n.9. This unique factual situation raises the question as to whether the Department’s evaluation was required to comply with ORS 468B.045 or OAR 340-048-0042, that is, whether the Department was responding to a notification from a federal agency that it was considering a change to a project that had previously received a water quality certification from the Department, versus, whether the Department was responding to a request for certification from an applicant. Since here, the Department received an application for 401 certification from an applicant in February 2022 and then subsequently received a notice from a federal agency that it was considering a license amendment to a previously certified project in late May 2022, DEQ has chosen to demonstrate compliance with all potentially applicable statutes and rules in its water quality evaluation of the Pumped Storage Project without making any determination as to which statute or rules are applicable in this unique factual situation.

Figure 1 – General Location of North Umpqua Hydropower Project



2.0 Requirement for Certification

2.1 Applicable Federal and State Law

Section 401 of the Federal Clean Water Act (Clean Water Act or CWA), 33 USC §1341, establishes requirements for state certification of proposed projects or activities that may result in any discharge of pollutants to navigable waters. Before a federal agency may issue a permit or license for any project that may result in any discharge of pollutants to navigable waters, the state must certify that the proposed project will comply with applicable provisions of Sections 301, 302, 303, 306, and 307 of the Clean Water Act and any state regulations, including state water quality standards, adopted to implement these sections. The state may condition any granted certificate to assure compliance with state water quality standards and other appropriate water quality-related requirements of state law.

DEQ is the agency of the State of Oregon authorized to implement certification functions prescribed by §401 of the Clean Water Act for state waters. DEQ must act on an application for certification in a manner consistent with the following federal and state requirements:

Federal Requirements

Sections 301, 302, 303, 306, and 307 of the Federal Clean Water Act: These sections prescribe effluent limitations, water quality related effluent limitations, water quality standards and implementation plans, national standards of performance for new sources, and toxic and pretreatment effluent standards.

State Requirements

OAR 340-041 and 340-048-0005 to 340-048-0050: These rules were adopted by the Environmental Quality Commission (EQC) to prescribe the state's water quality standards (OAR 340-041) and procedures for receiving, evaluating, and taking final action upon a § 401-certification application (OAR 340-048). OAR 340-048-0042 governs the Department's response to an application for certification for an activity for which certification is sought.

ORS 197.180(1): This statute requires state agency actions to be consistent with acknowledged land use plans and implementing regulations, or if a plan is not acknowledged, compatible with state land use goals. Findings must support the state agency action.

ORS 468B.045: When DEQ receives notice from a federal agency that it is considering a permit or license application related to a change to a hydroelectric project that has previously received a 401 water-quality certification from the Department, this statute requires DEQ to solicit comments from all affected state agencies "relative to adverse impacts on water quality caused by changes in the project" and approve or deny a water quality certification for the proposed change to that project after evaluating its consistency with applicable rules, such as water quality rules adopted by the Environmental Quality Commission (DEQ's policy and rulemaking board). On the basis of this evaluation and determination, DEQ must notify FERC either that (a) it has approved a water quality certificate for the proposed modified project (with or without conditions) or (b) that there are no longer reasonable assurances that the project as modified will comply with applicable legal requirements due to the proposed changes. Notification to FERC must take place within 60 days of FERC notification of receipt of an application for license amendment. If possible, see ORS 468B.046(2), DEQ provides a public comment period of at least 35 days for submission of written comments.

2.2 General Application of State Water Quality Standards

Oregon water quality standards are contained in Oregon Administrative Rule (OAR) Chapter 340, Division 41 entitled "Department of Environmental Quality Water Pollution Division 41 Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon." The water quality standards in Division 41 are composed of three elements: beneficial uses, numeric and narrative criteria, and the antidegradation policy. DEQ develops Total Maximum Daily Loads for waterbodies not attaining water quality standards, as explained below.

Designated beneficial uses

The Federal Clean Water Act and Oregon water quality standards require that water quality be protected and maintained such that existing and potential beneficial uses of public waters are not impaired or precluded by degraded water quality. The regulatory approach is: (1) identify existing and potential beneficial uses (2) develop and adopt numeric and narrative criteria necessary to protect and sustain existing and potential beneficial uses; (3) establish and enforce discharge effluent limitations for each source permitted to discharge treated wastes into public waters to ensure water quality standards are not

violated and beneficial uses are not impaired; and (4) establish and implement "best management practices" for a variety of land management activities to minimize water quality degradation and impairment of beneficial uses.

Table 1 identifies the beneficial uses to be protected in the Umpqua Basin.

Narrative and Numeric Criteria

Oregon's numeric and narrative criteria establish the levels necessary to support all designated beneficial uses. The development of water quality standards is a continuing process and is based on best available information at the time. Numeric criteria for water quality standards such as temperature and dissolved oxygen may vary seasonally to support specific life-stage developments of sensitive aquatic uses species such as salmonid species. Oregon Administrative Rules (OAR 340-041) include water quality criteria that apply to specific reaches and seasons, to a particular basin, and statewide.

Anti-degradation policy


Oregon's antidegradation policy (OAR 340-041-0004) applies to all surface waters. The goal of the antidegradation policy is to prevent unnecessary further degradation of water quality and to protect, maintain, and enhance the quality of existing surface waters to ensure the full protection of all existing beneficial resources. For waters that meet applicable water quality standards, the policy states that the existing water quality shall be maintained and protected unless the Environmental Quality Commission (EQC) makes certain rigorous findings of need. For water bodies that do not meet certain criteria, the policy prohibits further degradation.

Total Maximum Daily Loads

Waterbodies which fail to meet water quality criteria are designated as water quality limited pursuant to CWA §303(d). The U.S. Environmental Protection Agency requires States to develop total maximum daily loads for waters identified as water quality limited. A TMDL identifies the maximum pollutant load that a water body may receive from combined point and non-point sources and still meet water quality standards necessary to support all designated beneficial uses. TMDLs quantify wasteload allocations for point sources and load allocations for non-point sources. For hydroelectric projects located on a water quality limited waterbody, a § 401 certification may serve as the means for implementing allocations assigned to the project.

DEQ's Umpqua Basin TMDL was approved by EPA on April 12, 2007. The project contributes to warming of the river by diverting flows into project waterways for power production thus reducing flows in the bypass reaches. The TMDL allocates heat load above background to the hydroelectric project, as long as the numeric criterion is not exceeded anywhere within the reaches above Soda Springs and as long as either the numeric criterion is not exceeded or there is no measurable increase in stream temperature (0.3°C) downstream of Soda Springs. The Umpqua Temperature TMDL adopted the flows prescribed in the existing Section 401 certificate as PacifiCorp's load allocation. The flows are found in the 401, Exhibit A (Temp. Management Plan), Table 1. Accordingly, PacifiCorp must continue to implement, at a minimum, its 401 Certification minimum bypass reach flows to maintain compliance with its assigned TMDL heat load allocation.

Table 1 – Designated Beneficial Uses of the Umpqua Basin

 OAR 340-041-0320 Table 320A Designated Beneficial Uses Umpqua Basin (November 2003)					
Beneficial Uses	Umpqua R. Estuary to Head of Tidewater and Adjacent Marine Waters	Umpqua R. Main from Head of Tidewater to Confluence of N. and S. Umpqua Rivers	North Umpqua River Main Stem	South Umpqua River Main Stem	All Other Tributaries to Umpqua, North and South Umpqua Rivers
Public Domestic Water Supply ¹		X	X	X	X
Private Domestic Water Supply ¹		X	X	X	X
Industrial Water Supply	X	X	X	X	X
Irrigation		X	X	X	X
Livestock Watering		X	X	X	X
Fish & Aquatic Life ²	X	X	X	X	X
Wildlife & Hunting	X	X	X	X	X
Fishing	X ³	X	X	X	X
Boating	X	X	X	X	X
Water Contact Recreation	X ³	X	X	X	X
Aesthetic Quality	X	X	X	X	X
Hydro Power			X	X	X
Commercial Navigation & Transportation	X				

¹ With adequate pretreatment (filtration and disinfection) and natural quality to meet drinking water standards.
² See also Figures 320A and 320B for fish use designations for this basin.
³ For coastal water contact recreation and shellfish harvesting uses in the Umpqua River Estuary and Adjacent Marine Waters, see also Figure 320C.

3.0 Project Information

3.1 Name and Address of Project Owner (Applicant)

Applicant:
PacifiCorp
825 NE Multnomah, Suite 1800
Portland, OR 97232

Authorized representative:
Steve Albertelli
License Program Manager
925 South Grape Street, Building 5
Medford, Oregon 97501

3.2 Documents Filed in Support of § 401 Application

- North Umpqua Hydroelectric Project (FERC No.1927) Request to Modify the Water Quality Certification for the North Umpqua Hydroelectric Project to Include Pumped Storage Facilities and Operations. February 28, 2022.
- Technical Memorandum - Fish Creek Pumped Storage Project: Conceptual Assessment of Temperature and Dissolved Oxygen Changes. January 20, 2022.
- Application for Non-Capacity-Related Amendment of License for Major Project—Existing Dam Volume I Initial Statement and Exhibits A, B, C, D, E, F, and G. February 28, 2022.
- Application for Non-Capacity-Related Amendment of License for Major Project—Existing Dam Volume II Exhibits A and E Appendices. February 28, 2022.
- Application for Non-Capacity-Related Amendment of License for Major Project—Existing Dam Volume III Exhibit F—Appendices. February 28, 2022.
- Submission of Application to Amend Hydroelectric Certificate #84409. February 28, 2022.
- Oil Spill Control and Countermeasure Plan for the Fish Creek Hydroelectric Plant. December 16, 2016.

3.3 Project Description

Existing Facilities

The North Umpqua Hydroelectric Project consists of eight powerhouses, eight dams, 21.7 miles of canal, 9.8 miles of flume, and 5.8 miles of penstock and tunnels, for a total waterway length of 37.3 miles. Three major reservoirs, Lemolo Reservoir, Toketee Reservoir, and Soda Springs Reservoir, provide water storage. The proposed action would involve modifications to the Toketee and Fish Creek developments as described below. Project developments are identified in Figure 2.

Toketee Development

The Toketee Development includes Toketee Dam, Toketee Reservoir, the Toketee waterway and penstock, and the Toketee Powerhouse. Toketee Dam is a 1,318-foot long, 58-foot-tall earth-filled dam that impounds the North Umpqua River at RM 75.2. The dam impounds the 96.9-acre Toketee Reservoir, which has a normal maximum surface area of 2,424.0 feet above mean sea level. Water from the reservoir is diverted into 6,994 feet of wood-stave pipe and tunnel waterway with a hydraulic capacity of 1,530 cubic feet per second. From the waterway tunnel exit, the 1,067-foot Toketee penstock extends to the

Toketee Powerhouse where it trifurcates into three 6.3-foot diameter segments before entering each of the three powerhouses.

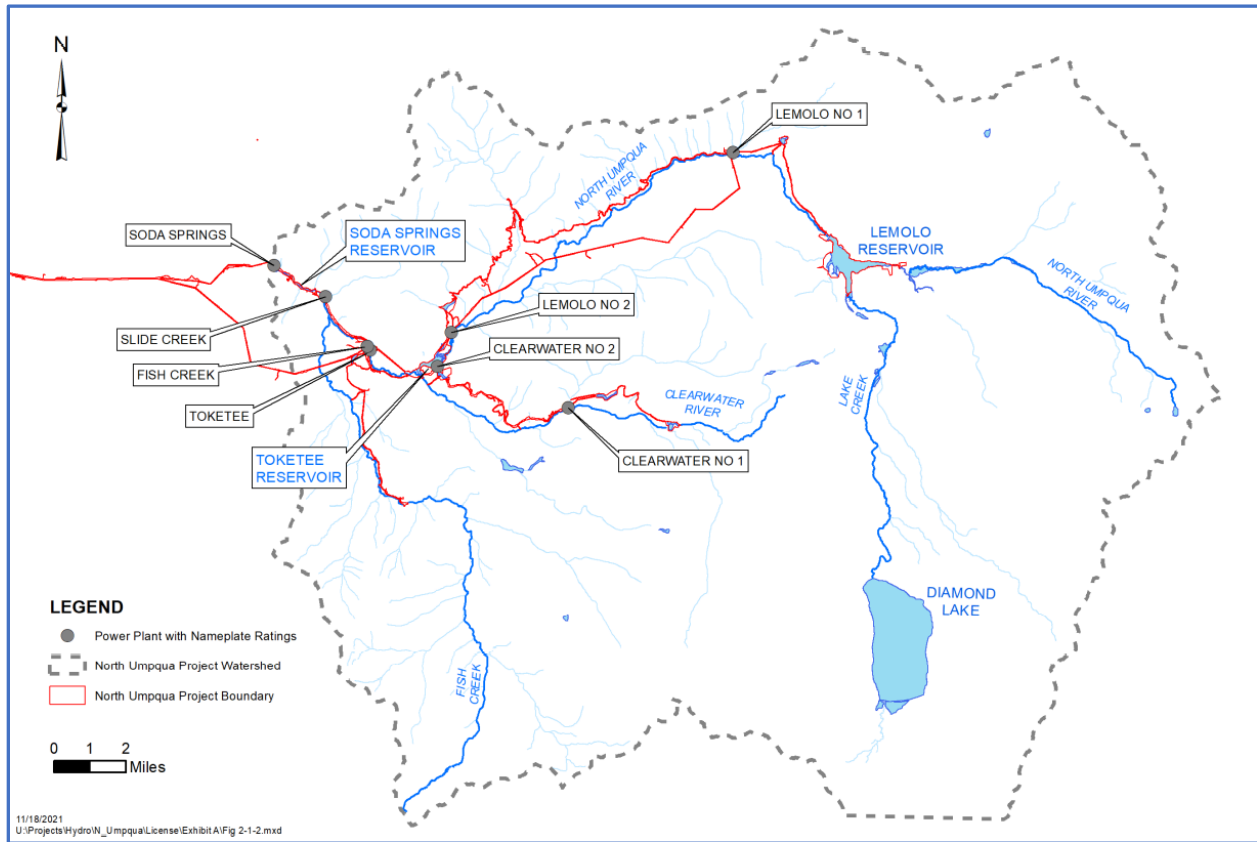
The Toketee Powerhouse consists of three generators with a combined rated capacity of 42.5 MW at 1,530 cfs and a net head of 440 feet. PacifiCorp generally operates the Toketee powerhouse in peaking mode that follows daily load demand from about 6 a.m. to 10 p.m. The powerhouse discharges to a segment of the North Umpqua River impounded by Side Creek Dam located approximately 0.2 miles downstream of the powerhouse. Slide Creek Dam maintains a normal tailwater elevation 1,982.0 feet above mean sea level.

Fish Creek Development

Fish Creek is a tributary to the North Umpqua River. The Fish Creek development includes a small diversion dam, a five-mile-long flume and tunnel waterway, a forebay, penstock and powerhouse. The 6.5-foot-tall Fish Creek diversion dam is located 6.6-miles upstream of its confluence with the North Umpqua River. The dam includes a fish screen and upstream and downstream fish passage. The waterway consists of a 4.9-mile-long open channel with a capacity of 177 cfs and terminating at the 9.3-acre forebay, which has an active storage capacity of 87.2 acre-feet at a normal maximum surface elevation of 3,025.9 feet above mean sea level. Water from the forebay is released through a 2,358-foot steel penstock to the Fish Creek Powerhouse with a centerline elevation of 1,992.0 feet above mean sea level. The generator has a rated capacity of 11 MW at 155 cfs and a rated net head of 995 feet. Discharge from the Fish Creek Powerhouse is to the North Umpqua River about 300 feet upstream from the Slide Creek Dam at a normal elevation of 1,982.0 feet.

PacifiCorp operates the Fish Creek Development in peaking mode to follow typical daily load demand. The FERC license and Condition 3(a) of the section 401 water quality certificate prescribe a minimum year-round instream flow of 130 cfs in the Fish Creek bypass reach below the diversion dam. Because of this requirement, diversions from Fish Creek often cease during summer and fall months when the natural base flow in Fish Creek declines below the required minimum flow.

Figure 2 – Location of Hydropower Project Developments



Proposed Action

PacifiCorp seeks to amend the FERC license to allow the construction, operation, and maintenance of new pumped storage facilities connecting the existing Toketee and Fish Creek Developments. The new infrastructure will create a pumped storage system utilizing the existing Toketee Reservoir as the source of water and the existing Fish Creek forebay as the upper, or storage, reservoir. Under an amended license, PacifiCorp will fill the forebay when demand for electrical power is low and release the water for generation during periods of high demand. Based on resource availability and electrical demand, PacifiCorp may conduct multiple pump-generation cycles each day.

The Fish Creek forebay is 9.3 acres in area with 87.2 acre-feet of active storage. During each generation cycle, water is discharged through the Fish Creek powerhouse to the Slide Creek impoundment where it mixes with inputs from the Toketee Powerhouse and the Toketee bypass reach. The Slide Creek impoundment is formed by Slide Creek Dam, which diverts up to 1,500 cfs of flow into the Slide Creek canal with the balance flowing over the dam into the Slide Creek bypass reach.

New facilities would include (1) a conduit connecting the existing Toketee Penstock to its existing Fish Creek Penstock, and (2) a pump within the new conduit that would transfer water up the existing Fish Creek Penstock and into the existing Fish Creek Forebay. The Pumped Storage Project would divert up to 190 cfs from the Toketee penstock. During a typical daily cycle, the pumped storage project would refill the 87 acre-feet of Fish Creek forebay's active storage. Diverting this volume of water would account for about one foot of change in the reservoir elevation. Water would be returned to the reservoir during each

subsequent generation cycle. The distance between the Toketee powerhouse tailrace and the Fish Creek powerhouse tailrace is approximately 560 feet. The North Umpqua Settlement Agreement does not prescribe any ramping restrictions in the North Umpqua full flow reach between Slide Creek Dam and the Toketee powerhouse.

PacifiCorp proposes to operate the Pumped Storage Project using two seasonal operational regimes corresponding to flows available in Fish Creek. Between June and December, flows in Fish Creek are generally insufficient to support hydropower production under the minimum instream flows prescribed in the 2003 FERC license and 2002 section 401 water quality certification. Using pumped storage to refill the 87 acre-feet Fish Creek forebay from 3,015.0 to 3,025.9 feet requires 5.6 hours at a flow rate of 190 cfs. Discharge through the powerhouse of the forebay’s active storage requires 5.9 hours. Thus, each pump-generate cycle during low flow operations takes about 11.5 hours.

During high-flow operations, typically between January and May, the Fish Creek forebay will refill to an elevation of 3,020.0 feet under normal hydro operations (i.e., using available diversions from Fish Creek) supplemented by pumped storage flow. PacifiCorp expects pumped storage operations will take 3.3 hours to fill the forebay from 3,020.0 to 3,025.9 feet. Therefore, each complete pump-generate cycle during high flow operations is expected to take about 6.8 hours. The duration of each pump-generate cycle under low flow and high flow conditions indicates the pumped storage project can complete multiple pump-generate cycles within each 24-hour period.

Proposed Water Quality Monitoring

As described further below, PacifiCorp proposes to conduct water quality monitoring from June through September during each year prior to construction of the proposed pumped storage project. The purpose of the monitoring is to establish a record of pre-project baseline conditions in the project area. Hourly temperature measurements will also be collected to validate the results of a water quality modeling study, commissioned by PacifiCorp, to evaluate the potential thermal effects of pumped storage project operation. In addition, PacifiCorp will conduct bi-weekly field audits at select locations to confirm proper operation and calibration of field instruments. To assess the potential effect of pumped storage project operation on water quality, PacifiCorp proposes to continue the monitoring effort for one year following start of the project.

The locations of the monitoring stations are described below. PacifiCorp currently operates a permanent water quality monitoring station at USGS gauge 14316460 below Soda Springs powerhouse in accordance with Condition 3(j) of the June 28, 2002, water quality certification. This station collects data year-round at 30-minute intervals for temperature, dissolved oxygen, specific conductivity, pH, and turbidity. At the remaining locations, PacifiCorp will monitor water temperature, dissolved oxygen, specific conductance, pH, and total dissolved gas pressure from either hand-held or remotely placed data-sondes as indicated in Table 2. Turbidity will be measured at the Fish Creek forebay outlet, the Fish Creek tailrace and the Slide Creek impoundment downstream of the Fish Creek tailrace. PacifiCorp will also record hourly temperature measurements using remotely placed thermographs at select locations.

The existing and proposed stations are described below:

<u>Station</u>	<u>Description</u>
Toketee Reservoir outlet	In Toketee Reservoir at the location of the waterway inlet
Toketee Powerhouse	Toketee powerhouse tailrace in Slide Creek Impoundment
Toketee bypassed reach	North Umpqua River where it enters the Slide Creek Impoundment

Slide Creek Upstream	Slide Creek impoundment above the Fish Creek Powerhouse tailrace
Fish Creek Forebay Inlet	Fish Creek waterway as it enters the forebay
Fish Creek Forebay Outlet	At depth and location where water enters the Fish Creek Penstock
Fish Creek Powerhouse	Fish Creek tailrace within the Slide Creek Impoundment
Slide Creek Downstream	Slide Creek impoundment below the Fish Creek Powerhouse tailrace
Slide Creek bypassed reach	USGS gaging station below Slide Creek Dam
Slide Creek full-flow reach	North Umpqua downstream of the Slide Creek Powerhouse tailrace
Soda Springs ⁴	Existing water quality station below Soda Springs powerhouse

Table 2 – Proposed Water Quality Monitoring Locations

Location	Purpose	Depth	Parameters	Frequency
Toketee Reservoir outlet	WQ monitoring	3 meters	Group A	Hourly
	Audit	1-meter increments	Group A	Bi-weekly
	WQ modeling	Surface, 3 m, 6 m	Temperature	Hourly
Toketee Powerhouse	WQ monitoring	Near bottom	Group A	Hourly
	Audit	Near bottom	Group A	Bi-weekly
	WQ modeling	Near bottom	Temperature	Hourly
Toketee Bypass Reach	WQ monitoring	Near bottom	Group A	Bi-weekly
	WQ modeling	Near bottom	Temperature	Hourly
Slide Creek upstream of Fish Creek tailrace	WQ monitoring	Near bottom	Group A	Bi-weekly
	WQ modeling	Near bottom	Temperature	Hourly
Fish Creek Forebay Inlet	WQ monitoring	Near bottom	Group A	Bi-weekly
	WQ modeling	Near bottom	Temperature	Hourly
Fish Creek Forebay Outlet	WQ monitoring	1-meter increments	Group B	Bi-weekly
	WQ modeling	Surface, 3 m, 6 m	Temperature	Hourly
Fish Creek Powerhouse tailrace	WQ monitoring	Near bottom	Group B	Bi-weekly
	WQ modeling	Near bottom	Temperature	Hourly
Slide Creek impoundment downstream of Fish Creek tailrace	WQ monitoring	Near bottom	Group B	Hourly
	Audit	Near bottom	Group B	Bi-weekly
	WQ modeling	Surface, near bottom	Temperature	Hourly
Slide Creek Bypass Reach	Monitoring & modeling	Near bottom	Group A	Hourly
	Audit	Near bottom	Group A	Bi-weekly
Slide Creek Full Flow Reach	Monitoring & modeling	Near bottom	Group A	Hourly
	Audit	Near bottom	Group A	Bi-weekly
Soda Springs	WQ monitoring	Near bottom	Group C	30-minutes

Group A parameters: water temperature, dissolved oxygen, specific conductance, pH, and total dissolved gas pressure.

Group B parameters: Group A parameters and turbidity.

Group C parameters: Temperature, dissolved oxygen, specific conductivity, pH, turbidity

⁴ PacifiCorp currently maintains a permanent water quality monitoring station collocated with USGS gauge 14316460 below Soda Springs powerhouse in accordance with Condition 3(j) of the June 28, 2002, water quality certification.

Proposed Mitigation

As described more specifically in Section IV.C of PacifiCorp’s 401 WQ certification application, PacifiCorp has proposed to fund the hatchery production of 100 rainbow trout per year to mitigate the potential annual loss of up to 4 native rainbow trout and 61 non-native trout of less than five inches in length through the diversion of water from the Toketee Powerhouse to the Fish Creek Powerhouse. DEQ’s evaluation of the proposed activity is also based upon PacifiCorp’s continued maintenance of fish screens described in that section.

3.4 Federal Energy Regulatory Commission Licensing

On November 18, 2003, the Commission issued PacifiCorp a new 35-year Federal Power Act license for the North Umpqua Hydroelectric Project (FERC Project No.1927). In conjunction with the relicensing of the project the Oregon Department of Environmental Quality issued a conditional water quality certification on June 28, 2002, pursuant to Section 401 of the Clean Water Act. The conditions of the certification are included in the License as Appendix A.

Although the FERC license does not expire until 2038, the proposed changes to the North Umpqua Project to construct, operate, and maintain a Pumped Storage Project as described above requires PacifiCorp to seek an amendment to the existing FERC license. The application to alter or amend a federal license also triggers the need for a review of the existing section 401 water quality certification. In this case, the Proposed Action has the potential to impact water quality, so the application for the FERC license amendment has triggered the need for a section 401 water quality review of the proposed activity by DEQ. This review is limited to evaluating potential water quality impacts from the proposed Pumped Storage Project as described by PacifiCorp in its Request to Modify the Water Quality Certification for the North Umpqua Hydroelectric Project to Include Pumped Storage Facilities and Operations dated February 28, 2022. ORS 468B.045 and OAR 340-048-0042(2).

On February 16, 2022, PacifiCorp filed with the Commission a non-capacity license amendment application to authorize construction and operation of the Pumped Storage Project. Correspondingly, on February 25, 2022, PacifiCorp submitted to DEQ an application for certification for the Pumped Storage Project.

4.0 Water Quality Standards Potentially Affected

4.1 Beneficial Uses in the North Umpqua River

Designated beneficial uses in the North Umpqua River are: public, private and domestic water supply; irrigation; livestock watering; wildlife and hunting; fishing; fish and aquatic life; boating; water contact recreation; aesthetic quality; and hydropower [OAR 320-41-0320, Table 320A].

Figures 3 and 4 present the fish use designations and salmon and steelhead spawning distributions within the basin [OAR 340-41 Figures 320A and 320B]. Figure 3 (OAR 340-041, Figure 320A) indicates fish use in the North Umpqua River above Soda Springs Dam is designated as salmon and trout rearing and migration habitat.

Figure 4 (OAR 340-041, Figure 320B) indicates salmon and steelhead are not present the North Umpqua River above Soda Springs Dam. In 2012 PacifiCorp completed construction of volitional upstream and downstream fish passage facilities at Soda Springs Dam that provided access to 6.6-miles of spawning habitat above the dam. DEQ is currently engaged in a Stakeholder Advisory process to update and revise these maps to accurately reflect fish use distributions that may have occurred since the maps were last updated. However, migratory access above of Soda Springs is blocked by Slide Creek Dam, which provides no upstream or downstream fish passage. The proposed action considered by this 401 WQC modification occurs upstream of the Slide Creek impoundment in a reach of the North Umpqua River that is currently inaccessible to salmon and steelhead.

Figure 3: Designated Fish Uses in the Umpqua Basin

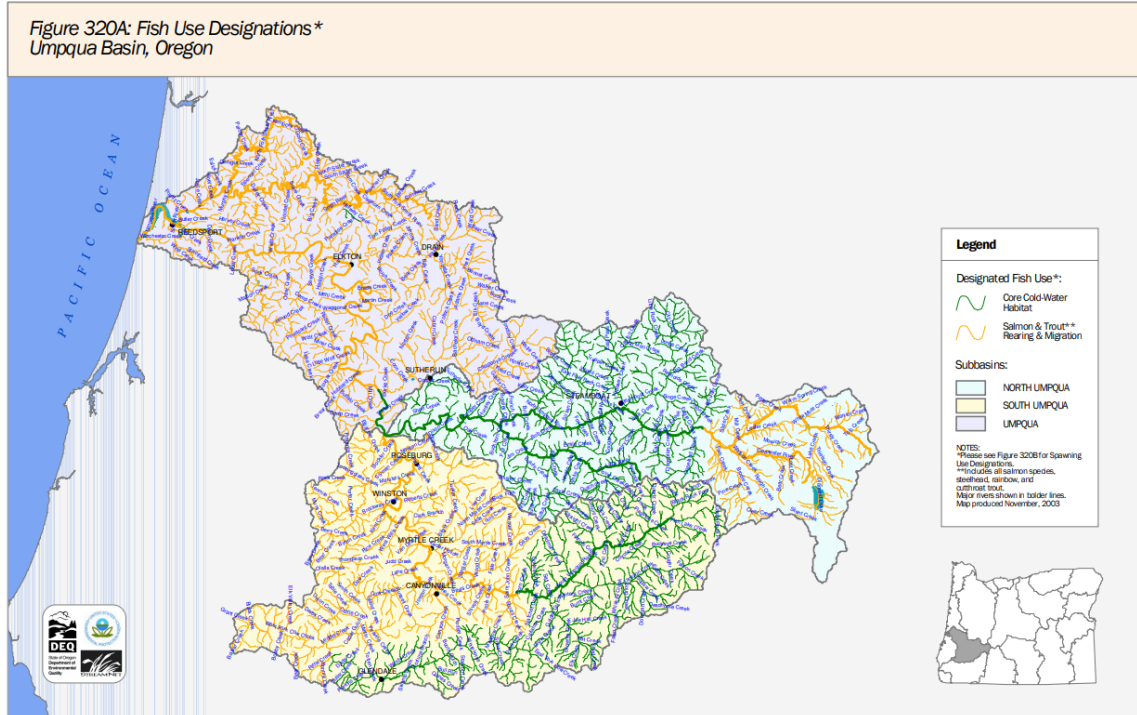
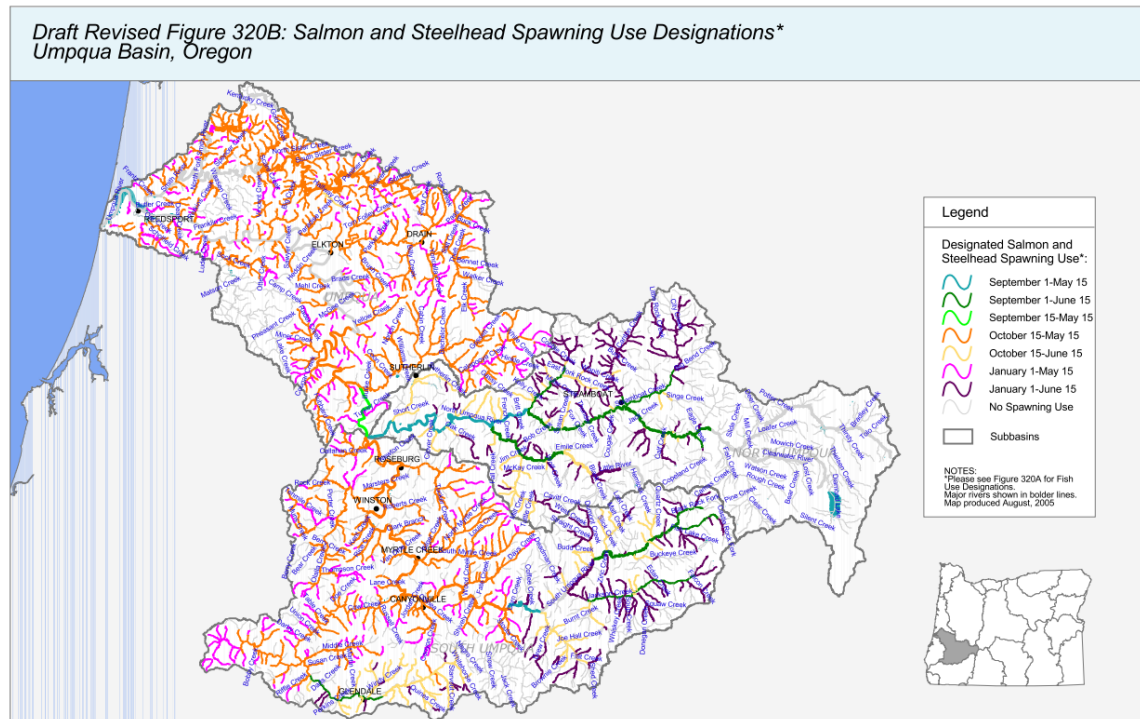


Figure 4: Salmon and Steelhead Spawning Uses in the Umpqua Basin



4.2 Water Quality Parameters of Potential Concern

This section provides the detailed evaluation of the Proposed Action’s relationship to each water quality parameter potentially impacted by the Proposed Action. Table 3 summarizes the parameters of concern. The following section describes DEQ’s evaluation of the Proposed Action’s impacts and proposed measures.

Table 3: Parameters of Potential Concern

Parameter	Summary of Criteria	Potential Impact
Antidegradation	<p>OAR 340-041-0004</p> <p>Statewide Narrative Criteria:</p> <p>Oregon’s Antidegradation Policy prevents unnecessary water quality degradation from new or increased point and nonpoint sources of pollution. The policy sets limits on allowable discharges to accommodate growth and certain activities while maintaining support for beneficial uses.</p>	<p>Modification of the Fish Creek development to operate as a pumped storage facility may affect water quality by extending the residency time in the Fish Creek forebay.</p>
Statewide Narrative Criteria: Formation of deleterious deposits not allowed	<p>OAR 340-041-0007</p> <p>Statewide Narrative Criteria:</p>	<p>Changes to project operation that result in repeated pump-generation cycles may accelerate sediment</p>

Parameter	Summary of Criteria	Potential Impact
	(11) The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed;	deposition in the Fish Creek forebay.
Statewide Narrative Criteria: Oily sheens not allowed	OAR 340-041-0007 Statewide Narrative Criteria: (12) Objectionable discoloration, scum, oily sheens, or floating solids, or coating of aquatic life with oil films may not be allowed;	Project modification proposes new pumps and equipment that may include hydraulics, lubricants or other oil-based products.
Turbidity	OAR 340-041-0036 No more than a ten percent cumulative increase in natural stream turbidities may be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity.	Daily ramping during pump-generation cycles may cause shoreline erosion in Fish Creek forebay that increase turbidity. Temporary turbidity may also result during project construction.
Dissolved Oxygen	OAR 340-041-011 Sufficient concentrations of dissolved oxygen are necessary to support aquatic life.	Changes to the timing and release of stored water may affect dissolved oxygen due to algal growth. Oxygen saturation may also be affected by increased warming caused by extended water storage.
Temperature	OAR 340-041-0028 Criteria is intended to minimize the risk to cold-water aquatic ecosystems from anthropogenic warming, to encourage the restoration and protection of critical aquatic habitat, and to control extremes in temperature fluctuations due to anthropogenic activities.	Operation of the Fish Creek development as a pumped storage facility may affect water temperature if pump-generation cycles result in extended residency periods.
Total Dissolved Gas	OAR 340-041-0031 Activities may not cause supersaturation of atmospheric gases in waters of the state at levels that exceed state numeric criteria.	The pressure required to pump water 995 vertical feet to the Fish Creek forebay during each pump cycle may affect saturation of entrained atmospheric gases.
pH	OAR 340-041-0021 Activities may not create changes to water quality that cause pH excursions beyond ranges necessary to support beneficial uses.	Changes in water retention schedules may promote algal growth. Photosynthesis and algal respiration directly affect hydrogen ion concentration in waterbodies.

Parameter	Summary of Criteria	Potential Impact
Biocriteria	OAR 340-041-0011 Biocriteria Waters of the State must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Operation of the project as a pumped storage facility may alter the ramp rates experienced in project reservoirs and forebays. Excessive ramping can cause bank erosion and degrade riparian habitat conditions.

The Proposed Action includes activities that may affect multiple parameters. The analysis below addresses each parameter of concern and contains a summary of the applicant’s proposal by applicable activity.

4.2.1 Statewide Narrative Criteria

OAR 340-041-0007

(1) Notwithstanding the water quality standards contained in this Division, the highest and best practicable treatment and/or control of wastes, activities, and flows must in every case be provided so as to maintain dissolved oxygen and overall water quality at the highest possible levels and water temperatures, coliform bacteria concentrations, dissolved chemical substances, toxic materials, radioactivity, turbidities, color, odor, and other deleterious factors at the lowest possible levels.

(11) The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed;

(12) Objectionable discoloration, scum, oily sheens, or floating solids, or coating of aquatic life with oil films may not be allowed.

Application of Standard

The statewide narrative water quality standard is intended to protect human health and aquatic life from adverse effects of conditions caused by water quality degradation. The criteria require that activities provide highest and best practicable treatment and control of wastes to maintain overall water quality at the highest possible levels and deleterious conditions at the lowest possible levels. The statewide narrative standard restricts activities that may negatively affect the chemical, biological, or physical characteristics of water necessary to maintain support for all designated beneficial uses. Narrative criteria may be translated into specific limitations to ensure a proposed activity is consistent with the specific beneficial uses and attributes of a particular body of water.

Applicant’s position

The Applicant did not address the potential effects of the proposed action on the Statewide Narrative Criteria.

DEQ Evaluation

DEQ has considered the direct, indirect and cumulative effects that the proposed action may have on water quality characteristics addressed by the Oregon statewide narrative criteria.

DEQ finds that the Pumped Storage Project will not likely contribute to appreciable deposits of organic or inorganic sludges that may reduce support for aquatic life, public health, recreation or other designated beneficial uses. This position is based on the following findings:

- Fish Creek forebay will be filled with water from the penstock of the Toketee powerhouse. This source is free of known wastes or other substances that may negatively affect water quality.
- PacifiCorp expects the Pumped Storage Project may complete multiple pump-generation cycles during each 24-hour period, depending on water and energy availability. DEQ recognizes that frequent flushing cycles can inhibit macrophyte growth and primary algal productivity. Reduced vegetative growth in the forebay will result in decreased biomass accumulation at the end of each growth cycle.
- The proposed Pumped Storage Project will refill the Fish Creek forebay through the existing penstock inlet. Because the proposed action merely reverses the flow direction through the existing inlet structure DEQ believes it is unlikely this action will contribute to scour, sediment mobilization or deposits within the forebay.

Accidental spills or releases of chemicals, lubricants or other hazardous materials may occur during construction and operation of the Pumped Storage Project. PacifiCorp prepared an Oil Spill Prevention Control and Countermeasure Plan for the Fish Creek Hydroelectric Plant (“Fish Creek SPCC”, PacifiCorp 2016), consistent with 40 CFR 112 to guide decision-making in the event of an accidental chemical release. DEQ has reviewed the Fish Creek SPCC and finds the general preparation, response and reporting measures are appropriate for the use, management and disposal hazardous substances at the facility. However, DEQ recommends PacifiCorp review and update the Fish Creek SPCC, as necessary, to reflect changes to equipment, operation or storage of materials that may be addressed by the plan as a result of the construction and operation of the Pumped Storage Project.

DEQ has reviewed and approves PacifiCorp’s water quality monitoring plan described in Table 2. DEQ believes that water quality data collected pursuant to the plan is necessary to validate the water quality modeling performed to support PacifiCorp’s request for water quality certification and to better assess the Pumped Storage Project’s potential effects on water quality standards including the Statewide Narrative Criteria.

DEQ finds that the proposed Pumped Storage Project will not contribute to objectionable discoloration, scum, oily sheens, or floating solids that impair aquatic life or other beneficial uses.

DEQ Findings

DEQ is reasonably assured that the Pumped Storage Project under an amended FERC license will not cause or contribute to a violation of statewide narrative criteria provided the following measures are implemented:

- The Applicant applies for and receives coverage under NPDES 1200-C construction stormwater permit prior to undertaking construction activities that may disturb more than one acre of land.
- The Applicant prepares and implements a Water Quality Management Plan as described in Condition 1 of this water quality certification.

- The Applicant reviews any new oil storage quantities, locations and containment measures related to completion of the Pumped Storage Project and makes any necessary revisions to the Fish Creek SPCC as required by 40 CFR 112 to reflect these changes.

4.2.2 Dissolved Oxygen

OAR 340-041-0016

Dissolved oxygen (DO): No wastes may be discharged and no activities may be conducted that either alone or in combination with other wastes or activities will cause violation of the following standards: The changes adopted by the Commission on January 11, 1996, become effective July 1, 1996. Until that time, the requirements of this rule that were in effect on January 10, 1996, apply:

(1) For water bodies identified as active spawning areas in the places and times indicated on the following Tables and Figures set out in OAR 340-041-0101 to 340-041-0340: Tables 101B, 121B, and 190B, and Figures 130B, 151B, 160B, 170B, 180A, 201A, 220B, 230B, 260A, 271B, 286B, 300B, 310B, 320B, and 340B, (as well as any active spawning area used by resident trout species), the following criteria apply during the applicable spawning through fry emergence periods set forth in the tables and figures and, where resident trout spawning occurs, during the time trout spawning through fry emergence occurs:

(a) The dissolved oxygen may not be less than 11.0 mg/l. However, if the minimum intergravel dissolved oxygen, measured as a spatial median, is 8.0 mg/l or greater, then the DO criterion is 9.0 mg/l;

(b) Where conditions of barometric pressure, altitude, and temperature preclude attainment of the 11.0 mg/l or 9.0 mg/l criteria, dissolved oxygen levels must not be less than 95 percent of saturation;

(c) The spatial median intergravel dissolved oxygen concentration must not fall below 8.0 mg/l.

(2) For water bodies identified by the Department as providing cold-water aquatic life, the dissolved oxygen may not be less than 8.0 mg/l as an absolute minimum. Where conditions of barometric pressure, altitude, and temperature preclude attainment of the 8.0 mg/l, dissolved oxygen may not be less than 90 percent of saturation. At the discretion of the Department, when the Department determines that adequate information exists, the dissolved oxygen may not fall below 8.0 mg/l as a 30-day mean minimum, 6.5 mg/l as a seven-day minimum mean, and may not fall below 6.0 mg/l as an absolute minimum (Table 21).

Application of Water Quality Standard

Dissolved oxygen is a fundamental natural water characteristic that is essential for maintaining conditions necessary to support and sustain aquatic life. The concentration of dissolved oxygen necessary to support healthy aquatic life may vary based on the biological requirements of each organism. Minimum dissolved oxygen requirements may vary further based on life stage developments characteristics. For this reason, DEQ recognizes five classes of dissolved oxygen criteria for beneficial use protection. The dissolved oxygen concentration needed to support each of these recognized classes is presented in OAR 340-041-0016, Table 21, “Dissolved Oxygen and Intergravel Dissolved Oxygen Criteria”. Providing that data exist to demonstrate adequate support for recognized beneficial uses, Table 21 may interpret these criteria based on mean dissolved oxygen data, intergravel dissolved oxygen concentrations, or the percent oxygen saturation if barometric pressure, altitude or temperature preclude attainment of numeric criteria.

The classes of beneficial uses in Table 21 are determined from fish distribution and salmonid spawning maps. The beneficial uses in the area of the proposed Pumped Storage Project include cold-water and salmonid spawning. The dissolved oxygen spawning criterion applies to waters upstream of the Slide Creek impoundment from January 1 through June 15. This period corresponds to the spawning period for

resident trout.⁵ The spawning dissolved oxygen criterion is 11.0 mg/l unless the conditions described in OAR 340-041-0016 (1)(a-c) preclude the attainment of this criterion. From June 16 through December 31 the rearing and migration cold-water dissolved oxygen criterion of 8.0 mg/l applies to this reach.

DEQ Evaluation

Water quality including concentrations of dissolved oxygen in the vicinity of the proposed Pumped Storage Project is very high. DEQ's 2018/2020 Integrated Report lists the North Umpqua River below Soda Springs Dam as "attaining" (Category 2) for dissolved oxygen. Annual water quality data collected at the USGS Gauge 14316460 below Soda Springs Dam as required by PacifiCorp's section 401 water quality certification further confirm dissolved oxygen levels are near or above 11.0 mg/l during the designated spawning period and consistently above 8.0 mg/l for the entire rearing and migration period. No recent data are available in the vicinity of the proposed Pumped Storage Project. However, PacifiCorp proposes to collect pre-construction water quality measurements including dissolved oxygen beginning 2022.

Operation of the proposed Pumped Storage Project will increase the residency time of stored water in the Fish Creek forebay prior to each generation cycle. This change from the current operating regime may increase the temperature of stored water during periods of warm ambient air conditions. Because dissolved oxygen saturation decreases when water warms the proposed action may cause a decrease in dissolved oxygen of water stored in the forebay.

To simulate the effect of the proposed Pumped Storage Project on water quality, PacifiCorp commissioned a study to model the potential effects on water quality. The study, conducted by Four Peaks Environmental, inferred the decrease in dissolved oxygen based on the modeled temperature increase caused by forebay storage.⁶ Three scenarios were modeled. The first scenario assumed 10.5 hours of storage (i.e., discharge later on the day it was filled). The second and third scenarios assumed the generation cycle occurred on each of the two days following filling (i.e., 10.5-hours plus one day and 10.5-hours plus two days, respectively). The model included several worst-case assumptions to evaluate the maximum impact on water quality that may occur. These include storage during maximum daylight hours under average warmest and worst-case historical ambient conditions.

The model results indicate the proposed Pumped Storage Project may decrease the dissolved oxygen by up to 0.1 mg/l under the <1-day storage scenario and up to 0.2 mg/l under each of the <2-day and <3-day storage scenarios. DEQ's antidegradation standard states that up to a 0.1 mg/l decrease in dissolved oxygen is not considered as a reduction in water quality so long as it has no adverse effects on threatened and endangered species. Modeling conducted by Four Peaks Environmental indicate this allowance may be slightly exceeded but only under conditions that assume above-average ambient temperatures and extended storage periods. PacifiCorp also cited the potential for reaeration to occur in the turbine discharge as a possible source of increased oxygenation. PacifiCorp offered no citations to support this possibility. However, DEQ recognizes the potential that modest aeration may occur in turbulent discharge from high-head discharge sources.

The modeling commissioned by PacifiCorp indicates the possibility that project operation could reduce dissolved oxygen in the Slide Creek impoundment by up to 0.2 mg/l. The conditions that require such a reduction rely on the simultaneous occurrence of worst-case ambient temperatures combined with a longer than typical retention of water in the Fish Creek forebay. While possible, these conditions are likely rare and avoidable events. Furthermore, any measurable aeration that may occur in the turbine

⁵ Letter from Michael Llewelyn, DEQ, to Randy Smith, EPA (Feb. 4, 2004) describing application of Oregon's spawning dissolved oxygen criteria to waters designated for resident trout spawning.

⁶ Four Creeks Environmental, "Fish Creek Pumped Storage Project: Conceptual Assessment of Temperature and Dissolved Oxygen Changes". November 1, 2021.

tailrace would likely supplement dissolved oxygen. DEQ finds it reasonable to expect that any measurable turbine aeration would presumably reduce the dissolved oxygen deficit caused by forebay storage. For these reasons, DEQ is reasonably assured that operation of the pumped storage project will not reduce dissolved oxygen more than allowable limits.

To confirm DEQ's expectation that the proposed Pumped Storage Project will comply with Oregon's dissolved oxygen water quality standard DEQ will require PacifiCorp to prepare and implement a WQMP in accordance with Condition 1 of the section 401 water quality certification. If monitoring data demonstrate that operation of the pumped storage project causes dissolved oxygen in the tailrace to decrease more than 0.1 mg/l DEQ may require PacifiCorp to assess the situation and submit to DEQ an adaptive management action plan. The plan shall propose modifications or operational strategies to reduce conditions that cause or contribute to dissolved oxygen deficits in project waters. Such strategies may include increasing the frequency of generation cycles, evaluating turbine aeration modifications or other measures to increase the concentration of dissolved oxygen. DEQ finds that such adaptive management strategies will likely eliminate factors that contribute to reduced dissolved oxygen.

DEQ Findings

DEQ is reasonably assured that the Pumped Storage Project under an amended FERC license will not cause or contribute to a violation of the dissolved oxygen criteria provided the following measures are implemented:

- The Applicant implements the Water Quality Management and Monitoring Plan as required by Condition 1 of the water quality certification.
- If DEQ determines that monitoring indicates the Dissolved Oxygen water quality standard is not being met, PacifiCorp shall consult with DEQ on adaptive management strategies to reduce the effect of project operation on dissolved oxygen to at or below the applicable standard and develop and implement an adaptive management plan in accordance with DEQ's approval.

4.2.3 Temperature

340-041-0028

(3) Purpose. The purpose of the temperature criteria in this rule is to protect designated temperature-sensitive, beneficial uses, including specific salmonid life cycle stages in waters of the State.

(4) Biologically Based Numeric Criteria. Unless superseded by the natural conditions criteria described in section (8) of this rule, or by subsequently adopted site-specific criteria approved by EPA, the temperature criteria for State waters supporting salmonid fishes are as follows:

(a) The seven-day-average maximum temperature of a stream identified as having salmon and steelhead spawning use on subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Tables 101B, and 121B, and Figures 130B, 151B, 160B, 170B, 220B, 230B, 271B, 286B, 300B, 310B, 320B, and 340B, may not exceed 13.0 degrees Celsius (55.4 degrees Fahrenheit) at the times indicated on these maps and tables;

(b) The seven-day-average maximum temperature of a stream identified as having core cold water habitat use on subbasin maps set out in OAR 340-041-101 to 340-041-340: Figures 130A, 151A, 160A, 170A, 180A, 201A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 16.0 degrees Celsius (60.8 degrees Fahrenheit);

(c) The seven-day-average maximum temperature of a stream identified as having salmon and trout rearing and migration use on subbasin maps set out at OAR 340-041-0101 (Basin-Specific Criteria (Main

Stem Columbia River): Beneficial Uses to Be Protected in the Main Stem Columbia River) to 340-041-0340 (Basin-Specific Criteria (Willamette): Beneficial Uses to Be Protected in the Willamette Basin): Figures 130A, 151A, 160A, 170A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 18.0 degrees Celsius (64.4 degrees Fahrenheit);

Application of Water Quality Standard

The temperature standard protects waters of the state against anthropogenic thermal loading which may undermine support for existing and designated beneficial uses. Water temperatures that are acutely or chronically above biologically based levels can harm aquatic organisms that depend upon cold water to live or reproduce. This is particularly true of Oregon's native "cold-water" fish such as salmon, bull trout, rainbow trout, cutthroat trout, steelhead trout and certain amphibians including frogs and salamanders. Elevated temperatures may also adversely affect other important water quality parameters including dissolved oxygen, pH, and increase algae and fungi productivity.

DEQ adopts biologically based numeric temperature criteria to support specific life stage and development activities of species that may currently occupy or have historically occupied certain ranges. DEQ applies the temperature criterion as a seven-day average maximum statistic calculated as the average of the daily maximum temperatures from seven consecutive days ("7-day average maximum", or 7dAM). The maximum 7dAM is the 7dAM for the warmest 7 consecutive days (week) of the year.

Designated fish uses in the Umpqua Basin are identified in Figure 3. The reach of the North Umpqua River upstream of Soda Springs Dam inclusive of the Slide Creek impoundment is identified as salmon and trout rearing and migration for which the 7dAM temperature may not exceed 18°C. The upstream range of salmon and steelhead does not currently extend upstream of the Slide Creek impoundment. Because salmon and steelhead spawning does not occur in the Slide Creek impoundment, the salmon and steelhead temperature criterion does not apply to this segment of the North Umpqua River.

Oregon's temperature standard further protects water quality by restricting activities that impact waterbodies that meet or exceed applicable criteria. Waterbodies that meet or exceed the applicable biologically-based temperature criteria may not be warmed more than 0.3° C above ambient water temperatures.⁷

Applicant's Position

The Applicant indicates the proposed action will cause water to be stored in the Fish Creek forebay for at least 3.3 hours (the time needed to fill the forebay under high flow conditions). PacifiCorp states that in most cases stored water will be released for generation within 24 hours (i.e., the water will be used during the next peak generation cycle). The Applicant notes that the temperature of water stored in the forebay may increase due to ambient warming and direct solar gain.

The Applicant states it is highly unlikely that water will be impounded for more than 72-hours. However, to evaluate the effect of extended storage on water temperature PacifiCorp commissioned a study to

⁷ OAR 340-041-0028(11): "The cold-water protection narrative criteria in subsection (a) do not apply if (A) there are no threatened or endangered salmonids currently inhabiting the water body; (B) The water body has not been designated as critical habitat; and (C) The colder water is not necessary to ensure that downstream temperatures achieve and maintain compliance with the applicable temperature criteria." Discharge from the proposed Pumped Storage Project enters the Slide Creek impoundment portion of the North Umpqua River. The proposed action directly influences water quality conditions in the North Umpqua River including the reach below Soda Springs Dam that is designated critical habitat for coho salmon. Since volitional upstream and downstream passage was provided in 2012, access for coho salmon and other migratory species has been extended to Slide Creek Dam, which currently represents the upstream extent of migratory accessibility.

model project-related effects of water storage for up to three days using conservative environmental assumptions, including:

- Using the maximum temperatures observed in the Toketee Reservoir source water (i.e., 13°C) as the inflow temperature for the forebay
- Storing water from at least approximately 5:30 a.m. to 4 p.m., when solar heating is highest
- Releasing water from approximately 4 p.m. to 10 p.m., before the reservoir can cool
- Clear sky conditions to maximize incident solar radiation
- Average warmest air temperature (i.e., average of the warmest week over the past 37 years, 1985 to present)
- Worst-case air temperature (i.e., the 90th percentile of the warmest annual 7-day air temperatures over the last 37 years)
- Using the highest observed summer temperatures for the inflow to the Slide Creek Impoundment from the Toketee bypass reach (i.e., 13°C).

The model examined the proposed action's effects on temperature under <1-day, <2-day and <3-day storage duration scenarios using the assumed conditions referenced above. The model further evaluated these effects on water stored within the forebay and fully mixed water released to the Slide Creek impoundment.

Forebay Storage

The model results predicted incremental warming within the forebay during each of the three storage duration scenarios. Assuming a baseline initial temperature of 13°C, the model predicted final temperatures of water in the Fish Creek forebay ranged from 14.8°C (in the scenario of < 1-day storage and average-warmest summer condition) to 17.8°C (in the scenario of < 3-day storage and worst-case summer condition). In all cases the final forebay temperature did not exceed the 18°C temperature criterion to protect salmon and trout rearing and migration.

Temperature Effect in Slide Creek Impoundment

The Applicant assessed the temperature effects of the proposed Storage Project on the receiving water body (i.e., the Slide Creek impoundment) using a simple mixing model. Using flow and temperature data from the Toketee Powerhouse and the Toketee bypass reach, as well as Fish Creek penstock flows and modeled forebay temperatures, the model estimated the temperature response in the Slide Creek impoundment under fully mixed conditions.

The model assumed Toketee penstock inflow of 677 cfs (i.e., full plan capacity) and Toketee bypass reach inflow of 90 cfs. The temperature of both sources was assumed to be 13°C. Based on Fish Creek penstock flows of 178 cfs and the temperatures modeled under the three storage duration scenarios, the mixing model predicted the temperature in the Slide Creek impoundment would increase by no more than 0.3°C under the warmest average air temperature scenario and by no more than 0.4°C under the worst-case ambient air temperature scenario.

The model results found that the temperature response in the Slide Creek impoundment was sensitive to the timing and number of the generation cycles within a seven-day averaging period. For example, for the <2-day storage duration scenario, the highest temperature impacts were recorded if generation cycles occurred on odd days (i.e., 1, 3, 5 and 7) of the 7dAM period. Similarly, for the <3-day storage duration scenario, higher temperatures were predicted if releases occurred days 1, 4 and 7 of the averaging period. The modeling results found that maximizing the number of generation cycles during the 7dAM averaging period corresponded to the highest temperature impacts. The model further determined that the 0.3°C temperature allowance would not be exceeded during worst-case ambient temperature conditions if no more than five generation cycles were performed per seven-day period for the <1-day duration storage, or

if the first generation cycle did not occur on the first day of the 7dAM averaging period for the <2-day and <3-day duration storage scenarios.

The Applicant believes these results can help inform operational strategies during exceptionally warm periods of the summer to avoid exceeding the 0.3°C temperature allowance for protecting cold water. These strategies may include reducing the frequency of generation cycles when prolonged periods of high ambient temperatures are forecasted.

To validate the assumptions used in the water quality modeling effort, PacifiCorp will monitor water quality at the locations identified in Table 1 during the critical water quality period from June through September. Water quality monitoring will be performed beginning summer 2022 and continue annually until the proposed Storage Project begins operation. Monitoring parameters will include water temperature, specific conductance, pH, dissolved oxygen, turbidity, and total dissolved gas pressure, where appropriate.

DEQ Evaluation

Operation of the proposed Storage Project may cause the temperature of water in the forebay to increase based on the duration of the storage period and heat input from ambient air temperature and solar gain. To evaluate the effect of the proposed action on water quality, PacifiCorp commissioned a study to model the project's potential effects under several operational scenarios and environmental conditions.

The study indicated water temperature in the comparatively small forebay responded quickly to heat gain based on environmental conditions that included worst-case ambient air temperatures. Within three days, the initial temperature increased from 13°C to as much as 17.8°C but never exceeded the 18.0°C temperature criterion to protect salmon and trout rearing and migration. Under the current and proposed future operation the forebay will be filled from sources that effectively exclude the presence of fish. The intake to the Toketee penstock includes a fish screen with 0.5-inch bar spacing intended to minimize entrainment of trout over five inches in length. Any fish passing the Toketee intake will not likely survive passage through the proposed pump. The intake to the Fish Creek power canal is screened with eight T-screen assemblies.

Water released from the forebay during each generation cycle is discharged to the Slide Creek impoundment where it mixes with inputs from the Toketee bypass reach and tailrace discharge from the Toketee powerhouse. Based on assumed temperature and flow conditions from these sources, the mixing model predicted the temperature in the Slide Creek impoundment would increase by no more than 0.3°C under the warmest average air temperature scenario and by no more than 0.4°C under the worst-case ambient air temperature scenario.

Under most operational scenarios, the thermal effect of the proposed Storage Project does not exceed the 0.3°C allowance to protect cold water resources in the North Umpqua River that meet or exceed temperature criteria. The conditions necessary for project effects to exceed the 0.3°C allowable increase require the simultaneous occurrence of worst-case ambient conditions combined with an operational schedule that maximizes the number of generation cycles during a seven-day averaging period. The study estimates the recurrence interval for these conditions as 20-30 years.

The water quality modeling study predicts that temperature in the forebay may reach as high as 17.8°C under presumed worst-case conditions. The predicted response is below the 18°C temperature to protect salmon and trout rearing and migration. However, because the forebay is filled from sources that are screened to exclude most fish the potential is low for exposure by this use. The predicted thermal increase in the Slide Creek impoundment is low and may cause temperature to increase more than the allowable limit only under ambient and operational circumstances that are expected to occur very infrequently. The modeling suggests that increasing the frequency of generation cycles reduces the potential for the forebay warming. By monitoring ambient temperature conditions, DEQ expects that temperature increases to the

Slide Creek impoundment may be maintained below the 0.3°C temperature allowance for protecting cold water.

To confirm DEQ's expectation that the proposed Pumped Storage Project will comply with Oregon's temperature water quality standard DEQ will require PacifiCorp to prepare and implement a WQMP in accordance with Condition 1 of the section 401 water quality certification. If monitoring data demonstrate that operation of the pumped storage project causes temperature in the tailrace to increase more than 0.3°C DEQ may require PacifiCorp to assess the situation and submit to DEQ an adaptive management action plan. The plan shall propose modifications or operational strategies to reduce conditions that cause or contribute to temperature exceedances in project waters. Such strategies may include increasing the frequency of generation cycles, modifying operation during periods of predicted worst-case ambient temperature conditions, increasing available shade or other measures to prevent temperature increases. DEQ finds that such adaptive management strategies will likely eliminate factors that contribute to water quality degradation.

DEQ Findings

DEQ is reasonably assured that the proposed Storage Project under an amended FERC license will comply with the temperature criteria provided PacifiCorp implements the following measures:

- Develop and implement a Water Quality Management and Monitoring Plan as described in Condition 1 of the water quality certification.
- If DEQ determines monitoring indicates the temperature criteria are not being met, PacifiCorp shall consult with DEQ on adaptive management strategies to reduce the effect of project operation on temperature to at or below the applicable standard and develop and implement an adaptive management plan in accordance with DEQ's approval.

4.2.4 Biocriteria

OAR 340-041-0011

Waters of the State must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.

Application of Water Quality Standard

This narrative criterion recognizes that compliance with individual criteria may not fully capture synergistic effects resulting from multiple stressors and cumulative impacts on aquatic species and resident biological communities. The biocriteria standard complements parameter-specific standards by extending broad protections to all designated beneficial uses with the implicit assumption that protection of the most sensitive beneficial use provides protection to all uses. Application of the biological criteria intends to assess the overall impact to the aquatic community from water quality changes attributable to an anthropogenic activity.

Applicant position

The Applicant did not directly evaluate the potential effect of the proposed action on the Biocriteria water quality standard. The Applicant states that any potential project-related effects will be limited to warming in the forebay related to the additional residence time of water storage, and the related effects of this warming on dissolved oxygen.

DEQ Evaluation

DEQ has considered the potential impacts of the proposed Storage Project on the water quality characteristics protected by the Biocriteria water quality standard. The proposed project will redirect water from the Toketee penstock to the Fish Creek forebay during periods of water and power availability and release the stored water through the Fish Creek powerhouse during periods of higher power demand. Under the proposed action up to 190 cfs of water that would otherwise enter the Slide Creek impoundment at the Toketee powerhouse would instead be discharged to the impoundment at the Fish Creek powerhouse, approximately 560 feet downstream.

Operation of the proposed Storage Project may affect ramping in certain project reservoirs and reaches during filling and generation cycles. Project related ramping causes stage changes that can accelerate bankside erosion, cause stranding of juvenile fish and reduce riparian habitat complexity.

Toketee Development

During each filling cycle, the proposed project would fill the 87-acre-foot Fish Creek forebay from the existing Toketee powerhouse penstock. This diversion would result in about a one foot lowering of the Toketee Reservoir surface elevation. The predicted stage change is within the 3.5 feet of typical daily fluctuation of this reservoir. The project would not affect flows or ramping in the Toketee bypass reach.

Because the proposed project will not cause stage changes in the Toketee Reservoir that exceed the current operational regime, DEQ finds the project will not increase bankside erosion or cause additional degradation of aquatic resources protected by the Biocriteria standard.

Slide Creek Impoundment

The Slide Creek impoundment has an area of two acres and a capacity of 43-acre-feet with no active storage. Under the proposed action, flow that would otherwise be discharged through the Toketee powerhouse would instead be redirected to the Fish Creek forebay and later released through the Fish Creek powerhouse during each generation cycle. DEQ expects operation of the proposed pumped storage project will have negligible effect on daily surface elevation fluctuations. Furthermore, the North Umpqua Settlement Agreement Section 6 does not impose any ramping restrictions in the Toketee full-flow reach between Toketee Powerhouse and Slide Creek Dam, a reach that includes the Fish Creek tailrace. For these reasons, DEQ expects no net change in hydraulic effects from the existing operating conditions.

Slide Creek Bypass Reach

The Slide Creek impoundment is formed by Slide Creek Dam, a 30-foot-high concrete structure with three spillway gates. The principal function of the dam is to divert water into the Slide Creek waterway, a 9,653-foot long open channel with a rated capacity of 1,500 cfs. Releases to the Slide Creek bypass reach below the dam are controlled by an Obermeyer weir. The weir has an adjustable crest that modulates to the bypass reach releases over a range of reservoir elevations. The minimum flow in the bypass reach is 240 cfs year-round. Under future conditions that include operation of the proposed pumped storage project, Slide Creek Dam will continue to release flows to the bypass reach under the schedule required by the North Umpqua Settlement Agreement. For this reason, the proposed action will not influence flows to the bypass reach.

DEQ Findings

DEQ is reasonably assured that the proposed Storage Project under an amended FERC license will comply with the Biocriteria water quality standard provided PacifiCorp implements the following measures:

- Develop and implement a Water Quality Management and Monitoring Plan as described in Condition 1 of the water quality certification.

- PacifiCorp must comply with the minimum flow requirements and ramping restrictions of the North Umpqua Settlement Agreement.

If DEQ determines the Pumped Storage Project causes a water quality violation that presents a risk of serious injury to aquatic species, then DEQ may require PacifiCorp to assess the situation and submit to DEQ an adaptive management action plan. The plan shall propose modifications or operational strategies to reduce adverse conditions that cause or contribute to water quality standard violations. Upon review and approval by DEQ, PacifiCorp shall implement the plan in accordance with DEQ's approval.

4.2.5 Turbidity

OAR 340-041-0036

Turbidity (Nephelometric Turbidity Units, NTU): No more than a ten percent cumulative increase in natural stream turbidities may be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity. However, limited duration activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities and which cause the standard to be exceeded may be authorized provided all practicable turbidity control techniques have been applied and one of the following has been granted:

- (1) Emergency activities: Approval coordinated by the Department with the Oregon Department of Fish and Wildlife under conditions they may prescribe to accommodate response to emergencies or to protect public health and welfare;
- (2) Dredging, Construction or other Legitimate Activities: Permit or certification authorized under terms of section 401 or 404 (Permits and Licenses, Federal Water Pollution Control Act) or OAR 14I-085-0100 et seq. (Removal and Fill Permits, Division of State Lands), with limitations and conditions governing the activity set forth in the permit or certificate.

Application of Standard

Turbidity is an optical property that results from inorganic and organic particulate matter held in suspension. The standard is designed to minimize the addition of soil particles or any other suspended substances that would cause significant increases in the river's normal, seasonal turbidity pattern.

Applicant position

The Applicant did not directly evaluate the potential effect of the proposed action on the Turbidity water quality standard. The Applicant states that any potential project-related effects will be limited to warming in the forebay related to the additional residence time of water storage, and the related effects of this warming on dissolved oxygen.

To evaluate the effect of the proposed Storage Project on water quality, PacifiCorp proposes to measure water quality, including turbidity, at locations potentially influenced by the project.

DEQ Evaluation

Construction

Construction projects near waterways can temporarily disturb soils that may contribute to soil erosion and sedimentation of streams. DEQ may require projects that cumulatively disturb more than one acre of land

to apply for and receive coverage under National Pollution Discharge Elimination System (NPDES) construction stormwater general permit 1200-C.

Activities that may cause the discharge of fill material into waters of the United States may require a permit from the US Army Corps of Engineers pursuant to Section 404 of the federal Clean Water Act (33 USC §1341) and a water quality certification from DEQ pursuant to Section 401 of the Clean Water Act.

Operation

Hydropower projects that cause project-related changes in reservoir or river stage can increase turbidity in receiving waters. During down-ramp cycles receding water levels create a hydraulic gradient that can mobilize saturated soils resulting in turbidity plumes. Ramping-induced turbidity is affected by local soil types, shoreline slope, and the magnitude and rate of the ramping event.

DEQ understands the Pumped Storage Project will operate within the range of reservoir and ramping limits currently observed by the North Umpqua Hydro Project. During the proposed project operation, however, the Fish Creek forebay will be filled by reversing flow through the existing penstock during each pump cycle. This daily reversal in forebay flows may cause changes to the current forebay circulation patterns that may directly affect shear stresses on forebay soils. No hydraulic modelling was conducted to estimate the effects that changes in shear stress during filling cycles may have on turbidity.

DEQ expects that any increase in turbidity caused by changes in forebay circulation related to the use of the penstock during fill cycles, if any, will be minor and temporary. This is because the change in elevation of the Slide Creek impoundment due to each filling cycle is small and within the range of historical operation. To ensure that even in the unlikely event that turbidity caused by the Pumped Storage Project is not minor or increases in frequency, DEQ will require PacifiCorp to develop a Water Quality Management Plan that includes a monitoring program for turbidity within the Fish Creek forebay and tailrace as described in Condition 7 of the certification conditions. If monitoring data demonstrate that operation of the pumped storage project causes excessive turbidity in the tailrace DEQ may require PacifiCorp to assess the situation and submit to DEQ an adaptive management action plan. The plan shall propose modifications or operational strategies to reduce conditions that cause or contribute to turbidity in project waters. Such strategies may include adjusting discharge to reduce the rate of stage change in the Slide Creek impoundment. DEQ finds that such adaptive management strategies are likely to eliminate any turbidity standard violation by reducing conditions that contribute to increased turbidity.

DEQ Findings

DEQ is reasonably assured that the Storage Project under a proposed amended FERC license will comply with the turbidity criteria provided PacifiCorp implements the following measures:

- Prepare a Water Quality Management Plan that includes measures to monitor turbidity as described in Condition 1 of the water quality certification.
- Apply for and receive coverage under NPDES permit 1200-C, as required, if the proposed action will disturb more than one acre of land during construction.
- If DEQ determines that monitoring indicates the turbidity water quality standard is not being met, PacifiCorp shall consult with DEQ on adaptive management strategies to reduce the effect of project operation on turbidity to at or below the applicable standard, and develop and implement an adaptive management plan in accordance with DEQ's approval.

4.2.6 Total Dissolved Gas

OAR 340-041-0031

(1) Waters will be free from dissolved gases, such as carbon dioxide hydrogen sulfide, or other gases, in sufficient quantities to cause objectionable odors or to be deleterious to fish or other aquatic life, navigation, recreation, or other reasonable uses made of such water.

(2) Except when stream flow exceeds the ten-year, seven-day average flood, the concentration of total dissolved gas relative to atmospheric pressure at the point of sample collection may not exceed 110 percent of saturation. However, in hatchery-receiving waters and other waters of less than two feet in depth, the concentration of total dissolved gas relative to atmospheric pressure at the point of sample collection may not exceed 105 percent of saturation.

Application of Standard

Supersaturation of atmospheric gases typically occurs when aerated water is discharged to a deeper portion of a receiving waterbody. The hydrostatic pressure that occurs at deeper zones increases gas solubility resulting in gas concentrations that can exceed normal maximum solubility. Total dissolved gas concentrations above 100-percent saturation can cause gas bubble trauma in salmonids in which the formation of gas bubbles on the gills and fins can cause stress or death.

Applicant position

The Applicant did not directly evaluate the potential effect of the proposed action on the Total Dissolved Gas water quality standard. To evaluate the effect of the proposed Storage Project on water quality, PacifiCorp proposes to measure water quality, including total dissolved gas, at locations potentially influenced by the project.

DEQ Evaluation

PacifiCorp collected limited TDG data during water quality studies to support the relicensing of the North Umpqua Hydroelectric Project. Referring to data collected at the Fish Creek tailrace, DEQ indicated:

PacifiCorp notes a single measurement of TDG above criterion of 118 % saturation on June 11, 1993, out of a total of 12 TDG % saturation readings. Both Slide Creek and Fish Creek [powerhouse tailraces] showed high readings on the same day but no high measurements before or after ... One measurement was above the criteria but appears to be a data anomaly because the next highest measurement was more than 10 percent less. PacifiCorp does not propose specific PME measures to address the TDG at this location.⁸

Under the proposed operation the turbine, powerhouse and penstock flow will remain unchanged from current operation. Although limited data are available to assess the effect of project operation on gas saturation levels data from relicensing studies appear to indicate the project's contribution to total dissolved gas is small. DEQ's 2002 WQC required no additional TDG monitoring at the Fish Creek powerhouse. Based on this information, DEQ expects the Pumped Storage Project will not cause concentrations of TDG to exceed the allowable numeric criteria.

⁸ *North Umpqua Hydroelectric Project (FERC No.1927) Evaluations and Findings Report*. Oregon DEQ, June 2002.

To confirm this expectation, DEQ will require PacifiCorp to develop a Water Quality Management Plan that includes a total dissolved gas monitoring schedule as required by Condition 1 of the water quality certification. If monitoring data indicate total dissolved gas concentrations in the Fish Creek forebay exceed 110-percent saturation, then DEQ may require PacifiCorp to assess the situation and submit to DEQ an adaptive management action plan. Upon approval by DEQ PacifiCorp shall implement the plan.

DEQ Findings

DEQ is reasonably assured that the Storage Project under an amended FERC license will comply with the Total Dissolved Gas water quality standard provided PacifiCorp implements the following measures:

- Prepare a Water Quality Management Plan that includes measures to monitor Total Dissolved Gas as required by Condition 1 of the water quality certification.
- If DEQ determines monitoring indicates the TDG water quality standard is not being met, PacifiCorp shall consult with DEQ on adaptive management strategies to reduce the effect of project operation on total dissolved gas to at or below the applicable standard.
- PacifiCorp shall develop and submit an adaptive management plan to DEQ to attain the TDG criteria. Following DEQ review and approval of the adaptive management plan, PacifiCorp shall implement the plan.

4.2.7 pH

OAR 340-041-0326

Basin-Specific Criteria (Umpqua Basin): Water Quality Standards and Policies for this Basin

pH (hydrogen ion concentration). pH values may not fall outside the following ranges:

- (a) Marine waters: 7.0–8.5;
- (b) Estuarine and fresh waters (except Cascade lakes): 6.5–8.5;
- (c) Cascade lakes above 3,000 feet altitude: pH values may not fall outside the range of 6.0 to 8.5.

Application of Standard

This standard applies to the Project-affected waters for surface waters in canals, waterways and streams, and in Project impoundments. The Project does not encompass or affect marine waters. The Project does not encompass or affect Cascade Lakes including lakes above 3,000 feet altitude.

Applicant position

PacifiCorp did not directly evaluate the potential effect of the proposed action on the pH water quality standard. To evaluate the effect of the proposed Storage Project on water quality, PacifiCorp proposes to measure water quality, including pH, at locations potentially influenced by the project.

DEQ Evaluation

Fish and other aquatic life in any particular stream have evolved within region-specific pH conditions. It is important to set a pH standard that reflects natural conditions and will prevent any intolerable

acid/alkalinity imbalances. Thus, the Umpqua Basin pH standard has been set at a tolerable range of 6.5 to 8.5 to coincide with the locally natural range.

Waterbody impoundments alter the natural surface water hydrology and may allow for the recruitment and growth of algae and water-dependent vegetation. Oxygen and carbon dioxide exchange caused by diel respiration and photosynthesis cycles directly affects water chemistry, including pH. Preventing the occurrence of aquatic vegetation in waterbodies, therefore, is an effective means of eliminating pH excursions caused by diel respiration and photosynthesis.

In November 2008, PacifiCorp measured pH in the Fish Creek tailrace for 30 hours as required by Condition 2(d)(3) of the June 2001 water quality certification. The objective was to measure pH following an extended idle period of operation. During the study, pH ranged from 7.54 to 7.8 standard units and never approached the limits established by the basin-specific range.

PacifiCorp expects the Pumped Storage Project may complete multiple fill-generation cycles in any given 24-hour period. The storage of water in Fish Creek forebay for any period longer than 72-hours is considered unlikely. DEQ considers the frequency at which the fill-generation cycles will occur to be sufficient to interrupt and delay algal growth cycles and thus prevent diel pH excursions that exceed the range established by the Umpqua basin-specific criteria. If monitoring data demonstrate that operation of the Pumped Storage Project causes pH in the tailrace to exceed the applicable range DEQ may require PacifiCorp to assess the situation and submit to DEQ an adaptive management action plan. The plan shall propose modifications or operational strategies to reduce conditions that cause or contribute to pH excursions in project waters. Such strategies may include treatment to remove or reduce aquatic vegetation in the forebay or measures to increase the discharge frequency to mitigate pH excursions. DEQ finds that such adaptive management strategies will likely eliminate any pH violation by reducing conditions that contribute to increased aquatic vegetation growth.

DEQ Findings

DEQ is reasonably assured that the Storage Project under an amended FERC license will comply with the pH water quality standard provided PacifiCorp implements the following measures:

- Prepare and implement a Water Quality Management Plan that includes measures to monitor pH as required by Condition 1 of the water quality certification.
- If DEQ determines monitoring indicates the pH water quality standard is not being met, PacifiCorp shall consult with DEQ on adaptive management strategies to reduce the effect of project operation on pH to within applicable range and develop and implement an adaptive management plan in accordance with DEQ's approval.

4.2.8 Antidegradation

Oregon's antidegradation policy can be found in its entirety in OAR 340-041-0004. The purpose of the antidegradation policy is described below:

Antidegradation

- (1) Purpose. The purpose of the Antidegradation Policy is to guide decisions that affect water quality such that unnecessary further degradation from new or increased point and nonpoint sources of pollution is prevented, and to protect, maintain, and enhance existing surface water quality to ensure the full protection of all existing beneficial uses. The standards and policies set forth in OAR 340- 041-0007 through 340-041-0350 are intended to supplement the Antidegradation Policy.

Application of Water Quality Standard

Oregon's antidegradation policy complements the use of water quality criteria. While narrative and numeric criteria establish the minimum values or conditions necessary to protect designated uses, the antidegradation policy protects existing water quality against the effects of new or increased discharge sources. Where water quality exceeds levels required to support existing and designated beneficial uses, the antidegradation policy prohibits actions that may reduce existing water quality. The policy provides certain exceptions to accommodate, for example, projects to support economic growth and social development after first completing a procedural review.

The policy recognizes several types of new or increased discharge sources that do not cause water quality degradation and, therefore, do not require antidegradation review. These include discharges to existing mixing zones, water conservation activities that do not increase the mass loading of the pollutant, insignificant increases in temperature⁹ and insignificant decreases in dissolved oxygen (i.e., less than 0.1 mg/l).

Applicant's Position

PacifiCorp maintains the proposed Storage Project will comply Oregon's antidegradation policy. PacifiCorp commissioned a water quality modeling study that found the project may increase the 7dAM temperature in the Slide Creek impoundment by 0.4°C assuming extended forebay retention periods and worst-case ambient temperature scenarios with recurrence intervals of 10-years or more. The 7dAM temperature did not exceed the 0.3°C allowance per OAR 340-041-0028(11) under conditions considered more typical of anticipated operation. PacifiCorp believes that minor adjustments to project operations during periods of very warm ambient conditions may cause any thermal effects to not exceed allowable temperature increases. These operational adjustments rely on increasing the frequency of generation cycles thereby reducing the opportunity for thermal gain during worst-case ambient temperature conditions.

PacifiCorp estimated the effect of project operation on dissolved oxygen based on the results of the above-referenced temperature modeling effort. Under worst-case conditions, the proposed project may decrease the concentration of dissolved oxygen in the Slide Creek impoundment by up to 0.2 mg/l. However, the model found that dissolved oxygen did not decrease by more than 0.1 mg/l under conditions considered more typical of anticipated operation. PacifiCorp additionally cited the reaeration that occurs in the powerhouse tailrace discharge as potentially mitigating any decrease in dissolved oxygen caused by thermal effects of forebay storage. However, PacifiCorp did not quantify any dissolved oxygen contribution attributable to turbine operation.

Based on this information PacifiCorp believes that operation of the proposed project will comply with Oregon's antidegradation policy.

DEQ Evaluation and Findings

Oregon's antidegradation policy is intended to maintain support for all designated beneficial uses by preventing unnecessary lowering of water quality from new or increased sources of pollution. The antidegradation policy establishes three categories of protections based on existing water quality. The high-quality waters policy applies to those waterbodies where the existing water quality meets or exceeds those levels necessary to support all designated beneficial uses. The 2018/2020 Integrated Report indicates no impaired water quality parameters in the reach of the North Umpqua River that includes the

⁹ Insignificant temperature increases authorized under OAR 340-041-0028(11) and (12) are not considered a reduction in water quality.

Slide Creek impoundment. Based on this assessment the river in the vicinity of the proposed Storage Project is classified as a high-quality water for the purpose of evaluating compliance with the antidegradation policy.

Oregon's high quality waters policy requires existing water quality be maintained and protected. New or increased discharge sources that may lower the existing water quality are prohibited. However, the Environmental Quality Commission may allow a lowering of water quality after completing an antidegradation review if it finds:

- No reasonable alternatives exist,
- The benefits outweigh the environmental costs of lowered water quality,
- All water quality standards will be met, and beneficial uses protected; and
- Federal threatened and endangered aquatic species will not be adversely affected.

Oregon's antidegradation policy allows certain exceptions to this rule. In particular, the policy does not require antidegradation reviews for certain new or increased discharges deemed "non-degradation discharges" (OAR 340-041-004[3]). DEQ completed the following review of the non-degradation discharge criteria to determine if the proposed action required a full antidegradation review:

OAR 340-041-004(3): Non-degradation Discharge.

The following sources are not required to undergo an antidegradation review:

(a) Discharges to existing mixing zones

PacifiCorp seeks a non-capacity license amendment to operate the Toketee and Fish Creek developments as a pumped-storage facility. During each generation cycle water will be discharged to the Slide Creek impoundment through the existing Fish Creek powerhouse. No change in discharge rate will occur and no new source or mixing zone will be created. Based on the proposed action, DEQ finds that the proposed action will discharge to the existing mixing in the tailrace below the powerhouse.

(b) Water conservation activities

The proposed Storage Project is not a water conservation project.

(c) Temperature: Insignificant temperature increases authorized under OAR 340-041-0028(11) and (12) are not considered a reduction in water quality.

The results of a temperature modeling exercise found that operation of the proposed Storage Project may cause the 7dAM temperature in the Slide Creek impoundment to increase by as much as 0.4°C although this increase was less for water storage retention times more typical of expected operation schedules. Furthermore, the model found that increasing the frequency of generation cycles effectively limited temperature increases and prevented the 7dAM temperature in Slide Creek from exceeding the 0.3°C temperature increase limit. For this reason, DEQ is reasonably assured the proposed Storage Project will comply with the temperature water quality standard including the thermal allowances prescribed in OAR 340-041-0028(11 and 12) provided PacifiCorp comply with the conditions of the section 401 water quality certification.

(d) Dissolved Oxygen: Up to a 0.1 mg/l decrease in dissolved oxygen from the upstream end of a stream reach to the downstream end of the reach is not considered a reduction in water quality so long as it has no adverse effects on threatened and endangered species.

Water quality modeling results found the Pumped Storage Project could reduce dissolved oxygen in the Slide Creek impoundment by up to 0.2 mg/l under circumstances that included worst-case ambient temperature conditions. However, under operational conditions deemed more typical of anticipated operations the reduction in dissolved oxygen was less. Furthermore, PacifiCorp cited the potential for reaeration of tailwater discharge as a possible oxygenation source. No citations were offered to support

this possibility. However, DEQ recognizes the potential for modest aeration to occur in turbulent discharge from high-head discharge sources.

Based on the potential temperature increase due to the storage of water in the Fish Creek forebay, the water quality modeling estimated that dissolved oxygen in the Slide Creek impoundment could decrease by 0.2 mg/l. However, PacifiCorp believes the reaeration of water provided in the turbine tailrace would offset any dissolved oxygen deficit. DEQ is reasonably assured the project will comply with the dissolved oxygen water quality standard provided PacifiCorp implement and complies with all of the conditions of the water quality certification, including required adaptive management should monitoring data indicate the Pumped Storage Project may be causing or contributing to degradation of water quality.

In conclusion, DEQ finds that the project if operated as proposed and in compliance the section 401 water quality certification will not represent a new or increased source of pollution or cause degradation of water quality. DEQ is reasonably assured that construction and operation of the proposed Pumped Storage Project under an amended FERC license that incorporates this water quality certification will comply with Oregon's antidegradation policy.

5.0 Evaluation of Compliance with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act

In order to certify a project pursuant to §401 of the federal Clean Water Act, DEQ must find that the project complies with applicable provisions of Sections 301, 302, 303, 306 and 307 of that Act and state regulations adopted to implement these sections.

Sections 301, 302, 306 and 307 of the federal Clean Water Act address effluent limitations, water quality related effluent limitations, national standards of performance for new sources and toxic and pretreatment standards. All of these requirements relate to point source discharges and are the foundation for conditions incorporated in National Pollution Discharge Elimination System (NPDES) permits issued to the point sources. Point source discharges at hydroelectric projects may include cooling water discharges, stormwater, and sewage discharges.

Section 303 of the Act relates to Water Quality Standards and Implementation Plans. The federal Environmental Protection Agency (EPA) has adopted regulations to implement Section 303 of the Act. The EQC has adopted water quality standards consistent with the requirements of Section 303 and the applicable EPA rules. The EQC standards are codified in OAR Chapter 340, Division 41. EPA has approved the Oregon standards pursuant to the requirements of Section 303 of the Act. Therefore, the Project must comply with Oregon Water Quality Standards to qualify for certification. As discussed above in this report, the proposed Project will comply with Oregon Water Quality Standards and therefore Section 303 of the Clean Water Act, provided the conditions to the section 401 Certification are satisfied.

6.0 Evaluation of Other Appropriate Requirements of State Law and ORS 543A.035(2) – (4) Minimum Standards

As part of the evaluation of an application for §401 certification, DEQ must evaluate whether the activity for which certification is sought will comply with other appropriate requirements of state law (OAR 340-048-0042(2)). Such requirements are “appropriate” if they have any relation to water quality, see *Arnold Irrigation Dist. v. DEQ*, 79 Or App 136 (1986); *PUD No.1 of Jefferson Co. v. Washington Dept. of Ecology*, 511 U.S. 700 (1994); *S.D. Warren v. Maine Board of Env'tl. Prot., et. al*, 547 U.S. 370 (2006).

In addition, for existing hydroelectric projects and where no state water rights are being reauthorized, DEQ’s evaluation of compliance with the minimum standards set forth in ORS 543A.025 is limited to evaluating consistency with (1) those statutory standards, (2) WRD’s ORS 543.025 minimum standards implementing rules, and (3) other state agencies’ rules that are consistent with such standards that the Director deems are “other appropriate requirements of state law” consistent with Section 401 of the federal Clean Water Act. See ORS 468B.045(2).¹⁰

Notably, PacifiCorp has not requested WRD to reauthorize its water rights. Instead, PacifiCorp is separately seeking an amendment to its water rights for the Pumped Storage Project, which will not change the expiration date of such water rights. Accordingly, OAR 340-048-0042(4) is inapplicable; however, DEQ’s evaluation of the Pumped Storage Project’s consistency with ORS 543A.025(2) – (4) minimum standards and WRD’s implementing rules is included herein to the extent that ORS 468B.045(2) may be applicable in this unique factual circumstance.

6.1 Department of State Lands

ORS 196.810 requires that permits be obtained from the Oregon Department of State Lands (DSL) prior to any fill and removal of material from the bed or banks of any stream. Such permits, if issued, may contain conditions to assure protection of water quality to protect fish and aquatic habitat. If the amended license authorizes construction activities that include fill or removal of material from the bed or banks of waterways, the Applicant must first apply for and receive a removal-fill permit from DSL. Such actions may also require a dredge and fill permit from the Corps pursuant to § 404 of the Clean Water Act, and a §401 water quality certification from DEQ. The Applicant must first obtain all applicable permits, certificates, and authorizations prior to engaging in activities required under the terms of a new FERC License.

¹⁰ ORS 468B.045(2) (“If the proposed certification is for a change to a federally licensed project, as defined in ORS 543A.005, that has been reauthorized under ORS 543A.060 to 543A.300 * * * the director shall * * * determine consistency with * * * standards established in ORS 543A.025 (2) to (4), rules adopted by the Water Resources Commission implementing such standards **and** rules of other state and local agencies that are consistent with the standards of ORS 543A.025 (2) to (4) **and that the director determines** are other appropriate requirements of state law according to section 401 of the Federal Water Pollution Control Act, P.L. 92-500, as amended.”) (emphasis added).

6.2 Department of Fish and Wildlife

The Oregon Department of Fish and Wildlife administers the following rules that pertain to providing and maintaining passage around artificial obstructions, protecting aquatic habitat and protecting and restoring native fish stocks.

- ORS 541.405 Oregon Plan for Salmon and Watersheds
Restore native fish populations and the aquatic systems that support them, to productive and sustainable levels that will provide environmental, cultural and economic benefits.
- ORS 496.012 Wildlife Policy
This statute establishes ODF&W's primary directive to prevent serious depletion of any indigenous species and to maintain all species of fish and wildlife at optimum levels.
- ORS 496.435 Policy to Restore Native Stocks
Restore native stocks of salmon and trout to historic levels of abundance.
- ORS 498.306 Screening or By-pass Devices for Water Diversions
Any person who diverts water from any body of water in this state in which any fish, subject to the State Fish and Wildlife Commission's regulatory jurisdiction, exist may be required to install, operate and maintain screening or by-pass devices to provide adequate protection for fish populations present at the water diversion.
- ORS 509.580 - 509.910; OAR 635, Division 412 ODF&W's Fish Passage Law
Provide upstream and downstream passage at all artificial obstructions in Oregon waters where migratory native fish are currently or have historically been present.
- OAR 635-007-0502 through 0509 Native Fish Conservation Policy
- OAR 635-500-0100-0120 Trout Management
Maintain the genetic diversity and integrity of wild trout stocks; and protect, restore and enhance trout habitat.
- OAR 635-415-0000-0030 Fish and Wildlife Habitat Mitigation Policy

In accordance with ORS 468B.045(1)(a), DEQ solicited comments from ODFW relative to potential adverse impacts to water quality caused by the Pumped Storage Project. In response, ODFW provided correspondence previously submitted on February 2, 2022, to PacifiCorp regarding ODFW's comments on a draft version of the non-capacity license amendment application for the proposed Storage Project.

ODFW notes the proposed pumped storage project would mostly use existing infrastructure associated with the Toketee and Fish Creek developments. The project would divert water from the existing Toketee penstock for storage in the Fish Creek forebay. Toketee Dam is located above the range of anadromous fish but within the range of distribution of Rainbow trout (*Oncorhynchus mykiss*), a native migratory fish. No structural or operational modifications are proposed for Toketee Reservoir or the Toketee intake.

During relicensing of the North Umpqua hydroelectric project, ODFW and PacifiCorp entered into a Memorandum of Understanding for a Waiver to Fish Passage (MOU, approved by the Oregon Fish and Wildlife Commission in 2001). Under the MOU, PacifiCorp agreed to a mitigation package in lieu of providing passage at several project-related artificial obstructions, including Toketee Dam. Because the

project proposes no structural, operational, or capacity changes to Toketee Dam, PacifiCorp has met and continues to meet all mitigation obligations required in the existing fish passage waiver, and per ORS 509.585(9)(a), ODFW has determined the proposed Storage Project will not require the MOU to be reopened and PacifiCorp does not need to address fish passage at Toketee Dam as part of this specific pumped storage project proposal.

In 2010, PacifiCorp completed modifications to the Toketee trashrack at the intake to the Toketee penstock as required by the North Umpqua Settlement Agreement (2001). The modifications included reducing bar spacing to 0.5-inches, increasing surface area to reduce approach velocities to no more than 0.8 feet-per-second, and an automated cleaning system to remove debris. Because PacifiCorp has met these obligations under the Settlement Agreement and the proposed Storage Project proposes no structural, operational, or capacity modifications proposed at the Toketee intake, the ODFW determined that PacifiCorp does not need to further modify the Toketee intake to address potential fish screening needs as part of this specific pumped storage project proposal.

6.3 Department of Environmental Quality

DEQ implements the following programs that regulate activities that may contribute to discharge to waters of the state.

Onsite Septic Systems

On-site disposal of sewage is governed by ORS 454.705 et. seq. and OAR Chapter 340, Divisions 71 and 73. The purpose of these rules is to prevent health hazards and protect the quality of surface water and groundwater. The proposed Storage Project does not propose the addition of on-site systems covered by this rule.

Hazardous Materials

ORS 466.605 et. seq. and ORS 468.780-815 establish requirements for reporting and clean-up of spills of petroleum products and hazardous materials. ORS 468.742 requires submittal of plans and specifications for water pollution control facilities to DEQ for review and approval prior to construction. One of the purposes of these statutes and rules is to prevent contamination of surface or groundwater. In the event of a spill or release or threatened spill or release to waters of the state of petroleum or other hazardous substances at or above reportable quantities as specified in state and federal regulations, PacifiCorp must implement spill response procedures, notify Oregon Emergency Response System within 24-hours, and comply with ORS Chapters 466 and 468, as applicable.

Construction Stormwater

DEQ requires that facilities apply for and receive coverage under National Pollution Discharge Elimination System construction stormwater system permit 1200-C prior to engaging in upland construction activities that may disturb one or more acres of land and which may reasonably result in discharge to surface waters of the state. DEQ will condition the section 401 water quality certification to require the Applicant to obtain all applicable permits prior to engaging in activities that may result in discharge to waters of the state.

6.4 Department of Water Resources

In accordance with ORS 468B.045(1)(a), DEQ solicited comments from OWRD relative to potential adverse impacts to water quality caused by proposed Storage Pumped project. In response, OWRD provided the following comments:

- a. OWRD has received an application for an amendment to the North Umpqua water right certificate for the proposed pumped storage project using Toketee Reservoir and the Fish Creek forebay.
- b. OWRD provided public notice of the application on March 22, 2022.
https://apps.wrd.state.or.us/apps/misc/wrd_notice_view/?notice_id=21
- c. Additional notice was published in the local newspaper twice in a two-week period. OWRD did not receive any comments regarding the project from these notices.
- d. ODFW has provided comments that the fish passage waiver will remain in effect for this amendment, and no modifications will be required for the existing fish screen.
- e. Operation of the proposed pumped storage project would maintain existing requirements for minimum flows as stated in the final unified statement for relicensing of the project under ORS 543A.
- f. OWRD finds no evidence that the project could cause injury to other water rights.
- g. OWRD identifies no adverse impacts to water quality from the proposal, other than what DEQ would normally regulate with best practices for erosion control and stormwater management during construction.
- h. Per OAR 690-053-0030, if no substantial issues are raised with regard to the proposal, OWRD will not schedule a public meeting for additional studies or consultation.
- i. OWRD will wait for the decision of ODEQ regarding modifications to the section 401 water quality certification before proceeding with a proposed order regarding the amendment.

In accordance with ORS 468B.045(2), DEQ evaluates and makes findings as whether its approval of certification includes sufficient:

- (a) Mitigation for adverse impacts to fish and wildlife resources attributable to new construction or operational changes to the project and to address ongoing adverse impacts, if any;
- (b) Measures to promote restoration and rehabilitation of fish and wildlife resources to support goals expressed in statute or in ODFW Commission standards, plans, guidelines and polices adopted by rule;
- (c) Protections to public health and safety, including operational restrictions that provide practical protection from vulnerability to seismic and geologic hazards;
- (d) Protections for wetland resources; and
- (e) Protections for other resources in the project vicinity including recreational opportunities, scenic and aesthetic values, historic, cultural and archaeological sites, and botanical resources.

DEQ notes that as identified in Section 3.3 of this report and further described in PacifiCorp's 401 WQ certification application for license amendment, PacifiCorp has proposed to continue to maintain all existing fish screens, and in addition, PacifiCorp has proposed mitigation in the form of funding fish hatchery production to address anticipated potential losses due to Pumped Storage Project operations. DEQ concurs with PacifiCorp's analysis in its 401 WQ certification application for license amendment that this aspect of their proposed action mitigates for adverse impacts to fish resources caused by its proposed construction and operational changes.

As discussed in Section E.4.3 of PacifiCorp’s license amendment application, PacifiCorp, in consultation with USDA Forest Service developed best management practices to reduce impacts to wildlife resources in the Project area. These include restricting equipment to the existing road prism where possible to avoid compaction in adjacent wetland areas, avoiding removal of ground-shading overstory and vegetative cover, and avoiding spoils disposal in the immediate area of the site, including adjacent wet areas, the ditch line, and/or under the existing penstock. PacifiCorp will further conduct monitoring of macroinvertebrate communities in the Slide Creek impoundment. If sampling efforts indicate that the proposed project has an impact on the aquatic macroinvertebrate community in the Slide Creek impoundment, PacifiCorp will develop additional monitoring and/or mitigation measures in consultation with the appropriate agencies. DEQ concurs with the measures proposed by PacifiCorp to protect wildlife resources against potential adverse effects caused by development of the proposed Pumped Storage Project.

As discussed in Section E.11.3 of PacifiCorp’s license amendment application, PacifiCorp plans to perform surface and sub-surface investigations to inform the design of the proposed action. The geotechnical investigation will include three phases: geologic mapping and site reconnaissance; noninvasive, geophysical surveys along the alignment; and subsurface drilling. PacifiCorp will prepare an Erosion and Sediment Control Plan for permitting of construction impacts and mitigation of project effects on soil resources. DEQ concurs with the measures proposed by PacifiCorp to provide practical protection against seismic and geologic hazards.

PacifiCorp will prepare a formal jurisdictional delineation of waters, including wetlands, prior to project construction. PacifiCorp will prepare an Erosion and Sediment Control Plan (ESCP) for permitting of construction impacts and mitigation of project effects on wetland, riparian, and littoral resources. The ESCP will include standard best management practices for sediment control including, but not limited to, silt fencing and straw wattles to prevent incidental impacts to wetland, riparian, and littoral resources. PacifiCorp must obtain all appropriate permits and authorizations prior to undertaking ground-disturbing work that affects jurisdictional waters including wetlands.

DEQ concurs with the measures proposed by PacifiCorp described in Sections E.4.7, E.4.8, and E.4.9 to protect cultural, recreational and aesthetic resources from impacts associated with construction and operation of the Pumped Storage Project.

6.5 Department of Land Conservation and Development

ORS Chapter 197 contains provisions of state law requiring the development and acknowledgement of comprehensive land use plans. This chapter also requires state agency actions to be consistent with acknowledged local land use plans and implementing ordinances.

OAR 340-048-0020 (2)(i)(A) require the application for section 401 certification to include land use compatibility findings prepared by the local planning jurisdiction. In the event a LUCS has not or cannot be issued, compatibility with local land use may alternatively be demonstrated pursuant to OAR 340-048-0020(2)(B, C).

PacifiCorp applied for and received a valid Land Use Compatibility Statement from the Douglas County Planning Department dated June 28, 2022. The LUCS confirms the proposed Pumped Storage Project is consistent with Douglas County local ordinance LUDO 3.2.050 (5).

7.0 Public Comment

On June 16, 2022, DEQ placed this Evaluation and Findings Document and section 401 water quality certification on public notice for a period of 35-days as required by OAR 340-048-0027. DEQ received three comments during this period. (Exhibit A – Public Comments). DEQ considered each of the comments and made adjustments, as deemed appropriate, prior to issuing the final certification decision.

8.0 Conclusions and Recommendation for Certification

DEQ has determined that the proposed Storage Project will comply with the applicable provisions of Sections 301, 302, 303, 306 and 307 of the Clean Water Act, OAR Chapter 340, Division 41 and other appropriate requirements of state law provided the Applicant implements the conditions included in the section 401 Certification.

Based on the preceding evaluation and findings, it is recommended that pursuant to section 401 of the Federal Clean Water Act and ORS 468.045, the Director, or assigned signatory, approve the request to modify the section 401 water quality certification for the North Umpqua Hydroelectric Project, FERC Project No. P-1927, subject to the conditions set forth in the attached certification.

9.0 References:

Oregon Department of Environmental Quality, North Umpqua Hydroelectric Project (FERC Project P-1927) Evaluation Report and Findings, June 2002.

PacifiCorp, North Umpqua Hydroelectric Project (FERC Project No. 1927) Request to Modify the Water Quality Certification for the North Umpqua Hydroelectric Project to Include Pumped Storage Facilities and Operations, February 16, 2022.

Four Peaks Environmental, Fish Creek Pumped Storage Project: Conceptual Assessment of Temperature and Dissolved Oxygen Changes, November 1, 2021.

PacifiCorp, North Umpqua Hydroelectric Project (FERC Project No. 1927) Application for Non-Capacity-Related Amendment of License for Major Project—Existing Dam Volume I, February 2022.

Oregon Department of Environmental Quality, 2018/2020 Integrated Report.

Oregon Department of Environmental Quality, Evaluation Report and Findings – North Umpqua Hydroelectric Project, FERC Project No.1927. June 2002.

Exhibit A: Public Comments



July 15, 2022

Chris Stine, Hydroelectric Specialist
Oregon Department of Environmental Quality
165 E. Seventh Ave., Suite 100
Eugene, OR 97401
Submitted via email: chris.stine@deq.oregon.gov

Re: Comments on the Department of Environmental Quality's Draft Clean Water Act Section 401 Certification Modification for PacifiCorp's Non-Capacity License Amendment for the North Umpqua Hydroelectric Project (FERC No. 1927)

Dear Mr. Stine:

The Conservation Angler ("TCA") submits the following comments on the Oregon Department of Environmental Quality's ("DEQ") Clean Water Act ("CWA") Section 401 Draft Certification Modification ("Draft Certification") for the North Umpqua Hydroelectric Project ("Project"). See DEQ, Draft Clean Water Act § 401 Certification Modification for PacifiCorp's Non-Capacity License Amendment for the North Umpqua Hydroelectric Project (FERC No. 1927), Umpqua River Basin, Douglas County, Oregon. TCA is concerned about the water quality impacts that the pumped storage operation ("Proposed Action") would cause in the North Umpqua River. DEQ's Draft Evaluation and Findings Report for the Draft Certification demonstrates that the Proposed Action would cause the Project to violate water quality standards. See DEQ, Draft Evaluation and Findings Report, Section 401 Water Quality Certification for the North Umpqua License Amendment, FERC Project Number 1927 (the "Draft Report"). Therefore, DEQ must deny the Certification. ORS 468B.045(1)(b)(A).

Because the Draft Report explains that the Proposed Action would cause the Project to violate water quality standards, DEQ cannot be reasonably assured that the Project as changed by the Proposed Action would comply with water quality standards. ORS 468B.045(1)(b)(A). Therefore, DEQ must notify the Federal Energy Regulatory Commission ("FERC") that there is no longer reasonable assurance that the Project as changed by the Proposed Action complies with the CWA. ORS 468B.045(3)(b).

1. THE PROPOSED ACTION WOULD CAUSE THE PROJECT TO VIOLATE THE ANTIDegradation RULE

The Proposed Action would cause the Project to violate Oregon’s Antidegradation Rule. OAR 340-041-0004. No exceptions to the Antidegradation Rule apply. DEQ must deny the Certification. ORS 468B.045(1)(b)(A).

a. The Proposed Action Would Cause the Project to Violate the High Quality Waters Rule

The Draft Report demonstrates that the Proposed Action would cause the Project to violate the High Quality Waters Rule. OAR 340-041-0004(6). The Slide Creek Impoundment reach of the North Umpqua River is a high-quality water for all parameters. Draft Report, at 31. The rule requires DEQ to protect and maintain high quality waters. OAR 340-041-0004(6). DEQ states that the Proposed Action would cause the Project to lower water quality in this reach of the North Umpqua River. For example, DEQ acknowledges that the Proposed Action would raise water temperatures in the Slide Creek Impoundment reach by as much as 0.4° C based on modeling that uses historical ambient air temperatures that do not represent warmer air temperatures that will occur because of climate change. Draft Report, 23. In any event, because DEQ admits that the Proposed Action would cause the Project to lower water quality in this high-quality water reach, DEQ must deny the Certification. ORS 468B.045(1)(b)(A).

b. No Exceptions to the High Quality Waters Rule Do Not Apply

No exceptions to the High Quality Waters Policy apply to the Draft Certification. *Id.* Other reasonable alternatives exist to lowering water quality. OAR 341-041-0004(6)(a). DEQ can deny the Certification, which it should. DEQ could include conditions in the Draft Certification that require operational changes to prevent the Project from violating water quality standards *before* they occur rather than wait for them to happen and come up with a plan to potentially prevent more violations in the future, as DEQ proposes. DEQ has not attempted to do that or explain why such conditions are not feasible. DEQ should deny the Certification.

DEQ has not explained why the action is necessary or how the benefits of lowered water quality outweigh the environmental costs of the reduced water quality. OAR 341-041-0004(6)(b). The North Umpqua River supports a world-renowned steelhead fishery, multiple salmonid species – one of which is threatened with extinction – and native rainbow trout. DEQ has not explained why it is so critical for PacifiCorp to generate additional electricity when these cherished and sensitive beneficial uses may be adversely affected.

For example, DEQ does not explain how the Proposed Action would protect rainbow trout. The dissolved oxygen criterion for rainbow trout spawning is 11.0 mg/l. OAR 340-041-0016(1). According to DEQ, dissolved oxygen below Soda Springs Dam is “*near or above 11.0 mg/l during the designated spawning period.*” Draft Report, 19 (Emphasis added). According to DEQ, modeling shows that the Proposed Action may cause dissolved oxygen (DO) – a parameter that affects rainbow trout – to decrease by 0.2 mg/l. Draft Report, 20. Rather than evaluating

how that might affect rainbow trout (e.g., by reducing DO by 0.2 mg/l below 11.0 mg/l, which the river is apparently “near”), DEQ relies on PacifiCorp’s tailrace reaeration DO reduction hypothesis, which DEQ acknowledges is not supported by data. Draft Report, at 20. That is not a reasonable attempt to evaluate the effects of the Proposed Action on rainbow trout. Because DEQ did not evaluate how this beneficial use or others will be protected, DEQ must deny the Certification.

DEQ also has not explained how lowering water quality in the Slide Creek Impoundment reach does not adversely affect coho salmon, which are listed under the Endangered Species Act as a threatened species. Draft Report, 20; OAR 340-041-0004(6)(d). Therefore, DEQ cannot issue the Certification.

c. The Nondegradation Discharges Exception Does Not Apply

i. The Tailrace is Not a Mixing Zone

DEQ knows that the “existing mixing in the tailrace below the [Fish Creek] powerhouse” is not a mixing zone. Draft Report, at 31. The Project is not a point source for which a mixing zone has been established in a National Pollution Discharge Elimination System (NPDES) permit. OAR 340-041-0053(2). For the mixing zone exception to apply, PacifiCorp would need to comply with all effluent limits set out in an applicable NPDES permit. *Id.* Therefore, the mixing zone exception does not apply.

ii. The Insignificant Temperature Increase Exception Does Not Apply

DEQ admits that the Proposed Action would cause the Project to increase water temperatures above 0.3° C. Draft Report, at 23. For example, DEQ acknowledges that the “*** the mixing model predicted the temperature in the Slide impoundment would increase *** by no more than 0.4° C under the worst-case ambient air temperature scenario.” *Id.* DEQ admits that the worst-case scenario will occur, albeit infrequently, in DEQ’s opinion. *Id.* Had DEQ relied on models that use future ambient air temperatures that will occur because of climate change, DEQ would have likely found that temperatures in this area would exceed 0.3° C more frequently. In any event, because the Proposed Action would cause the Project to exceed 0.3° C based on historical air temperatures, the insignificant temperature increase exception does not apply. OAR 340-041-0004(3)(c); 340-041-0028(11)(a).

iii. DEQ Apparently Has Not Evaluated Whether the Proposed Action Would Cause the Project to Increase Temperature Below Soda Springs Dam

The Draft Report does not discuss whether the Proposed Action would increase water temperatures in reaches below Soda Springs Dam, where the North Umpqua is water quality limited for temperature. *See* DEQ, Umpqua Basin TMDL (“Umpqua TMDL”). Instead, DEQ limited the scope of its analysis of temperature and other water quality impacts to the Slide Creek Impoundment reach.

DEQ's decision to exclude downstream reaches from its analysis is inconsistent with its observation that "[t]he proposed action directly influences water quality conditions in the North Umpqua River *including the reach below Soda Springs Dam.*" Draft Report, 21, n. 4 (Emphasis added). It is also inconsistent with DEQ's prior statement in the Umpqua River TMDL that the Project is "responsible for elevated stream temperatures between Lemolo Reservoir and the Umpqua River tidewater boundary." Umpqua TMDL, at 3-22.

DEQ has not demonstrated that temperature increases in the Slide Creek Impoundment reach would not cause an exceedance of 0.3° C below Soda Springs Dam. Draft Report, at 21, n. 4. According to PacifiCorp's application, modeling predicts that "temperature effects would diminish in the river downstream of Slide Creek Dam through additional dilution provided by Fish Creek, Slide Creek, and other tributaries." See, PacifiCorp, North Umpqua Hydroelectric Project (FERC Project No. 1927), Request to Modify the Water Quality Certification for the North Umpqua Hydroelectric Project to Include Pumped Storage Facilities and Operations (the "Application"), at 17. A copy of this model is not available for public review on FERC, DEQ, or PacifiCorp's websites, nor does DEQ mention the dilution theory in its Draft Report. Because the public has been deprived of an opportunity to verify the accuracy of the model's results or review its assumptions – much less read what DEQ has to say about it – it is unclear whether these small tributaries will indeed dilute increased water temperatures in a 32-acre reservoir. Considering that water temperatures in these tributaries are also affected by climate change, it is unclear whether these streams would dilute the Proposed Action's temperature impacts with their own warming water temperatures.

2. DEQ LACKS REQUIRED INFORMATION AND EVALUATIONS TO INFORM ITS ANALYSIS

DEQ does not have the necessary information to determine whether the Project as changed by the Proposed Action would meet water quality standards. The certification application rule requires applicants to provide, at a minimum, the "information and evaluations as necessary to demonstrate that the activity will comply with" Oregon's water quality standards. OAR 340-048-0020(g). The Draft Report indicates that PacifiCorp did not provide any information or evaluation to demonstrate that the Project will meet Statewide Narrative Criteria. Draft Report, at 17 ("The Applicant did not address the potential effects of the proposed action on the Statewide Narrative Criteria."). The Application, which appears on FERC's website but does not include copies of the modeling reports, indicates that PacifiCorp did not provide that information or evaluation. Because PacifiCorp apparently did not provide these materials, DEQ must deny the Certification.

The Draft Report also indicates that PacifiCorp did not "directly" evaluate the Project's effects on biocriteria, turbidity, total dissolved gas, or pH. *Id.*, at 24, 26, 28, and 29. Indeed, the copy of the Application on FERC's website does not include any evaluation – direct or indirect – related to the Project's effects on biocriteria, turbidity, total dissolved gas, or pH. https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20220225-5261&optimized=false. Instead, PacifiCorp asserts that "[t]he proposed Storage Project does not have the potential to

affect water quality parameters other than temperature and dissolved oxygen.” Application, at 20. Because PacifiCorp did not provide any information or evaluation to support its assertion, DEQ must deny the Certification.

Instead of requiring PacifiCorp to provide necessary information and evaluations, as required by rule, DEQ apparently accepted PacifiCorp’s opinions or predictions about the potential effects of the Proposed Action on biocriteria, turbidity, total dissolved gas, and pH. *Id.* The rule requires PacifiCorp to provide information and evaluations that support its statements. OAR 340-048-0020(3). Because PacifiCorp apparently did not provide these materials, DEQ must deny the Certification.

DEQ also apparently relied on the PacifiCorp’s proposal to evaluate these effects *after* the certification is issued. For example, “[t]o evaluate the effect of the proposed Storage Project on water quality,” PacifiCorp “proposes to measure water quality, including total dissolved gas, at locations potentially influenced by the project.” *Id.*, at 28. DEQ cannot postpone its evaluation of potential impacts on water quality while it waits for an evaluation of the measured effects of the Proposed Action. It must conduct that evaluation of the potential impacts now, which includes reviewing information and evaluations that PacifiCorp must provide to support its assertions.

3. DEQ DID NOT PROVIDE RELEVANT DOCUMENTS THAT WOULD INFORM PUBLIC COMMENTS

The modeling results on temperature and dissolved oxygen impacts are not available to the public. The copy of the Application posted on FERC’s website does not include the modeling reports. DEQ has not made them available on its website. TCA could not locate them on PacifiCorp’s website. Because the public has not received a copy of these reports, it has not been afforded the opportunity to provide comments on them or understand how they might have informed DEQ’s evaluation of the Certification Modification. Because these materials were not provided, DEQ should either deny the Certification or restart the 35-day commenting period and make the materials available for public review. OAR 340-049-0027(1).

4. DEQ CANNOT RELY ON MODELING THAT FAILS TO INCORPORATE CLIMATE CHANGE

DEQ cannot be reasonably assured that the Project will meet water quality standards based on modeling that uses historical ambient air temperature values. It is irrefutable that climate change is causing ambient air temperatures to exceed historic air temperatures values. Modeling that uses moderate emissions scenarios shows that summer air temperatures in the Pacific Northwest will rise significantly. For example, multi-model averages of the A1B scenario indicate that average June through August air temperatures will increase at the following rates over the century: 1.7° C (0.43° C to 3.4° C) by the 2020s; 2.7° C (1.3° C to 5.1° C) by the 2040s;

and 4.7° C (2.7° C to 8.1° C) by the 2080s (Mantua et al. 2010)¹. Multi-model averages of the B1 scenario project June through August temperature to increase as follows: 1.2° C (0.18° C to 2.4° C) by the 2020s; 1.8° C (0.2° C to 3.7° C) by the 2040s; and 2.9° C (1.3° C to 5.1° C) by the 2080s (Mantua et al. 2010).

Air temperatures are projected to rise significantly in the Project area. The average maximum air temperature in the Umpqua National Forest is projected to exceed the historical average by 3.17° F over the next 30 years. See Landscape Climate Dashboard, available online at <http://www.climatedashboard.org> (search for “Umpqua National Forest”).

PacifiCorp apparently did not use projected maximum air temperatures in its model (TCA relied on DEQ’s explanation of the model, as no copy of the model results were made available to the public). Instead, it used the average warmest air temperatures from 1985 to the present as well as the 90th percentile of the warmest annual seven-day air temperatures over the last 37 years (i.e., the “worst-case” air temperature). Draft Report, at 22. Due to climate change, 21st century average maximum air temperatures are higher than average maximum air temperatures recorded in the previous century, and they will continue to increase. To evaluate how the Proposed Action would impact temperature, DEQ must use models that incorporate projected average maximum air temperatures. Because DEQ did not consider climate change in its evaluation, it cannot be reasonably assured that the Project would meet water quality standards. Therefore, DEQ must deny the Certification.

DEQ also relied on models (or summaries of the model results) that use average warmest and worst-case *historical* ambient conditions in its dissolved oxygen evaluation. Draft Report, 19. Because that model fails to use projected air temperatures that are more likely to occur than historically cooler temperatures, DEQ cannot be reasonably assured that the Project would meet water quality standards for dissolved oxygen or comply with the Antidegradation Rule. As acknowledged in the Draft Report, the Project would exceed the antidegradation standard for dissolved oxygen under above-average historical ambient temperatures when water is stored for extended periods. Draft Report, 20. Because future ambient air temperatures will be warmer than historical air temperatures, the Project would likely exceed 0.1 mg/l more often than DEQ assumes.

DEQ cannot reasonably assume that these exceedances will be reduced under PacifiCorp’s tailrace reaeration hypothesis, which DEQ admits PacifiCorp provided no quantitative data to support. *Id.* Because PacifiCorp failed to provide any information to support its claim, DEQ must deny the certification modification.

¹ Mantua, N., I. Tohver, and A. Hamlet. 2010. [Climate change impacts on streamflow extremes and summertime stream temperature and their possible consequences for freshwater salmon habitat in Washington State](#). *Climatic Change* 102:187-223.

DEQ also failed to consider temperature impacts on pH levels. As DEQ knows, as temperatures increase, pH decreases. DEQ did not evaluate how projected air and water temperatures will affect pH values. Instead, it relied on a 2008 study that may not be useful for evaluating current and future conditions. Draft Report, at 29. Therefore, DEQ cannot be reasonably assured that the Project as changed by the Proposed Action would meet water quality standards for pH. DEQ must deny the Certification.

5. DEQ HAS NOT DETERMINED WHETHER THE PROJECTED DECREASE IN DISSOLVED OXYGEN WOULD HAVE NO ADVERSE EFFECTS ON THREATENED COHO SALMON

As DEQ acknowledges, ESA-listed coho are present in the Project area and downstream of Soda Springs Dam. Draft Report, at 21, n. 4. The Draft Report does not include any information on whether the modeled decrease in dissolved oxygen would have adverse effects on threatened coho. Therefore, DEQ cannot be reasonably assured that the Project would avoid these impacts on ESA-listed fish or meet water quality standards for dissolved oxygen. DEQ must deny the Certification.

CONCLUSION

The Draft Report explains that the Proposed Action would cause the Project to violate water quality standards. Therefore, DEQ must deny the Certification and notify FERC that there is no longer reasonable assurance that the Project as changed by the Proposed Action complies with the CWA. ORS 468B.045(1)(b)(A); ORS 468B.045(3)(b).

Thank you for considering TCA's comments.

Sincerely,

/s/ Rob Kirschner

Rob Kirschner
Legal and Policy Director
The Conservation Angler
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Electronically mailed July 21, 2022

Christopher Stine, PE
Hydroelectric Specialist
Oregon Department of Environmental Quality
165 East Seventh Avenue, Suite 100
Eugene, Oregon 97401

**Subject: North Umpqua Hydroelectric Project (FERC No. P-1927)
Comments on Draft Water Quality Certification Modification and
Draft Evaluation and Findings Report**

PacifiCorp is the owner, operator, and licensee of the North Umpqua Hydroelectric Project (Project) located on the North Umpqua River and two of its tributaries, primarily within the Umpqua National Forest, in eastern Douglas County, Oregon. The Federal Energy Regulatory Commission (FERC) issued a new, 35-year Federal Power Act license to PacifiCorp for the Project (FERC Project No. 1927) on November 18, 2003 (License). In conjunction with PacifiCorp's application for the License, the Oregon Department of Environmental Quality (DEQ) certified the project, with conditions, pursuant to Section 401 of the Clean Water Act on June 28, 2002 (Certification). On February 25, 2022, PacifiCorp submitted to DEQ a Request to Modify the Water Quality Certification for the Project to Include Pumped Storage Facilities and Operations (Request) at the Fish Creek Development of the Project (Pumped Storage Project). On June 16, 2022, DEQ issued a public notice of and request for comments on DEQ's Draft Certification Modification (Draft Certification) and Draft Evaluation and Findings Report (Draft Evaluation Report). PacifiCorp hereby provides the following comments for DEQ's consideration.

Draft Certification Condition 1(a) (Water Quality Management Plan, Monitoring Locations) inadvertently refers to Table 1, rather than the intended Table 2. PacifiCorp suggests that this Condition should read (edits identified in **bold font**):

*Water quality **monitoring** is required at the locations identified in Table ~~1~~ **2** of the June 16, 2022, Evaluations and Findings document.*

Draft Certification Condition 1(d)ii (Water Quality Management Plan, Parameters) states:

PacifiCorp shall monitor water temperature, dissolved oxygen, specific conductance, pH, total dissolved gas pressure, and turbidity at all other monitoring locations [identified in Table 2 of the Evaluation and Findings Report other than the permanent Soda Springs water quality station collocated with USGS gauge 14316460] unless expressly authorized otherwise by DEQ.

PacifiCorp notes that the proposed Pumped Storage Project has the potential to increase turbidity only at the Fish Creek forebay outlet at the penstock (i.e., the penstock outlet to the forebay during pumping modes). Turbidity in the forebay could potentially be transported to the Fish Creek powerplant tailrace and Slide Creek impoundment downstream of the Fish Creek powerplant tailrace. However, as discussed in Section E.4.1.2 (Page E-17) of the FERC license amendment application, there is no expected detrimental effect to the excavated forebay or embankment slopes at the forebay perimeter

from the proposed operation. Other elements of the Pumped Storage Project would not change the existing Project or its operations in any manner that would increase turbidity. Therefore, PacifiCorp requests that turbidity monitoring be limited to the Fish Creek forebay outlet, the Fish Creek powerplant tailrace, and the Slide Creek impoundment downstream of Fish Creek powerplant tailrace as proposed in PacifiCorp's Request.

Draft Certification Condition 1(e) (Adaptive Management) could be read to equate the phrases "degradation," "impairment," and "violations of water quality standards," which have distinct meanings in the pertinent regulations. PacifiCorp suggests that this Condition should read (edits identified in **bold font**):

*If DEQ finds that operation of the modified Project causes a degradation of water quality, DEQ will require PacifiCorp to submit a report that evaluates the cause of the **impairment degradation**. **If the degradation results in a violation of water quality standards**, ~~the~~ report must also propose adaptive management measures to investigate and modify project operations to prevent continued violations of water quality standards.*

Draft Certification Condition 3 requires that:

PacifiCorp must take action to ensure operation of the modified Project does not cause the 7dAM temperature in the Slide Creek impoundment from increasing by more than 0.3°C relative to baseline, i.e., incoming, water temperature.

PacifiCorp requests that DEQ clarify the monitoring locations for the baseline and Pumped Storage Project-affected waters in Slide Creek impoundment. The discharge of Pumped Storage Project waters occurs at Fish Creek tailrace. Monitoring at the upstream extent of Slide Creek impoundment (i.e., at the downstream extent of the Toketee bypassed reach of the North Umpqua River), however, would not account for the existing Project discharge to the Slide Creek impoundment from the Toketee tailrace upstream of the Fish Creek tailrace. Therefore, PacifiCorp suggests that baseline water temperatures in Slide Creek impoundment should be monitored upstream of Fish Creek tailrace, but downstream of Toketee tailrace, and Pumped Storage Project-affected waters should be monitored downstream of Fish Creek tailrace, but upstream of Slide Creek dam. These monitoring locations should also be identified in Draft Certification Conditions 4, 4(a), and 5(a), to specify the location of comparative monitoring locations in lieu of less specific descriptors, such as "in the Slide Creek impoundment...relative to baseline, i.e., incoming, water conditions" or "upstream and downstream of the Fish Creek powerhouse tailrace."

With respect to the water temperature requirements of Draft Certification Condition 3 and OAR 340-041-0028, PacifiCorp notes the air temperature exclusion provisions of OAR 340-041-0028(12)(c) apply to the Pumped Storage Project proposal during "daily maximum air temperatures that exceed the 90th percentile value of annual maximum seven-day average maximum air temperatures calculated using at least 10 years of air temperature data." PacifiCorp notes that the modelled water temperature warming in the Slide Creek Impoundment was estimated to exceed 0.3°C only during worst-case conditions, defined in the Technical Memorandum as the 90th percentile air temperatures over the

warmest week of each year during 37 years of data (i.e., an expected occurrence interval of once in 10 years).

With respect to Draft Certification Condition 3(a) (Ambient Air Temperature), which directs PacifiCorp to use the Toketee Remote Automated Weather Station for ambient temperatures, PacifiCorp is concerned that it could be misread to also establish an unclear standard for temperature controls. To clarify that this condition is intended only to identify the weather station for determining ambient temperature, PacifiCorp suggests that it should read (edits identified in **bold font**):

*PacifiCorp must use measurements of ambient air temperatures recorded at the Remote Automated Weather Station (RAWS) at Toketee, Oregon (TOFO3) or next nearest available reporting station to inform project operations **if needed to minimize-reduce the project Pumped Storage Project's thermal effects.***

Consistent with the latter edit, PacifiCorp requests that DEQ globally review, and replace where necessary, references to the Project (i.e., the existing North Umpqua Hydroelectric Project) that should only apply to the proposed Pumped Storage Project modifications (see Draft Certification Conditions 6, 7, and 8). Furthermore, the Pumped Storage Project includes three operational modes that should be clearly identified and distinguished in the Draft Certification and Draft Evaluation Report: pumping of water from Toketee Reservoir to Fish Creek forebay, storage of pumped water within Fish Creek forebay, and generation at Fish Creek powerplant using pumped water stored in Fish Creek forebay. The Draft Certification refers to “generation cycles” (e.g., Condition 3(b)(i), et al.), but existing generation may occur at Fish Creek powerplant without Pumped Storage Project operation. Additional clarifications are required to identify specific Pumped Storage Project operational modes or the full Pumped Storage Project cycle (i.e., pumping, storing, and generating with pumped and stored water) to distinguish these proposed operations from generation under existing Project conditions and authorizations. For example, Draft Certification Condition 3(b)(i) could be edited for clarity to read (edits identified in **bold font**):

*Reducing the number of ~~generation~~ **Pumped Storage Project** cycles during periods of high ambient temperature.*

Draft Certification Condition 3(b) refers to weather forecast predictions. PacifiCorp suggests that DEQ identify the National Weather Service, Medford, Oregon Office forecast for 12 miles west-southwest of Lemolo Lake, Oregon¹ (Toketee, Oregon (TOFO3)) as the relevant weather forecast.

With respect to Draft Certification Condition 4, PacifiCorp requests that DEQ account for the resolution of dissolved oxygen monitoring equipment in DEQ’s application of the 0.1 mg/L antidegradation criterion for dissolved oxygen. Industry-standard and DEQ-approved dissolved oxygen monitoring equipment (e.g., HOBO Dissolved Oxygen Logger Model U26-001) provides accuracy (0.2 mg/L up to 8 mg/L; 0.5 mg/L from 8 to 20 mg/L) that is greater than (i.e., less precise than) the criterion threshold. Therefore, if Draft Certification Condition 4 is intended to limit Pumped Storage Project effects to a dissolved oxygen reduction of no more than 0.1 mg/L, it is unwarranted to

¹ <https://forecast.weather.gov/MapClick.php?lat=43.26300960000003&lon=-122.41551259999994>

deem any single recorded differential greater than 0.1 mg/L as a violation of the Certification Condition.

Draft Certification Condition 4(b) (Dissolved Oxygen, Adaptive Management) refers to “ambient conditions ... that may cause dissolved oxygen saturation to decrease by more than 0.1 mg/l.” PacifiCorp’s understanding is that “ambient conditions” may refer to conditions of barometric pressure, altitude, and temperature that may preclude attainment of the 8.0 mg/L criterion (OAR 340-041-0016(2)), but PacifiCorp requests that DEQ clarify what is meant by “ambient conditions” in Condition 4. PacifiCorp suggests that this Condition should read (edits identified in **bold font**):

*PacifiCorp must consider and implement operating schedules when ambient conditions are predicted to ~~that may~~ cause dissolved oxygen saturation to **be less than the 8.0 mg/L criterion**. **During these conditions, PacifiCorp will take measures to limit the Pumped Storage Project’s reduction in dissolved oxygen saturation to 0.1 mg/l.***

Condition 4(b)(i) identifies “[r]educing the number of generation cycles during periods of high ambient temperature” as a potential adaptive management strategy. However, the dissolved oxygen criteria are generally based on instantaneous or daily minimum dissolved oxygen measurements, unlike temperature, which is evaluated based on the seven-day average of the daily maximum temperature. Therefore, reducing the number of generation cycles may not ameliorate and may exacerbate dissolved oxygen impacts from storage of water in Fish Creek forebay. See previous comments on Pumped Storage Project operational modes. PacifiCorp requests that DEQ remove Condition 4(b)(i) as an adaptive management strategy for dissolved oxygen impacts. Reducing the storage time (i.e., time from pumping to generation) may reduce dissolved oxygen impacts depending on the diurnal timing of pumping to and storage of water in Fish Creek forebay.

PacifiCorp requests that DEQ remove draft general condition 8(g), which states:

Water Quality Standards Compliance. Notwithstanding the conditions of this Certification, no wastes shall be discharged and no activities shall be conducted which will violate state water quality standards.

Conditions may be placed on Section 401 certifications only as “necessary to assure” compliance with applicable requirements. 33 U.S.C. § 1341(d). General condition 8(g) should be removed because it is not necessary to assure compliance with water quality standards. That assurance is provided by the specific water quality requirements in Draft Certification Conditions 1 through 7. Moreover, Condition 8(g) is not needed to address unanticipated future changes in the Pumped Storage Project or circumstances. Draft Condition 8(c) requires PacifiCorp to “notify DEQ of any change in ownership, scope, or operation of the Project” and to “obtain DEQ’s review and approval before undertaking any such change to the Project, including but not limited to changes in Project structures, construction, operations, and flows, which, among other changes, may potentially affect water quality.” In addition, Draft Condition 8(b) provides that “DEQ may modify the Certification to add, delete, or modify Certification conditions as authorized by OAR 340-048-0050” to address “changes in conditions regarding the activity or affected waterways since the certification was issued,” changes in applicable standards and requirements, and a host of other circumstances. See OAR 340-048-0050(1).

General Condition 8(g) should also be removed because it would create ambiguity and uncertainty regarding PacifiCorp's obligations. Notwithstanding compliance with all the specific conditions of the Certification designed to ensure compliance with water quality standards, as well as all the other general Certification conditions, DEQ—or, more likely, a third party—could assert that PacifiCorp was in violation of general Condition 8(g) based on a different interpretation of water quality standards or a different evaluation of Pumped Storage Project effects than DEQ's interpretation and evaluation when it issued the modified Certification. PacifiCorp recognizes that conditions similar to general Condition 8(g) have been a standard term of DEQ water quality certifications and discharge permits, but DEQ has recently begun omitting these conditions from the standard terms of its individual permits because they provide DEQ with no additional authority to address water quality issues and serve only to create ambiguity and uncertainty regarding the Project's compliance obligations.

The last sentence of Draft Evaluation Report Section 4.1 (page 13) references "the salmon and steelhead spawning designations identified in Figure 2." This reference is incorrect. The salmon and steelhead spawning uses in the Umpqua Basin are presented in the Draft Evaluation Report figure inadvertently identified as Figure 41, which should be Figure 4, on page 14.


The third paragraph of Draft Evaluation Report Section 4.2.3, Application of Water Quality Standard (page 21) states that the "biologically-based numeric temperature criterion of 13.0° C applies to the Slide Creek impoundment from January 1 through June 15 to protect resident trout spawning." This is incorrect. Per Figure 320B (reproduced in the Draft Evaluation Report as Figure 4), there is no salmon and steelhead spawning use depicted upstream of Soda Springs Dam. Therefore, the 13.0° C salmon and steelhead spawning criteria do not apply upstream of Soda Springs Dam. Per Figure 320A (reproduced in the Draft Evaluation Report as Figure 3), stream reaches upstream of Soda Springs Dam, inclusive of the Slide Creek impoundment, are designated for salmon and trout rearing and migration, in which the seven-day-average maximum temperature may not exceed 18.0° C (OAR 340-041-028(4)(c)). In the absence of a spawning designation, this criterion applies year-round. As such the following text of OAR 340-041-028(4)(c) should be added to the citation of 340-041-028 at the beginning of Draft Evaluation Report Section 4.2.3 (page 20):

The seven-day-average maximum temperature of a stream identified as having salmon and trout rearing and migration use on subbasin maps set out at OAR 340-041-0101 (Basin-Specific Criteria (Main Stem Columbia River): Beneficial Uses to Be Protected in the Main Stem Columbia River) to 340-041-0340 (Basin-Specific Criteria (Willamette): Beneficial Uses to Be Protected in the Willamette Basin): Figures 130A, 151A, 160A, 170A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 18.0 degrees Celsius (64.4 degrees Fahrenheit);

Chris Stine, Hydroelectric Specialist
North Umpqua Hydroelectric Project (FERC No. P-1927)
Comments on Draft Certification Modification
July 21, 2022
Page 6

PacifiCorp appreciates the opportunity to review and provide comment on DEQ's draft documents. This letter and its enclosures have been submitted electronically. If you have any questions concerning these documents, please contact Steve Albertelli, Licensing Program Manager, at steve.albertelli@pacificorp.com or 541-776-6676.

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Albertelli". The signature is written in a cursive style with a horizontal line through the middle.

Steve Albertelli
License Program Manager, Renewable Resources

From: [Doug Heiken](#)
To: [STINE Chris * DEQ](#)
Subject: North Umpqua Hydro - application for 401 certification for pumped storage
Date: Friday, July 29, 2022 10:37:31 AM

Hi Chris/DEQ,

We missed the July 22nd deadline, but wish to express our interest in this 401 cert for pumped storage within the North Umpqua Project and the need to maintain stable flows and maintain limits on ramping to protect fish and other aquatic organisms.

Sincerely,
/s/

Doug Heiken (he/him) [Oregon Wild](#)
PO Box 11648, Eugene OR 97440
dh@oregonwild.org, 541.344.0675

From: [Albertelli, Steve \(PacifiCorp\)](#)
To: [STINE Chris * DEQ](#)
Subject: RE: Fish Creek Pumped Storage Project - revised section 401 water quality certification
Date: Tuesday, December 6, 2022 8:44:20 AM
Attachments: [image001.png](#)

Chris-

On November 23, 2022 PacifiCorp received DEQ's revised Clean Water Act Section 401 water quality certification for the proposed Fish Creek Pumped Storage Project modifications of PacifiCorp's North Umpqua Hydroelectric Project. PacifiCorp understands that to appeal the revised certification conditions, PacifiCorp must file with DEQ an "answer and request for hearing" within 20 days of delivery of the revised certification, i.e., by December 13, 2022. Consistent with PacifiCorp's comments of July 21, 2022 on the Draft Water Quality Certification Modification and Draft Evaluation and Findings Report, PacifiCorp remains concerned that some of the conditions lack clarity and may complicate implementation and compliance with the certification conditions. Therefore, PacifiCorp seeks written clarification from DEQ regarding DEQ's interpretation and application of certain conditions and/or modification of certain conditions prior to December 12, 2022. The conditions for which PacifiCorp requests DEQ's interpretation and/or modification of the certification are described below in additional detail.

1. Condition 2(d)(i). Adaptive Management for Narrative Criteria and Antidegradation Policy.

Revised Condition 2(d)(i), which is under the heading for narrative criteria and the antidegradation policy, states:

If monitoring data at the locations identified in monitoring schedule provided as Exhibit A identify that dissolved oxygen decreases more than 0.1 mg/l or causes temperature at such locations to increase more than 0.3°C, DEQ may require PacifiCorp to assess the situation and submit to DEQ an adaptive management action plan. The plan shall propose modifications or operational strategies to reduce conditions that cause or contribute to water quality degradation. If DEQ finds the Pumped Storage Project is causing or contributing to an exceedance of applicable criteria, then PacifiCorp must take actions DEQ determines necessary to prevent such exceedances.

This condition raises two concerns. First, it suggests that, even if the Pumped Storage Project does not cause or contribute to an excursion from applicable water quality criteria (e.g., the 7-day average of daily maximum temperature increase of greater than 0.3°C identified in Condition 3), DEQ could require PacifiCorp to implement measures "to reduce conditions that cause or contribute to water quality degradation" for any single recorded exceedance of the stated temperature and dissolved oxygen metrics. Second, it suggests that this requirement applies to temperature and dissolved oxygen degradation at *any* of the 11 monitoring locations identified in Exhibit A, whereas Conditions 3 and 4 specify that the compliance point for temperature and dissolved oxygen criteria is the Slide Creek impoundment measured at a location downstream of the Fish Creek tailrace (i.e., not at all 11 monitoring locations identified in Exhibit A). PacifiCorp requests that DEQ clarify that this condition triggers adaptive management only for excursions from applicable temperature and

dissolved oxygen criteria related to pumped storage operations and to specify the Slide Creek impoundment downstream of the Fish Creek tailrace as the compliance point as specified in Conditions 3 and 4.

2. Condition 3. Temperature.

Condition 3.c. (Adaptive Management) states that:

...alternative operating schedules may include:

i. Reducing the number of Pumped Storage Project generation cycles when weather forecasts predict extended (i.e., 7 days or more) ambient temperatures at or above the 90th percentile warmest 7-day temperatures

Consistent with PacifiCorp's comments of July 21, 2022, the Pumped Storage Project includes three operational modes that should be clearly identified and distinguished in the certification: pumping of water from Toketee Reservoir to Fish Creek forebay, storage of pumped water within Fish Creek forebay, and generation at Fish Creek powerplant using pumped water stored in Fish Creek forebay. As detailed in PacifiCorp's application materials, storage time and duration have the greatest impact on water quality. Reducing the storage duration may reduce water quality impacts of the Pumped Storage Project, and PacifiCorp believes this is what DEQ intended to reference in this condition. However, as written, reducing the number of generation cycles could potentially increase storage time and, during periods of warm ambient air temperatures, may increase the water temperature discharged from the Fish Creek powerplant. PacifiCorp requests that DEQ clarify that the Pumped Storage Project operational modes should be "modified" rather than "reduced" to account for adaptive management of Pumped Storage Project operations to maintain compliance with state water quality standards.

3. Condition 4. Dissolved Oxygen.

Certification Condition 4 states:

PacifiCorp must take actions to ensure operation of the Pumped Storage Project does not cause or contribute to dissolved oxygen downstream of the Fish Creek tailrace to decrease more than 0.1 mg/l relative to baseline (i.e., incoming) water conditions as measured at a location upstream of the Fish Creek tailrace.

This condition could be read in isolation to prohibit the Pumped Storage Project from decreasing dissolved oxygen by more than 0.1 mg/L downstream of the Fish Creek tailrace regardless of whether the applicable dissolved oxygen criterion is met. In contrast, certification condition 4.b states:

PacifiCorp must implement alternative operating schedules when ambient conditions are predicted to cause dissolved oxygen saturation to be less than the 8.0 mg/l criterion to ensure the Pumped Storage Project will not cause or contribute to a reduction in dissolved oxygen to

no more than 0.1 mg/l. (Emphasis added.)

The water quality standards limit dissolved oxygen decreases to 0.1 mg/L only when the applicable criterion is not met. Condition 4, then, appears to be inconsistent with the applicable water quality standards if it is read to prohibit decreases in dissolved oxygen of more than 0.1 mg/L when the river meets the applicable dissolved oxygen criterion. The adaptive management requirement in Condition 4.b suggests that the 0.1 mg/L limit may be intended to apply only when the 8.0 mg/L criterion is not met. Therefore, the condition is ambiguous. PacifiCorp requests that DEQ clarify and limit the application of the condition to periods when the applicable criterion is not met.

PacifiCorp appreciates DEQ's incorporation of some of PacifiCorp's suggested, clarifying edits to the draft certification that were included in the revised certification, as well as DEQ's ongoing engagement on the revised certification. Please let me know if you have any questions regarding the requests for clarification provided herein.

Steve Albertelli
License Program Manager
Pacific Power, Renewable Resources
925 South Grape Street, Medford, OR 97501
Office: 541-776-6676
Cell: 541-646-2778

From: STINE Chris * DEQ <Chris.STINE@deq.oregon.gov>
Sent: Wednesday, November 23, 2022 5:07 PM
To: Albertelli, Steve (PacifiCorp) <steve.albertelli@pacificorp.com>
Cc: Rob Kirschner <rob@theconservationangler.org>; HEIKEN Doug <dh@oregonwild.org>; STINE Chris * DEQ <Chris.STINE@deq.oregon.gov>
Subject: [INTERNET] Fish Creek Pumped Storage Project - revised section 401 water quality certification

THIS MESSAGE IS FROM AN EXTERNAL SENDER.


Look closely at the **SENDER** address. Do not open **ATTACHMENTS** unless expected. Check for **INDICATORS** of phishing. Hover over **LINKS** before clicking. [Learn to spot a phishing message](#)
Steve,

Please accept this formal submittal of the revised 401 WQC for the Fish Creek Pumped Storage Project.

Chris

Oregon Department of Environmental Quality
165 East Seventh Avenue, Suite 100
Eugene, Oregon 97401
(541) 686-7810 (office)

Note: I will be teleworking from home until further notice. I check my email regularly and phone messages at least twice daily.



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We are modernizing and upgrading the way we process information at DEQ with **Your DEQ Online**: a new centralized hub for communities, businesses and individuals.
[Click here to learn more.](#)

From: [STINE Chris * DEQ](#)
To: [Albertelli, Steve](#)
Cc: [STINE Chris * DEQ](#)
Subject: Clarifications to 410 WQC for Fish Creek Pumped Storage Project
Date: Thursday, December 8, 2022 2:30:14 PM
Attachments: [image001.png](#)
[NUHP Fish Creek changes.docx](#)

Steve,

Per your December 6, 2022, email, DEQ provides the following response clarifying certain conditions to the November 3, 2022, 401 water quality certification for the proposed Fish Creek Pumped Storage Project. In consideration of these clarifications, DEQ proposes to reissue the certification to include the highlighted changes identified in the attached document. Please acknowledge receipt of this email and if you would like to set a time to discuss. -Chris

DEQ provides the following clarifications:

1. **Specified Narrative Criteria, Condition 2(d)(i).**

- This condition requires PacifiCorp to take actions DEQ determines necessary to prevent dissolved oxygen (DO) decreases of more than 0.1 mg/L or temperature increases of more than 0.3 degrees C only if DEQ finds the Pumped Storage Project is causing or contributing to such an exceedance.
- In addition, DEQ confirms that the Slide Creek impoundment downstream of the Fish Creek tailrace is where PacifiCorp's compliance with temperature criteria and dissolved oxygen criteria (see conditions 3 and 4) will be determined.
- Note: If the DO and temperature data collected at the other monitoring locations indicate DO decreases of more than 0.1 mg/L or temperature increases of more than 0.3 degrees C, then DEQ may request PacifiCorp assess the situation and submit an adaptive management plan. The antidegradation policy is intended to maintain support for all designated beneficial uses by preventing unnecessary lowering of water quality from new or increased sources of pollution. But to reiterate, only if (1) the temperature and DO data collected at such points indicate DO decreases of more than 0.1 mg/L or temperature increases of more than 0.3 degrees C are occurring **and** (2) DEQ determines that the Pumped Storage Project is causing or contributing to such an exceedance does this condition require PacifiCorp to take action(s) DEQ determines are necessary to prevent such exceedance(s).

2. **Temperature, Condition 3.**

- This condition specified an example of a potential "alternative operating schedule," which would not be required if such a schedule would result in the Pumped Storage Project further contributing to an exceedance of applicable temperature criteria. DEQ intended the condition to identify an example of a potential alternative operating schedule, but DEQ's inclusion of such an example does not limit the agency to require other modifications to the number of Pumped Storage Project generation cycles, which as you indicated, could include an alternative that would in effect reduce storage time and duration.

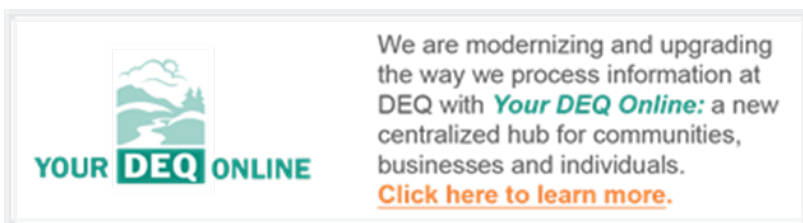
- Note that if DEQ determines that the Pumped Storage Project is causing or contributing to a violation of temperature criteria, then PacifiCorp is required to develop and propose measures to address such exceedance(s) such that PacifiCorp would have opportunity to present both alternative operating schedules as well as its assessment of the anticipated temperature impacts of same for DEQ's consideration and approval.

3. Dissolved Oxygen, Condition 4.

- The applicable biologically-based numeric criterion to protect cold-water life in the reach of the North Umpqua River that includes the Slide Creek impoundment is 8.0 mg/l. DEQ confirms that the Slide Creek impoundment downstream of the Fish Creek tailrace is where PacifiCorp's compliance with dissolved oxygen criteria will be determined.
- DEQ's antidegradation policy contains a provision intended to prevent unnecessary degradation from new or increased point and nonpoint sources. Where water quality meets or exceeds applicable criteria, that level must be maintained. OAR 340-041-0004(6). The antidegradation policy establishes that up to a 0.1 mg/l decrease in dissolved oxygen will not be considered a reduction in water quality. DEQ clarifies that when dissolved oxygen in the Slide Creek impoundment is at or above 8.0 mg/l PacifiCorp must implement alternative operating schedules such that operation of the Pumped Storage Project will not cause or contribute to a reduction in dissolved oxygen to no more than 0.1 mg/l.
- If DEQ determines from an evaluation of all monitoring data that operation of the Pumped Storage Project is causing dissolved oxygen to decrease by more than 0.1 mg/l then DEQ may request PacifiCorp assess the situation and submit an adaptive management plan and implement that plan in accordance with DEQ approval.

Christopher Stine, PE | Hydroelectric Specialist
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(541) 686-7810 (office)

Note: I will be teleworking from home until further notice. I check my email regularly and phone messages at least twice daily.



TEMPERATURE SECTION

* * *

c) Adaptive Management

When weather forecasts predict extended (i.e., 7 days or more) ambient temperatures at or above the 90th percentile warmest 7-day temperatures, PacifiCorp must implement alternate operating schedules to ensure Pumped Storage Project operations during periods of high thermal stress do not cause or contribute to an exceedance of the applicable temperature standard. These alternative operating schedules may include:

- i. **Modifying** the number of Pumped Storage Project generation cycles when weather forecasts predict extended (i.e., 7 days or more) ambient temperatures at or above the 90th percentile warmest 7-day temperatures

* * *

4. Dissolved Oxygen (OAR 340-041-0016)

PacifiCorp must take actions to ensure operation of the Pumped Storage Project does not cause or contribute to a violation of the applicable biologically-based numeric criterion (cause dissolved oxygen saturation to be less than 8.0 mg/L) as measured at a location downstream of the Fish Creek tailrace.

a) Water Quality Monitoring

PacifiCorp shall assess the effects of the Pumped Storage Project by measuring dissolved oxygen at locations upstream and downstream of the Fish Creek tailrace. PacifiCorp shall perform water quality monitoring in accordance with the WQMP developed in accordance with Condition 1 of this certification.

b) Adaptive Management

PacifiCorp must implement alternative operating schedules when ambient conditions are predicted to cause dissolved oxygen saturation to be less than the 8.0 mg/l. These alternative operating schedules may include:

- i. Increasing air entrainment in turbine discharge.
- ii. Other adaptive strategies informed by water quality monitoring or refined water quality modeling, or both.

If DEQ determines the Pumped Storage Project is causing or contributing to a violation of the applicable dissolved oxygen standard, PacifiCorp must submit to DEQ proposed alternative operating schedules in an adaptive management plan and implement that plan in accordance with DEQ's approval.

c) Reporting

PacifiCorp must document in the annual report required by Condition 1 of these § 401 Certification Conditions any temporary alternative operational changes undertaken specifically to limit dissolved oxygen reductions in the Slide Creek impoundment. The report must:

- i. Analyze monitoring data to evaluate the effect of Pumped Storage Project operations on dissolved oxygen at locations downstream of the Fish Creek powerhouse tailrace.
- ii. Discuss any operational changes undertaken during the reporting period specifically to address the Pumped Storage Project's effect on dissolved oxygen.
- iii. Propose modifications to PacifiCorp's adaptive management strategies, if warranted or requested by DEQ, based on a review of operational monitoring data, revised or refined water quality models, or other relevant new information.