DEPARTMENT OF ECOLOGY
State of Washington

Final Regulatory Analyses

Including the:
Final Cost-Benefit Analysis
Least-Burdensome Alternative Analysis
Administrative Procedure Act Determinations
Regulatory Fairness Act Compliance

Chapter 173-501 WAC
Instream Resources Protection Program – Nooksack Water Resource Inventory Area (WRIA) 1

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For more information contact:

Water Resources Program
P.O. Box 47600
Olympia, WA 98504-7600
Phone: 360-407-6872

Washington State Department of Ecology – www.ecology.wa.gov

- Headquarters, Olympia 360-407-6000
- Northwest Regional Office, Bellevue 425-649-7000
- Southwest Regional Office, Olympia 360-407-6300
- Central Regional Office, Union Gap 509-575-2490
- Eastern Regional Office, Spokane 509-329-3400

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Chapter 173-501 WAC

Instream Resources Protection Program – Nooksack Water Resource Inventory Area (WRIA) 1

by

Kasia Patora

with

Sam Wilson

for the

Water Resources Program
Washington State Department of Ecology
Olympia, Washington

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Acronyms

Afy Acre per year
APA Administrative Procedure Act
BERK BERK Consulting
CBA Cost-Benefit Analysis
ESSB Engrossed Substitute Senate Bill
ESA Endangered Species Act
Gpd Gallons per day
LBA Least-Burdensome Alternative Analysis
MAA Maximum annual average
MAR Managed aquifer recharge
NAICS North American Industry Classification System
RCW Revised Code of Washington
RFA Regulatory Fairness Act
RH2 RH2 Engineering
RSD Rule Supporting Document
SWSL Surface Water Source Limitation
UGA Urban Growth Area
U.S.C. United States Code
WAC Washington Administrative Code
WRIA Water Resource Inventory Area
WSU Washington State University

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 adopted amendments to the Instream Resources Protection Program – Nooksack Water Resource Inventory Area (WRIA) 1 rule (chapter 173-501 WAC; the "rule"). This includes the:

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

The rule amendments make the following changes:

- **Setting a residential conservation standard** for withdrawals from new permit-exempt domestic wells.
    - Individual homes will be limited to 500 gallons per day (gpd) indoor domestic water use, and irrigation of one-twelfth of an acre for noncommercial lawns and gardens.
    - Subdivisions will be limited to 500 gpd per home indoor domestic water use, and irrigation of one-twelfth of an acre noncommercial lawn and garden, with a collective limit for the subdivision of 3,000 gpd indoor domestic water use and one-half of an acre noncommercial lawn and garden.
- **Allowing issuance of interruptible retiming water rights.** Projects may apply for an interruptible water right to divert water from streams regulated under WAC 173-501-040 during high-flow times if they enhance streamflows during lower flow periods.

The rule amendments do not change the fees established in RCW 90.94.020.

Likely costs and benefits

Costs

We were not able to identify non-zero costs of the adopted amendments. While economic theory indicates that there could be some property value loss as a result of the amendments' restriction on withdrawals for domestic outdoor watering, we cannot identify a non-zero impact because:

- The difference between the most-comparable no-watering situation in the Dungeness basin and the limited outdoor watering in WRIA 1 (the adopted amendments), indicates an estimate of the impact in the Dungeness is an overestimate for the impact of the adopted amendments.
- For the Dungeness, the estimate in change in value is highly uncertain, and is not statistically different from zero.
- 34 percent of homes that would choose not to water outside at all, regardless of the limit in the rule.

- The unknown number of homes that will be developed as single homes and see the maximum change in outdoor irrigation area, compared to projects or subdivisions with multiple homes that will see a reduced change per home.

New homes in WRIA 1 can still have larger lawns exceeding the one-twelfth of an acre limit, but they will be limited to irrigating only a portion of the lawn. This is feasible in northwest Washington, as lawns generally survive without irrigation during the summer when there is reduced precipitation.[1] Landowners also have the ability to mitigate any real or perceived impacts by using cisterns, alternative groundcovers, and water-conserving gardening techniques

We expect property owners to reduce or eliminate any perceived property value impacts by voluntarily:

- Using cisterns ($4,000 per property) when more than one-twelfth of an acre needs irrigation. Assuming 66 percent of new homes using permit-exempt wells choose to water outdoors, and 2,150 homes are built at a uniform rate, the equivalent 20-year present value of this potential expenditure is $5.1 million.
- Replacing some grass with alternative drought-tolerant ground covers.
- Xeriscaping (i.e., using gardening techniques that reduce or eliminate the irrigated footprint.)

Benefits

The rule amendments and associated new residential conservation standard provide a reasonable assurance that 20 years of projected consumptive use will be offset and result in a net ecological benefit to instream resources within WRIA 1. Specifically, these benefits include:

- Returning 3,767 acre feet per year (afy) of water to streams, frequently during low-flow months. 3,377 afy of this water will be in excess of the offset target, providing significant habitat improvements for salmonids and other aquatic species of concern. This includes five threatened populations of Chinook and Steelhead.
- Protecting and increasing values for salmon, such as:
    - Use values, such as commercial and recreational fisheries.
    - Non-use values, such as habitat contributions, existence values, and bequest values.
    - Cultural value, including the significant values held by tribes (use and non-use values)
- Improving aesthetic and recreational values of streams in low-flow months.

While ecosystem services-related benefits are difficult to quantify, the rule amendments will result in both non-quantifiable and quantifiable benefits to streamflows and the environment. As an illustration, a 2016 survey indicates a statewide willingness to pay of $112 million per year

[1] Options to irrigate a larger area include connecting to another existing well (offsite), collecting rainwater, connecting to water system or utility district, using a water right.

over ten years, for the recovery of Puget Sound Salmon. The equivalent 20-year present value for salmon recovery is over $1 billion.[2]

In addition to the on-the-ground streamflow and environmental benefits, the new conservation standard reduces the need for additional of projects to achieve offsets and a net ecological benefit. These represent a collective benefit to the Washington State taxpayer in terms of cost avoidance.

- Absent the conservation standard, domestic water use from new permit-exempt wells would require additional projects in the form of water offsets to be reasonably assured that a net ecological benefit would be achieved.
- Based on WRIA 1 projects, the cost per home will be $9,674 to $37,779 to fund additional offset projects to irrigate five-twelfths of an acre, the difference between the one-twelfth acre conservation standard and one-half acre baseline.
- The present value of the cost of additional projects needed for all 2,150 new homes projected over 20 years will be $18.8 million to $73.3 million to irrigate the difference between the one-twelfth acre conservation standard and one-half acre baseline.[3]
- The rule amendments do not change the fees for individual property owner; therefore, funding for the additional projects would come from Washington State taxpayers. The conservation standard avoids requiring this additional cost.

Conclusion

Ecology concludes, based on reasonable understanding of the quantified and qualitative costs and benefits likely to arise from the rule amendments, that the benefits of the rule amendments are greater than the costs.

Least-Burdensome Alternative

During development of the amendments, Ecology considered alternative rule content, including:

- Setting water use limits higher for new domestic permit-exempt wells.
- Setting water use limits lower for new domestic permit-exempt wells.
- Making the limits during a drought mandatory.

After considering alternatives to the rule's contents, as well as the goals and objectives of the authorizing statute, Ecology determined that the amended rule represents the least-burdensome alternative of possible rule contents meeting these goals and objectives.

Regulatory Fairness Act

While we identified potential costs of reduced property values as a result of the amendments, we did not identify any costs that covered residential permit-exempt water users or project

[2] Based on aggregate statewide willingness to pay of $112 million for the first ten years, followed by zero payments in the subsequent ten years.
[3] Assumes homes are built at a uniform rate over 20 years.

proponents will incur in order to comply with the rule. In past rulemakings related to water resources, for example, compliance costs included the costs of metering and reporting.

The adopted amendments only add the conservation standard and project allowance, but do not require any monitoring, reporting, or other additional compliance behavior. We are therefore not required to perform analyses under the RFA, per RCW 19.85.030.

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 adopted amendments to the Instream Resources Protection Program – Nooksack Water Resource Inventory Area (WRIA) 1 rule (chapter 173-501 WAC; the "rule"). This includes the:

- Final 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 (RCW 34.05.328(1)(d)). 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 provides the documentation for these determinations.

All determinations are based on the best available information at the time of publication.

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

1.1.1 About this rulemaking

In January 2018, Washington passed a new law (Engrossed Substitute Senate Bill (ESSB) 6091) that provides Ecology and local governments with tools to protect and enhance streamflows while ensuring that water is available for homes in rural parts of the state. ESSB 6091 was a direct response to the 2016 *Hirst*[4] decision by the Washington Supreme Court. The law (now

[4] *Whatcom Cty. v. Hirst*, 186 Wn.2d 648, 381 P.3d 1 (2016)

primarily codified in chapter 90.94 RCW, Streamflow Restoration), clarifies how counties issue building permits for rural homes intending to use a groundwater permit-exempt well for their domestic water source.

The law allows new permit-exempt domestic wells to impact closed water bodies and water bodies with minimum instream flows. It also requires the development of watershed plan updates[5] or watershed restoration and enhancement plans[6] in 15 Water Resource Inventory Areas (WRIAs). The purpose of the plans is to:

- Estimate the consumptive use by new domestic permit-exempt wells over the next 20 years.
- Identify projects and actions that can offset impacts from the new wells and achieve a net ecological benefit for the WRIA.

Streamflow restoration projects and actions are to be prepared with implementation in mind. However, state law[7] does not predicate the issuance of building permits on the implementation of watershed plans or any projects and actions in those plans.[8]

The new law established a February 1, 2019 deadline for Ecology to adopt a locally developed and approved watershed plan update for WRIA 1 (Nooksack). Although a Watershed Management Plan Update was not locally approved by the deadline, tremendous work was accomplished during the WRIA 1 planning process. Ecology is building on that work to carry out the rulemaking now required under RCW 90.94.020.

On February 5, 2019, Ecology's Water Resources Program announced the start of rulemaking to amend *Chapter 173-501 WAC - Instream Resources Protection Program – Nooksack WRIA 1* to meet the requirements in RCW 90.94.020. RCW 90.94.020(7)(a) requires Ecology to adopt rules for WRIA 1 by August 1, 2020.

1.2 Summary of the rule amendments

The rule amendments make the following changes:

- **Setting a residential conservation standard** for withdrawals from new permit-exempt domestic wells.
    - Individual homes will be limited to 500 gallons per day (gpd) indoor domestic water use, and irrigation of one-twelfth of an acre for noncommercial lawns and gardens.
    - Subdivisions will be limited to 500 gpd per home indoor domestic water use, and irrigation of one-twelfth of an acre noncommercial lawn and garden, with a collective limit for the subdivision of 3,000 gpd indoor domestic water use and one-half of an acre noncommercial lawn and garden.

[5] See RCW 90.94.020
[6] See RCW 90.94.030
[7] RCW 90.94.020 and RCW 90.94.030
[8] Ecology Water Resources POL-2094.

- **Allowing issuance of interruptible retiming water rights.** Projects may apply for an interruptible water right to divert water from streams regulated under WAC 173-501-040 during high-flow times if they enhance streamflows during lower flow periods.

The rule amendments do not change the fees established in RCW 90.94.020.

1.3 Reasons for the rule amendments

1.3.1 Setting a residential conservation standard

The law directs Ecology to consider a conservation standard. A residential conservation standard will reduce the likelihood that development in the WRIA will adversely impact streamflows, Endangered Species Act (ESA)-listed salmonids, and fish and other aquatic habitat. Ecology must make a determination that the projects and actions proposed for the WRIA will result in offsets that exceed the impacts of the new homes, achieving a net ecological benefit in the WRIA.

The law allows new permit-exempt wells to supply water for new development,[9] which will increase new domestic permit-exempt well water use over time. By setting a conservation standard, homes reliant on a new permit-exempt wells in the WRIA will use less water than what is allowed under current law. This will reduce the:

- Total impact to streamflows.
- Number of offsets and projects needed to achieve a net ecological benefit.
- Overall costs to implement projects to offset the new consumptive use and achieve net ecological benefit in the WRIA.

The conservation standard allows Ecology to balance consumptive water use for new development with the number of projects necessary to achieve a net ecological benefit, and will not increase the fees associated with new permit-exempt wells.

1.3.2 Allowing issuance of retiming water rights

As currently established in chapter 173-501 WAC, most of the subbasins in the WRIA are fully or partially closed to new water rights.[10] In many areas of the WRIA, Ecology cannot issue new water rights, even if they are for projects that improve the timing of flows to offset domestic permit-exempt well water use (even though they may be non-consumptive) because there is a change in the timing of diversion and return flow. By allowing for the possible issuance of water rights that divert water during high-flow periods, and enhance flows during lower-flow periods, an offset of the projected new domestic permit-exempt well water use will be possible and streamflow benefits can be achieved.

[9] chapter 90.94 RCW and RCW 19.27.097

[10] Water rights in which the full volume of water is returned to the waterbody after beneficial use, such as a fish diversion which are considered "non-consumptive water rights" may be authorized. However, domestic water use requires a "consumptive" water right, which are those rights for which some use of water reduces the total water available in the system.

1.4 Document organization

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

- Baseline and the rule amendments (chapter 2): Description and comparison of the baseline (what would occur in the absence of the rule amendments) and the adopted changes to rule requirements.
- Likely costs of the rule amendments (chapter 3): Analysis of the types and sizes of costs we expect impacted entities to incur as a result of the rule amendments.
- Likely benefits of the rule amendments (chapter 4): Analysis of the types and size of benefits we expect to result from the 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 rule amendments.
- Regulatory Fairness Act Compliance (chapter 7, when applicable): Comparison of compliance costs to small and large businesses; mitigation; impact on jobs.
- RCW 34.05.328 determinations not discussed in chapter 5 or 6 (Appendix A)

Chapter 2: Baseline and the Adopted Rule Amendments

2.1 Introduction

We analyzed the impacts of the rule amendments relative to the baseline of 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 amended rule was not adopted. It is discussed in Section 2.2, below.

While we are required to analyze the amendments by comparing amended and existing rule language, allowing for other legal requirements, we also try to provide a realistic understanding of impacts in the context of real economies and human behavior and values.

2.2 Baseline

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

For this rulemaking, the baseline includes:

- Chapter 90.44 RCW, Regulation of Public Groundwaters
- Chapter 90.94 RCW, Streamflow Restoration
- The existing rule, chapter 173-501 WAC
- All other applicable federal, state, and local rules and laws.

2.3 Adopted rule amendments

The rule amendments make the following changes:

- **Setting a residential conservation standard** for withdrawals from new permit-exempt domestic wells.
    - Individual homes will be limited to 500 gallons per day (gpd) indoor domestic water use, and irrigation of one-twelfth of an acre for noncommercial lawns and gardens.
    - Subdivisions will be limited to 500 gpd per home indoor domestic water use, and irrigation of one-twelfth of an acre noncommercial lawn and garden, with a collective limit for the subdivision of 3,000 gpd indoor domestic water use and one-half of an acre noncommercial lawn and garden.
- **Allowing issuance of interruptible retiming water rights.** Projects may apply for an interruptible water right to divert water from streams regulated under WAC 173-501-040 during high-flow times if they enhance streamflows during lower flow periods.

2.3.1 Setting a residential conservation standard

Baseline

Ecology issues water rights that allow the use of a specific amount of water with a defined place of use, period of use, and purpose of use. Exemptions to this permitting are set in law. The legal baseline for residential use is a complex combination of state laws and case law:

- The Regulation of Public Groundwaters law (chapter 90.44 RCW) initially set water rights permitting exemptions for small uses of groundwater for domestic, non-commercial lawn and garden, stockwatering, and industrial uses in RCW 90.44.050. These are called "permit-exempt" uses.
- Court decisions further clarified limits associated with RCW 90.44.050.

The Streamflow Restoration statute (chapter 90.94 RCW) sets limits in some areas of the state – including WRIA 1 – for new permit-exempt domestic use and watering of non-commercial lawn and garden, using a different metric than previous definitions. However, the previous laws and court decisions continue to apply.

Regulation of Public Groundwaters law

The 1945 Regulation of Public Groundwaters law exempts certain groundwater withdrawals from permitting requirements:[11]

- Domestic – 5,000 gpd daily limit
- Lawn or Non-commercial garden – one-half acre limit (no gpd limit)
- Stockwatering – no gpd limit
- Industrial – 5,000 gpd daily limit

Court decisions

Decisions in subsequent court cases[12] have further defined the limits of permit-exempt well withdrawals. In *Department of Ecology v. Campbell & Gwinn*,[13] the Washington Supreme Court held that a development project, such as a residential subdivision, is collectively limited to the 5,000 gpd domestic limit specified in RCW 90.44.050, regardless of the actual number of associated wells used.

Streamflow Restoration statute

In 2018, the Washington legislature passed ESSB 6091 (primarily codified in chapter 90.94 RCW), which includes new limits on new domestic permit-exempt withdrawals. These new limits apply only to building permit applicants relying on a new permit-exempt well for a new home permitted after January 19, 2018.[14] As specified in the

[11] RCW 90.44.050

[12] *See Department of Ecology v. Campbell & Gwinn, LLC*, 146 Wn.2d 1, 9-10, 43 P.3d 4 (2002); *Five Corners Family Farmers v. State*, 173 Wn.2d 296, 268 P.3d 892 (2011).

[13] *Campbell & Gwinn*, 146 Wn.2d at 9-10.

[14] Note that while water rights permits are issued by Ecology, building permits are issued by local permitting authorities.

legislation, the water use restrictions adopted in RCW 90.94.020 remain in place unless and until Ecology amends the limits through rulemaking.

The 2018 law established a new type of withdrawal limit called a maximum annual average (MAA) withdrawal limit on some new domestic permit-exempt withdrawals in some areas of the state. The MAA withdrawal limit was set at 3,000 gpd for new "domestic use" in WRIA 1.[15]

Harmonizing the expressly written sections in chapter 90.94 RCW, Ecology interprets "domestic use" in the MAA withdrawal limits to include both indoor and outdoor home uses, including watering of a noncommercial lawn and garden up to one-half of an acre in size. We interpret that the larger MAA quantities for "domestic use" allowed in non-drought years includes both indoor and outdoor uses for a household, including watering of a noncommercial lawn and garden.

The 3,000 gpd MAA withdrawal limits specified in RCW 90.94.020 apply collectively to the new permit-exempt well withdrawals identified in RCW 90.44.050 for:

- Domestic use
- Watering of non-commercial lawn and garden

This means that a home with a building permit issued after January 19, 2018 cannot withdraw more than 3,000 gpd total for the two categories above, as the daily average over the entire year. The requirements of RCW 90.44.050, which includes a daily limit of 5,000 gpd for domestic purpose and the irrigation of up to one-half of an acre of non-commercial lawn or garden are also still in effect and overlay the limits set forth in RCW 90.94.020. This is the baseline for new homes in WRIA 1 permitted for construction that intend to rely on a new permit-exempt well for their domestic source of water.

The limits specified in RCW 90.94.020 mean that projects with two or more homes (subdivisions) that apply to the county for building permits after January 19, 2018, and will rely on a permit-exempt well(s) for domestic purposes, are subject to the following withdrawal limits:

- Each home is individually limited to withdrawing no more than 3,000 gpd MAA.
- Collectively, the homes cannot withdraw more than 5,000 gpd.
- Collectively, the homes cannot irrigate more than one-half of an acre lawn or non-commercial garden within the entire project area.

The withdrawal limits under chapter 90.94 RCW **do not** apply to permit-exempt well withdrawals under RCW 90.44.050 for:

- Stockwatering
- Industrial use

[15] (RCW 90.94.020(5)).

Adopted

The amendments modify the limits set forth in RCW 90.94.020 for new building permit applicants relying on a new permit-exempt well for a new home permitted after the adoption of this rule. This promotes water conservation necessary to protect instream resources and achieve a net ecological benefit in the WRIA.

The amendments establish the following limits for new building permit applicants relying on a new permit-exempt well for a new home permitted after the adoption of the rule:

- Withdrawals from a new permit-exempt domestic well(s) serving a single connection are limited to:
  - Indoor domestic water use of 500 gpd.
  - Outdoor domestic water use watering one-twelfth of an acre.
- Withdrawals from a new permit-exempt domestic well(s) serving a small group domestic system are limited to:
  - Indoor domestic water use of 500 gpd per connection, and a total use of 3,000 gpd for the entire project or small water system.
  - Outdoor domestic water use for irrigating one-twelfth of an acre for each connection, and irrigating a total of one-half of an acre for the entire group.
- Upon the issuance of a drought emergency order under RCW 43.83B.405, withdrawals from new permit-exempt domestic wells may be curtailed except for indoor domestic water use and withdrawals to maintain up to one-twelfth of an acre for non-commercial subsistence gardening purposes.

Note that this rulemaking does not require metering and reporting of water use or changes to any metering laws. Metering requirements may be required under existing laws and rules (e.g., RCW 90.44.050 and 90.44.250, and the provisions in chapter 173-173 WAC).

The amendments include the following definitions:

- "New permit-exempt domestic wells" are wells for groundwater withdrawals exempt from permitting under RCW 90.44.050 for the purposes of indoor domestic water use and outdoor domestic water use.
- "Indoor domestic water use" means potable water to satisfy the domestic needs of a household, including water used for drinking, bathing, sanitary purposes, cooking, laundering, and other incidental uses.
- "Outdoor domestic water use" means water used for non-commercial lawns and gardens.
- "Subsistence gardening" means food cultivation for personal use by residents of the home.

Expected impact

These amendments are likely to result in costs and benefits, as residential properties that are developed in the future will be limited in the amount of water they can use for indoor and outdoor domestic water use.

Table 1: Comparison of domestic withdrawal limits from new permit-exempt wells

Connection type	Baseline	Adopted Amendments
Single connections / individual homes	3,000 gpd MAA total for: • Domestic use • Watering of non-commercial lawn and garden	• Indoor domestic water use of 500 gpd • Outdoor domestic water use watering one-twelfth of an acre.
Multiple connections / subdivisions	• Each home is individually limited to withdrawing no more than 3,000 gpd MAA • Collectively, the homes cannot withdraw more than 5,000 gpd • Collectively, the homes cannot irrigate more than one-half of an acre lawn or non-commercial garden within the entire project area.	• Indoor domestic water use of 500 gpd per connection. • Total use of 3,000 gpd for the entire project or small water system. • Outdoor domestic water use for irrigating one-twelfth of an acre for each connection, and irrigating a total of one-half of an acre for the entire group.

Likely costs include potential for reduced value of some residential properties.
Likely benefits include:

- Reduced risk of future curtailment of domestic water use under RCW 43.83B.405[16]
- Reduced number of projects and actions need to offset estimated use and achieve a net ecological benefit in the WRIA

This amendment balances the amount of consumptive water use offset needed with costs of projects to provide for offsets and achieve a net ecological benefit. Outside lawn and garden watering use accounts for roughly 95 percent of all consumptive water uses associated with new home, and the conservation standard reduces this use. A significant reduction in costs to implement offset projects is a result of the conservation standard, allowing residential connection fees to remain at the $500 level established in RCW 90.94.020.

2.3.2 Allowing issuance of retiming water rights

Baseline

Many of the stream management units in WRIA 1 have partial or year-round closures listed in WAC 173-501-040(1), making water unavailable for projects that retime high flows to restore and enhance streamflows, and provide offsets per RCW 90.94.020.

[16] Note that in the event of a drought, new permit-exempt domestic wells may be curtailed, but would still be allowed indoor domestic water use and withdrawals to maintain up to 1/12 of an acre of non-commercial subsistence garden. Curtailment is not required, and this increased flexibility also reduces the risk of curtailment.

Table 2: Partial and year-round closures in WRIA 1

Source Name	Tributary To	Status Under Regulation	Period of Closure
Anderson Creek	Nooksack River	Partial year closure	May 1-Oct. 31
Bells Creek	North Fork Nooksack	Closure	Year round
Bertrand Creek	Nooksack River	Closure	Year round
Black Slough	Nooksack - South Fork	Low flow	-
California Creek	Drayton Harbor	Closure	Year round
Canyon Creek	North Fork Nooksack	Partial year closure	July 1-Oct. 31
Canyon (Lake) Creek	Middle Fork Nooksack	Partial year closure	July 1-Oct. 31
Chuckanut Creek	Chuckanut Bay	Closure	Year round
Colony Creek (incl. Whitehall)	Samish Bay	Closure	Year round
Cornell Creek	North Fork Nooksack	Partial year closure	July 1-Oct. 31
Dakota Creek	Drayton Harbor	Closure	Year round
Deer Creek	Barrett Lake (Tenmile)	Closure	Year round
Fishtrap Creek (incl. Double Ditch)	Nooksack River	Closure	Year round
Fourmile Creek	Tenmile Creek	Closure	Year round
Gallop Creek	North Fork Nooksack	Partial year closure	July 1-Oct. 31
Hutchinson Creek	South Fork Nooksack	Partial year closure	July 1-Oct. 31
Johnson Creek	Sumas River	Closure	Year round
Kamm Ditch/Stickney Slough	Nooksack River	Closure	Year round
Kendall Creek	North Fork Nooksack	Closure	Year round
Maple Creek	North Fork Nooksack	Closure	July 1-Oct. 31
Nooksack River - mainstem	Bellingham Bay	Minimum flow (new flow)	-
Nooksack River - Middle Fk.	Nooksack River	Minimum flow (new flow)	-
Nooksack River - North Fk.	Nooksack River	Partial year closure	Sept. 1-Oct. 31
Nooksack River - South Fk.	Nooksack River	Partial year closure	July 1-Oct. 31
Oyster Creek	Samish Bay	Closure	Year round
Padden Creek	Bellingham Bay	Closure	Year round
Porter Creek	Middle Fork Nooksack	Partial year closure	July 1-Oct. 1
Racehorse Creek	North Fork Nooksack	Partial year closure	July 1-Oct. 31
Saar Creek	Vedder Canal-Canada	Closure	Year round
Saxon Creek	South Fork Nooksack	Closure	Year round
Silver Creek	Nooksack River	Partial year closure	May 1-Oct. 31
Skookum Creek	South Fork Nooksack	Partial year closure	July 1-Oct. 31
Smith Creek	Nooksack River	Partial year closure	May 1-Oct. 31
Squalicum Creek	Bellingham Bay	Closure	Year round
Sumas River	Vedder Canal-Canada	Closure	Year round
Tenmile Creek	Nooksack River	Closure	Year round

Source Name	Tributary To	Status Under Regulation	Period of Closure
Terrell Creek	Birch Bay	Partial year closure	May 1-Oct. 31
Thompson Creek	Glacier Cr./N. Fk.	Partial year closure	July 1-Oct. 31
Unnamed Stream - Elder Ditch/Scott Ditch	Nooksack River	low flow	-
Unnamed stream - White Creek	Colony Creek	Closure	-
Whatcom Creek*	Bellingham Bay	Closure	Year round
Wiser Lake Creek	Nooksack River	Partial year closure	May 1-Oct. 31
Lummi Indian Reservation Streams	-	Closure	-
Barrett Lake	Tenmile Creek	Closure	-
Green Lake	Fourmile Creek	Closure	-
Lake Terrell	Terrell Creek	Closure	-
Lake Whatcom	Whatcom Creek	Closure	Year round
Wiser Lake	Wiser Lake Creek	Closure	-

Adopted

The rule amendments add an exemption to WAC 173-501-070 allowing Ecology to consider projects that divert water from streams in closed basins during periods when instream flows are met under WAC 173-501-030. These projects would need to enhance streamflows during lower-flow periods or provide consumptive impact offsets to instream flows to meet requirements under chapter 90.94 RCW.

Ecology recognizes that high flows provide important biological and physical benefits such as fish migration and channel maintenance flows. Determining how much water is available during high flow periods to provide low flow offsets will be analyzed and considered during the associated water right permitting process for proposed projects.

Expected impact

Under this exemption, a new, interruptible water right could be approved during the closure period, subject to an established instream flow or Surface Water Source Limitation (SWSL) and conditions necessary to protect high-flow functions, provided the proposed water use would enhance streamflows and protect instream resources. Ecology anticipates that future projects, such as managed aquifer recharge (MAR) storage projects located on closed tributaries, could be eligible for water right permits using this exemption.

This amendment is likely to contribute to benefits of reduced impacts of development on streamflows and aquatic habitat. By allowing Ecology to find projects and offsets that achieve net ecological benefits, the amendments help to put more water in streams during critical times for fish and aquatic resources. We note that net ecological benefits will be achieved at the WRIA scale, offsets do not need to be matched with specific development, and development is not contingent on offsets.

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Chapter 3: Likely Costs of the Rule Amendments

3.1 Introduction

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

3.2 Cost analysis

The rule amendments make the following changes:

- **Setting a residential conservation standard** for withdrawals from new permit-exempt domestic wells.
    - Individual homes will be limited to 500 gallons per day (gpd) indoor domestic water use, and irrigation of one-twelfth of an acre for noncommercial lawns and gardens.
    - Subdivisions will be limited to 500 gpd per home indoor domestic water use, and irrigation of one-twelfth of an acre noncommercial lawn and garden, with a collective limit for the subdivision of 3,000 gpd indoor domestic water use and one-half of an acre noncommercial lawn and garden.
- **Allowing issuance of interruptible retiming water rights.** Projects may apply for an interruptible water right to divert water from streams regulated under WAC 173-501-040 during high-flow times if they enhance streamflows during lower flow periods.

3.2.1 Setting a residential conservation standard

Setting a residential conservation standard for new residential development drawing water from new permit-exempt wells will potentially reduce the future benefits (from selling or using a property) that some property owners, developers, or buyers expect from currently undeveloped parcels of land. This could potentially manifest as lower willingness to pay for some properties. Since the amendment to chapter 173-501 WAC, including the residential conservation standard, only affects new connections to new wells, property owners considering new domestic development on their property may consider alternatives to a new well, including:

- Connecting to an existing well onsite
- Connecting to an existing well offsite (e.g. a neighbor's well)
- Connecting to a water system or water district
- Rainwater collection

3.2.1.1 Future residential development using new permit-exempt wells

To estimate the amount of future residential development using new permit-exempt wells, we looked to existing analyses performed by RH2 Engineering (RH2)[17] for the WRIA 1 watershed planning group.[18]

RH2's technical memo lays out the results of their analysis of the number of new domestic permit-exempt wells expected, between 2018 and 2038, within the nine aggregated subbasins in WRIA 1. They used population forecasts from Whatcom County's 2018 Comprehensive Plan to develop rural population estimates by aggregated subbasin. These forecasts estimate a population increase of 8,163 people outside of the established Urban Growth Areas (UGAs) in Whatcom County.

RH2 then divided BERK Consulting (BERK)-developed population data by an assumed 2.56 average number of people per single-family home to estimate the number of expected housing units.[19] They adjusted these numbers per subbasin to account for the likely number of homes that will be constructed outside of UGAs, but can still hook up to water purveyors with capacity and infrastructure to serve additional customers.

RH2 used BERK's data and considered several alternative scenarios to make adjustments to derive the number of new connections to new domestic permit-exempt wells per aggregated subbasin. Significant considerations were given to these derivations, and an agreed to planning estimate of 2,150 connections to new permit-exempt wells, between 2018 and 2038, was established. The planning group's calculation for development of the planning estimate is consistent with Ecology's guidance.

The WRIA 1 planning process selected the "Option 4, Scenario 4" estimate from the RH2 analysis as the most likely development path. Ecology approved this estimate, and we use it as the estimated development path under both the baseline and the amendments. It is the most likely number of new homes using new permit-exempt wells between 2018 and 2038.

[17] RH2 Engineering is a consulting firm that provided technical support to the WRIA 1 planning group.
[18] RH2's analyses are memorialized in a technical memo submitted to the Department of Ecology on August 21, 2018 (*Potential Consumptive Use Impacts of Domestic Groundwater Permit-Exempt Wells Over the Next 20 Years in WRIA 1 – Final Updated*).
[19] Whatcom County Comprehensive Plan Update Environmental Impact Statement, 2015.

Table 3: 20-year development forecast, most likely scenario

Aggregated Subbasin	Number of New Homes Connected to New Permit-Exempt Wells
1. Coastal North	594
2. Coastal South	241
3. Coastal West	290
4. Lake Whatcom	145
5. Lower Nooksack	561
6. Middle Fork Nooksack	9
7. North Fork Nooksack	126
8. South Fork Nooksack	22
9. Sumas	162
Total	**2,150**

3.2.1.2 Reduction in property value

Future developments that will be affected include households that would, under the baseline:

- Use more than 500 gpd indoors.
- Water more than one-twelfth of an acre of non-commercial lawn and garden.
- Not have access to an alternative water source, (e.g., a well constructed before January 19, 2018, a proximate water system or district, rainwater collection, or water right).

Ecology assumes[20] a per-person consumptive water use of 60 gpd (2.56 people using 60 gpd each, would use 154 gpd). To use 500 gpd indoors, a household would need to have a significantly above average number of people, or use significantly more water per person on average. A household would need to have at least nine people using the full rate of 60 gpd/person, to exceed the adopted limit. This is more than 3.5 times the average household size in Whatcom County and does not take economies of scale (lower water use) frequently found with larger households. Similarly, a household with 2.56 people would need to use more than 195 gpd per person indoors to exceed the adopted indoor domestic conservation standard.

An average American household uses 138 gpd, and the types of use are distributed per the table below.[21]

[20] Washington State Department of Ecology. *ESSB 6091 – Streamflow Restoration Recommendations for Water Use Estimates*. Publication 18-11-007. April 2018. Available at https://fortress.wa.gov/ecy/publications/SummaryPages/1811007.html

[21] https://www.watercalculator.org/water-use/indoor-water-use-at-home/#targetText=When%20most%20people%20in%20the,gallons%20per%20person%20per%20day.

Table 4: Average US indoor domestic water use, by fixture

Appliance/Device	Household Water Use per Day	Percent of Total
Toilet	33 gallons	24%
Shower	28 gallons	20%
Faucet	26 gallons	19%
Washing Machine	23 gallons	17%
Leaks	17 gallons	12%
Bath	4 gallons	3%
Dishwasher	2 gallons	1%
Other	5 gallons	4%
Total	**138 gallons**	**100%**

Since the adopted indoor water use quantity does not appear to be a significant limiting factor, we assumed the most significant impact to be the perceived limit to a future use of a property – and therefore to the value of a property at development or sale – will come from the conservation standard for watering a non-commercial lawn and garden. The conservation standard includes a reduction in outside lawn and garden watering since that use accounts for roughly 95 percent of all consumptive water uses associated with new home.

Current Whatcom County code allows up to six homes per permit-exemption as a part of a "project".[22] This means that the baseline includes a collective outdoor irrigation limit of no more than one-half acre of non-commercial lawn and garden, which would therefore limit each of these six homes to an average irrigated lawn size of one-twelfth of an acre. Thus, there is no change to the amount these homes can use to irrigate their non-commercial lawn and garden, other than the amendment equally divides the one-half acre between all of the homes. This amendment maintains the baseline for six home developments, provides clarity in the rule, and reduces uncertainty among homeowners.

The effect on potential property value loss continues to be muted for subdivisions with two to five new homes, as the reduction in per-house outdoor irrigation is spread among multiple homes with the same overall cap of one half of an acre (see Table 4). The subdivision per house reduction in outdoor irrigation potential ranges from 0.17 to 0.02 irrigated acres of non-commercial lawn and garden, for two home to five home subdivisions respectively, presuming equal irrigation areas among each home. We expect the property value impacts to be reduced as the change in outdoor irrigation acreage falls.

[22] *See Department of Ecology v. Campbell & Gwinn, LLC*, 146 Wn.2d 1, 9-10, 43 P.3d 4 (2002)

Table 5: Comparison of outdoor domestic acreage reductions
Calculations assume subdivisions divide outdoor irrigation equally among homes.

Number of homes using one permit-exempt well	Baseline Domestic outdoor irrigation under RCW 90.44.050 (acres)	Adopted outdoor domestic irrigation under rulemaking (acres)	Adopted reduction in domestic outdoor irrigation (acres)
1	0.50	0.083	0.42
2	0.25	0.083	0.17
3	0.17	0.083	0.08
4	0.13	0.083	0.04
5	0.10	0.083	0.02
6	0.083	0.083	0.00

In 2013, Ecology rulemaking resulted in restrictions of outdoor domestic water use in the Dungeness Basin. Based on the hydrology in different areas, new homes in some parts of the basin connecting to a permit-exempt well were required to purchase water from a water bank to mitigate indoor and outdoor use. In other parts of the basin, new homes connecting to a permit-exempt well were required to purchase mitigation water from a water bank, but only indoor water use was available.

Economists at Washington State University (WSU) are currently analyzing data to estimate the value of outdoor watering, based on the impacts of the regulatory change in the Dungeness Basin. The results will reflect the value of being able to irrigate non-commercial lawn and garden, compared to not being allowed to irrigate them at all. It compares property sales values in the subbasin across areas with different watering restrictions, before and after the restrictions went into effect.[23] This is by far the most similar situation to the amendments that has been analyzed.

WSU's preliminary unpublished results have indicated the potential for a measurable impact on property values where no outdoor irrigation is authorized versus property values for properties which have access to limited outdoor irrigation. These preliminary research results indicate that being able to use water for outdoor irrigation increases property values by 20 percent as compared to properties with no legal supply of water for outdoor irrigation. However, this is only a point estimate, and the 95-percent confidence interval is very large, encompassing negative values, zero and very large impacts.[24] The conclusion from WSU research at this point is that there is a not a statistically significant change in property value (it is not statistically differentiable from zero). The non-significant result is likely due, in part, to the limited data set available, and the many factors that influence property values. Thus, it remains unclear what, if any, property value reduction will result from the amendments.

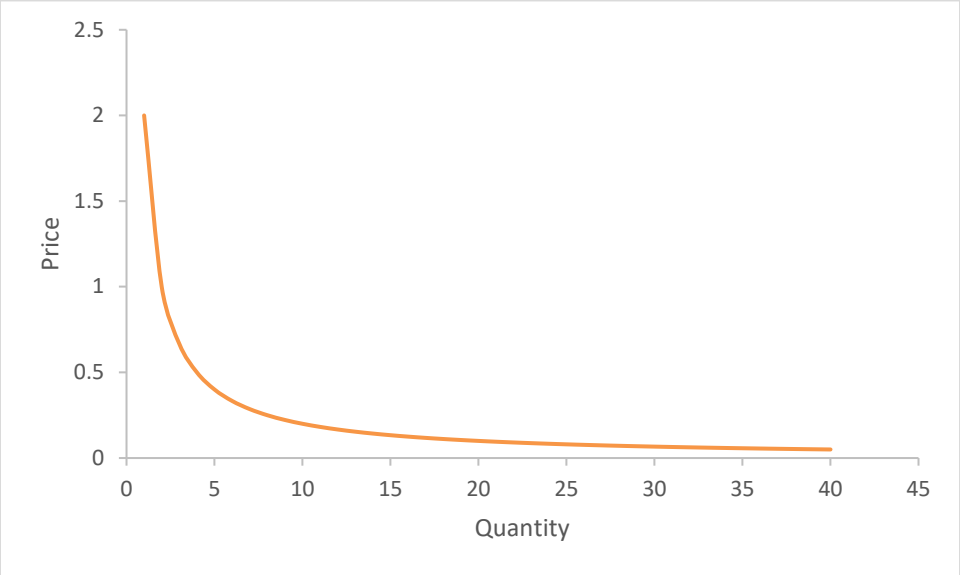
Additionally, while the WSU analysis analyzes a similar situation, any estimated impacts are an overestimate for the impacts of the adopted amendments.

[23] Communication with Michael Brady, WSU. 10/22/19.
[24] The 95-percent confidence interval describes the range of values that could be the true impact 95 percent of the time.

- In the Dungeness Basin mitigation packages are for either 50 sq. feet (about one one-thousandth of an acre) or 75 sq. feet (nearly two one-thousandths of an acre) of outdoor irrigation depending on the mitigation package selected.[25] The WSU analysis compares this with homes that are not allowed any outdoor irrigation.
- Under the amendments for WRIA 1, the reduction in outdoor irrigation area will depend on the number of homes developed using one permit-exempt well, but range only from zero acres (where six homes are developed, baseline and conservation standard are both 0.083 acres) to a maximum of 0.42 acres (one home developed, baseline is 0.5 acres, conservation standard in 0.083 acres). Homes will always be able to irrigate up to one-twelfth (0.083) of an acre.

The expected willingness to pay for the first fractions of an acre of irrigated noncommercial lawn and garden (i.e., for being able to go from zero irrigation to some irrigation; better reflected by the WSU analysis) are likely to be higher than for additional lawn and garden. While data are not available to construct a demand curve (the quantitative relationship between quantity and wiliness to pay) for irrigated noncommercial lawn and garden, demand curves are downward-sloping and generally convex.[26] Figure 1 shows an example of an example demand curve shape. This means people have a higher willingness to pay to go from no irrigation to some irrigation, than they do to go from some irrigation to more irrigation, and that wiliness to pay falls significantly after the initial units of acreage are authorized.[27]

Figure 1: Example demand curve shape
Demand curves show price (willingness to pay) as a function of quantity. They are typically downward-sloping and convex.



[25] http://www.washingtonwatertrust.org/dungeness-water-exchange-faqs
[26] See, e.g., Paul Samuelson and William Nordhaus, 2009. Economics. ISBN 978-0073511290.
[27] We also note that the Whatcom County's Assessor's Office did not modify (or reduce) any property values based on the passage of RCW 90.94.020, which established the baseline limit on domestic use. This means assessed values for residential properties do not reflect the current half-acre irrigation limitation, and are not usable as a baseline for this analysis.

Further, not all homes will be affected the same. Homes developed as part of a subdivision will see even less change in value since they will experience less (or no) reduction in outdoor irrigation area (as seen in Table 4). Data for projections of one to six-home projects in WRIA 1 for 2018-2038 were not found, so calculating the amount of reduction to allowable irrigation cannot be estimated.

Also, not all households will ultimately seek to water the entire allowable lawn or non-commercial garden area, under the baseline or under the amendments. The RH2 aerial analysis helps inform the portion of affected properties that would not water at all, which they estimate to be 34 percent.[28]

To summarize, while economic theory indicates that there could be some property value loss as a result of the amendments, we cannot identify a non-zero impact because:

- The difference between the no-watering situation in the Dungeness basin (analyzed by WSU) and the limited outdoor watering in WRIA 1 (the amendments), indicates an estimate of the impact in the Dungeness is an overestimate for the impact of the amendments.
- The WSU preliminary estimate in change in value is highly uncertain, and is not statistically different from zero.
- The 34 percent of homes that would choose not to water outside at all, regardless of the limit in the rule.
- The unknown number of homes that will be developed as single homes and see the maximum change in outdoor irrigation area, compared to projects or subdivisions with multiple homes that would see a reduced change per home.

New homes in WRIA 1 can still have larger lawns exceeding the one-twelfth of an acre limit, but they will be limited to irrigating only a portion of the lawn. This is feasible in northwest Washington, as lawns generally survive without irrigation during the summer when there is reduced precipitation.[29] Landowners also have the ability to mitigate any real or perceived impacts by using cisterns, alternative groundcovers, and water-conserving gardening techniques (see section 3.2.1.4).

3.2.1.3 Context within RCW 90.94.020: offset requirement

RCW 90.94.020 requires a water offset for the estimated consumptive quantity of groundwater withdrawals from new connections to new domestic permit-exempt wells in the WRIA from 2018-2038 and that a net ecological benefit be achieved in the watershed. See section 4.2 for discussion of this benefit of the adopted amendments, related to development and permit-exempt water use.

3.2.1.4 Behaviors that mitigate property value impacts (replacement cost)

[28] RH2 Engineering, 2018.

[29] Options to irrigate a larger area include connecting to another existing well (offsite), collecting rainwater, connecting to water system or utility district, using a water right.

Property owners can mitigate potential impacts to property values from the new limits to domestic permit-exempt water use under the amendments in a variety of ways:

- Use an existing water right.
- Connect to an existing well that predates the amendment.
- Install a cistern to collect rainwater for watering lawns and non-commercial gardens.
- Reduce irrigated acreage (in most areas of WRIA 1, lawns do not require active irrigation to survive).
- Bring in water from another legal source (water system, utility district, truck water in from a wholesale seller).[30]
- Avoided irrigation costs.

The costs of using the alternative water sources above are estimates of the replacement cost of the value of watering five-twelfths or 0.42 of an acre (the difference between one-twelfth of an acre and one-half acre) more lawn or non-commercial garden, the maximum acreage change realized under the amendment.

Using an existing water right
Properties with existing water rights for domestic water use and/or irrigation will not be subject to the rule amendment affecting domestic water use

Connect to an existing well
An existing well will not be subject to the rule amendments affecting domestic water use standards (and not to RCW 90.94.020 if the well pre-dates the law). If costs to connect to an existing well are less than potential perceived losses of not being able to water the five-twelfths or 0.42 of an acre difference between the baseline and amended rule, then it would fully offset the costs of the amended rule on that property.

Installing a cistern
Homeowners are permitted to collect rainwater captured on their homes (and other structures, such as barns, sheds, garages, etc.) and put it to beneficial use under Ecology Water Resources policy.[31] Rainwater collected may be stored and used for irrigation during dry months. The amount of stored water necessary to maintain the quantity needed during the irrigation season is specific to:

- Each property's soils.
- Hydrogeology.
- Weather.
- The type of plants irrigated.

[30] Bringing in water from other sources is likely to be more costly than alternatives discussed here, as it would not only include the cost of the water, but also costs of transport and building/installation of storage such as a cistern.
[31] Washington State Department of Ecology POL 1017 – Water Resources Program Policy Regarding Collection of Rainwater for Beneficial Use.

- The type of irrigation equipment used.
- The frequency and amounts of rain events during irrigation season.

Although we are unable to estimate some of these variables at this time, we can provide examples of storage systems costs. A typical system includes the following:

- Cistern
    - These typically range in size from between 100 and 20,000 gallons[32] and cost between $200 and $21,000 respectively (not including shipping or installation).[33]
    - Cisterns may be placed above or below ground, depending on local rules. Costs for foundations or excavation would be additional.
- Accessories
    - Depending on the size, location, and specific set-up of a system, it may require additional accessories including valves, filters, or water pumps. The majority of these accessories cost less than $100, however a large gas-powered water pump may cost over $1,000. We note, however, that pumping would also be required as part of a well installation. While this may not be a one-to-one comparison, and would vary by property, we did not include pumping and connection costs in the overall cost estimate.

Using available data from rural Snohomish County Public Utility Districts (PUD) customers as an analogue, we estimated summer outdoor water use for new homes in WRIA 1 with irrigated areas less than one-half of an acre, at less than 7,080 gallons per season (84 gpd).[34,35] Under the adopted changes, households wishing to irrigate up to one-half of an acre would need to irrigate five-twelfths or 0.42 of an acre using captured and stored rainwater. Ecology anticipates the cost of purchasing cisterns to be around $4,000 for two above ground 5,000 gallon cisterns. This estimate does not include installation or accessory costs.

In our economic analyses, Ecology uses present value calculations to convert future impacts that occur at different times into single comparable values in current dollars. Present value account not only for inflation, but for the opportunity cost of having money or value in the future versus having it now. They are most useful if future impacts manifest over different time scales, but we also note that impacts of the amendments that are based on future home development can be compared on an impact-per-home basis.

To calculate the present value of potential cistern purchases used to offset perceived property value impacts, if we assume 2,150 homes develop at an even rate over 20 years, and 34 percent

[32] Collection devices of this size are most frequently used in houses collecting rainwater for potable (indoor) water purposes.
[33] Barrel and cistern prices observed at the National Tank Outlet website, http://www.ntotank.com/
[34] Snohomish County PUD. 2019. Documentation for the Watershed Restoration and Enhancement Committee. https://www.ezview.wa.gov/Portals/_1962/images/WREC/WRIA07/201906/WRIA07-SnoPUDWaterUseDataForSnohomishWREC.pdf
[35] The summer season is defined as June through August, or 92 days. These figures are an average of water use data collected in 2015 and 2017

of homeowners chose not to water,[36] an average of about 71 homes per year would choose to install cisterns. If each of these homes paid $4,000, the 20-year present value would be about $5.1 million.[37]

However, this overestimates the costs, as it presumes all of the 2,150 new homes would have developed as single homes and would see the maximum change of one-twelfth or 0.42 of an acre for outdoor irrigation, which is unlikely as described above.

Reducing irrigated acreage

New homes could reduce the irrigation requirements of their lawn to overcome potential reductions in actual or perceived property values by planting lawn types that remain green with no additional irrigation (beyond naturally occurring precipitation events). Some of these options can provide green lawns throughout the year. Examples include:[38, 39]

- Buffalograss (Bouteloua dactyloides):
  - Warm-season grass.
  - Thrives during the hottest parts of the year.
  - Remains green with little irrigation (only requires one-quarter inch to one-half inch a week).
  - Slow-growing
- Blue Grama (Bouteloua gracilis):
  - Warm-season grass.
  - Prefers more sandy soils.
  - Doesn't require any irrigation once established. (Looks best with one-quarter inch to one-half inch per week.)
- Sheep Fescue (Festuca ovina):
  - Cool-season grass.
  - Only needs ten inches of rain annually.
  - Gets green more quickly in spring and later into fall.
- White Clover (Trifolium repens):
  - Requires less water than grasses.
  - Tolerates poorer soils.
  - Needs no fertilizer.
  - Naturally low-growing.
  - Blooms are forage for pollinators.

[36] RH2 Engineering, 2018.
[37] Present values are discounted using a historic real, risk-free rate of return, 1998 – 2019, of one percent. US Treasury Department, 2019.
[38] Alternative groundcovers should be checked against invasive and noxious weed lists for the region, including the statewide list (https://www.nwcb.wa.gov/pdfs/2019-State-Weed-List_Common_Name-8.5x11.pdf) and Whatcom County list (http://www.whatcomcounty.us/DocumentCenter/View/39112/CountyList19). None of the suggested alternatives is considered harmful for the area.
[39] https://www.naturesseed.com/

    - Unaffected by dog urine.
- Yarrow (Achillea millefolium; common yarrow is native to the Pacific Northwest):
    - Perennial herb
    - Thick mat of lacy foliage even when mowed
    - Drought tolerant.
    - Needs no fertilizer.
- Xeriscaping – landscaping using plants and groundcovers that do not need irrigation.

For non-commercial gardens, homeowners could alter their gardening layout or practices to reduce the amount of garden space they irrigate:

- Plant succession plantings and employ crop rotation based on harvest timing.
- Grow year-round using row covers and greenhouse/indoor starting, as well as plants that survive lower temperatures during the wet season, such as brassicas (kale, collards, cabbage, and broccoli).
- Grow high-yield plants with a smaller footprint.
- Employ moisture preservation techniques, such as mulching, weed prevention, and tilling.
- Plant crops that are tolerant to heat and low water, such as nightshades (tomatoes, peppers, eggplant, and potatoes) and sweet potatoes.

There is also evidence that dry gardening is possible in the western Pacific Northwest. Master Gardeners at the Oregon State University Extension Service have recently tested zero-irrigation methods of growing small vegetable gardens.[40] The gardeners had success with deeply-planted, mulched, and initially fertilized tomatoes, peppers, zucchini, and winter squash. The gardens used deep soil with good water-holding characteristics. Investing in deep raised beds with water-holding, mulched soil for some or all of their garden space is also an investment property owners could take to offset the value lost to not being able to water a larger garden.

Avoided irrigation costs
Irrigating less non-commercial lawn and garden will save landowners associated costs, including:

- Electricity for pumping water from well
- Irrigation equipment and maintenance
- Lawn/crop seed and fertilizer

3.2.2 Allowing issuance of retiming water rights

We do not expect the amendment that allows the issuance of water rights to retime high flows to result in costs. This is because the amendments do not require anyone to pursue a retiming water right. We would issue these types of water rights using existing processes under existing rules

[40] https://www.oregonlive.com/hg/2019/06/trial-gardens-show-vegetables-can-be-grown-without-irrigation.html

and policies, and any associated application and timing costs would not be a result of this rulemaking.

Chapter 4: Likely Benefits of the Rule Amendments

4.1 Introduction

We estimated the likely benefits associated with the rule amendments, as compared to the baseline (both described in Chapter 2 of this document).

4.2 Benefit analysis

The rule amendments make the following changes:

- **Setting a residential conservation standard** for withdrawals from new permit-exempt domestic wells.
    - Individual homes will be limited to 500 gallons per day (gpd) indoor domestic water use, and irrigation of one-twelfth of an acre for noncommercial lawns and gardens.
    - Subdivisions will be limited to 500 gpd per home indoor domestic water use, and irrigation of one-twelfth of an acre noncommercial lawn and garden, with a collective limit for the subdivision of 3,000 gpd indoor domestic water use and one-half of an acre noncommercial lawn and garden.
- **Allowing issuance of interruptible retiming water rights.** Projects may apply for an interruptible water right to divert water from streams regulated under WAC 173-501-040 during high-flow times if they enhance streamflows during lower flow periods.

4.2.1 Setting a residential conservation standard

By setting a conservation standard, the amendments meet the requirements of the law, and reduce the number of projects needed to offset the new consumptive uses and achieve net ecological benefit. Based on Option 4, Scenario 4 of the RH2 analysis, which was agreed to by the WRIA 1 planning group, and used in the rulemaking amendment Rule Supporting Document (RSD), to provide the best planning estimate, the baseline domestic consumptive water use would be 648 afy used by 2,150 homes over 20 years.[41] Under the conservation standard in the amendments, this amount falls to 390 afy.[42]

Higher consumptive use of water by future development could potentially deplete streamflows and result in environmental losses of habitat and fish, and other aquatic species. To avoid that outcome there would be a need for an increased number of projects to offset the higher consumptive water use, to achieve net ecological benefit. Increased projects would require additional funding.

Since the law requires us to achieve a net ecological benefit and meet offsets, the conservation standards balance the needs for:

[41] RH2 Engineering, 2018.
[42] Ecology, 2019.

- New residential water use.
- The number of projects required to achieve offsets and net ecological benefit.
- The cost of implementation including the fees paid for new permit-exempt wells.

The conservation standards in the adopted rule do not include a change in fees established in RCW 90.94.020, which is a significant benefit to future users.

4.2.2 Allowing issuance of retiming water rights

By allowing Ecology to issue interruptible water rights in currently closed or partially closed subbasins, the amendments will increase instream water availability during lower-flow months.[43] During rule development, Ecology identified projects that are most likely to move forward if water rights become available. This list of projects includes projects that can only proceed with this rule amendment, such as #8 and #28. Other projects would be more likely to occur under the amendments, because they would receive priority in funding and approval. In total, the projects provide for an estimated 3,767 afy of offsets in WRIA 1.

Table 5: Projects used in rule development to provide offset and net ecological benefit

WRIA 1 Project ID No.	Name	Total Offset (afy)
1	Dairy Waste Processing/Treatment	13.4
2	Bertrand Augmentation	170.7
8	MAR - North Fork site	200
19	Skookum Creek Restoration	1,449
19NG	Wetland Restoration, Enhancement/Creation	2
21	Stewart Mountain/SF Nooksack Conservation	7,240
23	Middle Fork Porter Creek Phase 4 Project	11.2
24	Birch Bay/Blaine Deep Wells	880
26	Lower Nooksack SW to GW Conversion Projects	158
28	Storage Projects including Gravel Pits	365
44	PUD No. 1: Vista Road Project	194
45	PUD No. 1: Lake Terrell/ Coastal Drainages	324
46NG modified	WRIA 1 Conservation Program	Unknown
	Total	**3,767**

[43] Note that water retiming projects would withdraw water only during high-flow months when minimum instream flows or SWSLs were met. Approval of a water right would first be required. We do not expect this to result in net ecological losses, and the rule amendments are designed overall to have a positive net ecological benefit. For discussion, see the associated Rule Supporting Document for this rulemaking.

4.2.3 Benefits of the combined amendments

To reflect the impact of the amendments, we compared the amount of offset water to the amount of projected water use. Taking the amendments as a whole, Ecology estimated consumptive permit-exempt domestic water use of 390 afy.[44] We based this estimate on an adjusted version of the RH2 analysis, assuming the same amount of permit-exempt domestic development across subbasins as "Option 4, Scenario 4" of the RH2 analysis. Assumptions included:

- 2,150 new homes on permit-exempt wells, uniformly distributed over 20 years.
- Limiting outdoor domestic water use to one-twelfth of an acre.
- An average of 2.56 people per household.
- 60 Sixty gpd of consumptive water use per person.

This calculation resulted in a total consumptive water use of 260 afy. Ecology then adjusted this estimate to address uncertainty associated with the assumptions, by adding an additional 50 percent to the consumptive use estimate. This resulted in a total permit-exempt consumptive domestic water use of 390 afy.

Using the WRIA 1 planning processes estimates (see section 4.2.2), the identified projects provide an estimated offset of 3,377 afy on top of offsetting new domestic use from new permit-exempt wells. This increased factor provides for uncertainty in realized offsets, project implementation, funding availability, and other factors that may impact project success, such that net ecological benefit can be achieved.

Cost savings to new exempt well users

The adopted conservation measures strike a balance between future domestic water use, the need for projects to deliver consumptive water uses offsets and achieve net ecological benefit, and the costs of necessary projects. As consumptive water use increases, so do the required projects and costs. Three funded WRIA 1 projects provide insight into the cost of water. The projects estimate the cost at $17,274 to $67,463 per afy of offset water (see Table 6).[45] These are likely the easier projects to implement ("the low hanging fruit") and future projects would likely be more challenging to implement and therefore increase the price per afy of offset.

[44] WA Department of Ecology, 2019.

[45] Costs include full project cost (which includes other funding sources such as previous grants or other contributions), but does not include O&M costs.

Table 6: Costs per Acre-Foot of water for three funded projects in WRIA 1
Costs include full costs to implement project (including previous grants or other contributions), but does not include operating and maintenance costs. Cost per home for extended outdoor irrigation would be to fund projects for additional consumptive use offsets to irrigate five-twelfths of an acre, or the difference between the one-twelfth acre conservation standard and one-half acre baseline. [46]

Project	Cost	AFY offset (total)	Cost per Acre Foot	Cost per home extended outdoor irrigation
Lummi Porter Creek	$193,471	11.2	$17,274	$9,674
California Creek Augmentation	$3,411,675	194.0	$17,586	$9,848
Dairy Waste	$904,000.00	13.4	$67,463	$37,779

The adopted rule seeks a middle ground by not increasing fees, and instead limiting outdoor domestic water use.

If the conservation measures were not in place, offsetting the baseline one-half of an acre of noncommercial lawn and garden for a single home would cost an additional ~$9,674 to $37,779 per property to fund projects for the additional offsets from the conservation standard.

In our economic analyses, Ecology uses present value calculations to convert future impacts that occur at different times into single comparable values in current dollars. Present value account not only for inflation, but for the opportunity cost of having money or value in the future versus having it now. They are most useful if future impacts manifest over different time scales, but we also note that impacts of the amendments that are based on future home development can be compared on an impact-per-home basis.

If the additional offset projects were needed for all 2,150 new homes projected over 20 years (developed at a uniform rate) then the present value of this cost would be $18.8 million to $73.3 million for the increase in outdoor irrigation from one-twelfth of an acre to one-half of an acre. These increased costs would be borne by Washington State taxpayers through increased grant funding or be borne by the landowner through increased per connection fees, or a combination of both.

By adopting these conservation measures, new permit-exempt well users will save a significant cost to taxpayers or significant out-of-pocket costs, while retaining some outdoor domestic water use.

Streamflow and habitat impacts
Low flows, especially during summer months, degrade critical habitat for culturally important and ESA-listed salmonids including:

[46] Project costs were based on likely projects identified by WRIA 1 Streamflow Restoration Planning work. As project approval and implementation is part of the implementation of the rule, there is inherent uncertainty in which projects will be developed, approved, and implemented. Projects with higher initial or long-run costs would result in higher costs per acre-foot of water, as would be the case toward the higher end of the range we present.

- Chinook salmon.
- Steelhead.
- Bull trout.

Currently, less than 15 percent of salmonid stocks identified in WRIA 1 are considered healthy.[47] The impacts of decreased flow, including increased temperature and reduced habitat connectivity and volume, are likely to become more frequent and extreme with climate change.

Increased flow during critical periods is likely to enhance habitat and natural ecosystem functions, leading to better spawning habitat and increased survival for returning adults and out-migrating juvenile salmon.[48] WRIA 1 is home to fall and spring Chinook salmon runs. Although spring run Chinook enter freshwater as early as March, they remain in deep, cool pools in the river until they begin spawn during August and September. River flow is vital to maintain the cool temperatures needed by spring run Chinook.[49]

Additional streamflow downstream could also benefit other aquatic species, downstream estuarine habitat for juvenile fish, as well as shellfisheries.

The purpose of the amendments is to achieve net ecological benefit on the WRIA level. This will come in the form of offsetting potential impacts to streamflows and adding additional water during low-flow periods. Additional water resulting in improved habitat will support improved populations of salmonids and other aquatic life, but this impact was not quantifiable due to uncertainty and variability in development and offsets. As such, we have provided illustrative information about fish populations and the values people can hold for them, as well as streamflows themselves, below.

Status of salmonids in WRIA 1
Five species (two chinook, three steelhead) in WRIA 1 are listed as threatened under the ESA.[50]

Table 7: Threatened populations of salmonids in WRIA 1

Population Name	Species
North Fork Nooksack Chinook (including Middle Fork Nooksack River)	Chinook
South Fork Nooksack Chinook	Chinook
Drayton Harbor Tributaries Winter Steelhead	Steelhead
Nooksack Winter Steelhead	Steelhead
South Fork Nooksack Summer Steelhead	Steelhead

[47] Lummi Indian Business Council, 2016. Lummi Nation Atlas. https://www.lummi-nsn.gov/userfiles/592_2018LummiAtlas.pdf
[48] WRIA 1 Watershed Management Board, 2005. WRIA 1 Salmonid Recovery Plan. http://salmonwria1.org/webfm_send/23
[49] Nooksack Salmon Enhancement Association, 2019. Chinook Salmon. https://www.n-sea.org/chinook-salmon
[50] https://fortress.wa.gov/dfw/score/score/maps/map_details.jsp?geocode=wria&geoarea=WRIA01_Nooksack

Under the ESA, a species must be listed if it is threatened or endangered because of any of the following.

- Present or threatened destruction, modification, or curtailment of its habitat or range.
- Over-use of the species for commercial, recreational, scientific, or educational purposes.
- Disease or predation.
- Inadequacy of existing regulatory mechanisms.
- Other natural or manmade factors affecting its continued existence.[51]

An "endangered species" is one that is in danger of extinction throughout all or a significant portion of its range. A "threatened species" is one that is likely to become endangered in the foreseeable future throughout all or a significant portion of its range.[52]

The WRIA is also home to salmonid species for which ESA protection is not a factor, but may be a species of concern:

Table 8: Non ESA-listed salmonid species in WRIA 1

Population Name	Species
Nooksack Fall Chum	Chum
Samish/Independents Fall Chum	Chum
Nooksack Coho	Coho
North Puget Sound Tribs Coho	Coho
Samish Coho	Coho
Nooksack Coastal Cutthroat	Cutthroat
North Puget Sound Tribs Coastal Cutthroat	Cutthroat
Sumas Coastal Cutthroat	Cutthroat
Whatcom Creek Coastal Cutthroat	Cutthroat
Nooksack Pink	Pink

Values for salmonids

Salmonids (like other animals) may hold multiple types of value simultaneously. These can include:

- Use values, such as commercial and recreational fisheries.

[51] https://www.fisheries.noaa.gov/national/endangered-species-conservation/listing-species-under-endangered-species-act#targetText=A%20species%20is%20added%20to%20this%20list%20when%20we%20determine,%2C%20from%20threatened%20to%20endangered).

[52] https://www.fws.gov/endangered/esa-library/pdf/listing.pdf

- Non-use values, such as:
    - Habitat contribution (as prey, predator, or for nutrient transfer)
    - Existence value (the species existing in and of itself)
    - Bequest value (the ability of future generations to have a species)
    - Cultural value, including the significant values held by tribes. Tribal values can include:
        - Use values, such as ceremonial value, subsistence value, and maintenance of traditional lifeways.
        - Non-use values, such as spiritual value, existence value, and bequest value.

Many of these values are difficult to quantify, particularly non-use values that are not reflected in expenditures such as spending on travel or recreational fishing.

Because Ecology was not able to confidently quantify numbers of fish that could benefit from improved habitat created by the amendments, we instead focus on threatened salmonid values, and illustrative values as a whole. We do know from a 2012 survey of households that people are willing to pay an average of $40.49 per household per year for ten years for the recovery of Puget Sound Chinook salmon from threatened species status. For the 2.8 million households in Washington, this translates to an annual willingness to pay of $112 million, or over $1 billion in present value.[53,54]

In terms of habitat contribution, salmonids contribute to nutrient transfer up river as part of their lifecycle. They are also an important source of nutrition for marine mammals. Puget Sound's endangered Southern Resident Killer Whale (orca) population consumes primarily salmon (whereas other, transient populations eat marine mammals such as sea lions). They show a distinct preference for Chinook as the main part of their diet. As an illustrative non-use or interactive value, the value of the overall whale watching industry in Washington is at least $65 million annually.[55] There is no current estimate of the existence values of this orca population. We note that, Chinook salmon come from various river sources in addition to WRIA 1, and travel long distances in inland waters and the ocean. The Southern Resident Killer Whales travel throughout Puget Sound, the Salish Sea, Strait of Juan de Fuca, and Pacific Coast, and contributions to Chinook populations can benefit them throughout their journey.

The health of salmonids is paramount to tribal culture and treaty rights. Continued habitat restoration is necessary to preserve the cultural, ceremonial, commercial, and subsistence harvest of salmonids and shellfish for tribes in Washington.[56] Increased flow during lower-flow months will benefit salmon as well as tribes that rely on healthy water and fish populations. By providing

[53] Wallmo, K and DK Lew, 2016.
[54] Based on aggregate statewide willingness to pay of $112 million for the first ten years, followed by zero payments in the subsequent ten years. The current historic average discount rate is one percent. US Treasury Department, 2019. Series I Savings Bonds Rates & Terms. https://www.treasurydirect.gov/indiv/research/indepth/ibonds/res_ibonds_iratesandterms.htm Historic rates 1998 to present.
[55] Southern Resident Killer Whale Chinook Salmon Initiative, 2015. Economic Value. https://srkwcsi.org/the-economic-value-of-southern-resident-killer-whales/
[56] Northwest Indian Fisheries Commission, 2016.

additional WRIA 1 habitat, the amendments will help support healthy salmon stocks and provide a collective benefit to tribes reliant on these fish.

Other aquatic species
Salmonids are not the only species likely to benefit from increased streamflows under the adopted amendments. Animals such as non-salmonid fish, insects, amphibians, and crustaceans would benefit from less-depleted streamflows and habitat during low-flow months as well. Similarly, related species that live near the water, or prey on these animals, would also benefit. These could include birds and aquatic or shoreline mammals, as well as the salmonids discussed above.

Recreational and aesthetic values
The adopted amendments, by reducing the amount of new domestic water use from new permit-exempt wells, and providing for offset projects, could also increase the usability of streams for recreational and aesthetic purposes during low-flow months. It is uncertain to what degree increased streamflows make river or stream segments better for boating, fishing, swimming, or aesthetic appreciation from shoreline properties or activities such as shoreline recreation and hiking. There is, however, potential for streamflows to be improved from a mostly dry streambed to active, thriving streams. Where there is significant depletion forecast over the next 20 years, there is potential for improvement in terms of all of these values.

Chapter 5: Cost-Benefit Comparison and Conclusions

5.1 Summary of the costs and benefits of the rule amendments

Costs

We were not able to identify non-zero costs of the adopted amendments. While economic theory indicates that there could be some property value loss as a result of the amendments' restriction on withdrawals for domestic outdoor watering, we cannot identify a non-zero impact because:

- The difference between the no-watering situation in the Dungeness basin (most-comparable available data and regulatory situation) and the limited outdoor watering in WRIA 1 (the amendments), indicates an estimate of the impact in the Dungeness is an overestimate for the impact of the adopted amendments.
- For the Dungeness, the preliminary estimate in change in value is highly uncertain, and is not statistically different from zero.
- The 34 percent of homes that would choose not to water outside at all, regardless of the limit in the rule.
- The unknown number of homes that will be developed as single homes and see the maximum change in outdoor irrigation area, compared to projects or subdivisions with multiple homes that will see a reduced change per home.

New homes in WRIA 1 can still have larger lawns exceeding the one-twelfth of an acre limit, but they will be limited to irrigating only a portion of the lawn. This is feasible in northwest Washington, as lawns generally survive without irrigation during the summer when there is reduced precipitation.[57] Landowners also have the ability to mitigate any real or perceived impacts by using cisterns, alternative groundcovers, and water-conserving gardening techniques

We expect property owners to reduce or eliminate any perceived property value impacts by voluntarily:

- Using cisterns ($4,000 per property) when more than one-twelfth of an acre needs irrigation. Assuming 66 percent of new homes using permit-exempt wells choose to water outdoors, and 2,150 homes are built at a uniform rate, the equivalent 20-year present value of this potential expenditure is $5.1 million.
- Replacing some grass with alternative drought-tolerant ground covers.
- Xeriscaping (i.e., using gardening techniques that reduce or eliminate the irrigated footprint.

[57] Options to irrigate a larger area include connecting to another existing well (offsite), collecting rainwater, connecting to water system or utility district, using a water right.

Benefits

The rule amendments will benefit the environment and streamflows, and result in a collective cost savings for Washington State taxpayers.

- Streamflow benefits: New consumptive water uses will be offset over a 20-year period, resulting in 3,767 afy of water returned to streams, which will be especially beneficial during critical low flow periods. 3,377 afy of this water will be in excess of the offset target, which provides reasonable assurance that these offsets will be met and exceeded to provide a net benefit to the watershed.
- Environmental and habitat benefits: Investments in terrestrial and aquatic habitat restoration and enhancement projects will benefit threatened populations of Chinook and Steelhead. These project investments protect and increase total values for salmon, such as use values (e.g., commercial and recreational fisheries), non-use values, such as ecosystem service contributions and existence values, and cultural values, including use and non-use values held by tribes. Projects identified as part of this rule supporting documentation will receive some amount of grant funding prioritization, thereby providing reasonable assurance that these benefits will be realized.

  While ecosystem services-related benefits are difficult to quantify, the rule amendments will result in both non-quantifiable and quantifiable benefits to streamflows and the environment. As an illustration, a 2016 survey indicates a statewide willingness to pay of $112 million per year over ten years, for the recovery of Puget Sound Salmon. The equivalent 20-year present value for salmon recovery is over $1 billion.[58]
- Collective cost avoidance: Washington State taxpayers bear the costs of the Streamflow Restoration grant program established to help fund projects and actions identified to meet the required offset of 20 years of new consumptive use and provide a net ecological benefit at the watershed scale. The offset target is calculated based on the number of projected new wells and the corresponding consumptive use, which is directly correlated to the extent of outdoor water use. The greater the area allowed for outdoor irrigation, the greater the consumptive quantity and therefore the higher the offset target. Without a residential conservation standard, additional projects would be needed and these costs would be borne by Washington State taxpayers rather than individual WRIA 1 property owners.

  Based on WRIA 1 projects, the cost per home would be $9,674 to $37.779 to fund additional offset projects to irrigate five-twelfths of an acre, the difference between the one-twelfth acre conservation standard and one-half acre baseline. The present value of the cost of additional projects needed for all 2,150 new homes projected over 20 years would be $18.8 million to $73.3 million.[59]

5.2 Conclusion

[58] Based on aggregate statewide willingness to pay of $112 million for the first ten years, followed by zero payments in the subsequent ten years.
[59] Assumes homes are built at a uniform rate over 20 years.

Ecology concludes, based on reasonable understanding of the quantified and qualitative costs and benefits likely to arise from the rule amendments, that the benefits of the rule amendments are greater than the costs.

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Chapter 6: Least-Burdensome Alternative Analysis

6.1 Introduction

RCW 34.05.328(1)(e) 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, Ecology is 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).

Ecology assessed alternative rule content, and determined whether they met the goals and objectives of the authorizing statutes. Of those that would meet these goals and objectives, Ecology determined whether those chosen for the amended rule were the least burdensome to those required to comply with them.

6.2 Goals and objectives of the authorizing statute: Chapter 90.94 RCW

The authorizing statute (chapter 90.94 RCW, Streamflow Restoration) sets out goals and objectives for watershed plans, and requires Ecology to adopt rules meeting those requirements if a watershed plan is not adopted. The goals and objectives include:

- Offsetting 20 years of new consumptive domestic permit-exempt well withdrawals and achieving a net ecological benefit for the WRIA.

- Implementing a program to restore and enhance streamflows by fulfilling obligations to develop and implement plans to restore streamflows to levels necessary to support robust, healthy, and sustainable salmon populations.

- Updating the watershed plan to include recommendations for projects and actions that will measure, protect, and enhance instream resources and improve watershed functions that support the recovery of threatened and endangered salmonids.

- Working with governments and planning units to review existing watershed plans to identify:
    - Potential impacts of exempt well use.
    - Evidence-based conservation measures.
    - Projects to improve watershed health.

- Requiring qualifying projects to be specifically designed to enhance streamflows and not result in negative impacts to ecological functions or critical habitat.

- Requiring the watershed plan to include actions necessary to offset potential impacts to instream flows associated with permit-exempt domestic water use.

- Authorizing potential impacts on a closed water body and potential impairment to an instream flow for new domestic groundwater withdrawals exempt from permitting under RCW 90.44.050 through compliance with the requirements established in statute.

6.3 Alternatives considered and why they were not included

During development of the adopted amendments, Ecology considered alternative rule content, including:

- Setting water use limits higher for new domestic permit-exempt wells.
- Setting water use limits lower for new domestic permit-exempt wells.
- Making the limits during a drought mandatory
- Using water efficiency in place of offsets

6.3.1 Setting water use limits higher for new domestic permit-exempt wells

While developing the amendments, we considered setting water use limits higher for new domestic permit-exempt wells. This alternative would not have met the goals and objectives of the authorizing statute. Higher limits could mean more impacts to fish, and would require more projects (and therefore funding) in the watershed to try to offset those impacts.

A goal of the authorizing statute is to offset 20 years of new consumptive domestic permit-exempt well withdrawals and to achieve a net ecological benefit for the WRIA. The law includes direction to Ecology to consider a conservation standard since the new use must be offset and a net ecological benefit must be achieved. The limits are in line with other water use standards in the state, in nearby WRIAs, and consistent with other Puget Sound watershed conservation

standards required under RCW 90.94.030 during droughts. No compelling information was provided by stakeholders that the limits were burdensome, only that they would prefer higher limits. By lowering the withdrawal limits we are taking an action, along with the encouraging the projects put forward by local proponents to offset the new well use and achieve net ecological benefit NEB. Lowering the water use limits gives us more reasonable assurance of meeting these requirements and keeping costs for projects at a lower rate.

Note that one option for setting higher use limits for new domestic permit-exempt wells would be to not complete rulemaking, and default to the existing requirements in the statute (RCW 90.94.020). As this would not be alternative language for the rule amendments, and instead an alternative to rulemaking, we discuss it in Appendix A.

6.3.2 Setting water use limits lower for new domestic permit-exempt wells

While developing the adopted amendments, we considered setting water use limits lower for new domestic permit-exempt wells. This alternative would have imposed more burden on users of new domestic permit-exempt wells. Lower limits could mean fewer people build homes in rural areas. They could also limit large families to insufficient domestic indoor water use, resulting in public health concerns.

The goal of the rulemaking is to meet the requirements in RCW 90.94.020 to offset 20 years of new consumptive domestic permit-exempt well withdrawals and achieve a Net Ecological Benefit for the WRIA. Lowering the water use limits further would be mean fewer projects are needed in the WRIA to offset the new use and achieve net ecological benefit. However, lower limits would be more burdensome to the new domestic permit-exempt well users. Setting withdrawal limits involves balancing the needs of regional growth, with protection of the watershed and fish habitat. See discussion above in section 6.3.1 about why the limits were set at the levels adopted.

6.3.3 Making the limits during a drought mandatory

While developing the adopted amendments, we considered making the water use limits during a drought mandatory. This alternative would not have universally met the goals and objectives of the authorizing statute, as droughts are likely to vary.

The adopted amendments include a domestic permit-exempt water use limit that Ecology *may* use during a drought. It would limit wells covered by the rule to only indoor use (at the conservation standard) and outdoor watering only for subsistence gardening. Ecology may use this limit, but did not feel it should be a mandatory limit since each drought will likely be different and it would be better for Ecology to have flexibility in managing water resources in those cases.

6.3.4 Using water efficiency in place of offsets

Public comments suggested use of water efficiency measures in place of water offset projects. This alternative would not have met the goals and objectives of the authorizing statute related to permanent availability of water. For instance, Ecology heard from the agricultural community both during the planning process and rulemaking that they did not want any conserved irrigation water to go towards offsets of domestic permit-exempt wells; they wanted it to remain for irrigation purposes. Offset projects offer greater certainty in meeting the goal of permanence.

6.4 Conclusion

After considering alternatives to the amended rule's contents, as well as the goals and objectives of the authorizing statute, Ecology determined that the adopted rule represents the least-burdensome alternative of possible rule contents meeting these goals and objectives.

Chapter 7: Regulatory Fairness Act Compliance

The Regulatory Fairness Act (RFA; RCW 19.85.070) requires Ecology to perform a set of analyses and make certain determinations regarding the rule amendments, if the amendments impose more than minor costs in order for businesses to comply with the rule.

While we identified potential costs of reduced property values as a result of the amendments, we did not identify any costs that covered residential permit-exempt water users or project proponents will incur in order to comply with the rule. In past rulemakings related to water resources, for example, compliance costs included the costs of metering and reporting.

The adopted amendments only add the conservation standard and project allowance, but do not require any monitoring, reporting, or other additional compliance behavior. We are therefore not required to perform analyses under the RFA, per RCW 19.85.030.

References

Lummi Indian Business Council, 2016. Lummi Nation Atlas. https://www.lummi-nsn.gov/userfiles/592_2018LummiAtlas.pdf

Nooksack Salmon Enhancement Association, 2019. Chinook Salmon. https://www.n-sea.org/chinook-salmon

Personal communication with Michael Brady, 10/22/19. Conference call regarding "Quantifying the Economic Loss from Outdoor Residential Water Use Restrictions" preliminary results.

RH2 Engineering, 2018. Potential Consumptive Use Impacts of Domestic Groundwater Permit-Exempt Wells Over the Next 20 Years in WRIA 1 – Final Updated. Technical memo submitted to the Department of Ecology on August 21, 2018.

Snohomish County PUD, 2019. Documentation for the Watershed Restoration and Enhancement Committee. https://www.ezview.wa.gov/Portals/_1962/images/WREC/WRIA07/201906/WRIA07-SnoPUDWaterUseDataForSnohomishWREC.pdf

Southern Resident Killer Whale Chinook Salmon Initiative (2015). Economic Value. https://srkwcsi.org/the-economic-value-of-southern-resident-killer-whales/

US Bureau of Labor Statistics, 2019. Consumer Price Index for all urban consumers. https://www.bls.gov/cpi/

US Treasury Department, 2019. Series I Savings Bonds Rates and Terms. 1998 to present. https://www.treasurydirect.gov/indiv/research/indepth/ibonds/res_ibonds_iratesandterms.htm

Wallmo, K and DK Lew, 2016. A comparison of regional and national values for recovering threatened and endangered marine species in the United States. Journal of Environmental Management 179 (2016) 38 – 46.

Washington State Department of Ecology, 2018. Ecology grant WRPFIFA-1719-LuInBC-00013. Middle Fork Porter Alluvial Fan. 9/1/18 – 3/1/21.

Washington State Department of Ecology, 2019. Rule Supporting Document for Amendment to Chapter 173-501 WAC, Instream Resources Protection Program – Nooksack Water Resource Inventory Area (WRIA) 1.

Washington State Department of Ecology, 2019a. Ecology Water Resources POL-2094.

Washington State Department of Ecology, 2019b. Final Guidance for Determining Net Ecological Benefit GUID 2094; Publication 19-11-079; July 2019

Washington State Department of Ecology, 2019c. Ecology grant WRSRP-2019-WCPUD1-00019. California Creek Domestic Well Offset & Streamflow Restoration Project. 1/1/19 – 12/31/21.

Whatcom County, 2015. Whatcom County Comprehensive Plan Update Environmental Impact Statement, 2015.

WRIA 1 Watershed Management Board, 2005. WRIA 1 Salmonid Recovery Plan. http://salmonwria1.org/webfm_send/23

Appendix A
Administrative Procedure Act (RCW 34.05.328)

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.

This rule amendment is required by RCW 90.94.020(7)(a) because a watershed plan update that meets the requirements of RCW 90.94.020 was not locally approved and adopted for Water Resource Inventory (WRIA) 1 (Nooksack) by February 1, 2019. The consequence of not adopting this rule amendment is that Ecology would not be complying with chapter 90.94 RCW.

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 and record for rulemaking.

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.

This rule amendment provides direction that ensures compliance with RCW 90.94.020 in WRIA 1. Complying with the rule amendment allows new homes using permit-exempt wells for domestic purposes to apply for building permits from local jurisdictions in a manner that

will not violate federal or state law, or case law. Prior to the passage of chapter 90.94 RCW there was case law that halted local jurisdictions' ability to issue building permits for new homes using permit-exempt wells for domestic water use where the well water was in continuity with surface waters not meeting minimum instream flows. This court ruling essentially halted new construction of homes using permit-exempt wells in WRIA 1. The rule amendment also allows Ecology to consider projects in areas previous closed to new water rights under the existing rule to retime high water flows to benefit streams. The rule amendment follows the direction in chapter 90.94 RCW.

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.

The rule amendment establishes a conservation standard for connections to new domestic permit-exempt wells, as directed by RCW 90.94.020. The law and rule amendment does not address wells operated by public entities or existing users (public or private). The rule amendment exemption to allow retiming of high water flows applies to any entity that chooses to purse a water right under the exemption.

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. This rule amendment does not differ from federal regulation or statute. Ecology is responsible under state laws and regulations for managing the water resources of the state, including issuing the right to use water, as well as protecting the instream resources for the benefit of the public.

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 considered how to integrate this rule amendment into the existing rule, and how the rule amendment would be implemented within regulatory processes.