Preliminary Regulatory Analyses:

Including the:

- Preliminary Cost-Benefit Analysis
- Least-Burdensome Alternative Analysis
- Administrative Procedure Act Determinations
- Regulatory Fairness Act Compliance

Chapter 173-201A WAC

Water Quality Standards for Surface Waters of the State of Washington (Chelan Use Attainability Analysis)

By
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For the

Water Quality Program

Washington State Department of Ecology
Olympia, Washington

March 2021, Publication 21-10-005

Publication Information

This document is available on the Department of Ecology's website at:
https://apps.ecology.wa.gov/publications/SummaryPages/2110005.html

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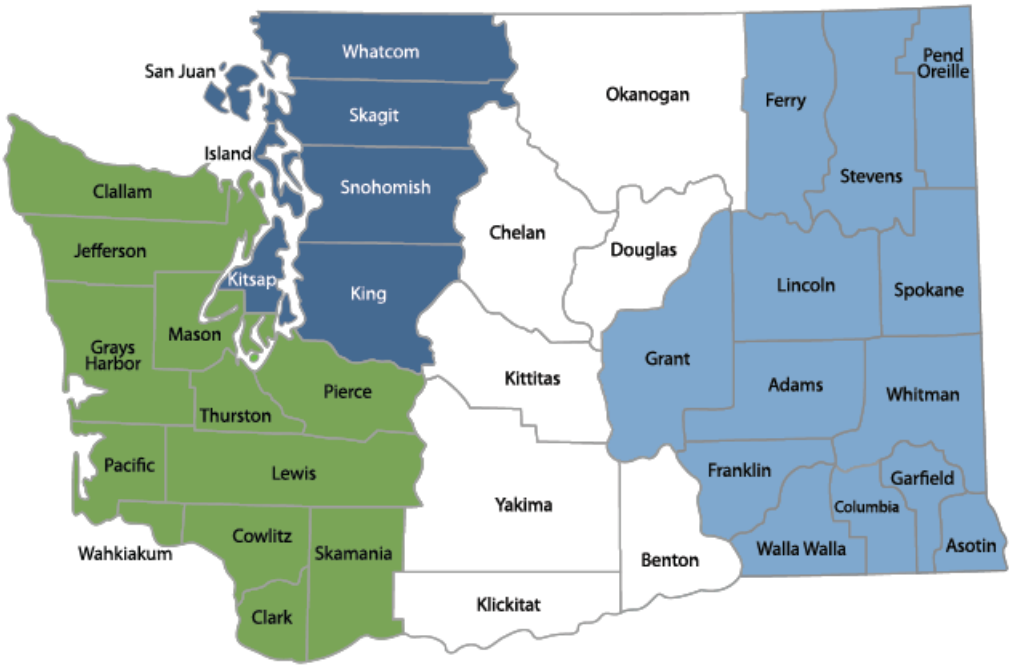

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Acronyms

APA	Administrative Procedure Act
C	Celsius
CBA	Cost-Benefit Analysis
CWA	Clean Water Act
FERC	Federal Energy Regulatory Commission
L	Liter
LBA	Least-Burdensome Alternative Analysis
LLO	Low-Level Outlet
mg	milligrams
PUD	Public Utility District
RCW	Revised Code of Washington
RFA	Regulatory Fairness Act
UAA	Use Attainability Analysis
WAC	Washington Administrative Code
WQC	Water Quality Certification

Executive Summary

This report presents the determinations made by the Washington State Department of Ecology (Ecology) as required under chapters 34.05 RCW and 19.85 RCW, for the proposed amendments to the Water Quality Standards for Surface Waters of the State of Washington rule (chapter 173-201A WAC; the "rule"). This includes the:

- Preliminary Cost-Benefit Analysis (CBA)
- Least-Burdensome Alternative Analysis (LBA)
- Administrative Procedure Act Determinations
- Regulatory Fairness Act Compliance

The Washington Administrative Procedure Act (APA; RCW 34.05.328(1)(d)) requires Ecology to evaluate significant legislative rules to "determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the law being implemented." Chapters 1 – 5 of this document describe that determination.

The APA also requires Ecology to "determine, after considering alternative versions of the rule…that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives" of the governing and authorizing statutes. Chapter 6 of this document describes that determination.

The APA also requires Ecology to make several other determinations (RCW 34.05.328(1)(a) – (c) and (f) – (h)) about the rule, including authorization, need, context, and coordination. Appendix A of this document provides the documentation for these determinations.

The Washington Regulatory Fairness Act (RFA; chapter 19.85 RCW) requires Ecology to evaluate the relative impact of proposed rules that impose costs on businesses in an industry. It compares the relative compliance costs for small businesses to those of the largest businesses affected. Chapter 7 of this document documents that analysis, when applicable.

All determinations are based on the best available information at the time of publication. We encourage feedback (including specific data) that may improve the accuracy of this analysis.

The proposed rule amendments would make the following changes:

- Revising aquatic life use designations for reaches 1 – 4 of the Chelan River to the highest attainable use.
- Revising temperature criteria to reflect the new aquatic life use.
- Revising dissolved oxygen criteria to reflect the new aquatic life use.
- Requiring ongoing monitoring.

Ecology is proposing new aquatic life use designations appropriate for each reach of the river. These designations more accurately represent the aquatic life potential of the Chelan River than

the aquatic life designations currently in the rule. Proposed amendments to temperature and dissolved oxygen criteria support the proposed new aquatic life designations, and would necessitate ongoing monitoring.

The sole party covered by the proposed rule amendments is the Public Utility District No. 1 of Chelan County (Chelan PUD).

Cost-Benefit Analysis: Costs

The proposed rule amendments would result in ongoing monitoring costs, as compared to the baseline. This is because existing monitoring requirements for the Chelan PUD stop at the end of their 10-year adaptive management plan. By setting site-specific criteria, the proposed rule amendments would necessitate continuous monitoring from the top of Reach 1 to the end of the Reach 4 habitat channel, in order to ensure the temperature criteria are met. Ensuring compliance with the proposed dissolved oxygen criteria would not necessitate continuous monitoring, but it could be done at the Chelan PUD's discretion.

While the specific attributes of the new monitoring system planned by Chelan PUD are currently in development, the PUD estimates $200,000 in internal and external costs for design and installation, as well as currently unknown calibration costs, and operating and maintenance costs.

Cost-Benefit Analysis: Benefits

By revising the aquatic life use designations for the Chelan River – based on what is achievable given the physical configuration of the river and after the Chelan PUD has taken all known, reasonable, and feasible measures – the proposed rule amendments are likely to result in benefits of avoided noncompliance for Chelan PUD. We were not able to quantify specific value of this benefit, as it depends on the type and timing of actions taken in response to noncompliance with a standard that is unachievable due to natural attributes of the Chelan River and Lake Chelan.

Ecology generally emphasizes bringing covered parties into compliance, and many actions might be taken before enforcement actions and fines. There would potentially be an incremental increase in enforcement, involving corrective actions and evaluations of progress, which would determine next steps. Looking to the 401 Water Quality Certification issued by Ecology for the Chelan River, we find explicit possible additional requirements, including (but not limited to) higher flow requirements.

During the federal relicensing, Chelan PUD addressed the potential impacts of various methods to increase river flows, and indicated they would be too costly relative to potential beneficial impact.

Beyond ongoing incremental actions to bring the Chelan PUD into compliance, there is also the possibility of future fines, enforcement actions, and potentially future issues with licensing and operations. All of these would result in ongoing costs to the Chelan PUD and their ratepayers, as well as increased uncertainty about future energy generation and retail prices.

Proposed amendments to temperature and dissolved oxygen criteria, and monitoring to ensure they are met, support achieving the benefits (avoided ongoing costs) described above.

Cost-Benefit Analysis: Conclusion

We conclude, based on a reasonable understanding of the quantified and qualitative costs and benefits likely to arise from the proposed rule amendments, as compared to the baseline, that the benefits of the proposed rule amendments are greater than the costs.

Least-Burdensome Alternative Analysis

The authorizing statute (law) for this rule is chapter 90.48 RCW, Water Pollution Control. Its goals and objectives are:

- Maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state.
- Require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington.
- Retain and secure high quality for all waters of the state.
- Working cooperatively with the federal government in a joint effort to extinguish the sources of water quality degradation.
- Preserving and vigorously exercising state powers to insure that present and future standards of water quality within the state shall be determined by the citizenry, through and by the efforts of state government.

After considering alternatives to the proposed rule's contents, within the context of the goals and objectives of the authorizing statute, we determined that the proposed rule represents the least-burdensome alternative of possible rule contents meeting the goals and objectives.

Regulatory Fairness Act Compliance

The proposed rule affects only one covered party: Chelan PUD. The Chelan PUD is the only discharger on the river, and employs between 250 and 499 employees. The Regulatory Fairness Act (RFA; chapter 19.85 RCW) defines a small business in RCW 19.85.020(3), as "any business entity, including a sole proprietorship, corporation, partnership, or other legal entity, that is owned and operated independently from all other businesses, and that has fifty or fewer employees." The proposed rule is therefore exempt from the RFA under RCW 19.85.025(4), which states, "This chapter does not apply to the adoption of a rule if an agency is able to demonstrate that the proposed rule does not affect small businesses."

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Chapter 1: Background and Introduction

1.1 Introduction

This report presents the determinations made by the Washington State Department of Ecology (Ecology) as required under chapters 34.05 RCW and 19.85 RCW, for the proposed amendments to the Water Quality Standards for Surface Waters of the State of Washington rule (chapter 173-201A WAC; the "rule"). This includes the:

- Preliminary Cost-Benefit Analysis (CBA)
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The Washington Administrative Procedure Act (APA; RCW 34.05.328(1)(d)) requires Ecology to evaluate significant legislative rules to "determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the law being implemented." Chapters 1 – 5 of this document describe that determination.

The APA also requires Ecology to "determine, after considering alternative versions of the rule…that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives" of the governing and authorizing statutes. Chapter 6 of this document describes that determination.

The APA also requires Ecology to make several other determinations (RCW 34.05.328(1)(a) – (c) and (f) – (h)) about the rule, including authorization, need, context, and coordination. Appendix A of this document provides the documentation for these determinations.

The Washington Regulatory Fairness Act (RFA; chapter 19.85 RCW) requires Ecology to evaluate the relative impact of proposed rules that impose costs on businesses in an industry. It compares the relative compliance costs for small businesses to those of the largest businesses affected. Chapter 7 of this document documents that analysis, when applicable.

All determinations are based on the best available information at the time of publication. We encourage feedback (including specific data) that may improve the accuracy of this analysis.

1.1.1 Background

This rulemaking was prompted by a use attainability analysis (UAA) and site-specific water quality criteria request submitted to Ecology by Public Utility District No. 1 of Chelan County (Chelan PUD). Ecology acknowledged that the submittal was complete and data was sufficient to consider a rulemaking.

Chelan PUD is the owner and operator of the Lake Chelan hydropower project built at the headwaters of the Chelan River. The hydropower project consists of a barrier dam that is now used to delineate Lake Chelan from the Chelan River. Chelan PUD is currently under a 50-year Federal Energy Regulatory Commission (FERC) license. Before 2009, all flows from the Chelan River were diverted through a penstock[2] to the powerhouse[3] of the dam. The Chelan River occasionally flowed, when surface flows exceeded the Chelan Dam's capacity to generate, resulting in spill over the dam into the Chelan River riverbed. With the exception of these high flow events, the Chelan River remained mostly dry for over 80 years.

The aquatic life and habitat potential of the Chelan River was largely unknown before the last FERC relicensing in 2006 due to the temporary nature of the river as a result of dam operations. The 401 Water Quality Certification (WQC)[4] provided by the Washington State Department of Ecology under the Federal Clean Water Act (CWA) during the FERC relicensing period required identification of the aquatic life and habitat potential of the Chelan River and to establish minimum instream flows.[5]

In 2009, Chelan PUD implemented minimum instream flows for the Chelan River resulting in consistent year-round flows. The 401 WQC required Chelan PUD to implement reasonable and feasible measures to achieve a series of biological objectives over a 10-year period that involved monitoring, evaluation, and adaptive management to determine the potential for the Chelan River to support aquatic life.

The 401 WQC for Lake Chelan Dam states that at the end of the 10-year monitoring period, if some biological objectives have not been met, but that all known, reasonable, and feasible measures have been implemented, then "Ecology intends to initiate a process to modify the applicable water quality standards to the extent necessary" to reflect the objectives that are attainable.

The 10-year monitoring and evaluation program has concluded and Ecology took the next steps to assess the results from this program to determine the highest attainable aquatic life uses and water quality conditions for the Chelan River. The monitoring data collected during the first 10 years of the FERC license, in addition to any other information, have been used to evaluate the Chelan UAA application that considers changes to aquatic life uses and site-specific criteria for the Chelan River. For detailed information about the Chelan River, data, and UAA, please see Ecology's Chelan River Use Attainability Analysis technical support document.[6]

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[2] A penstock is a closed conduit or pipe for conducting water to the powerhouse.
[3] A powerhouse is the structure that houses generators and turbines.
[4] Ecology, 2004. 401 Certification Order No. 1233, Lake Chelan Hydroelectric Project, FERC Project No. 637, Washington Department of Ecology, Yakima, Washington. June 1.
[5] Ecology's Chelan River Use Attainability Analysis technical support document provides summaries of each biological objective. Washington State Department of Ecology, 2021. Chelan River Use Attainability Analysis and Site-Specific Criteria. Publication 21-10-008
[6] Ibid.

1.2 Summary of the proposed rule amendments

The proposed rule amendments would make the following changes:

- Revising aquatic life use designations for reaches 1 – 4 of the Chelan River to the highest attainable use.
- Revising temperature criteria to reflect the new aquatic life use.
- Revising dissolved oxygen criteria to reflect the new aquatic life use.
- Requiring ongoing monitoring.

1.3 Reasons for the proposed rule amendments

1.3.1 Revising aquatic life use designations

After reviewing the Chelan PUD's submittal and relevant data, Ecology determined that the aquatic life use designation currently in the rule (salmonid spawning, rearing, and migration) is not appropriate. Ecology is proposing new aquatic life use designations appropriate for two unique segments of the river. These designations more accurately represent the aquatic life potential of the Chelan River than the aquatic life designations currently in the rule. Ecology's Chelan River Use Attainability Analysis technical support document details the reasons for the change and the proposed uses.[7]

1.3.2 Revising temperature criteria

New aquatic life use designations would necessitate corresponding site-specific water quality criteria.[8] Ecology reviewed criteria in the existing rule and determined the temperature criteria would need to be revised as part of this rulemaking. The revised temperature criteria are based on the natural temperature increase that occurs over the distance of the Chelan River due to solar heating. The proposed temperature criteria supporting proposed revisions to the aquatic life uses would rely on the natural thermal regime of the Chelan River compared with the single numeric value currently in rule.

1.3.3 Revising dissolved oxygen criteria

New aquatic life use designations would necessitate corresponding site-specific water quality criteria.[9] Ecology reviewed criteria in the existing rule and determined the dissolved oxygen criteria would need to be revised as part of this rulemaking. The proposed dissolved oxygen criteria supporting proposed revisions to the aquatic life uses adds an oxygen saturation component to the dissolved oxygen criteria for the Chelan River, compared with the criteria currently in the rule. The primary reason for this addition is that as water temperature increases, the capacity of oxygen to dissolve in water decreases. The oxygen saturation

[7] Ibid.
[8] Supporting water quality criteria include temperature, DO, turbidity, total dissolved gas, pH, and toxics limits.
[9] Ibid.

component accounts for the elevated water temperatures in the Chelan River that is a direct result of the influence of Lake Chelan on water quality.

1.3.4 Requiring ongoing monitoring

The Chelan PUD is currently required to perform monitoring for water entering the river, at the dam forebay, and at the end of Reaches 1, 3, and 4, based on requirements in the 401 WQC. This comprehensive monitoring is no longer required, however, after the end of the 10-year adaptive management plan. In setting site-specific proposed temperature and dissolved oxygen criteria, the 401 WQC will require Chelan PUD to conduct monitoring for temperature and dissolved oxygen to ensure compliance with water quality standards. To ensure compliance with the proposed site-specific criteria, continuous monitoring will need to occur from the top of Reach 1 to the end of the Reach 4 habitat channel, to ensure the temperature criteria are met. Ensuring compliance with the proposed dissolved oxygen criteria would not necessitate continuous monitoring, but it could be done at the Chelan PUD's discretion.[10]

1.4 Document organization

The remainder of this document is organized in the following chapters:

- **Baseline and the proposed rule amendments (Chapter 2):** Description and comparison of the baseline (what would occur in the absence of the proposed rule amendments) and the proposed rule requirements.
- **Likely costs of the proposed rule amendments (Chapter 3):** Analysis of the types and sizes of costs we expect impacted entities to incur as a result of the proposed rule amendments.
- **Likely benefits of the proposed rule amendments (Chapter 4):** Analysis of the types and sizes of benefits we expect to result from the proposed rule amendments.
- **Cost-benefit comparison and conclusions (Chapter 5):** Discussion of the complete implications of the CBA.
- **Least-Burdensome Alternative Analysis (Chapter 6):** Analysis of considered alternatives to the contents of the proposed rule amendments.
- **Regulatory Fairness Act Compliance (Chapter 7):** When applicable. Comparison of compliance costs for small and large businesses; mitigation; impact on jobs.
- **APA Determinations (Appendix A):** RCW 34.05.328 determinations not discussed in chapters 5 and 6.

[10] Monitoring locations would be at the dam outlet or top of Reach 1, end of the canyon at the end of Reach 3, and the end of the Reach 4 habitat channel.

Chapter 2: Baseline and Proposed Rule Amendments

2.1 Introduction

We analyzed the impacts of the proposed rule amendments relative to the existing rule, within the context of all existing requirements (federal and state laws and rules). This context for comparison is called the baseline, and reflects the most likely regulatory circumstances that entities would face if the proposed rule was not adopted. It is discussed in Section 2.2, below.

2.2 Baseline

The baseline for our analyses generally consists of existing rules and statutes (laws), and their requirements. This is what allows us to make a consistent comparison between the state of the world with and without the proposed rule amendments.

For this rulemaking, the baseline includes:

- Authorizing statute: chapter 90.48 RCW, Water Pollution Control.
- Existing rule: chapter 173-201A WAC, Water Quality Standards for Surface Waters of the State of Washington.
- The 401 Water Quality Certification (WQC) provided by Ecology under the federal Clean Water Act (CWA) during the Federal Energy Regulatory Commission (FERC) relicensing period.[11]

2.3 Proposed rule amendments

The proposed rule amendments would make the following changes:

- Revising aquatic life use designations for the Chelan River to the highest attainable use.
- Revising temperature criteria to reflect the new aquatic life use.
- Revising dissolved oxygen criteria to reflect the new aquatic life use.
- Requiring ongoing monitoring.

2.3.1 Revising aquatic life use designations

Baseline

Under the baseline rule, all four reaches of the river have an aquatic life use of "Salmonid spawning, rearing, and migration". The 401 WQC required the Public Utility District No. 1 of Chelan County (Chelan PUD) to implement all known, reasonable, and feasible

[11] Ecology, 2004. 401 Certification Order No. 1233, Lake Chelan Hydroelectric Project, FERC Project No. 637, Washington Department of Ecology, Yakima, Washington. June 1.

measures to meet existing biological objectives. After implementing these measures, and 10 years of monitoring the river, if biological objectives had not been met or were not achievable, Ecology would consider revising the aquatic life use based on the evidence gathered.

Proposed

The proposed rule would revise the aquatic life use designations for all four reaches of the river, based on evidence from ten years of monitoring under the 401 WQC. The table below summarizes the proposed aquatic life uses, by river reach.

Table 1: Proposed aquatic life use, by reach

Reach	Proposed Aquatic Life Use
1 to 3	Migration in naturally limited waters
4	Salmonid spawning, rearing, and migration in naturally limited waters

Expected impact

Comparing the uses listed in the baseline and proposed rules, the proposed rule would more accurately assign the aquatic life uses than the baseline. The proposed uses are based on evidence from monitoring the river, after implementing all known, reasonable, and feasible measures to attain the current designated uses and water quality criteria. The proposed designated uses are representative of the highest possible aquatic life uses, based on the attributes of the Chelan River and upstream Lake Chelan. See the Chelan River Use Attainability Analysis technical support document included in this rulemaking for details of river attributes and monitoring data that support this determination.[12]

We therefore do not expect costs (negative impacts) to arise as a result of this proposed rule amendment. We expect a benefit (positive impact) to arise from the Chelan PUD not being held to a standard that is unachievable given the natural attributes of the river and the lake that feed it. We discuss these potential benefits in Chapter 4.

2.3.2 Revising temperature criteria

Baseline

Temperature criteria under the baseline rule are based on supporting the baseline aquatic life use of "Salmonid spawning, rearing, and migration". They are summarized in the table below.

[12] Washington State Department of Ecology, 2021. Chelan River Use Attainability Analysis and Site-Specific Criteria. Publication 21-10-008

Table 2: Baseline temperature criteria

Criteria	Duration	Frequency
≤17.5 ºC	7-day average of the daily minimum	No more than one exceedance every 10 years
Anthropogenic allowance of 0.3 ºC	7-day average of the daily minimum	No more than one exceedance every 10 years

Proposed

Since the proposed rule amendments would revise the aquatic life use designations for the river, they correspondingly propose amended temperature criteria. The proposed criteria are summarized in the table below.

Table 3: Proposed temperature criteria, by reach

Reach	Proposed Water Quality Criteria	Duration	Frequency
Reaches 1 to 3	When temperature is >17.5 °C at the end of Reach 3, the maximum allowable increase in temperature is 3.75 °C from the Lake Chelan dam outlet to end of Reach 3.	7-day average of the daily maximum increase.	Same as statewide criteria.
Reach 4	When temperature is >17.5 °C at the end of Reach 4 habitat channel, the maximum allowable increase in temperature from the end of Reach 3 to the end of the Reach 4 habitat channel is 1.25 °C.	7-day average of the daily maximum increase.	Same as statewide criteria.
All Reaches	No anthropogenic heat source inputs are allowed downstream of the Lake Chelan Dam outlet to the Chelan River confluence with the Columbia River.	n/a	n/a

Expected impact

Comparing the temperature criteria in the baseline and proposed rules, the proposed rule would more accurately set temperature criteria to the natural thermal regime of the river. The proposed temperature criteria support new proposed aquatic life uses, which are based on evidence from monitoring the river, after implementing all known, reasonable, and feasible measures. The proposed designated uses are representative of the highest possible aquatic life uses, given the attributes of the Chelan River and upstream Lake Chelan. See the Chelan River Use Attainability Analysis technical support document included in this rulemaking for details of river attributes and monitoring data that support this determination.[13]

We therefore do not expect costs (negative impacts) to arise as a result of this proposed rule amendment. We expect a benefit (positive impact) to arise from the Chelan PUD not being held to a standard that is unachievable given the natural attributes of the river and

[13] Washington State Department of Ecology, 2021. Chelan River Use Attainability Analysis and Site-Specific Criteria. Publication 21-10-008

the lake that feed it. Ecology identified the proposed temperature criteria as the most stringent and achievable using current and historical river attributes and restoration actions. We discuss these potential benefits in Chapter 4, as part of overall benefits of a feasible aquatic life use designation, in section 4.3.1.

2.3.3 Revising dissolved oxygen criteria

Baseline

Dissolved oxygen criteria under the baseline rule are based on supporting the baseline aquatic life use of "Salmonid spawning, rearing, and migration". They are summarized in the table below.

Table 4: Baseline dissolved oxygen criteria

Criteria	Duration	Frequency
≥8.0 mg/L	1-day minimum	No more than one exceedance every 10 years
Anthropogenic allowance of 0.2 mg/L	1-day minimum	No more than one exceedance every 10 years

Proposed

Since the proposed rule amendments would revise the aquatic life use designations for the river, they correspondingly propose amended dissolved oxygen criteria. The proposed criteria are summarized in the table below.

Table 5: Proposed dissolved oxygen criteria

Proposed Water Quality Criteria	Duration	Frequency
8.0 mg/L or 90 percent saturation.	1-day minimum.	Same as statewide criteria.

Expected impact

Comparing the dissolved oxygen criteria in the baseline and proposed rules, the proposed rule would add an additional oxygen saturation component to the dissolved oxygen criteria to account for the influence of Lake Chelan on Chelan River conditions, including elevated water temperatures and subsequently, decreased ability to dissolve oxygen in the Chelan River. The proposed dissolved oxygen criteria support new proposed aquatic life uses, which are based on evidence from monitoring the river, after implementing all known, reasonable, and feasible measures. They would be the dissolved oxygen criteria supporting the highest possible aquatic life uses, given the attributes of the Chelan River and upstream Lake Chelan. See the Chelan River Use Attainability Analysis technical

support document included in this rulemaking for details of river attributes and monitoring data that support this determination.[14]

We therefore do not expect costs (negative impacts) to arise as a result of this proposed rule amendment. We expect a benefit (positive impact) to arise from the Chelan PUD not being held to a standard that is unachievable given the natural attributes of the river and the lake that feed it. Ecology identified the proposed dissolved oxygen criteria as the most stringent and achievable in relation to natural conditions of the Chelan River. We discuss these potential benefits in Chapter 4, as part of overall benefits of a feasible aquatic life use designation, in section 4.3.1.

2.3.4 Requiring ongoing monitoring

Baseline

The Chelan PUD is currently required to perform monitoring for water entering the river, at the dam forebay, and at the end of Reaches 1, 3, and 4, based on requirements in the 401 WQC. This comprehensive monitoring is no longer required, however, after the end of the 10-year adaptive management plan.

Proposed

In setting the proposed site-specific temperature and dissolved oxygen criteria, the proposed rule amendments necessitate ongoing monitoring consistent with the 401 WQC, to ensure the temperature and dissolved oxygen criteria are met.

Expected impact

These proposed amendments are likely to result in ongoing monitoring costs for the Chelan PUD, as well as the benefits that come from monitoring – namely, compliance with the proposed temperature and dissolved oxygen criteria.

[14] Washington State Department of Ecology, 2021. Chelan River Use Attainability Analysis and Site-Specific Criteria. Publication 21-10-008

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Chapter 3: Likely Costs of the Proposed Rule Amendments

3.1 Introduction

We analyzed the likely costs associated with the proposed rule amendments, as compared to the baseline. The proposed rule amendments and the baseline are discussed in detail in Chapter 2 of this document.

3.2 Cost analysis

The proposed rule amendments would make the following changes:

- Revising aquatic life use designations for reaches 1 – 4 of the Chelan River to the highest attainable use.
- Revising temperature criteria to reflect the new aquatic life uses.
- Revising dissolved oxygen criteria to reflect the new aquatic life uses.
- Requiring ongoing monitoring.

3.2.1 Revising aquatic life use designations

We do not expect this proposed amendment to result in costs as compared to the baseline. See Chapter 2 for discussion.

3.2.2 Revising temperature criteria

We do not expect this proposed amendment to result in costs as compared to the baseline. See Chapter 2 for discussion.

3.2.2 Revising dissolved oxygen criteria

We do not expect this proposed amendment to result in costs as compared to the baseline. See Chapter 2 for discussion.

3.2.2 Requiring ongoing monitoring

The proposed rule amendments would result in ongoing monitoring costs, as compared to the baseline. This is because existing monitoring requirements for the Chelan PUD stop at the end of the 10-year adaptive management plan. By setting site-specific criteria, the proposed rule amendments would necessitate ongoing monitoring from the top of Reach 1 to the end of the Reach 4 habitat channel, in order to ensure the temperature criteria are

met. Ensuring compliance with the proposed dissolved oxygen criteria would not necessitate continuous monitoring, but it could be done at the Chelan PUD's discretion.[15]

In conversation with the Chelan PUD, we received information about current monitoring practices, as well as plans for future monitoring. Currently, monitoring is done by individuals sampling the river directly. Staff travel down the river, which can be dangerous given the steep canyon surrounding it. The PUD is currently in the planning phase for design and installation of automatic monitoring gauges.

While the specific attributes of this new monitoring system are currently in development, the PUD estimates $200,000 in internal and external costs for design and installation, as well as currently unknown calibration costs, and operating and maintenance costs.[16] For illustration, annual calibration of total dissolved gas (TDG) probes costs between $10,000 and $20,000.[17] We note that automatic monitoring is being pursued as a cost-savings over current practice, as well as for safety of monitoring staff.

For rulemakings, Ecology's practice is to typically calculate 20-year present value costs (discounted sums of a stream of costs over time), but for this cost we were only able to estimate the up-front (likely across 2022-2025) cost of design and installation. As the PUD is currently in the early planning stages, and ongoing maintenance costs are undetermined until design is complete, we used the estimate of at least $200,000.

[15] Monitoring locations would be at the dam outlet or top of Reach 1, end of the canyon at the end of Reach 3, and the end of the Reach 4 habitat channel. The temperature criteria necessitate continuous monitoring but the dissolved oxygen criteria do not unless it is written in the 401 WQC.
[16] Conversation with Marcie Clement, Chelan PUD, 02/09/2021.
[17] Ibid.

Chapter 4: Likely Benefits of the Proposed Rule Amendments

4.1 Introduction

We analyzed the likely benefits associated with the proposed rule amendments, as compared to the baseline. The proposed rule amendments and the baseline are discussed in detail in Chapter 2 of this document.

4.2 Benefits analysis

The proposed rule amendments would make the following changes:

- Revising aquatic life use designations for reaches 1 – 4 of the Chelan River to the highest attainable use.
- Revising temperature criteria to reflect the new aquatic life uses.
- Revising dissolved oxygen criteria to reflect the new aquatic life uses.
- Requiring ongoing monitoring.

4.2.1 Revising aquatic life use designations

By revising the aquatic life use designations for the Chelan River, based on what is achievable given the physical configuration of the river and after the Public Utility District No. 1 of Chelan County (Chelan PUD) has taken all known, reasonable, and feasible measures, this proposed rule amendment is likely to result in benefits of avoided noncompliance for Chelan PUD. We were not able to quantify specific value of this benefit, as it depends on the type and timing of actions taken in response to noncompliance with a standard that is unachievable due to natural attributes of the Chelan River and Lake Chelan.

Ecology generally emphasizes bringing covered parties into compliance, and many actions might be taken before enforcement actions and fines. There would potentially be an incremental increase in enforcement, involving corrective actions and evaluations of progress, which would determine next steps. Looking to the 401 WQC, we find explicit possible additional requirements, including (but not limited to) higher flow requirements.

During the federal relicensing, Chelan PUD addressed the potential impacts of various methods to increase river flows, and indicated they would be too costly relative to potential beneficial impact, including:[18]

- "Increasing flow to maintain [Chelan] River water temperatures within 0.3 °C of natural temperatures when water temperature exceeds 18 °C. The higher flow option was eliminated because it would not contribute significantly to meeting biological objectives and high flows would have reduced habitat area available for native fish species."
- "Building a pipeline to transport cool water several miles from deeper regions of [Lake Chelan] to provide flows for a minimum-flow release structure. This option was eliminated because of limited ability to provide cooler water and excessively high costs."
- "Pumping groundwater into the upper [Chelan] River (Reach 1). This option was eliminated due to the low probability that enough groundwater would be available to create thermal refugia.[19]"
- "Pumping surface water from the Columbia River into the lower [Chelan] River (Reach 4). This option was eliminated due to expectation of warmer water temperatures in the Columbia River during Chinook Salmon spawning and the adverse ecological consequences of mixing these waters."

As the 401 WQC required all known, reasonable, and feasible measures, the above additional measures were determined to be unfeasible. Beyond ongoing incremental actions to bring the Chelan PUD into compliance, there is also the possibility of future fines, enforcement actions, and potentially future issues with licensing and operations. All of these would result in ongoing costs to the Chelan PUD and their ratepayers, as well as increased uncertainty about future energy generation and retail prices.

4.2.2 Revising temperature criteria

We do not expect this proposed amendment to result in benefits as compared to the baseline, in excess of supporting benefits described in section 4.2.1.

4.2.2 Revising dissolved oxygen criteria

We do not expect this proposed amendment to result in benefits as compared to the baseline, in excess of supporting benefits described in section 4.2.1.

[18] Additional options considered but not selected by the Natural Science Working Group (state and federal fishery managers, Tribes, and other stakeholders). Mugunthan P, Miller J, Stachura M. 2019. Prepared for Public Utility District No. 1 of Chelan County. Prepared by Four Peaks Environmental Science & Data Solutions. Wenatchee, WA. December.

[19] Thermal refugia are places that act as refuge from adverse temperatures.

4.2.2 Requiring ongoing monitoring

Chelan PUD would be required to continue monitoring to meet the proposed aquatic life use designations, through compliance with proposed temperature and dissolved oxygen criteria as part of their 401 WQC. This would support the benefits discussed in section 4.2.1. This is particularly the case because the Chelan PUD's Lake Chelan hydropower project has no associated discharge permit, where monitoring requirements would otherwise be specified.

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Chapter 5: Cost-Benefit Comparison and Conclusions

5.1 Summary of costs and benefits of the proposed rule amendments

As compared to the baseline, we assessed likely costs and benefits of the proposed rule amendments. For additional information on costs and benefits described below, see chapters 3 and 4.

Costs

The proposed rule amendments would result in ongoing monitoring costs, as compared to the baseline. This is because existing monitoring requirements for the Chelan PUD stop at the end of the 10-year adaptive management plan. By setting site-specific criteria, the proposed rule amendments would necessitate continuous monitoring from the top of Reach 1 to the end of the Reach 4 habitat channel, in order to ensure the temperature criteria are met. Ensuring compliance with the proposed dissolved oxygen criteria would not necessitate continuous monitoring, but it could be done at the Chelan PUD's discretion.[20]

While the specific attributes of a new planned monitoring system are currently in development, the Chelan PUD estimates $200,000 in internal and external costs for design and installation, as well as currently unknown calibration costs, and operating and maintenance costs.

Benefits

By revising the aquatic life use designations for the Chelan River, based on what is achievable given the physical configuration of the river and after the Chelan PUD has taken all known, reasonable, and feasible measures, the proposed rule amendments are likely to result in benefits of avoided noncompliance for Chelan PUD. We were not able to quantify a specific value of this benefit, as it depends on the type and timing of actions taken in response to noncompliance with a standard that is unachievable due to natural attributes of the Chelan River and Lake Chelan.

Ecology generally emphasizes bringing covered parties into compliance, and many actions might be taken before enforcement actions and fines. There would potentially be an incremental increase in enforcement, involving corrective actions and evaluations of progress, which would determine next steps. Looking to the 401 WQC, we find explicit possible additional requirements, including (but not limited to) higher flow requirements.

[20] Monitoring locations would be at the dam outlet or top of Reach 1, end of the canyon at the end of Reach 3, and the end of the Reach 4 habitat channel. The temperature criteria necessitate continuous monitoring but the dissolved oxygen criteria do not unless it is written in the 401 WQC.

During the federal relicensing, Chelan PUD addressed the potential impacts of various methods to increase river flows, and indicated they would be too costly relative to potential beneficial impact.

Beyond ongoing incremental actions to bring the Chelan PUD into compliance, there is also the possibility of future fines, enforcement actions, and potentially future issues with licensing and operations. All of these would result in ongoing costs to the Chelan PUD and their ratepayers, as well as increased uncertainty about future energy generation and retail prices.

Proposed amendments to temperature and dissolved oxygen criteria, and monitoring to ensure they are met, support achieving the benefits (avoided ongoing costs) described above.

5.2 Conclusion

We conclude, based on a reasonable understanding of the quantified and qualitative costs and benefits likely to arise from the proposed rule amendments, as compared to the baseline, that the benefits of the proposed rule amendments are greater than the costs.

Chapter 6: Least-Burdensome Alternative Analysis

6.1 Introduction

RCW 34.05.328(1)(c) requires Ecology to "…[d]etermine, after considering alternative versions of the rule and the analysis required under (b), (c), and (d) of this subsection, that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated under (a) of this subsection." The referenced subsections are:

> (a) Clearly state in detail the general goals and specific objectives of the statute that the rule implements;
>
> (b) Determine that the rule is needed to achieve the general goals and specific objectives stated under (a) of this subsection, and analyze alternatives to rule making and the consequences of not adopting the rule;
>
> (c) Provide notification in the notice of proposed rulemaking under RCW 34.05.320 that a preliminary cost-benefit analysis is available. The preliminary cost-benefit analysis must fulfill the requirements of the cost-benefit analysis under (d) of this subsection. If the agency files a supplemental notice under RCW 34.05.340, the supplemental notice must include notification that a revised preliminary cost-benefit analysis is available. A final cost-benefit analysis must be available when the rule is adopted under RCW 34.05.360;
>
> (d) Determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented.

In other words, to be able to adopt the rule, we are required to determine that the contents of the rule are the least burdensome set of requirements that achieve the goals and objectives of the authorizing statute(s).

We assessed alternative proposed rule content, and determined whether they met the goals and objectives of the authorizing statute(s). Of those that would meet the goals and objectives, we determined whether those chosen for inclusion in the proposed rule amendments were the least burdensome to those required to comply with them.

6.2 Goals and objectives of the authorizing statute

The authorizing statute (law) for this rule is chapter 90.48 RCW, Water Pollution Control. Its goals and objectives are:

- Maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state.

- Require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington.
- Retain and secure high quality for all waters of the state.
- Working cooperatively with the federal government in a joint effort to extinguish the sources of water quality degradation.
- Preserving and vigorously exercising state powers to insure that present and future standards of water quality within the state shall be determined by the citizenry, through and by the efforts of state government.

6.3 Alternatives considered and why they were excluded

We considered the following alternative rule content, and did not include it in the proposed rule amendments for the reasons discussed below.

- Not proceeding with the use attainability analysis (UAA) and site-specific criteria.

6.3.1 Not proceeding with the use attainability analysis and site-specific criteria

Ecology could have decided not to proceed with the designated use change and site-specific criteria being considered in this rulemaking. Designated uses are those uses specified in the water quality standard rules for each water body or segment, regardless of whether or not the uses are currently attained. Existing uses are "those uses actually attained in fresh or marine waters on or after November 28, 1975, whether or not they are designated uses."

The salmonid spawning, rearing, and migration use assigned to the Chelan River is a general use that is assigned to all water bodies when there is a lack of site-specific information. The monitoring data and scientific analysis conducted by Chelan PUD has demonstrated that the designated aquatic life uses are not appropriately assigned for the Chelan River. When the initial designated aquatic life uses are assigned to water bodies, monitoring and scientific data is not always available. If data can demonstrate that a designated use is not correctly assigned, the federal Clean Water Act allows the implementation of water quality tools such as a UAA to correct the designation.

If Ecology did not proceed with the proposed rule, the Lake Chelan hydroelectric project would be out of compliance for reasons that are attributed to naturally occurring physical habitat and water quality conditions. Chelan PUD would be out of compliance due to environmental conditions that are out of their control.

This alternative would therefore not meet the goals and objectives of the authorizing statute (as well as imposing additional burden on the Chelan PUD).

6.4 Conclusion

After considering alternatives to the proposed rule's contents, within the context of the goals and objectives of the authorizing statute, we determined that the proposed rule represents the least-burdensome alternative of possible rule contents meeting the goals and objectives.

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Chapter 7: Regulatory Fairness Act Compliance

The proposed rule affects only one covered party: Public Utility District No. 1 of Chelan County (Chelan PUD). The Chelan PUD is the only discharger on the river, and employs between 250 and 499 employees.[21] The Regulatory Fairness Act (RFA; chapter 19.85 RCW) defines a small business in RCW 19.85.020(3), as "any business entity, including a sole proprietorship, corporation, partnership, or other legal entity, that is owned and operated independently from all other businesses, and that has fifty or fewer employees."

The proposed rule is therefore exempt from the RFA under RCW 19.85.025(4), which states, "This chapter does not apply to the adoption of a rule if an agency is able to demonstrate that the proposed rule does not affect small businesses."

[21] Infogroup/Data Axle employment database for Washington State, 2020.

References

RCW 34.05.272 requires Ecology to categorize sources of information used in significant agency actions made in the Water Quality Program.

Independent peer review: Review is overseen by an independent third party.

Mugunthan P, Miller J, Stachura M. 2019. Prepared for Public Utility District No. 1 of Chelan County. Prepared by Four Peaks Environmental Science & Data Solutions. Wenatchee, WA. December.

Internal peer review: Review by staff internal to Ecology.

Washington State Department of Ecology, 2021. Chelan River Use Attainability Analysis and Site-Specific Criteria. Publication 21-10-008.

Ecology, 2004. 401 Certification Order No. 1233, Lake Chelan Hydroelectric Project, FERC Project No. 637, Washington Department of Ecology, Yakima, Washington. June 1.

External peer review: Review by persons that are external to and selected by Ecology.

N/A

Open review: Documented open public review process that is not limited to invited organizations or individuals.

N/A

Legal and policy documents: Documents related to the legal framework for the significant agency action, including but not limited to: federal and state statutes, court and hearings board decisions, federal and state administrative rules and regulations, and policy and regulatory documents adopted by local governments.

Chapter 90.48 RCW, Water Pollution Control.

Chapter 173-201A WAC, Water Quality Standards for Surface Waters of the State of Washington.

Data from primary research, monitoring activities, or other sources, but that has not been incorporated as part of documents reviewed under independent, internal, or external peer review.

Infogroup/Data Axle employment database for Washington State, 2020.

Conversation with Marcie Clement, Chelan PUD, 02/09/2021.

Records of the best professional judgment of Ecology employees or other individuals.

N/A

Other: Sources of information that do not fit into other categories.

N/A

Appendix A: Administrative Procedure Act (RCW 34.05.328) Determinations

A. RCW 34.05.328(1)(a) – Clearly state in detail the general goals and specific objectives of the statute that this rule implements.

See Chapter 6.

B. RCW 34.05.328(1)(b) –

1. Determine that the rule is needed to achieve the general goals and specific objectives of the statute.

See chapters 1 and 2.

2. Analyze alternatives to rulemaking and the consequences of not adopting this rule.

The alternatives to this rulemaking have been reviewed in accordance with the Compliance Schedule for Dams (WAC 173-201A-510(5)), which requires dams to identify all reasonable and feasible improvements to meet water quality standards. Public Utility District No. 1 of Chelan County (Chelan PUD) has completed this adaptive management process and determined that no new reasonable and feasible improvements are available to meet the assigned designated uses and that these assigned uses never existed.

Other alternatives were discussed between Ecology and Chelan PUD within Part 510(5) of the surface water quality standards. The UAA and site-specific criteria alternatives were the only viable options for this water body. The only other alternative to this rulemaking is to maintain the currently assigned designated uses and numeric criteria. The consequence of not proceeding with a UAA is that water quality standards will be incorrectly assigned to most of the Chelan River. The natural features of the Chelan River inhibit upstream salmonid migration for most of the river, and the current standards do not consider the natural water temperatures that flow from Lake Chelan. Chelan PUD would continue to be out of compliance with the current inaccurately assigned standards if this rulemaking does not proceed.

Please see the Least Burdensome Alternative Analysis, Chapter 6 of this document, for discussion of alternative rule content considered.

C. RCW 34.05.328(1)(c) - A preliminary cost-benefit analysis was made available.

When filing a rule proposal (CR-102) under RCW 34.05.320, Ecology provides notice that a preliminary cost-benefit analysis is available. At adoption (CR-103 filing) under RCW 34.05.360, Ecology provides notice of the availability of the final cost-benefit analysis.

D. RCW 34.05.328(1)(d) – Determine that probable benefits of this rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented.

See chapters 1 – 5.

E. RCW 34.05.328 (1)(e) - Determine, after considering alternative versions of the analysis required under RCW 34.05.328 (b), (c) and (d) that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated in Chapter 6.

Please see Chapter 6.

F. RCW 34.05.328(1)(f) - Determine that the rule does not require those to whom it applies to take an action that violates requirements of another federal or state law.

40 CFR 131.20 requires states and tribes (with primacy for clean water actions) to periodically review and update the Water Quality Standards. The Clean Water Act allows the use of water quality tools to modify designated uses (40 CFR 131.10) and develop site-specific criteria (40 CFR 131.11) to characterize water quality conditions specific to a water body. The adopted updates are reviewed and approved by the EPA before becoming effective for Clean Water Act actions.

G. RCW 34.05.328 (1)(g) - Determine that the rule does not impose more stringent performance requirements on private entities than on public entities unless required to do so by federal or state law.

This rule would not impose more stringent performance requirements on private entities than on public entities. Chelan PUD owns the land surrounding the entire Chelan River. There are no private entities that would be affected by the proposed rule. The basis for this rule is to develop water quality standards that are protective of the highest attainable aquatic life uses that are present and attainable in the Chelan River. Any entity who uses natural resources on the Chelan River will be subject to chapter 173-201A WAC, Water Quality Standards for Surface Waters of the State of Washington.

H. RCW 34.05.328 (1)(h) Determine if the rule differs from any federal regulation or statute applicable to the same activity or subject matter.

No.

I. RCW 34.05.328 (1)(i) – Coordinate the rule, to the maximum extent practicable, with other federal, state, and local laws applicable to the same subject matter.

We worked with the Environmental Protection Agency to ensure this rule is approvable and meets federal Clean Water Act requirements. We also met with tribes to help understand how the proposed rule could impact water quality regulations in the Chelan River.