



Final Regulatory Analyses:

Including the:

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

Chapter 173-340 WAC

Model Toxics Control Act Cleanup Regulations

By

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For the

Toxics Cleanup Program

Washington State Department of Ecology

Olympia, Washington

August 2023, Publication 23-09-075

Publication Information

This document is available on the Department of Ecology's website at:
<https://apps.ecology.wa.gov/publications/SummaryPages/2309075.html>

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Act Cleanup Regulations

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Washington State Department of Ecology

Olympia, WA

August 2023 | Publication 23-09-075



DEPARTMENT OF
ECOLOGY
State of Washington

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Abbreviations

AML	Acute Myeloid Leukemia
APA	Administrative Procedure Act
CBA	Cost-Benefit Analysis
CLARC	Cleanup Levels and Risk Calculation
CLL	Chronic Lymphocytic Leukemia
cPAH	Carcinogenic Polycyclic Aromatic Hydrocarbon
DCA	Disproportionate Cost Analysis
DOH	Washington State Department of Health
EHD	Environmental Health Disparities
EPA	US Environmental Protection Agency
FAQ	Frequently Asked Questions
HEAL Act	Health Environment for All Act
LBA	Least-Burdensome Alternative Analysis
LUST	Leaking Underground Storage Tank
MTCA	Model Toxics Control Act
PCB	Polychlorinated biphenyl
PFAS	Per- and polyfluoroalkyl substances
PLIA	Washington State Pollution Liability Insurance Agency
RCW	Revised Code of Washington
REMI	Regional Economic Models, Inc.
RFA	Regulatory Fairness Act
SCUM	Sediment Cleanup User's Manual
SEPA	State Environmental Policy Act
SHARP	Site Hazard and Ranking Process
SMS	Sediment Management Standards
STAG	Stakeholder and Tribal Advisory Group
TCE	Trichloroethylene
TEE	Terrestrial Ecological Evaluations
TPH	Total Petroleum Hydrocarbons
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WAC	Washington Administrative Code
WARM	Washington Ranking Method

Executive Summary

This report presents the determinations made by the Washington State Department of Ecology as required under Chapters 34.05 RCW and 19.85 RCW, for the adopted amendments to the Model Toxics Control Act Cleanup Regulations rule (Chapter 173-340 WAC; MTCA; 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. Chapter 6 of this document describes that determination.

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

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

Background

Ecology implements the Hazardous Waste Cleanup – Model Toxics Control Act statute (Chapter 70A.305 RCW) through the Model Toxics Control Act Cleanup Regulations rule (Chapter 173-340 WAC). The Model Toxics Control Act (MTCA) is Washington’s environmental cleanup law. MTCA funds and directs the investigation, cleanup, and prevention of sites contaminated by hazardous substances. It works to protect people’s health and the environment, and to preserve natural resources for the future.

The adopted rule amendments address the following major themes, as well as amending internal procedures (procedures internal to Ecology), and clarifying, correcting, and restructuring the rule, with no material impact.

- **Strengthen environmental justice principles when prioritizing and cleaning up contaminated sites.**

The rule amendments strengthen environmental justice principles at both the program level and the site level:

- At the program level, they strengthen our commitments by requiring Ecology to prioritize the cleanup of contaminated sites that may impact vulnerable populations or overburdened communities, and to periodically assess progress. However, Ecology retains the flexibility to establish goals, plans, and performance metrics outside of the rule. We expect to reduce environmental and health disparities in Washington state through these commitments.
- At the site level, the amendments emphasize accountability and transparency when making cleanup decisions. Rather than establishing new environmental justice criteria and evaluations that would be difficult to implement, the amendments emphasize the need to consider the impact of contaminated sites and their cleanup on vulnerable populations and overburdened communities under existing cleanup requirements. The amendments also require documentation to improve accountability and transparency. By adhering to these requirements, we expect that cleanup actions will result in equitable outcomes for vulnerable populations and overburdened communities impacted by a site.
- **Improve the site hazard assessment and ranking process.**

The rule amendments improve Ecology’s process for assessing and ranking the hazard posed by contaminated sites. Ecology uses the rankings to compare and prioritize the threats to human health and the environment posed by contaminated sites. The amendments replace the outdated Washington Ranking Method (WARM) specified in the existing rule (without change since 1992) with a requirement that Ecology establish, implement, and maintain a new process outside the rule. This process will still be subject to performance standards and public comment opportunities in the rule. By maintaining the process outside of the rule, Ecology will be able to review and update it more frequently.
- **Require comprehensive program plans and performance assessments.**

The rule amendments require Ecology to develop comprehensive program plans for cleaning up contaminated sites in Washington state. In particular, the amendments commit Ecology to develop and maintain a comprehensive and integrated strategic plan for cleaning up contaminated sites, and to periodically assess its performance. However, the amendments do not specify the content of such plans or how frequently they will be updated, or performance assessed. The requirements are intended to provide a level agency accountability and transparency, but also provide the agency sufficient flexibility to adjust plans as needed.
- **Improve initial response to releases from regulated underground storage tanks.**

The rule amendments help accelerate the investigation and cleanup of releases from UST systems regulated under Chapter 173-360A WAC. The changes are intended to streamline, clarify, and update the rule and improve integration between the rules.

These cleanup rules are needed to maintain Washington state's federally approved UST program.

- **Update and clarify remedial investigation and remedy selection requirements.**
The rule amendments update and clarify the process for investigating and cleaning up contaminated sites based on the experience of practitioners over the past 20 years. For example, they introduce stepwise procedures for remedial investigations and feasibility studies, clarify reporting requirements, revise and clarify how public concerns and tribal rights and interests are considered and documented, and incorporate policies related to climate change resilience, environmental justice, and cultural resource protection. However, the amendments do not provide detailed guidance. Ecology plans to update or develop additional guidance to provide more specific instruction as needed.
- **Clarify which requirements apply to independent remedial actions.**
The rule amendments clarify the applicability of substantive requirements to independent remedial actions (e.g., conducting a Feasibility Study) and identify the differences in administrative requirements between independent remedial actions and Ecology-conducted and Ecology-supervised remedial actions (e.g., reporting Feasibility Study results and whether subject to public comment).

In addition, the amendments add investigation reporting requirements to provide Ecology information about site hazards and eliminate public opportunity to comment on post-cleanup actions to be consistent with existing rules for cleanup actions. They also replace the required method for providing the public with notice of independent remedial actions.

- **Strengthen public participation and tribal engagement requirements for Ecology-conducted or supervised cleanups.**
The rule amendments update public notification methods to reflect changes in technology and practice over 20 years, and to enable Ecology to provide more information sooner to the public in a way that is more efficient. The amendments also update and clarify some of the public participation requirements for Ecology-conducted and Ecology-supervised remedial actions.

The rule amendments also establish requirements for tribal engagement for Ecology-conducted and Ecology-supervised remedial actions that are separate and independent from public participation requirements. However, the amendments do not prescribe how Ecology must engage Indian tribes during the cleanup process. Ecology plans to develop programmatic policies and templates based on guidance developed under the HEAL Act.²

² See Chapter 70A.02 RCW, Environmental Justice.

Adopted rule amendments

The rule amendments include changes that impact only internal Ecology operations (exempt from this analysis under RCW 34.05.328(5)(b)(ii)), or do not materially impact rule requirements:

- Amending internal procedures (procedures internal to Ecology). Including, but not limited to:
 - Initial investigations.
 - Site hazard assessment and ranking.
 - Site listing.
 - Program planning and performance assessment.
 - Public notification and participation.
- Clarifying, correcting, and restructuring the rule, with no material impact.

The rule amendments include the following changes that potentially impact external parties (not just Ecology):

- Adding new definitions to support new requirements.
- Expanding release reporting exemptions.
- Updating release reporting timelines.
- Emphasizing consideration of vulnerable populations, overburdened communities, and Tribes, including documentation requirements.
- Adding documentation of appropriate management of waste generated during investigation to the Remedial Investigation Report.
- Emphasizing consideration of climate change impacts.
- Establishing a stepwise procedure for the Disproportionate Cost Analysis (DCA), and clarifying how public concerns and tribal interests are considered in the DCA.
- Adding documentation requirements in the Feasibility Study report.
- Updating UST site characterization requirements.
- Updating UST free product removal deadline and reporting.
- Modifying demonstrations and documentation of groundwater and vapor intrusion threats in UST interim actions.
- Requiring periodic updates for UST reporting.
- Expanding cultural resource protection requirements.
- Adding a requirement to report separate independent investigations of a site.
- Aligning the rule with current guidance and practice.

Costs

We identified the following likely costs resulting from the rule amendments. See Chapter 3 for details.

- Updating release reporting timelines for all sites and UST free product removal deadlines:
 - At sites that complete a remedial action within 90 days of release, the release will need to be reported separately within 90 days of the release, rather than later once the remedial action has been completed. We could not confidently assess how frequently this would occur at future sites, or the degree to which report timing would differ. We note, however, these would not be significant additional costs, as compared to the baseline, but rather opportunity costs of expenditures at different times. The table below illustrates the opportunity costs associated with spending a dollar at various times.
 - We expect these rule amendments to result in costs associated with earlier removal of free product,³ at UST sites that currently take longer than 30 days. We could not confidently assess how frequently it takes sites longer than 30 days to begin removal of free product, or how much longer they take. We note, however, these would not be additional costs, as compared to the baseline, but rather opportunity costs of expenditures at different times. The table below illustrates the opportunity costs associated with spending a dollar at various times.

Table 1. Relative real cost of a dollar spent at different times.

Delay (years)	Present Value	Difference
0	\$1.00	\$0.00
1	\$0.99	\$0.01
2	\$0.98	\$0.02
3	\$0.97	\$0.03
4	\$0.96	\$0.04

- Emphasizing consideration of vulnerable populations, overburdened communities, and Tribes, including documentation requirements:⁴
 - Annual costs: \$0.3 million – \$1.4 million.
 - 20-year present value costs: \$5.7 million – \$26.6 million.

³ Ecology estimates that there are approximately five such sites each year.

⁴ This includes documentation in Feasibility Studies, summary in cleanup action plans, and equitable participation in Public Participation Plans.

- Adding documentation requirements in the Feasibility Study report:⁵
 - Annual costs: \$42,000 – \$84,000.
 - 20-year present value costs: \$0.8 million – \$1.5 million.
- Amending UST free product removal monitoring and reporting requirements:
 - Annual costs: \$56,000 – \$306,000.
 - 20-year present value costs: \$1.0 million – \$5.6 million.
- Modifying demonstrations and documentation of groundwater and vapor intrusion threats in UST interim actions:
 - Annual costs: \$0.2 million – \$0.6 million.
 - 20-year present value costs: \$4.2 million – \$10.6 million.
- Requiring periodic updates for UST reporting:
 - Annual costs: \$1.2 million – \$6.0 million.
 - 20-year present value costs: \$22.3 million – \$111.3 million.
- Expanding cultural resource protection requirements:
 - Annual costs: \$0.1 million – \$0.3 million.
 - 20-year present value costs: \$2.1 million - \$4.7 million.
- Adding a requirement to report separate independent investigations of a site:
 - Annual costs: \$57,000 – \$113,000.
 - 20-year present value costs: \$1.0 million – \$2.1 million.

We estimated total quantifiable annual costs of \$2.0 million – \$8.8 million, and corresponding 20-year present value costs of \$37.1 million – \$162.4 million. We note that the likelihood of costs is not distributed uniformly across this range:

- The majority of sites are relatively simple (e.g., involving a single known contaminant, at a known location or contained within a single property, without likely impacts to groundwater, surface water, or sediments), and will therefore fall at the lower end of the estimated range of compliance costs.
- Under the baseline a large part of these requirements is likely to already be met despite lack of explicit wording in the rule, as part of protection of public health and the environment, site management, and assessment of remedial actions.

We therefore expect true costs to fall toward the low end of this range: **\$2.0 million in annual costs and \$37.1 million over 20 years** (in present value).

⁵ This includes documentation of nonconformance with expectations and summary of Remedial Investigation results.

Benefits

We identified the following likely benefits resulting from the rule amendments. See Chapter 4 for details.

- Expanding reporting exemptions:
 - Annual benefits: \$19,000 – \$37,000.
 - 20-year present value benefits: \$0.3 million – \$0.7 million.
- Updating release reporting timelines for all sites:
 - Comprehensive and timely knowledge of releases, regardless of whether remedial action has been taken, and support uniformity of site assessment and ranking under the newly adopted process.
- Emphasizing consideration of vulnerable populations, overburdened communities, and Tribes, including documentation requirements:⁶
 - Assurance that consideration of vulnerable populations, overburdened communities, and Tribes is being consistently and successfully applied in MTCA compliance and site cleanup. Consideration of these groups could result in improved understanding of the impacts of contamination and cleanup. Improved understanding could, in turn, result in earlier or different cleanup of sites affecting these communities.
 - The table below provides examples of the present value of each dollar’s worth of benefits occurring earlier.

Table 2. Increases in present value due to earlier versus later occurrence of benefits.

Delay (years)	Present Value	Difference
0	\$1.00	\$0.00
1	\$0.99	\$0.01
2	\$0.98	\$0.02
3	\$0.97	\$0.03
4	\$0.96	\$0.04
5	\$0.95	\$0.05

⁶ This includes documentation in Feasibility Studies, summary in cleanup action plans, and equitable participation in Public Participation Plans.

- Comparing the quantifiable total annual costs of these rule amendments, estimated in Chapter 3 as between \$0.3 million and \$1.4 million, the table below summarizes the populations annually avoiding a drop in life expectancy due to earlier site cleanup near vulnerable populations, overburdened communities, or Tribal interests, that would balance estimated costs of these rule amendments. (Recall that since most sites are relatively simple, and because many of the activities underlying quantitative costs are likely already performed under the baseline to some degree, true total costs are likely to be closer to the low \$0.3 million end of this range.)

Table 3. Total-cost-equivalent populations avoiding life expectancy reduction due to sites with improved protection due to documented community involvement, by degree of earlier benefit achievement.

Delay (years)	Low	High
1	1,962	9,123
2	976	4,536
3	649	3,018
4	484	2,249
5	386	1,792

- Vulnerable populations and overburdened communities are more likely to live near MTCA sites than the rest of the public. One reflection of this is a comparison of where these populations live and the locations of MTCA sites. See Figures 1-4 for mapped rankings of Environmental Health Disparities and toxic releases, and Figures 5-6 for maps of MTCA sites.
- Making consideration of climate change impacts explicit:
 - We do not expect this amendment to result in significant change to compliance behavior, but rather an emphasis and focus to comprehensively verify this work is being done. This assurance could reduce costs of Ecology site manager time to request this information under the baseline, and any time costs resulting from this additional baseline interaction, to the extent this implicit baseline consideration is not already clearly documented.
- Adding an explicit, stepwise procedure for Disproportionate Cost Analysis:
 - Annual benefits: \$0.1 million – \$0.3 million.
 - 20-year present value benefits: \$2.5 million – \$4.9 million.
- Adding documentation requirements in the Feasibility Study report:
 - Identifying nonconformance and determining whether it is appropriate for the site in question.
 - Consistent and accessible documentation of Remedial Investigation results in the Feasibility Study report.

- Amending UST site characterization requirements, free product removal monitoring and reporting requirements, demonstrations and documentation of groundwater and vapor intrusion threats in interim actions, and periodic update requirements:
 - Extending the timeframe for site characterization will allow for more complete investigations. Ecology received input from stakeholders that the availability of drilling companies and turnaround times for laboratories necessitate more time for site characterization. This will also aid in achieving compliance and avoiding potential noncompliance due to factors outside of an UST system’s owner.
 - Free product removal timing, monitoring, and reporting requirements will result in benefits associated with earlier removal of free product (at sites that currently take longer than 30 days), and comprehensive knowledge of the current status of free product removal and monitoring that would also facilitate ongoing assistance in effective free product removal that is protective of human health and the environment. Based on Ecology experience implementing MTCA, leaking UST sites need to continue tracking free-product removal operations, as many of these sites do not receive immediate cleanup.
 - Adding characterization of potential for vapor intrusion to site characterization could reduce risks to potentially affected structures (e.g., basements, utility vaults, and parking garages) and people that use them. These risks include potential threats to safety related to explosive concentrations of petroleum vapors, and adverse health effects from inhalation of toxic chemicals.
 - The table below illustrates the number of years of cumulative statewide medical and drug costs associated with chronic lymphocytic leukemia (CLL) and acute myeloid leukemia (AML) that would need to be avoided to offset our estimated \$0.3 million to \$0.9 million in annual costs of these amendments.

Table 4. Cost-equivalent avoided leukemia treatment, years.

Total Annual Costs	Equivalent Years of CLL Treatment	Equivalent Years of AML Treatment
Low	5	1
High	16	5

- Expanding cultural resource protection requirements:
 - The value of protecting cultural resources is inherently not quantifiable or monetizable. We can instead look to descriptions of these values, history, and extensive current preservation efforts.
 - See Section 4.2.15 for discussion of the value of cultural resources and the actions taken to protect them, from the Hoh Tribe, Spokane Tribe Preservation Program, and Wanapum Heritage Center. Resources include archeological artifacts, natural resources and ecosystems, and culturally or historically important geographies.

- Adding a requirement to report separate independent investigations of a site:
 - For sites at which remedial action does not occur within 90 days of completion of independent investigations, these rule amendments will result in benefits associated with earlier reporting of up-to-date site and remedial action characteristics, and of having comprehensive information about all sites as necessary to rank all sites under rule amendments for internal operations. Earlier reporting of site investigations will enable Ecology to better assess and rank the hazards posed by a site to the public and the environment, and to make more informed site prioritization and management decisions. It will also enable the public to better understand the hazards posed by the site to them.

Conclusion

The APA requires Ecology 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 statute being implemented.” We conclude, based on a reasonable understanding of the quantified and qualitative costs and benefits likely to arise from the rule amendments (summarized in the previous section), as compared to the baseline, that the benefits of the rule amendments are likely greater than the costs.

Many benefits of the rule amendments were not fully quantifiable, due to compounding uncertainty in future site attributes and how the amendments will subsequently affect:

- Assessment, prioritization, timing, and attributes of different cleanup sites and their remediation.
- Changes to exposure and risk over time.
- Site-specific health and environmental impacts of different toxic substances and exposure pathways.
- Frequency and scope of impacts to vulnerable populations, overburdened communities, and the rights and interests of Tribes.
- Contribution of additional, consistent, and comprehensive information on Ecology strategic planning and public interests.

To attempt to illustrate the scope of benefits when uncertainty constrained our ability to quantify or monetize these impacts, we estimated the avoided costs of potential public health impacts that would counterbalance our estimated costs. Under the APA requirement quoted above, qualitative benefits and costs should be considered in conjunction with those that we were able to quantifiably estimate.

Least-Burdensome Alternative

We considered the following alternative rule content for each significant rule amendment, and did not include it in the adopted amendments.

- Contaminated sites list:
 - Recovering petition review costs for listings made in error.

- Continuing to require public notice and opportunity to comment before removing independent cleanup sites from the contaminated sites list.
- Remedial investigation:
 - Requiring periodic updates of independent remedial actions regardless of whether change or progress has occurred.
 - Not requiring reporting of independent site investigations until independent interim actions or cleanup have been completed.
 - Not requiring (though recommending) Inadvertent Discovery Plans for remedial actions.
- Feasibility Study:
 - Requiring site-specific environmental justice analysis for all Ecology-conducted and Ecology-supervised cleanups, including cumulative environmental health impacts, community engagement, and evaluation of the distribution of cleanup benefits and burden.
 - Not requiring documentation of consideration of vulnerable populations and overburdened communities.
- Not requiring documentation of appropriate waste management and disposal in the Remedial Investigation Report or Feasibility Study.
- Cleanup action expectations:
 - Not requiring the Feasibility Study Report to document nonconformance with expectations.
- Cleanup Action Plan:
 - Not requiring a summary of how the selected action reflects considerations of public concerns and the rights and interests of Tribes.
- Tribal engagement and cultural resource protection:
 - Requiring site-specific Tribal engagement efforts only upon request from Tribes or based on Ecology anticipation of concerns.
- Releases from underground storage tanks (USTs):
 - Requiring completion of site investigation within 20 days.
 - Not requiring vapor intrusion as part of the initial site characterization.
 - Requiring free product removal to begin within 60 days of release confirmation.
 - Not requiring regular reporting to track ongoing free-product removal.
 - Not requiring demonstration of why groundwater impacts are not expected despite lack of testing.

- Not requiring demonstration of why vapor intrusion is not expected although there is no identified pathway.
- Requiring updates to Interim Action Reports every 5 years.

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

Regulatory Fairness Act/Small Business Economic Impact

Rather than assuming the subset of costs incurred by a site, we calculated the estimated costs per employee for each type of cost (and underlying number of sites). The table below summarizes these costs and the cost per employee to the largest businesses as a percentage of the costs per employee for small businesses.⁷

Table 5. Compliance costs per employee.

Cost Category	Small Businesses	Largest 10%	Ratio of Costs Largest to Small
Reporting exemptions	(\$2.59)	(\$0.00)	0.019%
Consideration of populations – Feasibility study	\$1,680.00	\$0.06	0.003%
Consideration of populations – Cleanup action plan	\$840.00	\$0.04	0.005%
Consideration of populations – Equitable participation	\$4,200.00	\$0.02	0.000%
Stepwise DCA	(\$840.00)	(\$0.16)	0.019%
Feasibility study	\$840.00	\$0.04	0.005%
UST – Free product	\$1,336.00	\$0.34	0.026%
UST – Groundwater	\$420.00	\$0.08	0.019%
UST – Vapor intrusion	\$105.00	\$0.04	0.037%
UST – Periodic updated	\$168.00	\$0.08	0.046%
Cultural resource protection – Engagement plan	\$63.00	\$0.02	0.031%
Cultural resource protection – Work plan	\$210.00	\$0.07	0.032%
Cultural resource protection – Inadvertent discovery plan	\$420.00	\$0.08	0.019%
Separate remedial investigation report	\$210.00	\$0.04	0.019%

We conclude that the rule amendments are likely to have disproportionate impacts on small businesses, and therefore Ecology must include elements in the rule amendments to mitigate this disproportion, as far as is legal and feasible.

We found that the rule amendments would not significantly affect price levels and would negatively impact output in the state by the amounts below. For context, we note that baseline

⁷ Note that benefits of cost-savings are reflected as negative costs.

state output is forecast to be over \$1.2 trillion by 2027, of which the highest modeled impacts would be less than one-five-hundredth of one percent.

Table 6. Modeled impacts to output (billions of \$).

Cost Impact	2023	2030	2040
Low	-\$0.004	-\$0.007	-\$0.007
High	-\$0.017	-\$0.030	-\$0.033

Following parallel trajectories, modeled results indicate the highest impacts in the following industries, with total output losses across each industry of between \$1 million and \$3 million:

- Construction.
- Real estate.
- Retail trade.

The rule amendments will result in transfers of money within and between industries, as compared to the baseline. Our modeled impacts on employment are the result of multiple small increases and decreases in employment, prices, and other economic variables across all industries in the state. Overall, the highest modeled impacts to jobs were for 2027, with a total statewide loss of 38 to 166 FTE equivalents across all sectors of the state economy.

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Chapter 1: Background and Introduction

1.1 Introduction

This report presents the determinations made by the Washington State Department of Ecology as required under Chapters 34.05 RCW and 19.85 RCW, for the adopted amendments to the Model Toxics Control Act Cleanup Regulations rule (Chapter 173-340 WAC; MTCA; 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. Chapter 6 of this document describes that determination.

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

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

1.1.1 Background

Ecology implements the Hazardous Waste Cleanup – Model Toxics Control Act statute (Chapter 70A.305 RCW) through the Model Toxics Control Act Cleanup Regulations rule (Chapter 173-340 WAC). The Model Toxics Control Act (MTCA) is Washington’s environmental cleanup law. MTCA funds and directs the investigation, cleanup, and prevention of sites contaminated by hazardous substances. It works to protect people’s health and the environment, and to preserve natural resources for the future.

There are about 14,000 known or suspected contaminated sites in Washington — and the list keeps growing. Thanks to cleanup efforts funded by MTCA, more than 7,700 of these sites are already cleaned up or require no further action.

The Hazardous Substance Tax helps pay for this cleanup work. Voters approved a tax on hazardous substances (such as petroleum products, pesticides, and other chemicals) to pay for cleanups. Under MTCA, Ecology may also recover penalties or require polluters to pay for cleanups and our oversight.

1.1.2 MTCA policies and guidance

Ecology has developed policies, procedures, implementation memoranda, and guidance to interpret the MTCA statute and its associated rules:

- MTCA Cleanup Regulations (Chapter 173-340 WAC; for cleanups on land or groundwater).
- Sediment Management Standards (SMS; Chapter 173-204 WAC; for cleanups in freshwater or marine environments).
- Remedial Action Grants and Loans (Chapter 173-322A WAC).⁸

Policies interpret specific cleanup requirements. Some include templates pre-loaded with standard language. Overall, policies help cleanup program managers apply MTCA across many types of cleanups — as different as tanks leaking petroleum into the Columbia River, to dry-cleaners seeping toxic chemicals into the soil.

Procedures put policies into action. They often identify roles and responsibilities, such as who files an environmental covenant to ensure a remedy keeps working in the future.

Implementation memoranda and guidance answer frequently asked questions and offer best practices for successful cleanups.

1.2 Adopted rule amendments

The rule amendments include changes that will impact only internal Ecology operations (exempt from this analysis under RCW 34.05.328(5)(b)(ii)), or do not materially impact rule requirements:

- Amending internal procedures (procedures internal to Ecology). Including, but not limited to:
 - Initial investigations.
 - Site hazard assessment and ranking.
 - Site listing.
 - Program planning and performance assessment.
 - Public notification and participation.

⁸ See <https://ecology.wa.gov/Regulations-Permits/Plans-policies/Toxics-cleanup-policies> for more information and links to all policies, procedures, implementation memoranda, and guidance documents.

- Clarifying, correcting, and restructuring the rule, with no material impact.

The rule amendments include the following changes that potentially impact external parties (not just Ecology):

- Adding new definitions to support new requirements.
- Expanding release reporting exemptions.
- Updating release reporting timelines.
- Emphasizing consideration of vulnerable populations, overburdened communities, and Tribes, including documentation requirements.
- Adding documentation of appropriate management of waste generated during investigation to the Remedial Investigation Report.
- Emphasizing consideration of climate change impacts.
- Establishing a stepwise procedure for the Disproportionate Cost Analysis (DCA), and clarifying how public concerns and tribal interests are considered in the DCA.
- Adding documentation requirements in the Feasibility Study report.
- Updating UST site characterization requirements.
- Updating UST free product removal deadline, monitoring, and reporting.
- Modifying demonstrations and documentation of groundwater and vapor intrusion threats in UST interim actions.
- Requiring periodic updates for UST reporting.
- Expanding cultural resource protection requirements.
- Adding a requirement to report separate independent investigations of a site.
- Aligning the rule with current guidance and practice.

1.3 Reasons for the rule amendments

The rule amendments address the following major themes, as well as amending internal procedures (procedures internal to Ecology), and clarifying, correcting, and restructuring the rule, with no material impact.

- **Strengthen environmental justice principles when prioritizing and cleaning up contaminated sites.**

The rule amendments strengthen environmental justice principles at both the program level and the site level:

- At the program level, they strengthen our commitments by requiring Ecology to prioritize the cleanup of contaminated sites that may impact vulnerable populations or overburdened communities, and to periodically assess progress.

However, Ecology retains the flexibility to establish goals, plans, and performance metrics outside of the rule. We expect to reduce environmental and health disparities in Washington state through these commitments.

- At the site level, the amendments emphasize accountability and transparency when making cleanup decisions. Rather than establishing new environmental justice criteria and evaluations that would be difficult to implement, the amendments emphasize the need to consider the impact of contaminated sites and their cleanup on vulnerable populations and overburdened communities under existing cleanup requirements. The amendments also require documentation to improve accountability and transparency. By adhering to these requirements, we expect that cleanup actions will result in equitable outcomes for vulnerable populations and overburdened communities impacted by a site.
- **Improve the site hazard assessment and ranking process.**

The rule amendments improve Ecology’s process for assessing and ranking the hazard posed by contaminated sites. Ecology uses the rankings to compare and prioritize the threats to human health and the environment posed by contaminated sites. The amendments replace the outdated Washington Ranking Method (WARM) specified in the existing rule (without change since 1992) with a requirement that Ecology establish, implement, and maintain a new process outside the rule. This process will still be subject to performance standards and public comment opportunities in the rule. By maintaining the process outside of the rule, Ecology will be able to review and update it more frequently.
- **Require comprehensive program plans and performance assessments.**

The rule amendments require Ecology to develop comprehensive program plans for cleaning up contaminated sites in Washington state. In particular, the amendments commit Ecology to develop and maintain a comprehensive and integrated strategic plan for cleaning up contaminated sites, and to periodically assess its performance. However, the amendments do not specify the content of such plans or how frequently they will be updated, or performance assessed. The requirements are intended to provide a level agency accountability and transparency, but also provide the agency sufficient flexibility to adjust plans as needed.
- **Improve initial response to releases from regulated underground storage tanks.**

The rule amendments help accelerate the investigation and cleanup of releases from UST systems regulated under Chapter 173-360A WAC. The changes are intended to streamline, clarify, and update the rule and improve integration between the rules. These cleanup rules are needed to maintain Washington state’s federally approved UST program.
- **Update and clarify remedial investigation and remedy selection requirements.**

The rule amendments update and clarify the process for investigating and cleaning up contaminated sites based on the experience of practitioners over the past 20

years. For example, they introduce stepwise procedures for remedial investigations and feasibility studies, clarify reporting requirements, revise and clarify how public concerns and tribal rights and interests are considered and documented, and incorporate policies related to climate change resilience, environmental justice, and cultural resource protection. However, the amendments do not provide detailed guidance. Ecology plans to update or develop additional guidance to provide more specific instruction as needed.

- **Clarify which requirements apply to independent remedial actions.**
The rule amendments clarify the applicability of substantive requirements to independent remedial actions (e.g., conducting a Feasibility Study) and identify the differences in administrative requirements between independent remedial actions and Ecology-conducted and Ecology-supervised remedial actions (e.g., reporting Feasibility Study results and whether subject to public comment).

In addition, the amendments add investigation reporting requirements to provide Ecology information about site hazards and eliminate public opportunity to comment on post-cleanup actions to be consistent with existing rules for cleanup actions. They also replace the required method for providing the public with notice of independent remedial actions.

- **Strengthen public participation and tribal engagement requirements for Ecology-conducted or supervised cleanups.**

The rule amendments update public notification methods to reflect changes in technology and practice over 20 years, and to enable Ecology to provide more information sooner to the public in a way that is more efficient. The amendments also update and clarify some of the public participation requirements for Ecology-conducted and Ecology-supervised remedial actions.

The rule amendments also establish requirements for tribal engagement for Ecology-conducted and Ecology-supervised remedial actions that are separate and independent from public participation requirements. However, the amendments do not prescribe how Ecology must engage Indian tribes during the cleanup process. Ecology plans to develop programmatic policies and templates based on guidance developed under the HEAL Act.⁹

1.4 Document organization

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

⁹ See Chapter 70A.02 RCW, Environmental Justice.

- **Baseline and the adopted rule amendments (Chapter 2):** Description and comparison of the baseline (what would occur in the absence of the rule amendments) and the adopted 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 sizes 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 for small and large businesses; mitigation; impact on jobs.
- **APA Determinations (Appendix A):** RCW 34.05.328 determinations not discussed in chapters 5 and 6.

Chapter 2: Baseline and Adopted Rule Amendments

2.1 Introduction

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

2.2 Baseline

The baseline for our analyses generally consists of existing rules and 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 70A.305 RCW, Hazardous Waste Cleanup – Model Toxics Control Act
- Chapter 173-340 WAC, Model Toxics Control Act – Cleanup (the existing rule).
- Chapter 70A.355 RCW, Underground Storage Tanks
- Chapter 173-360A WAC, Underground Storage Tank Regulations
- Executive Order 21-02, Archeological and Cultural Resources¹⁰
- Other cited and relevant regulations, including but not limited to:¹¹
 - Chapter 27.44 RCW, Indian Graves and Records
 - Chapter 27.53 RCW, Archaeological Sites and Resources
 - Chapter 34.05 RCW, Administrative Procedure Act
 - Chapter 36.70A RCW, Growth Management Act
 - Chapter 43.21C RCW, State Environmental Policy Act
 - Chapter 43.376 RCW, Government-to-Government Relationship with Indian Tribes
 - Chapter 68.50 RCW, Human Remains
 - Chapter 68.60 RCW, Abandoned and Historic Cemeteries and Historic Graves
 - Chapter 70A.02 RCW, Environmental Justice

¹⁰ https://www.governor.wa.gov/sites/default/files/exe_order/eo_21-02.pdf

¹¹ Note that regardless of the adoption of the rule amendments, parties must comply with all state and federal rules and laws applicable to their activities.

- Chapter 70A.205 RCW, Solid Waste Management – Reduction and Recycling
- Chapter 70A.300 RCW, Hazardous Waste Management
- Chapter 70A.330 RCW, Petroleum Storage Tank Systems – Pollution Liability Protection Act
- Chapter 90.56 RCW, Oil and Hazardous Substances Spill Prevention and Response
- Chapter 197-11 WAC, SEPA Rules.
- 16 U.S.C 470aa, Archaeological Resource Protection Act of 1979
- 25 U.S.C. 3001, Native American Graves Protection and Repatriation Act of 1990
- 42 U.S.C. 6901, Resource Conservation and Recovery Act
- 54 U.S.C. 300101, National Historic Preservation Act of 1966
- 54 U.S.C, 312501, Archaeological and Historic Preservation Act of 1974

2.2.1 Guidance

Our Toxics Cleanup Program's Policy & Technical Support Unit develops policies and guidance in collaboration with cleanup project managers and technical staff statewide. These scientists, engineers, toxicologists, lawyers, hydrologists, and writers also provide technical assistance to people involved in a cleanup, such as cleanup project managers, property owners, environmental consultants, and local governments.

MTCA procedures, policies, implementation memoranda, and guidance documents are **not** part of the legal baseline for this rulemaking, because they are interpretations of laws and rules. They do, however, inform current behavior and understanding of how cleanup site owners and managers currently interpret the law and rule, and how to comply with them. In cases where multiple plausible interpretations of the baseline exist, we consider those interpretations in a range of baseline assumptions. If, however, the interpretation that exists in policies, procedures, or guidance is the only reasonable interpretation of the baseline, we use it as part of the baseline for this analysis.

Ecology procedures related to the MTCA rule include Procedure numbers:

- 320 Site Hazard Assessment and Ranking of MTCA Sites by Ecology Staff
- 321 Site Hazard Assessment of MTCA Sites by Local Health Districts/Departments
- 440A Establishing Environmental Covenants under the Model Toxics Control Act
- 440C Releasing Environmental Covenants under the Model Toxics Control Act
- 500A Identification of Potentially Liable Persons (formerly Procedure 500B)
- 550A Cost Recovery under a MTCA Order or Decree
- 550B Property Liens under RCW 70.105D.055

Ecology policies related to the MTCA rule include Policy numbers: ¹²

- 120A Independent Remedial Actions
- 130A Coordination of MTCA and SEPA
- 300 Site Discovery
- 310A Initial Investigations
- 310B Creating or Changing the Name, Address, or Identification Number for a Facility or Site
- 330A Listing of Sites on the Hazardous Sites List
- 330B Removal of Sites from the Hazardous Sites List
- 340B Managing TCP's Program Plan
- 500A Identification of Potentially Liable Persons
- 520A Consent Decrees
- 520B Prospective Purchaser Agreements
- 520C De Minimis Consent Decrees
- 530A Agreed Orders
- 540A Enforcement Orders
- 550A Cost Recovery
- 550C Prepaid Cleanup Oversight
- 560B Granting Mixed Funding for LUST Cleanups
- 600A Site Register Publication
- 710A Permit Exemptions for Remedial Actions under MTCA (formerly Policy 130B)
- 730 Taking into Account Federal Human Health Surface Water Quality Criteria under MTCA
- 800A Property Access
- 800B Information Access
- 840 Data Submittal Requirements
- 900 Underground Storage Tank (UST) Enforcement
- 920 Providing Public Participation in UST Settlements
- 930 Investigation and Response to Complaints of UST Violations

¹² Note this list excludes policies that are obsolete or have been withdrawn.

Ecology implementation memoranda include:¹³

- Memo #2 Applicability of WAC 173-340-706
- Memo #4 Determining compliance with Method A Cleanup Levels for diesel and heavy oil
- Memo #5 Collecting and preparing soil samples for VOC analysis
- Memo #6 Nematode bioassay protocol for soil toxicity screening
- Memo #7 Soil moisture corrected reporting by EPA Method 8000C
- Memo #8 Natural background for dioxins/furans in WA soils
- Memo #9 Building code compliance for factory built commercial structures
- Memo #10 Evaluating the human health toxicity of cPAHs using TEFs
- Memo #11 Dioxins, furans, and dioxin-like PCB congeners: Addressing non-detects and establishing PQLs for ecological risk assessments in upland soil
- Memo #12 When to use EPA Method 1668 for PCB congener analyses
- Memo #13 Dioxins, furans, and dioxin-like PCB congeners: Ecological risk calculation methodology for upland soil
- Memo #15 Frequently asked questions (FAQs) regarding empirical demonstrations and related issues
- Memo #16 Developing conditional points of compliance at MTCA sites where groundwater discharges to surface water
- Memo #19 Gasoline and diesel soil concentrations predicted to be protective of upland ecological receptors
- Memo #20 Frequently asked questions (FAQs) regarding model remedy implementation
- Memo #23 Concentrations of gasoline and diesel range organics predicted to be protective of aquatic receptors in surface waters

Ecology's major guidance documents related to MTCA include:¹⁴

- Climate change:
 - Adaptation strategies for resilient cleanup remedies: A guide for cleanup project managers to increase the resilience of toxic cleanup sites to the impacts from climate change (guidance manual)
 - Climate change and cleanup (two-page focus sheet)

¹³ Note this list excludes memoranda that are obsolete or have been withdrawn.

¹⁴ See <https://ecology.wa.gov/Regulations-Permits/Plans-policies/Toxics-cleanup-policies> for links.

- Empirical demonstrations
- Model remedies:
 - Model remedies for sites with petroleum impacts to groundwater
 - Model remedies for sites with petroleum contaminated soils
 - FAQs for implementing model remedies (Implementation Memo 20)
- PFAS (per- and polyfluoroalkyl substances) at cleanup sites:
 - DRAFT guidance (comments accepted Dec 15, 2022-Jan 27, 2022)
 - Focus on: PFAS cleanup levels
- Petroleum cleanups:
 - CLARC: Cleanup Levels and Risk Calculation spreadsheet
 - Guidance on remediation of petroleum-contaminated ground water by natural attenuation
 - Guidance for remediation of petroleum contaminated sites (also called "TPH Guidance" and "Total Petroleum Hydrocarbons Guidance")
- Remedial action plans & reports
- Sediment cleanups:
 - Sediment cleanup user's manual (SCUM)
 - Wood waste cleanup: Identifying, assessing, and remediating wood waste in marine and freshwater environments
- Silica gel:
 - Draft guidance for silica gel cleanup in Washington state
- Terrestrial Ecological Evaluations (TEE):
 - Draft Terrestrial Ecological Evaluation guidance
- Underground Storage Tanks/Leaking Underground Storage Tanks (UST/LUST)
- Vapor intrusion:
 - Guidance for evaluating vapor intrusion in Washington state: Investigation and remedial action (March 2022)
 - Focus sheet on trichloroethylene (TCE) in residential indoor air

2.3 Adopted rule amendments

The rule amendments include changes that would impact only internal Ecology operations (exempt from this analysis under RCW 34.05.328(5)(b)(ii)), or do not materially impact rule requirements:

- Amending internal procedures (procedures internal to Ecology). Including, but not limited to:
 - Initial investigations.
 - Site hazard assessment and ranking.
 - Site listing.
 - Program planning and performance assessment.
 - Public notification and participation.
- Clarifying, correcting, and restructuring the rule, with no material impact.

The rule amendments include the following changes that potentially impact external parties (not just Ecology):

- Adding new definitions to support new requirements.
- Expanding release reporting exemptions.
- Updating release reporting timelines.
- Emphasizing consideration of vulnerable populations, overburdened communities, and Tribes, including documentation requirements.
- Adding documentation of appropriate management of waste generated during investigation to the Remedial Investigation Report.
- Emphasizing consideration of climate change impacts.
- Establishing a stepwise procedure for the Disproportionate Cost Analysis (DCA), and clarifying how public concerns and tribal interests are considered in the DCA.
- Adding documentation requirements in the Feasibility Study report.
- Updating UST site characterization requirements.
- Updating UST free product removal deadline, monitoring, and reporting.
- Modifying demonstrations and documentation of groundwater and vapor intrusion threats in UST interim actions.
- Requiring periodic updates for UST reporting.
- Expanding cultural resource protection requirements.
- Adding a requirement to report separate independent investigations of a site.
- Aligning the rule with current guidance and practice.

2.3.1 Amending internal procedures (procedures internal to Ecology)

Baseline

Many of the baseline rule requirements affect only Ecology internal procedures. These procedures may or may not have indirect impacts on entities outside of Ecology.

Adopted

The rule amendments clarify or update internal procedures that are not likely to have impacts external to Ecology, including but not limited to:

- Updating methods of informing the public about remedial actions at sites.
- Publication of information on the Ecology website.
- Investigations of sites, including timelines, and next steps.
- Consideration of vulnerable populations or overburdened communities during initial investigations and strategic planning.
- Deletion of obsolete internal procedures.

The rule amendments also change internal procedures that may result in indirect impacts (costs and/or benefits) outside of Ecology.¹⁵ These include, but are not limited to:

- Site hazard assessment and ranking.
- Site listing and delisting procedures.
- Program planning and performance assessment.
- Public notification and participation.

In many cases, these amendments overlap with baseline or amended requirements reflected in current guidance and practice, or with clarifications of the rule that have no material impact.

¹⁵ These internal operations and procedures, though not subject to violation by any nongovernment party (and therefore exempt from this analysis), could ultimately have indirect impacts on contaminated site cleanup and on the public. Ecology's site hazard assessment and ranking, listing and delisting, program planning, and public notice and participation procedures could affect the timing or other aspects of cleanups, which could in turn affect the timing of cleanup costs and benefits and property values. Such indirect impacts (positive or negative) are complex and depend on the specific attributes of sites and their surrounding geographies, populations, and economies.

In particular, certain changes to requirements for public notice and comment periods may appear to reduce opportunities for public input for independent cleanups. These include post-cleanup comment periods for removing sites from the HSL, for amendment or termination of institutional controls, and for periodic post-cleanup reviews required at some sites. However, Ecology believes that improvements in the quality and quantity of information available to the public under the rule, combined with Ecology's discretion under the baseline to require public comment periods whenever necessary, will offset the effects of reducing routine notice and comment periods under the rule. Further, as under the baseline, the public may continue to provide input to Ecology at any time during the cleanup process.

Expected impact

Where amendments to internal operations are unlikely to result in impacts external to Ecology, we do not expect them to result in costs or benefits beyond internal efficiencies or clarity. Elements of the amended rule that affect only internal government operations are exempt from this analysis under RCW 34.05.328(5)(b)(ii) (“Rules relating only to internal governmental operations that are not subject to violation by a nongovernment party”).

2.3.2 Clarifying, correcting, and restructuring the rule, with no material impact

Baseline

Through years of implementation of the baseline rule, and through extensive engagement with stakeholders, Ecology identified elements of the rule language that would benefit from clarification.

Adopted

The rule amendments significantly restructure the rule and clarify language throughout. These changes are not intended to change rule requirements.¹⁶

The adopted amendments include various additional clarifications of the proposed rule language, including:

- Restating Ecology’s baseline authority to request additional information or documentation if necessary.
- Removing potentially confusing language regarding the role of exposure to hazardous substances in remedial action alternative permanence versus protectiveness.
- Adding “likely” to multiple instances of overburdened community and vulnerable population requirements.
- Reverting to the baseline “overall” in describing threats to human health.
- Adding language describing baseline circumstances under which cleanup levels will not be revised, to include not only changes to rules but the relevant analytical methods used in implementing them.

As with other clarifications, these changes are not intended to materially impact the rule’s requirements.

¹⁶ The adopted rule amendments do not include a clarification that was included in the proposed rule language, that a nonpermanent groundwater cleanup action must, “Provide an alternate water supply or treatment if the cleanup action does not protect an existing use of the groundwater. A cleanup action is not protective of an existing use if a hazardous substance concentration exceeds the protective groundwater concentration for that use.” We chose to remove this clarification, as it potentially exceeds the scope of compliance requirements for groundwater cleanup standards. We may address this in a future rulemaking.

Expected impact

We do not expect costs or benefits from these rule amendments beyond clarity that facilitates understanding of the rule requirements and, therefore, possible greater efficiency for regulated parties seeking to understand and comply with MTCA requirements.

2.3.3 Adding new definitions supporting new requirements

Baseline

The baseline rule includes multiple definitions necessary to implement it.

Adopted

The rule amendments add the following new or significantly revised definitions, to support newly adopted requirements:

- “Contaminated sites list” means a list of contaminated sites maintained by Ecology under WAC 173-340-330. For each listed site, the list also identifies the site’s current remedial action status. This list is referred to as the hazardous sites list in Chapter 70A.305 RCW.
- “Ecology-conducted remedial action” means a remedial action conducted by Ecology.
- “Ecology-supervised remedial action” means a remedial action conducted by a potentially liable person or prospective purchaser and supervised by Ecology under an order or decree.
- “Inadvertent discovery plan” means a plan prepared under WAC 173-340-815 that describes procedures for responding to a discovery of archaeological materials or human remains in accordance with applicable state and federal laws.
- “Independent remedial action” means a remedial action conducted without Ecology oversight or approval and not under an order or decree.
- “Indian tribe” means the term as defined in RCW 43.376.010(1).
- “Indigenous peoples” means individual members of Indian tribes; other individual Native Americans; individual Native Alaskans, Native Hawaiians, and Native Pacific Islanders; and indigenous and tribal community-based organizations.
- “No further action sites list” means a list of sites for which Ecology or PLIA has determined no further remedial action is necessary under state cleanup law to meet the criteria in WAC 173-340-330(5). For each listed site, the list also identifies whether institutional controls or periodic reviews remain necessary at the site. Ecology maintains the list under WAC 173-340-335.
- “PLIA” means the Washington Pollution Liability Insurance Agency.
- “Site hazard assessment and ranking” means a remedial action that consists of an assessment and ranking conducted under amended WAC 173-340-320.

- “Vulnerable population” and “overburdened community” means those terms as defined in RCW 70A.02.010(11).

Expected impact

Definitions do not, in and of themselves, have impacts. Their associated costs or benefits result from how each definition functions or is applied in the rule. Any costs and benefits of the rule amendments that involve these new definitions are discussed in their corresponding sections, below.

2.3.4 Expanding release reporting exemptions

Baseline

The baseline rule allows exemptions from reporting releases if the release has been previously reported to:

- Ecology to fulfill a reporting requirement in this chapter or in another Ecology law or rule, including chapter 173-360A WAC.
- The United States Environmental Protection Agency under CERCLA, Section 103(c) (42 U.S.C. Sec. 9603(c)).

It also includes an exemption for application of pesticides and fertilizers for their intended purposes and according to label instructions.

Adopted

The rule amendments add an exemption for releases previously reported to:

- The state division of emergency management under RCW 90.56.280.
- PLIA under WAC 374-45-030 for a release from a heating oil tank.

Expected impact

We expect this rule amendment to result in benefits of avoided reporting costs for releases previously reported to the division of emergency management or PLIA.

2.3.5 Updating release reporting timelines

Baseline

Under the baseline, releases must be reported within 90 days unless some type of remedial action is completed within that time. When this is the case, both the release and the action must be reported within 90 days of the remedial action being completed.

Adopted

The rule amendments require all releases to be reported within 90 days, regardless of whether remedial action has occurred.

Expected impact

We expect this rule amendment to result in minor costs associated with the timing of reporting releases for some sites. At sites that complete a remedial action within 90 days of release, the release needs to be reported separately within 90 days of the release, rather than later once the remedial action has been completed. This amendment will result in benefits of comprehensive and timely knowledge of releases, regardless of whether remedial action has been taken, and support uniformity of site assessment and ranking under the newly adopted process.

2.3.6 Emphasizing consideration of vulnerable populations, overburdened communities, and Tribes, including documentation requirements

Baseline

Under the baseline, including its interpretation in guidance, site managers must consider impacts of remedial options on vulnerable populations, overburdened communities, and Tribes. While this is not explicitly stated in the law and rules, the statute declares that “each person has a fundamental and inalienable right to a healthful environment.”¹⁷ Accordingly, baseline requirements include protecting public health and accounting for public concerns. The current understanding is that this includes vulnerable populations, overburdened communities, and Tribes, because they are part of the public. However, Ecology is unable to track how consistently these requirements are applied due to lack of clarity and explicit requirements.

Adopted

The rule amendments require explicit consideration of vulnerable populations, overburdened communities, and Tribes, and add requirements to document this consideration in the Remedial Investigation and the Feasibility Study.¹⁸

Expected impact

We expect these rule amendments to result in costs because of the extra time needed to document the concerns and impacts on these specific populations. We also expect to see benefits from this documentation, including increased public engagement, greater transparency, and improved environmental justice.

¹⁷ See RCW 70A.305.010(1), <https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305.010>.

¹⁸ The adopted rule amendments include an explicit requirement that, “Ecology will maintain meaningful engagement with Indian tribes throughout the cleanup process.” This language was not included in the proposed rule amendments. This is a procedural change internal to Ecology, but Ecology must ensure this also happens in Ecology-supervised cleanups.

2.3.7 Adding documentation of appropriate management of waste generated during investigation to the Remedial Investigation Report

Baseline

Under the baseline waste generated during remedial investigation must be handled appropriately. While the current rule does not explicitly require documentation of waste management, Ecology site managers routinely require such documentation under the rule when conducting, supervising, or evaluating investigations and cleanups of contaminated sites. The baseline rule allows Ecology to require additional information as part of a remedial investigation.

Adopted

The rule amendments add a requirement to include documentation of appropriate management of hazardous wastes generated during remedial investigation. This documentation will be included in the Remedial Investigation Report.

Expected impact

We do not expect this rule amendment to result in significant new costs or benefits arising from additional documentation because this information is routinely required in practice by Ecology site managers as part of additional Remedial Investigation information requested, which is allowed under the baseline rule.

2.3.8 Emphasizing consideration of climate change impacts

Baseline

Under the baseline, consideration of resilience to likely climate change impacts during the feasibility study are not explicit and clear. Baseline requirements do exist, however, for consideration of the protectiveness and the long-run effectiveness of a cleanup action, which would include accounting for climate change risks to the action. In addition, Ecology provides guidance¹⁹ for increasing the protectiveness and resilience of cleanup actions to high-likelihood impacts of climate change under current law.

Adopted

The rule amendments make resilience to high-likelihood impacts of climate an explicit general requirement for cleanup actions, and include such resilience in the assessment of long-term effectiveness during the Disproportionate Cost Analysis of cleanup action alternatives.

Expected impact

We expect this rule amendment to result in costs and benefits of documenting and assuring consideration of climate change resilience during the development and selection of cleanup action alternatives in the feasibility study, to the extent that is not already done. Under the

¹⁹ See <https://apps.ecology.wa.gov/publications/SummaryPages/1709052.html>

baseline, however, we expect that likely climate change impacts are already a consideration in determining the protectiveness and long-run effectiveness of remedial actions, so we do not expect that this amendment will result in significant additional costs, but rather an emphasis and focus to comprehensively verify this work is being done.

2.3.9 Establishing stepwise procedure for Disproportionate Cost Analysis (DCA), and clarifying how public concerns and Tribal interests are considered in DCA

Baseline

Under the baseline, cleanup actions are required to meet certain requirements, including but not limited to:

- Protecting human health and the environment.
- Complying with cleanup standards.
- Complying with applicable state and federal laws.
- Providing for compliance monitoring.
- Using permanent solutions to the maximum extent practicable.
- Providing for a reasonable restoration time frame.
- Considering public concerns.
- Meeting additional requirements for groundwater cleanup and institutional controls.

The baseline also sets out a procedure and evaluation criteria for the Disproportionate Cost Analysis (DCA) of any non-permanent cleanup action alternatives to determine which of the alternatives is permanent to the maximum extent practicable. The DCA process includes:

- The test: “Costs are disproportionate to benefits if the incremental costs of the alternative over that of a lower cost alternative exceed the incremental degree of benefits achieved by the alternative over that of the other lower cost alternative.”
- Evaluation criteria, including:
 - Protectiveness.
 - Permanence.
 - Cost.
 - Long-term effectiveness.
 - Management of short-term risks.
 - Technical and administrative implementability.
 - Consideration of public concerns.

The baseline requires the DCA to include “the net present value of any long-term costs” of cleanup action alternatives.

Adopted

The rule amendments largely clarify baseline requirements, but add an explicit, stepwise procedure for Disproportionate Cost Analysis (each with relevant subsections and clarification):

- **Step 1:** Determine the benefits and costs of each cleanup action alternative using the criteria in (d) of this subsection.
- **Step 2:** Rank the cleanup action alternatives by degree of permanence. To determine the relative permanence of an alternative, consider the definition of a permanent cleanup action.
- **Step 3:** Identify the initial baseline alternative for use in the disproportionate cost analysis in Step 4.
- **Step 4:** Conduct a disproportionate cost analysis of the ranked list of cleanup action alternatives identified in Step 2, based on criteria. Use the cleanup action alternative identified in Step 3 as the initial baseline for the analysis.

The rule amendments maintain the baseline requirement to calculate a present value of costs (renamed “present worth analysis”), and specify how postconstruction costs are to be discounted using US Treasury Department real rates of return (discount rates).²⁰

The rule amendments also replace the separate “public concerns” DCA criterion with the requirement to consider public concerns and tribal interests when determining and when weighting each of the five remaining benefit criteria (protectiveness, permanence, long-term effectiveness, management of short-term risks, and implementability).

Expected impact

We expect the rule amendments to result in benefits of clarity and potential reductions in time cost performing the Disproportionate Cost Analysis and/or needing technical support and additional revisions. We also expect the amendments to assure that public concerns and tribal interests are considered when determining and weighting each of the DCA criteria.

By specifying the relevant discount rates to use in calculating the present value of postconstruction costs, and maintaining the baseline requirement to calculate present values, the rule amendments will apply a consistent approach to consideration of future costs in DCAs. We do not expect this to result in costs compared to the baseline, but do expect benefits of:

²⁰ This differs from the proposed rule language, which specified discount rates, but made using a discount rate optional.

- Potential reductions in time spent determining the correct approach to present value calculations, including identifying appropriate inflation and discount rates.
- A universal discounting structure applied to all sites, reducing the variance across sites, of cost estimates used in remedy selection. This supports consistent and equitable decision making across the universe of sites regulated by the rule, and reduces potential opportunities for independently chosen inflation and discount rates to affect remedy selection.²¹
- Using the appropriate discount rate to reflect the relatively low-risk or risk-free, inflation-adjusted opportunity costs faced by the public. This ensures cost-effectiveness decisions regarding environmental and public health objectives are based on efficiency rather than private return.²²

2.3.10 Adding documentation requirements in the Feasibility Study report

Baseline

The baseline rule sets out expectations for cleanup action alternatives.

Adopted

The rule amendments retain the baseline expectations and add requirements to the Feasibility Study, to document:

- When a preferred cleanup action does not conform to the expectations.
- Remedial Investigation results, if the two reports are not combined.

Expected impact

We expect the rule amendments to result in costs associated with additional documentation, as well as benefits of:

- Identifying nonconformance and determining whether it is appropriate for the site in question. The inability to adequately explain any non-conformance could result in increased benefits and costs of an alternative that does meet the expectations.

²¹ We could not identify the degree to which choice of inflation and discount rates affects cross-site variability in remedy selection under the baseline. Generally, use of higher inflation rates relative to discount rates would increase baseline present value costs of remedies incurring ongoing future costs, incentivizing choice of remedial actions with lower future costs. Use of higher discount rates relative to inflation rates would reduce baseline present value costs of remedies with ongoing future costs, incentivizing choice of remedial actions with higher ongoing costs. Overall present value costs also depend on the magnitude of up-front and future costs.

²² We note that discount rates in analyses affecting public goods such as public health and the environment should reflect the social rate of time preference, and in this differ from rates used in internal investment decisions that use internal rates of return (e.g., rate of return on invested capital). The adopted discount rates based on the US Treasury rate of return for the relevant time period correctly reflect relatively low-risk or risk free, inflation-adjusted public opportunity costs.

- Consistent and accessible documentation of Remedial Investigation results in the Feasibility Study report.

2.3.11 Amending UST site characterization requirements

Baseline

The baseline rule sets requirements for initial UST site characterization. These include identification of hazardous substances released, the source of the release, and impacted media. The baseline specifies minimum requirements for sampling and analysis, and investigation of groundwater. UST system owners have 20 days from confirmation of a release to perform the initial site characterization tasks

Adopted

The rule amendments extend the deadline for initial UST site characterization to 30 days and add investigation of the potential for vapors from contaminated soil or groundwater to enter a building, utility vault, or other structure.

Expected impact

We expect these rule amendments to result in benefits of ten additional days to perform site characterization, as well as costs and benefits associated with characterizing the potential for vapor intrusion. The latter includes costs of additional time and effort for site characterization, and benefits of reduction or prevention of vapor intrusion into structures.

2.3.12 Updating UST free product removal deadline, monitoring, and reporting

Baseline

The baseline specifies minimum requirements related to removal of free product from an UST site as soon as possible after discovery. These include free product removal to the maximum extent practicable, proper treatment or disposal, and monitoring.

Adopted

The rule amendments set a deadline of 30 days after discovery to start removal of free product. They also add requirements to conduct quarterly monitoring and to submit quarterly progress reports, describing the results of free product removal and monitoring. The amendments provide Ecology with the flexibility to set a different free product monitoring and reporting frequency as appropriate for a given site.

Expected impact

We expect these rule amendments to result in costs and benefits associated with earlier removal of free product, at sites that currently take longer than 30 days. They will also result in costs associated with writing quarterly progress reports, and benefits of:

- Comprehensive knowledge of the current status of free product removal.

- Monitoring that would also facilitate ongoing assistance in effective free product removal that is protective of human health and the environment.
- An enforceable requirement to monitor assuring that recovery continues until the source is removed.

The above costs could be mitigated to some degree if Ecology determines free product monitoring and reporting may occur less frequently.

2.3.13 Modifying demonstrations and documentation of groundwater and vapor intrusion threats in UST interim actions

Baseline

Under the baseline, UST site owners must submit Interim Action Reports within 90 days of release confirmation. Reports must include the results of the initial site characterization, site characteristics, diagrams, free product removal, remedial actions and results, and planned actions.

Adopted

The rule amendments add the following to Interim Action Report requirements:

- Demonstration that the release does not threaten groundwater, if groundwater has not been tested.
- Demonstration that no potential for vapor intrusion exists, if none has been identified.

Expected impact

We expect these rule amendments to result in costs associated with developing the demonstrations and documenting them in Interim Action Reports for UST sites. We also expect them to generate benefits of comprehensive knowledge of initial site characterization regarding groundwater and vapor intrusion, which also facilitates ongoing assistance in effective cleanup that is protective of human health and the environment.

2.3.14 Requiring periodic updates for UST reporting

Baseline

Under the baseline, UST site owners are not required to update the Interim Action Report. However, they are required under the baseline to submit to Ecology reports of independent interim actions or cleanup actions. See WAC 173-340-450(8) and 173-340-515(4) in the current rule.

Adopted

The rule amendments add a requirement to update Interim Action Reports at least every three years (or more frequently as directed by Ecology). The following conditions exempt a site from this requirement:

- The site is removed from the contaminated sites list.
- Ecology is conducting or supervising remedial action at the site.
- Ecology or PLIA is providing technical assistance for independent remedial actions at the site.

Expected impact

We expect this rule amendment to result in costs of additional effort to update Interim Action Reports every three years, as well as benefits associated with up-to-date knowledge of UST site and cleanup attributes and site hazard assessment, which also facilitates ongoing assistance in effective cleanup that is protective of human health and the environment. The additional effort is mitigated by the fact that independent interim actions and cleanup actions must already be reported under baseline and that separate independent investigations must be reported under the rule amendments, which is analyzed separately in Section 2.3.16. Those reports can be summarized and referenced.

2.3.15 Expanding cultural resource protection requirements

Baseline

Across multiple state and federal regulations, the baseline sets requirements intended to avoid, minimize, or mitigate impacts of remedial actions on:

- Archeological and historic archeological sites.
- Historic buildings and structures.
- Traditional cultural places.
- Sacred sites.
- Other cultural resources.

These requirements apply to remedial actions conducted by Ecology, and remedial actions funded by Ecology.

Under the baseline, for Ecology-funded cleanups, Ecology is required to consult with the Department of Archaeology and Historic Preservation (DAHP) and with Tribes unless the remedial action is subject to Section 106 review under the National Historic Preservation Act of 1966, as amended ([54 U.S.C. 300101 et seq.](#)). Based on these consultations, cultural resource work plans sometimes required to conduct remedial actions. Under the baseline, inadvertent discovery plans are not explicitly required for any cleanups.

Executive Order 21-02, Archeological and Cultural Resources,²³ directs all Executive Branch and Small Cabinet agencies in their planning and actions related to cultural resources, including, but not limited to:

²³ https://www.governor.wa.gov/sites/default/files/exe_order/eo_21-02.pdf

- Consult with DAHP and affected tribes on the potential effects of projects on cultural resources proposed in state-funded construction or acquisition projects that will not undergo Section 106 review under the National Historic Preservation Act of 1966.
- Initiate consultation with DAHP and affected tribes early in the project planning process, and complete it before the expenditure of any state funds for construction, demolition, or acquisition.
- Take all reasonable action to avoid, minimize, or mitigate adverse effects to archeological and historic archaeological sites.
- Ensure, and provide records to demonstrate to DEHP to demonstrate, that any delegated non-state recipient of state funds completes an adequate consultation process.
- Consult with DAHP and the affected tribes when notified that an archaeological or historic archaeological site, historic building/structure, or traditional/sacred place study is needed before a project may proceed. The purpose of consultation is to seek agreement on studies that must be completed before the expenditure of any state funds for construction or purchase.
- Consult with DAHP or the affected tribes on avoidance strategies and harm minimization, if DAHP or the affected tribes identify a known archaeological or historic archaeological site, historic building/structure, cultural, or sacred place that may be impacted by either direct or indirect effects of an activity.
- Develop mitigation strategies for impacts to historic buildings/structures, and develop mitigation strategies if avoidance cannot be attained for all other cultural resources including archaeological and historic archaeological sites or traditional and sacred places.
- Identify mitigation strategies through consultation with DAHP and the affected tribes.

Adopted

The rule amendments add a section specifying all requirements and other applicable regulations that must be met to protect cultural resources. The amendments expand applicability of cultural resource consultation and inadvertent discovery planning as follows:

- For Ecology-conducted but not funded cleanups, Ecology is required to conduct consultations with DAHP and tribes. Ecology can recover costs from potentially liable persons.
- Based on those consultations, Ecology may require the development and implementation of a cultural resources work plan (e.g., survey or monitoring plan) to identify cultural resources and to avoid, minimize, or mitigate impacts to them. This work plan is implemented and funded by potentially liable persons.
- For all Ecology-conducted, required, or funded cleanups, an inadvertent discovery plan is required that is readily available during all remedial actions and is updated as needed.

Expected impact

We expect these rule amendments to result in additional costs to liable parties, including:

- Consultation costs recovered by Ecology.
- Development and implementation of cultural resources work plans, if required.
- Development of inadvertent discovery plans.

These rule amendments also generate benefits of more comprehensive engagement, planning, and documentation that will reduce likelihood of impacts to cultural resources.

2.3.16 Adding a requirement to report separate independent investigations of a site

Baseline

Under the baseline, independent cleanups of contaminated sites must include an investigation of the site meeting the requirements in the rule. Results of such investigations must be reported to Ecology when reporting interim actions or cleanup actions. Results of investigations do not need to be reported separately to Ecology when they occur.

Adopted

Under the rule amendments, persons conducting independent investigations of contaminated sites are required to submit a separate site investigation report to Ecology if further remedial action does not occur at the site within 90 days of completion of the investigation.

Expected impact

For sites at which further remedial action does not occur within 90 days of completion of independent investigations, this rule amendment will result in marginal costs associated with developing a separate site investigation report. Earlier reporting of site investigations will enable Ecology to better assess and rank the hazards posed by a site to the public and the environment, and to make more informed site prioritization and management decisions. It will also enable the public to better understand the hazards posed by the site to them.

2.3.17 Aligning the rule with current guidance and practice

Baseline

Multiple elements of the baseline necessitate interpretation via guidance, policies, procedures, and implementation memoranda. These interpretations inform current practice. Section 2.2.1, above, summarizes the policy, procedure, guidance, and memorandum documents that inform current practice.

Adopted

The rule amendments add many elements of current practice to the rule, including but not limited to sections related to:

- Coordinating with agencies.
- Conceptual site models.
- Collecting additional information if needed for an initial investigation determination.
- Processes for conducting remedial investigation and feasibility study.
- Groundwater investigations, such as groundwater interface with surface water and the geologic and hydrogeologic impacts on cleanup action alternative implementation.
- The impact of future site uses on cleanup actions.

In many cases, these amendments overlap with baseline or amended requirements affecting internal Ecology operations, or with clarifications of the rule that have no material impact.

Expected impact

Where current practice is the only reasonable interpretation of existing baseline, we do not expect rule amendments that align with current practice to result in costs or benefits beyond clarity.

Where current practice is unclear or undocumented, or multiple possible interpretations or implementations of the baseline are plausible, we discuss the baseline, rule amendments, and expected impacts in relevant sections, above:

- 2.3.6 Emphasizing consideration of populations, overburdened communities, and Tribes explicit, including documentation requirements.
- 2.3.7 Adding documentation of appropriate management of waste generated during investigation to the Remedial Investigation Report.
- 2.3.8 Emphasizing consideration of climate change impacts.
- 2.3.9 Establishing stepwise procedure for Disproportionate Cost Analysis (DCA) and clarifying how public concerns and Tribal interests are considered in DCA.

Chapter 3: Likely Costs of the Rule Amendments

3.1 Introduction

We analyzed 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 include changes that impact only internal Ecology operations (exempt from this analysis under RCW 34.05.328(5)(b)(ii)), or do not materially impact rule requirements:

- Amending internal procedures (procedures internal to Ecology). Including, but not limited to:
 - Initial investigations.
 - Site hazard assessment and ranking.
 - Site listing.
 - Program planning and performance assessment.
 - Public notification and participation.
- Clarifying, correcting, and restructuring the rule, with no material impact.

The rule amendments include the following changes that potentially impact external parties (not just Ecology):

- Adding new definitions to support new requirements.
- Expanding release reporting exemptions.
- Updating release reporting timelines.
- Emphasizing consideration of vulnerable populations, overburdened communities, and Tribes, including documentation requirements.
- Adding documentation of appropriate management of waste generated during investigation to the Remedial Investigation Report.
- Emphasizing consideration of climate change impacts.
- Establishing a stepwise procedure for the Disproportionate Cost Analysis (DCA), and clarifying how public concerns and tribal interests are considered in the DCA.
- Adding documentation requirements in the Feasibility Study report.
- Updating UST site characterization requirements.

- Updating UST free product removal deadline and reporting.
- Modifying demonstrations and documentation of groundwater and vapor intrusion threats in UST interim actions.
- Requiring periodic updates for UST reporting.
- Expanding cultural resource protection requirements.
- Adding a requirement to report separate independent investigations of a site.
- Aligning the rule with current guidance and practice.

3.2.1 Amending internal procedures (procedures internal to Ecology)

Elements of the amended rule that affect only internal government operations are exempt from this analysis under RCW 34.05.328(5)(b)(ii) (“Rules relating only to internal governmental operations that are not subject to violation by a nongovernment party”).²⁴

3.2.2 Clarifying, correcting, and restructuring the rule, with no material impact

We do not expect costs from these rule amendments, as compared to the baseline. See Section 2.3 for discussion.

3.2.3 Adding new definitions to support new requirements

Definitions do not, in and of themselves, have impacts. Their associated costs result from how each definition is used in the rule. Any costs of the rule amendments that involve these new definitions are discussed in their corresponding sections, below.

²⁴ These internal operations and procedures, though not subject to violation by any nongovernment party (and therefore exempt from this analysis), could ultimately have indirect impacts on contaminated site cleanup and on the public. Ecology’s site hazard assessment and ranking, listing and delisting, program planning, and public notice and participation procedures could affect the timing or other aspects of cleanups, which could in turn affect the timing of cleanup costs and benefits and property values. Such indirect impacts (positive or negative) are complex and depend on the specific attributes of sites and their surrounding geographies, populations, and economies.

In particular, certain changes to requirements for public notice and comment periods may appear to reduce opportunities for public input for independent cleanups. These include post-cleanup comment periods for removing sites from the HSL, for amendment or termination of institutional controls, and for periodic post-cleanup reviews required at some sites. However, Ecology believes that improvements in the quality and quantity of information available to the public under the rule, combined with Ecology’s discretion under the baseline to require public comment periods whenever necessary, will offset the effects of reducing routine notice and comment periods under the rule. Further, as under the baseline, the public may continue to provide input to Ecology at any time during the cleanup process.

3.2.4 Expanding release reporting exemptions

We do not expect these rule amendments to result in costs, as compared to the baseline. See Section 2.3 for discussion.

3.2.5 Updating release reporting timelines

We expect this rule amendment to result in minor costs associated with the timing of reporting releases for some sites. At sites that complete a remedial action within 90 days of release, the release will need to be reported separately within 90 days of the release, rather than later once the remedial action has been completed.

We could not confidently assess how frequently this will occur at future sites, or the degree to which report timing will differ. We note, however, these would not be significant additional costs, as compared to the baseline, but rather opportunity costs of expenditures at different times. The table below illustrates the opportunity costs associated with spending a dollar at various times.

Table 7. Relative real cost of a dollar spent at different times.

Delay (years)	Present Value	Difference
0	\$1.00	\$0.00
1	\$0.99	\$0.01
2	\$0.98	\$0.02
3	\$0.97	\$0.03
4	\$0.96	\$0.04

3.2.6 Emphasizing consideration of vulnerable populations, overburdened communities, and Tribes, including documentation requirements

We expect these rule amendments to result in costs of documenting and assuring consideration of concerns and impacts on these specific populations. While the amendments occur throughout the rule, we identified three areas in which they are likely to result in additional effort as compared to the baseline:

- Documenting how vulnerable populations and overburdened communities were considered when conducting a Remedial Investigation, when evaluating cleanup action alternatives in a Feasibility Study, and when selecting a cleanup action in the Cleanup Action Plan.
- Summarizing how the selected cleanup action reflects considerations of public concerns and the rights and interests of Tribes, in Cleanup Action Plan.
- Adding “equitable participation” to the purpose of the Public Participation Plan for Ecology-conducted and Ecology-supervised sites, to a degree commensurate with threats posed by the site to vulnerable populations and overburdened communities.

We estimated a weighted wage of consultants that would be performing this work of \$210 per hour. This reflects weighting of junior, senior, and administrative staff wages (including overhead and profit) as summarized below, plus a 20% markup for direct expenses.

Table 8. Weighted consultant wage.

Category	Hourly Wage	Share of Time	Weighted Wage
Senior	250	0.25	\$62.50
Junior	175	0.50	\$87.50
Admin	100	0.25	\$25.00
Total	n/a	1.0	\$175.00
Total plus direct expenses	n/a	n/a	\$210.00

We assumed the ranges of hours and numbers of sites that would be impacted by the rule amendments, below, and calculated corresponding ranges of annual costs. We assumed:²⁵

- Feasibility Study documentation requirements would impact 16 sites each year – ten percent of the average annual number of sites designated as “No Further Action” (NFA) since the beginning of 2017²⁶. Most of the other NFA sites are this status during the initial investigation. Such actions are typically permanent, and as such, would not require a feasibility study.²⁷
- Public concern and Tribal concern requirements would impact only Ecology-conducted and Ecology-supervised cleanups, of which an average of 40²⁸ sites were awarded No Further Action status each year.
- Equitable participation requirements would impact half of the sites above, or about 20 each year.

Total annual costs would be between \$0.3 million and \$1.4 million.

²⁵ Internal research using data from Ecology’s MTCA Integrated Site Information System (ISIS), and from the US Environmental Protection Agency’s *EJScreen* web site (<https://www.epa.gov/ejscreen/download-ejscreen-data>, accessed January 30, 2018). Based on data through January 2018, 54% of all MTCA sites are located in census block groups at or above the 50th state percentile of nonwhite or Hispanic population.

²⁶ Ecology, 2022. MTCA Integrated Site Information System. Accessed October 19, 2022.

²⁷ We note that the adopted rule amendments include specifications that were not included in the proposed rule amendments: Separately including information on risks to likely vulnerable populations and overburdened communities in the remedial investigation and separately documenting how impacts on such populations were considered when selecting the Cleanup Action Plan. While we added the requirement to separately include this information, we do not expect this additional work to significantly affect our assumed ranges of hours needed to perform this overall effort. We note also that our assumed ranges of hours are sufficiently broad to capture small variances in documentation activity, and small changes would not affect our overall conclusions in this analysis.

²⁸ Ecology, 2022. MTCA Integrated Site Information System. Accessed October 19, 2022.

Table 9. Costs of making consideration of vulnerable populations, overburdened communities, and Tribes explicit; adding documentation requirements.

Amendment	Hours (low)	Hours (high)	Annual Cost per Site (low)	Annual Cost per Site (high)	Sites per Year	Annual Cost (low)	Annual Cost (high)
Feasibility Study Documentation	30	80	\$6,300	\$16,800	16	\$100,800	\$268,800
Public and Tribal concern summary	20	40	\$4,200	\$8,400	40	\$168,000	\$336,000
Equitable participation	10	200	\$2,100	\$42,000	20	\$42,000	\$840,000
Total	n/a	n/a	n/a	n/a	n/a	\$310,800	\$1,444,800

Ecology considers costs and benefits of rulemakings on a 20-year timescale, using present value calculations. Present values discount future values using a discount rate based on the long-run average risk-free rate of return, which is currently 0.89%²⁹, and add them into a single value for comparison.

The total 20-year present value of the range of the three types of cost under these amendments would be between \$5.7 million and \$26.6 million. We note that the likelihood of these costs is not distributed uniformly across this range: Under the baseline a large part of these requirements is likely to already be met, as part of protection of public health and the environment – this inherently includes understanding impacts to vulnerable populations, overburdened communities, and the rights and interests of Tribes – so we expect these costs are more likely to fall toward the low end of this range. Moreover, the majority of sites are relatively simple, further indicating that costs are likely toward the low end of this range.

3.2.7 Adding documentation of appropriate management of waste generated during investigation to the Remedial Investigation Report

We do not expect this rule amendment to result in significant new costs or benefits arising from additional documentation because this information is routinely required in practice by Ecology site managers, as part of additional Remedial Investigation information requested, which is allowed under the baseline rule.

3.2.8 Emphasizing consideration of climate change impacts

We expect this rule amendment to result in costs of documenting and assuring consideration of climate change resilience during the development and selection of cleanup action alternatives in the feasibility study, to the extent that is not already done. Under the baseline, however, we

²⁹ US Treasury Department, 2022. I bond interest rates. Historic average September 1998 through November 2022. <https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.>

expect that likely climate change impacts are already a consideration in determining the protectiveness and long-run effectiveness of cleanup actions, so we do not expect that this amendment will result in significant additional costs, but rather an emphasis and focus to comprehensively verify this work is being done.

3.2.9 Establishing a stepwise procedure for Disproportionate Cost Analysis (DCA), and clarifying how public concerns and tribal interests are considered in DCA

We do not expect these rule amendments to result in costs, as compared to the baseline. See Section 2.3 for discussion.

3.2.10 Adding documentation requirements in the Feasibility Study report

We expect the rule amendments to result in costs associated with additional documentation of nonconformance with expectations and summary of Remedial Investigation results.

We estimated a weighted wage of consultants that would be performing this work of \$210 per hour. This reflects weighting of junior, senior, and administrative staff wages (including overhead and profit) as summarized below, plus a 20% markup for direct expenses. (See Table 2 for calculation.)

We assumed the following ranges of hours and numbers of sites that would be impacted by the rule amendments and calculated corresponding ranges of annual costs. We assumed these amendments would impact 10 sites each year. This number is based on Ecology experience, but is inherently uncertain, as much of this information is not currently required or known. Total annual costs would be between \$42,000 and \$84,000.

Table 10. Costs of adding documentation requirements in the Feasibility Study.

Hours (low)	Hours (high)	Annual Cost per Site (low)	Annual Cost per Site (high)	Sites per Year	Annual Cost (low)	Annual Cost (high)
20	40	\$4,200	\$8,400	10	\$42,000	\$84,000

Ecology considers costs and benefits of rulemakings on a 20-year timescale, using present value calculations. Present values discount future values using a discount rate based on the long-run average risk-free rate of return, which is currently 0.89%³⁰, and add them into a single value for comparison.

The total 20-year present value of the range of the three types of cost under these amendments would be between \$0.8 million and \$1.5 million. We note that the likelihood of

³⁰ Ibid.

these costs is not distributed uniformly across this range: The majority of sites are relatively simple compared to the most complex, indicating that costs are likely toward the low end of this range.

3.2.11 Updating UST site characterization requirements

We expect these rule amendments to result in costs associated with characterizing the potential for vapor intrusion. This would include costs of additional time and effort for site characterization. We estimated this cost as part of overall costs related to vapor intrusion (see Section 3.2.13).

3.2.12 Updating UST free product removal deadline, monitoring, and reporting

We expect these rule amendments to result in costs associated with earlier removal of free product, at UST sites that currently take longer than 30 days. They will also result in costs associated with quarterly monitoring and reporting.

30-day time limit

We could not confidently assess how frequently it takes sites longer than 30 days to begin removal of free product, or how much longer they take. We note, however, these would not be additional costs, as compared to the baseline, but rather opportunity costs of expenditures at different times. The table below illustrates the opportunity costs associated with spending a dollar at various times.

Table 11. Relative real cost of a dollar spent at different times.

Delay (years)	Present Value	Difference
0	\$1.00	\$0.00
1	\$0.99	\$0.01
2	\$0.98	\$0.02
3	\$0.97	\$0.03
4	\$0.96	\$0.04

Quarterly monitoring

Based on past experience, Ecology believes that in the absence of a requirement in the MTCA Cleanup Regulations for quarterly monitoring and/or removal of free product at UST sites, some site owners/operators have monitored and/or removed free product less than quarterly. We could not confidently predict the number of sites that would continue to remove and/or monitor less than quarterly if the rule amendments were not adopted. Further, the cost of any additional monitoring and/or removal of free product can vary from site to site. Therefore, we have estimated a likely range of monitoring costs associated with this rule amendment as summarized below, with total annual costs of between \$16,000 and \$225,000.

Table 12. Free product monitoring costs.

Frequency or Cost	Low	High
Total UST sites with free product monitoring or removal and reporting (M/RR) events in any year	8	15
Current share of sites with free product but fewer than quarterly M/RR events	20%	50%
Annual additional M/RR events per site where needed to achieve quarterly reporting	2	3
Cost per additional M/RR event	\$5,000	\$10,000
Total additional annual cost to comply with quarterly M/RR requirement	\$16,000	\$225,000

The above costs could be mitigated if Ecology allows free product removal and/or monitoring to occur less frequently.

Quarterly progress reports

We estimated costs of quarterly progress reports based on ranges of additional effort necessary.

We based the weighted wage of consultants that would be performing this work of \$210 per hour. This reflects weighting of junior, senior, and administrative staff wages (including overhead and profit) as summarized below, plus a 20% markup for direct expenses. (See Table 2 for calculation.)

We assumed the following ranges of hours and numbers of sites that would be impacted by the rule amendments and calculated corresponding ranges of annual costs. We assumed these amendments would impact 12 sites each year based on statewide experience in recent years.³¹ Total annual costs would be between approximately \$40,000 and \$81,000.

Table 13. Costs of amending UST free product removal deadline and reporting.

Hours (low)	Hours (high)	Annual Cost per Site (low)	Annual Cost per Site (high)	Sites per Year	Annual Cost (low)	Annual Cost (high)
16	32	\$3,360	\$6,720	12	\$40,320	\$80,640

Ecology considers costs and benefits of rulemakings on a 20-year timescale, using present value calculations. Present values discount future values using a discount rate based on the long-run average risk-free rate of return, which is currently 0.89%³², and add them into a single value for

³¹ The median of the 8 and 15 site range assumed to be monitoring free product in any given year is 11.5. We rounded this up to 12 sites per year.

³² US Treasury Department, 2022. I bond interest rates. Historic average September 1998 through November 2022. <https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.>

comparison. The total present value of this free product removal deadline and reporting cost is between \$0.7 million and \$1.5 million.

Total present value costs

The total 20-year present value of the range of the three types of cost under these amendments would be between \$1.0 million and \$5.6 million. We note that the likelihood of these costs is not distributed uniformly across this range: The majority of sites are relatively simple compared to the most complex, indicating that costs are likely toward the low end of this range.

The above costs could be mitigated to some degree if Ecology determines free product reporting may occur less frequently.

3.2.13 Modifying demonstrations and documentation of groundwater and vapor intrusion threats in UST interim actions

We expect these rule amendments to result in costs associated with developing the demonstrations and documenting them in Interim Action Reports for UST sites.

We based the weighted wage of consultants that would be performing this work of \$210 per hour. This reflects weighting of junior, senior, and administrative staff wages (including overhead and profit) as summarized below, plus a 20% markup for direct expenses. (See Table 2 for calculation.)

We assumed the following ranges of hours and numbers of sites that would be impacted by the rule amendments and calculated corresponding ranges of annual costs. We assumed amendments related to groundwater would impact half of the average 78 new leaking UST sites identified each year.³³ We assumed vapor intrusion related amendments would impact 75% of the average 78 new leaking UST sites identified each year.³⁴ Total annual costs would be between \$0.2 million and \$0.6 million.

Table 14. Costs of adding groundwater threat and vapor intrusion to UST interim action reports.

Amendments	Hours (low)	Hours (high)	Annual Cost per Site (low)	Annual Cost per Site (high)	Sites per Year	Annual Cost (low)	Annual Cost (high)
Groundwater	20	40	\$4,200	\$8,400	39	\$163,800	\$327,600
Vapor intrusion	5	20	\$1,050	\$4,200	59	\$61,950	\$247,800
Total	n/a	n/a	n/a	n/a	n/a	\$225,750	\$575,400

Ecology considers costs and benefits of rulemakings on a 20-year timescale, using present value calculations. Present values discount future values using a discount rate based on the long-run

³³ Ecology, Leaking Underground Storage Tank Cleanup Dashboard, accessed February 3, 2023.

³⁴ Ibid.

average risk-free rate of return, which is currently 0.89%³⁵, and add them into a single value for comparison.

The total 20-year present value of the range of the three types of cost under these amendments would be between \$4.2 million and \$10.6 million. We note that the likelihood of these costs is not distributed uniformly across this range: The majority of sites are relatively simple compared to the most complex, indicating that costs are likely toward the low end of this range.

3.2.14 Requiring periodic updates for UST reporting

We expect this rule amendment to result in costs of additional effort to update Interim Action Reports every three years.

We based the weighted wage of consultants that would be performing this work of \$210 per hour. This reflects weighting of junior, senior, and administrative staff wages (including overhead and profit) as summarized below, plus a 20% markup for direct expenses. (See Table 2 for calculation.)

We assumed the following ranges of hours and numbers of sites that would be impacted by the rule amendments and calculated corresponding ranges of annual costs. We assumed these amendments would impact 2,161 leaking UST sites that currently have with “awaiting cleanup” or “cleanup started” status and that are not receiving technical assistance from PLIA or Ecology’s voluntary cleanup program³⁶. Sites will report every three years. Total annual costs would be between \$1.2 million and \$6.0 million.

Table 15. Costs of requiring periodic updates for UST reporting.

Hours (low)	Hours (high)	Annual Cost per Site (low)	Annual Cost per Site (high)	Sites per Year	Annual Cost (low)	Annual Cost (high)
8	40	\$1,680	\$8,400	720	\$1,209,600	\$6,048,000

Ecology considers costs and benefits of rulemakings on a 20-year timescale, using present value calculations. Present values discount future values using a discount rate based on the long-run average risk-free rate of return, which is currently 0.89%³⁷, and add them into a single value for comparison.

³⁵ US Treasury Department, 2022. I bond interest rates. Historic average September 1998 through November 2022. <https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.>

³⁶ Ecology, 2022. MTCA Integrated Site Information System. Accessed October 19, 2022.

³⁷ US Treasury Department, 2022. I bond interest rates. Historic average September 1998 through November 2022. <https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.>

The total 20-year present value of the range of the three types of cost under these amendments would be between \$22.3 million and \$111.3 million. We note that the likelihood of these costs is not distributed uniformly across this range: The majority of sites are relatively simple compared to the most complex, indicating that costs are likely toward the low end of this range.

3.2.15 Expanding cultural resource protection requirements

We expect these rule amendments to result in additional costs to liable parties, including:

- Consultation costs recovered by Ecology.
- Development and implementation of cultural resources work plans, if required.
- Development of inadvertent discovery plans.

We based the weighted wage of consultants that would be performing this work of \$210 per hour. This reflects weighting of junior, senior, and administrative staff wages (including overhead and profit) as summarized below, plus a 20% markup for direct expenses. (See Table 2 for calculation.)

We assumed the following ranges of hours and numbers of sites that would be impacted by the rule amendments and calculated corresponding ranges of annual costs. Based on the experience of Ecology cultural resources staff, we assumed the amendments would require the following additional work:

- 15 additional consultations with the Department of Archaeology and Historic Preservation (DAHP) and Tribes.³⁸
- 5 additional sites requiring the development of cultural resources work plans.³⁹
- 22 sites requiring the development of inadvertent discovery plans.⁴⁰

Total annual costs would be between \$0.1 million and \$0.3 million.

³⁸ Assuming 7 sites required under the baseline Executive Order 21-02, increasing to 22 sites under the rule amendments.

³⁹ One-third of sites requiring consultations.

⁴⁰ Assuming zero sites requiring plans under the baseline, increasing to 22 sites under the rule amendments.

Table 16. Cost of expanding cultural resource protection requirements.

Amendment	Hours (low)	Hours (high)	Annual Cost per Site (low)	Annual Cost per Site (high)	Sites per Year	Annual Cost (low)	Annual Cost (high)
Cultural resource consultations ^a	3	10	\$630	\$2,100	15	\$9,450	\$31,500
Cultural resource work plans ^b	10	35	\$2,100	\$7,350	5	\$10,500	\$36,750
Inadvertent discovery plans	20	40	\$4,200	\$8,400	22	\$92,400	\$184,800
Total	n/a	n/a	n/a	n/a	n/a	\$112,350	\$253,050

^a Actual hours spent would be specific to the parties involved in consultations.

^b Actual hours spent would be specific to the number and types of cultural resources affected, and additional elements such as monitoring and data recovery.

Ecology considers costs and benefits of rulemakings on a 20-year timescale, using present value calculations. Present values discount future values using a discount rate based on the long-run average risk-free rate of return, which is currently 0.89%⁴¹, and add them into a single value for comparison.

The total 20-year present value of the range of the three types of cost under these amendments would be between \$2.1 million and \$4.7 million. We note that the likelihood of these costs is not distributed uniformly across this range: The majority of sites are relatively simple compared to the most complex, indicating that costs are likely toward the low end of this range.

3.2.16 Adding a requirement to report separate independent investigations of a site

For sites at which remedial action does not occur within 90 days of completion of independent investigations, this rule amendment will result in costs associated with developing a separate site investigation report.

We based the weighted wage of consultants that would be performing this work of \$210 per hour. This reflects weighting of junior, senior, and administrative staff wages (including overhead and profit) as summarized below, plus a 20% markup for direct expenses. (See Table 2 for calculation.)

⁴¹ US Treasury Department, 2022. I bond interest rates. Historic average September 1998 through November 2022. <https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.>

We assumed the following ranges of hours and numbers of sites that would be impacted by the rule amendments and calculated corresponding ranges of annual costs. We assumed amendments related to separate independent Remedial Investigation Reports would impact one-third of the average of 80 Voluntary Cleanup Program or PLIA sites that receive “no further action” status each year.⁴² Total annual costs would be between \$57,000 and \$113,000.

Table 17. Costs of adding a separate Remedial Investigation Report for independent remedial actions.

Amendments	Hours (low)	Hours (high)	Annual Cost per Site (low)	Annual Cost per Site (high)	Sites per Year	Annual Cost (low)	Annual Cost (high)
Separate reports	10	20	\$2,100	\$4,200	27	\$56,700	\$113,400

Ecology considers costs and benefits of rulemakings on a 20-year timescale, using present value calculations. Present values discount future values using a discount rate based on the long-run average risk-free rate of return, which is currently 0.89%⁴³, and add them into a single value for comparison.

The total 20-year present value of the range of the three types of cost under these amendments would be between \$1.0 million and \$2.1 million. We note that the likelihood of these costs is not distributed uniformly across this range: The majority of sites are relatively simple compared to the most complex, indicating that costs are likely toward the low end of this range.

3.2.17 Aligning the rule with current guidance and practice

Where current practice is the only reasonable interpretation of the baseline, based on existing practice, Ecology experience implementing the rule, and stakeholder engagement, we do not expect amendments that align with current practice to result in costs.

Where current practice is unclear or undocumented, or multiple possible interpretations or implementations of the baseline are plausible, we discuss the likely costs in relevant sections, above:

- 3.2.6 Emphasizing consideration of populations, overburdened communities, and Tribes explicit, including documentation requirements.
- 3.2.7 Adding documentation of appropriate management of waste generated during investigation to the Remedial Investigation Report.

⁴² Ecology, 2022. MTCA Integrated Site Information System. Accessed October 19, 2022.

⁴³ US Treasury Department, 2022. I bond interest rates. Historic average September 1998 through November 2022. <https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.>

- 3.2.8 Emphasizing consideration of climate change impacts.
- 3.2.9 Establishing stepwise procedure for Disproportionate Cost Analysis (DCA) and clarifying how public concerns and Tribal interests are considered in DCA.

Chapter 4: Likely Benefits of the Rule Amendments

4.1 Introduction

We analyzed the likely benefits 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.

4.2 Benefits analysis

The rule amendments include changes that will impact only internal Ecology operations (exempt from this analysis under RCW 34.05.328(5)(b)(ii)), or do not materially impact rule requirements:

- Amending internal procedures (procedures internal to Ecology). Including, but not limited to:
 - Initial investigations.
 - Site hazard assessment and ranking.
 - Site listing.
 - Program planning and performance assessment.
 - Public notification and participation.
- Clarifying, correcting, and restructuring the rule, with no material impact.

The rule amendments include the following changes that potentially impact external parties (not just Ecology):

- Adding new definitions to support new requirements.
- Expanding release reporting exemptions.
- Updating release reporting timelines.
- Emphasizing consideration of vulnerable populations, overburdened communities, and Tribes, including documentation requirements.
- Adding documentation of appropriate management of waste generated during investigation to the Remedial Investigation Report.
- Emphasizing consideration of climate change impacts.
- Establishing a stepwise procedure for the Disproportionate Cost Analysis (DCA), and clarifying how public concerns and tribal interests are considered in the DCA.
- Adding documentation requirements in the Feasibility Study report.
- Updating UST site characterization requirements.

- Updating UST free product removal deadline and reporting.
- Modifying demonstrations and documentation of groundwater and vapor intrusion threats in UST interim actions.
- Requiring periodic updates for UST reporting.
- Expanding cultural resource protection requirements.
- Adding a requirement to report separate independent investigations of a site.
- Aligning the rule with current guidance and practice.

4.2.1 Amending internal procedures (procedures internal to Ecology), with or without external impact

Where amendments to internal operations are unlikely to result in impacts external to Ecology, we do not expect them to result in costs or benefits beyond internal efficiencies or clarity. Elements of the amended rule that affect only internal government operations are exempt from this analysis under RCW 34.05.328(5)(b)(ii) (“Rules relating only to internal governmental operations that are not subject to violation by a nongovernment party”).

Other amendments to internal Ecology operations are likely to result in external impacts – although they are not subject to violation by nongovernmental parties – and are therefore of interest to this analysis. See footnote in Chapter 2 for discussion.

4.2.2 Clarifying, correcting, and restructuring the rule, with no material impact

We do not expect benefits from these rule amendments, beyond clarity that facilitates understanding of the rule requirements.

4.2.3 Adding new definitions to support new requirements

Definitions do not, in and of themselves, have impacts. Their associated benefits result from how each definition is used in the rule. Any benefits of the rule amendments that involve these new definitions are discussed in their corresponding sections, below.

4.2.4 Expanding release reporting exemptions

We expect this rule amendment to result in benefits of avoided reporting costs for releases previously reported to the division of emergency management and to PLIA.

We assumed the following ranges of hours and numbers of sites that would be impacted by this rule amendment and calculated corresponding ranges of annual benefits. Between July 2015 and March 2022, there were 3,080 oil spills to water reported to Ecology, averaging 456 spills

each year.⁴⁴ While this does not reflect all releases, we assumed this would be a minimum reflection of affected releases, as RCW 90.56.280 covers reporting of releases of oil and other hazardous substances to waters to the emergency management division.

We also included releases that were reported to PLIA, estimated at an average of 263 per year. This reflects reports in conjunction with requests to PLIA for financial and/or technical assistance with heating oil tank sites.⁴⁵

We estimated the wage of individuals performing this work using the median hourly wage for “Petroleum Pump System Operators, Refinery Operators, and Gaugers” of \$51.81⁴⁶ as these releases might occur during oil transportation or transfer. Total annual benefits (avoided costs) would be between \$19,000 and \$37,000.

Table 18. Benefits of expanding reporting exemptions.

Hours (low)	Hours (high)	Annual Benefit per Site (low)	Annual Benefit per Site (high)	Sites per Year	Annual Benefit (low)	Annual Benefit (high)
0.5	1.0	\$25.91	\$51.81	719	\$18,633	\$37,267

Ecology considers costs and benefits of rulemakings on a 20-year timescale, using present value calculations. Present values discount future values using a discount rate based on the long-run average risk-free rate of return, which is currently 0.89%⁴⁷, and add them into a single value for comparison.

The total 20-year present value of the range of benefits under this amendment would be between \$0.3 million and \$0.7 million.

4.2.5 Updating release reporting timelines

We expect this rule amendment to result in benefits of comprehensive and timely knowledge of releases, regardless of whether remedial action has been taken, and support uniformity of site assessment and ranking under the newly adopted process. Earlier reporting of releases will enable Ecology to better assess and rank the hazards posed by a site to the public and the environment, and to make more informed site prioritization and management decisions.

⁴⁴ WA Department of Ecology, 2023. Reported spills to water (one gallon or more). Underlying spill incident map data. https://apps.ecology.wa.gov/coastalatlas/storymaps/spills/spills_sm.html?&Tab=nt3

⁴⁵ WA Pollution Liability Insurance Agency, 2022. PLIA Book, page 2. December 2022. <https://plia.wa.gov/wp-content/uploads/Current-PLIA-Book.pdf>

⁴⁶ US Bureau of Labor Statistics, 2022. May 2021 State Occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2023. Consumer Price Index, all urban consumers. <https://www.bls.gov/cpi/data.htm>

⁴⁷ US Treasury Department, 2022. I bond interest rates. Historic average September 1998 through November 2022. <https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.>

4.2.6 Emphasizing consideration of vulnerable populations, overburdened communities, and Tribes, including documentation requirements

We expect these rule amendments to result in benefits arising from documenting and assuring consideration, including potential higher engagement as a result of needing to provide documentation, and improved environmental justice.

Under the baseline, including its interpretation in guidance, site managers are required to consider impacts of remedial options on vulnerable populations, overburdened communities, and Tribes. While this is not explicitly stated throughout the rule and laws, baseline requirements include protecting public health and accounting for public concerns. This is understood to include vulnerable populations, overburdened communities, and Tribes, as they are part of the public. However, because there is no requirement to systematically document these considerations, we do not know how consistently or effectively site managers meet these requirements.

Documentation requirements help assure that consideration of vulnerable populations, overburdened communities, and Tribes is being consistently and successfully applied in MTCA compliance and site cleanup. Consideration of these groups could result in improved understanding of the impacts of contamination and cleanup.⁴⁸ Improved understanding could, in turn, result in earlier or different cleanup of sites affecting these communities.

The table below provides examples of the present value of each dollar's worth of benefits occurring earlier. The percentage values reflect a 0.89% discount rate⁴⁹ (rate of time preference) that accounts for inflation and opportunity costs over time and is an estimate of the rate at which people are willing to trade off value at different points in time.

Table 19. Increases in present value due to earlier versus later occurrence of benefits.

Delay (years)	Present Value	Difference
0	\$1.00	\$0.00
1	\$0.99	\$0.01
2	\$0.98	\$0.02
3	\$0.97	\$0.03
4	\$0.96	\$0.04
5	\$0.95	\$0.05

⁴⁸ Note that these impacts can be highly complex and extend through the life of the site and beyond. See, e.g., <https://journals.sagepub.com/doi/abs/10.1177/0885412215610491?journalCode=jplb> or <https://www.aeaweb.org/articles?id=10.1257/aer.101.3.620> for discussion.

⁴⁹ US Treasury Department, 2022. I bond interest rates. Historic average September 1998 through November 2022. <https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.>

The table above does not, however, reflect any increases in the risks associated with a site with delayed cleanup. If delays result in increased exposure, or more people exposed to hazardous chemicals, the differences above would be higher.

We could not confidently estimate the number of sites that could potentially be reprioritized or differently addressed due to consideration of vulnerable populations, overburdened communities, and Tribal rights and interests. This is particularly the case because consideration of these populations is implicit in baseline rule requirements, though only infrequent documentation confirms that these considerations are happening. Both the frequency and degree of this impact are highly uncertain, site specific, and community specific. We can, however, observe how estimated costs of the rule amendments could be balanced with benefits occurring earlier for these communities.

Comparing the quantifiable total annual costs of these rule amendments, estimated in Chapter 3 as between \$0.3 million and \$1.4 million, the table below summarizes the total public benefits (health and environmental values) that would generate equivalent benefits increases by occurring sooner. Recall that since most sites are relatively simple, and because many of the activities underlying quantitative costs are likely already performed under the baseline to some degree, true total costs are likely to be closer to the low \$0.3 million end of this range.

Table 20. Cost-equivalent public benefits of sites with improved protection due to documented community involvement, by degree of earlier benefit achievement (millions).

Delay (years)	Low	High
1	\$34.92	\$162.34
2	\$17.36	\$80.72
3	\$11.55	\$53.71
4	\$8.61	\$40.02
5	\$6.86	\$31.89

For illustration, a 2021 study found that living near superfund sites reduces life expectancy by 1.22 years in census tracts with “high sociodemographic disadvantage.”⁵⁰ The study used life expectancy as a proxy for overall health and quality of life. Considering the average value of a statistical life (scaled value of avoided mortality risk) of \$11.1 million,⁵¹ and average US life expectancy of 76.1 years,⁵² 1.22 years would reflect the average equivalent of nearly \$178,000.

We note that proximity to superfund sites likely bears greater or different risks to public health than the typical MTCA site, as superfund sites are typically large sites affected by historic

⁵⁰ Kiaghadi, A, HS Rifai, and CN Dawson, 2021. The presence of Superfund sites as a determinant of life expectancy in the United States. *Nature Communications* 12:1947. <https://doi.org/10.1038/s41467-021-22249-2>.

⁵¹ US Environmental Protection Agency, 2022. Mortality Risk Valuation. March 30, 2022. <https://www.epa.gov/environmental-economics/mortality-risk-valuation>; US Bureau of Labor Statistics, 2023. Consumer Price Index, all urban consumers. <https://www.bls.gov/cpi/data.htm>

⁵² Arias, E, B Tejada-Vera, KD Kochanek, and FB Ahmad, 2022. Provisional life expectancy estimates for 2021. *NVSS Vital Statistics Rapid Release*. Report no. 23, August 2022.

industrial activity. We therefore made the conservative assumption that reduction in life expectancy for this comparison could be 10 percent of this impact, or an equivalent value of avoided mortality of \$17,800, or the equivalent of about 1.5 months. The table below summarizes the populations annually avoiding this drop in life expectancy earlier, that would balance estimated costs of these rule amendments.

Table 21. Total-cost-equivalent populations avoiding life expectancy reduction due to sites with improved protection due to documented community involvement, by degree of earlier benefit achievement.

Delay (years)	Low	High
1	1,962	9,123
2	976	4,536
3	649	3,018
4	484	2,249
5	386	1,792

Vulnerable populations and overburdened communities are more likely to live near MTCA sites than the rest of the public. One reflection of this is a comparison of where these populations live and the locations of MTCA sites.

Environmental Health Disparities and MTCA site maps

The Washington State Department of Health (DOH) Environmental Health Disparities (EHD) map⁵³ evaluates environmental health risk factors in communities, using a model adapted from CalEnviroScreen — a cumulative environmental impacts assessment mapping tool developed by CalEPA and used in California. The model estimates a cumulative environmental health impact score for each census tract reflecting pollutant exposures and factors that affect people’s vulnerability to environmental pollution. The model is based on a conceptual formula of risk being the product of threat and vulnerability, where threat and vulnerability are based on several indicators.

Threat is represented by indicators that account for pollution burden, which is a combination of environmental effects and environmental exposures in communities. Environmental effects include indicators that account for adverse environmental quality generally, even when population contact with an environmental hazard is unknown or uncertain. Environmental exposures include the levels of certain pollutants that populations come into contact with.

Vulnerability is represented by indicators of socioeconomic factors and sensitive populations for which there is clear evidence that they may affect susceptibility or vulnerability to an increased pollution burden. Indicators in socioeconomic factors measure population characteristics that modify the pollution burden itself. Sensitive populations refer to those who are at greater risk due to intrinsic biological vulnerability to environmental stressors.

⁵³ WA Department of Health, 2022a. Washington Tracking Network, Environmental Health Disparities Map. <https://fortress.wa.gov/doh/wtnibl/WTNIBL/>

The rankings help to compare health and social factors that may contribute to disparities in a community. Rankings should not be interpreted as absolute values. Instead, the relationships within and between map layers help to identify where the adopted rule will generate benefits with greater focus on vulnerable populations and overburdened communities. A higher rank generally reflects a higher combined threat and vulnerability to the depicted variable.

The figures below show EHD rankings across the state and with more detail in the Puget Sound region.

Figure 1. EHD rankings, Washington.

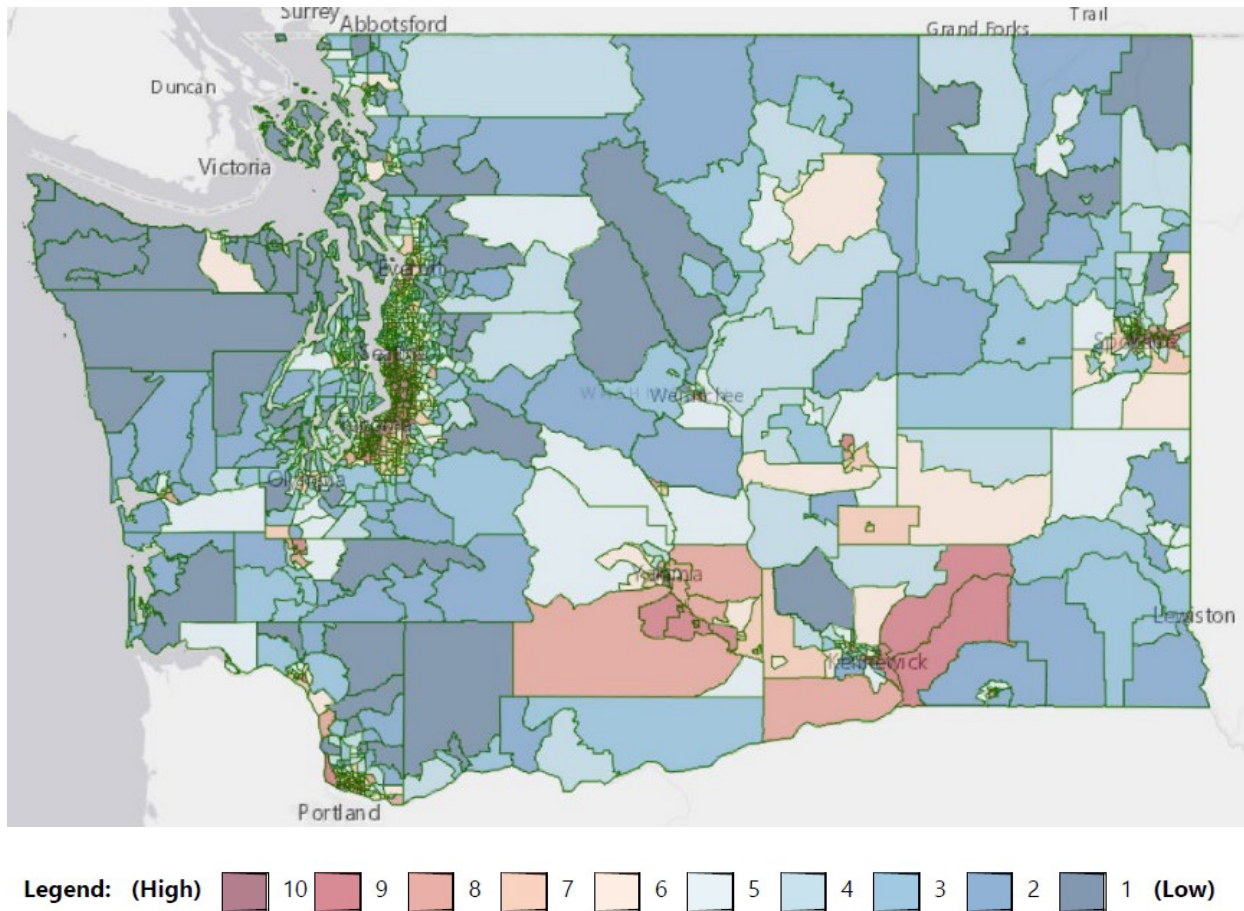
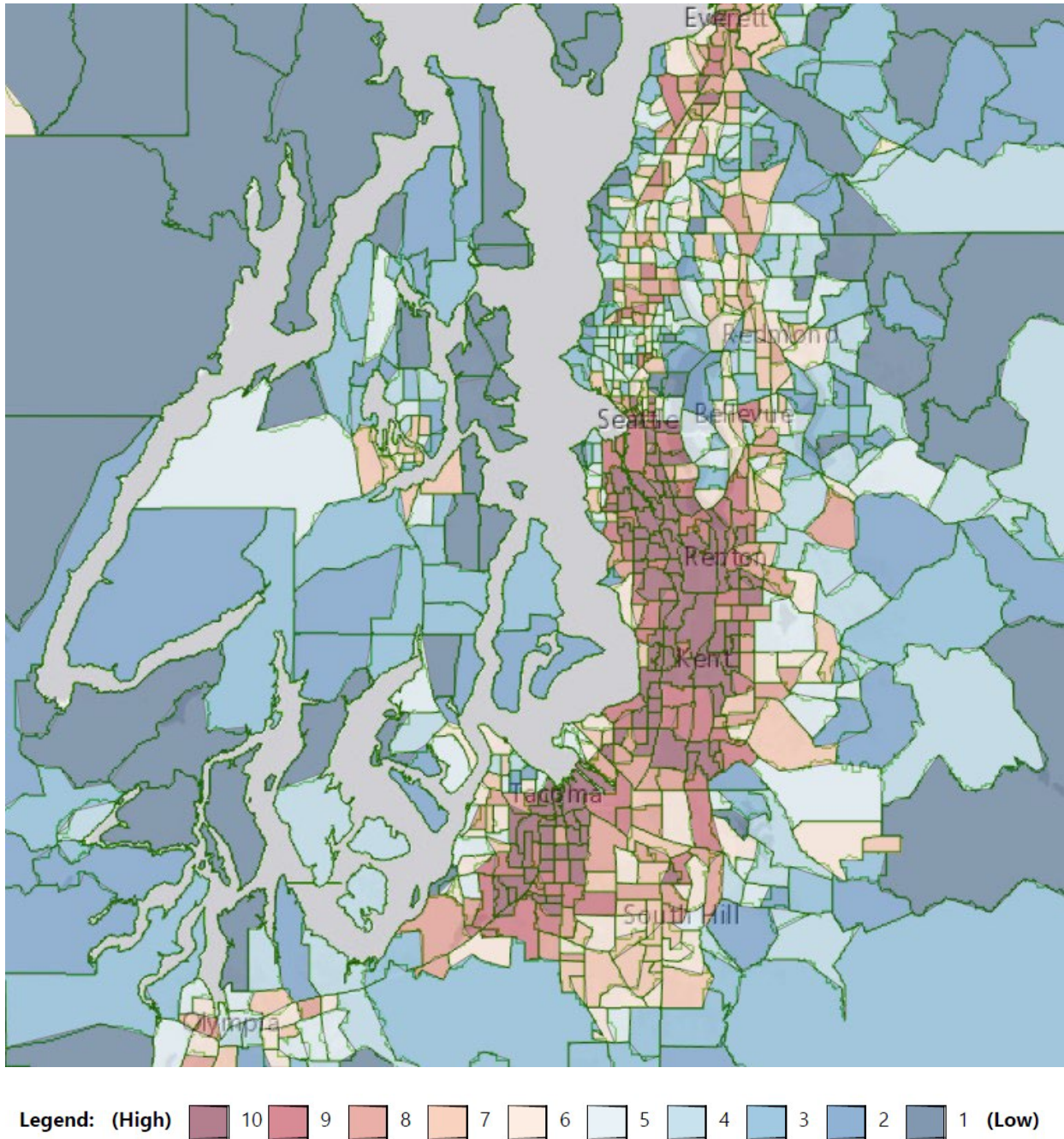


Figure 2. EHD rankings, Puget Sound region.



The EHD map also allows us to view rankings of toxic releases from facilities, shown below across the state and with more detail in the Puget Sound region.⁵⁴

⁵⁴ <https://fortress.wa.gov/doh/wtnibl/WTNIBL/>

Figure 3. Toxic releases from facilities, Washington.

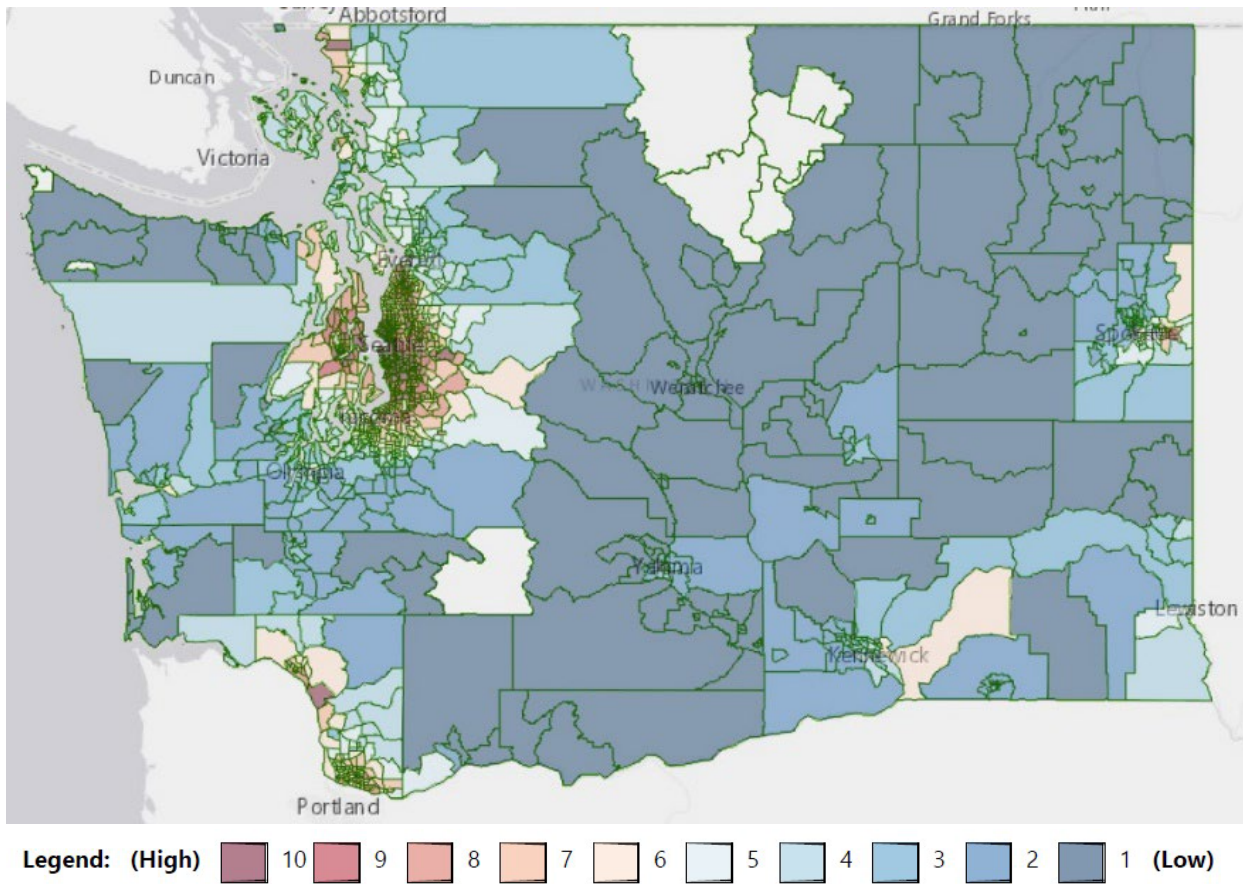
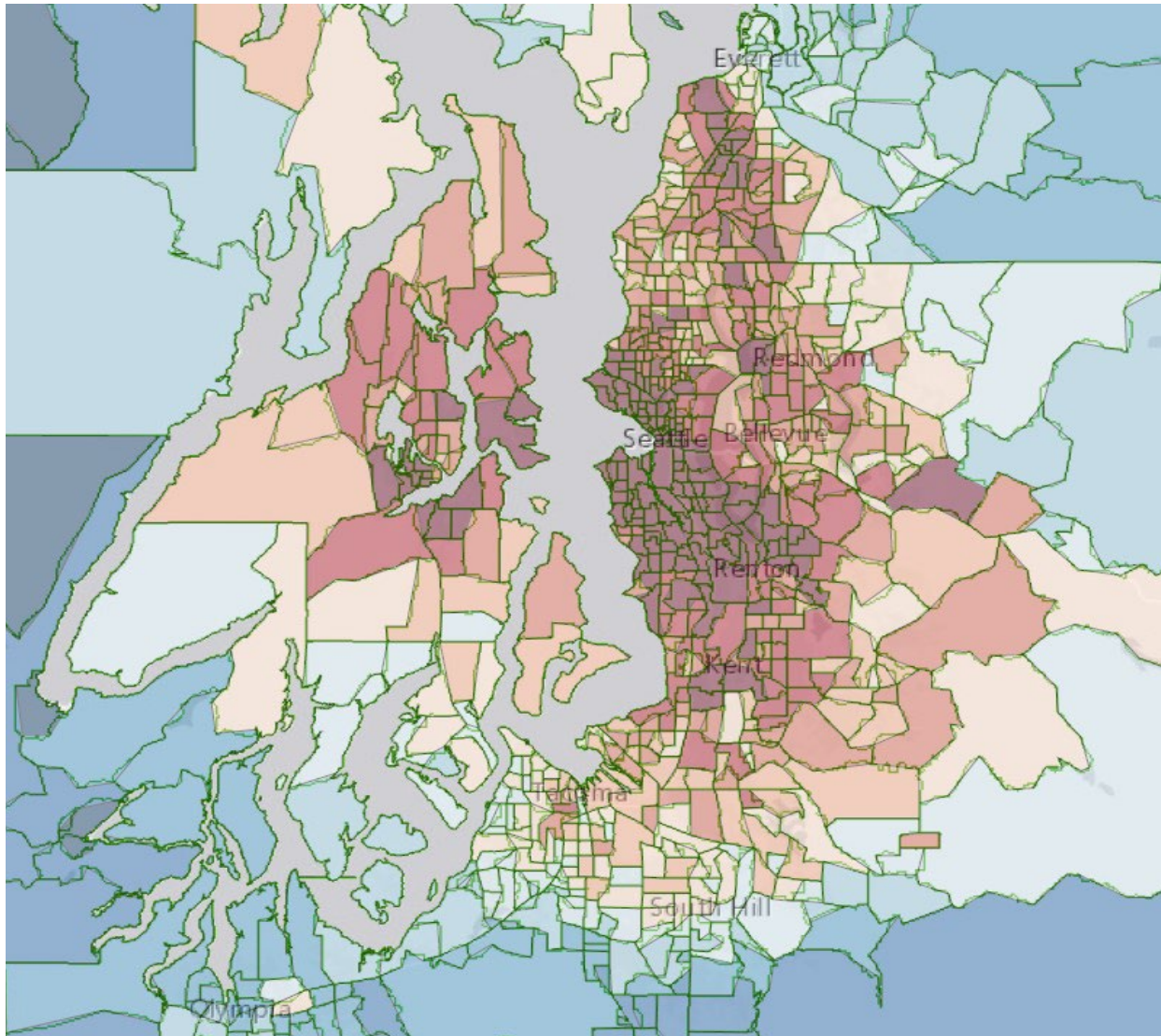


Figure 4. Toxic releases from facilities, Puget Sound region.



Legend: (High) 10 9 8 7 6 5 4 3 2 1 (Low)

The figures below show the locations of MTCA sites (excluding those designated as “No Further Action”) across geographies corresponding to the maps above.⁵⁵

⁵⁵ Ecology, 2023. What’s in my neighborhood: Toxics Cleanup. Mapping site.
<https://apps.ecology.wa.gov/neighborhood/?lat=47.500000&lon=-121.000000&zoom=7&radius=false>

Figure 5. MTCA sites, Washington, excluding No Further Action.

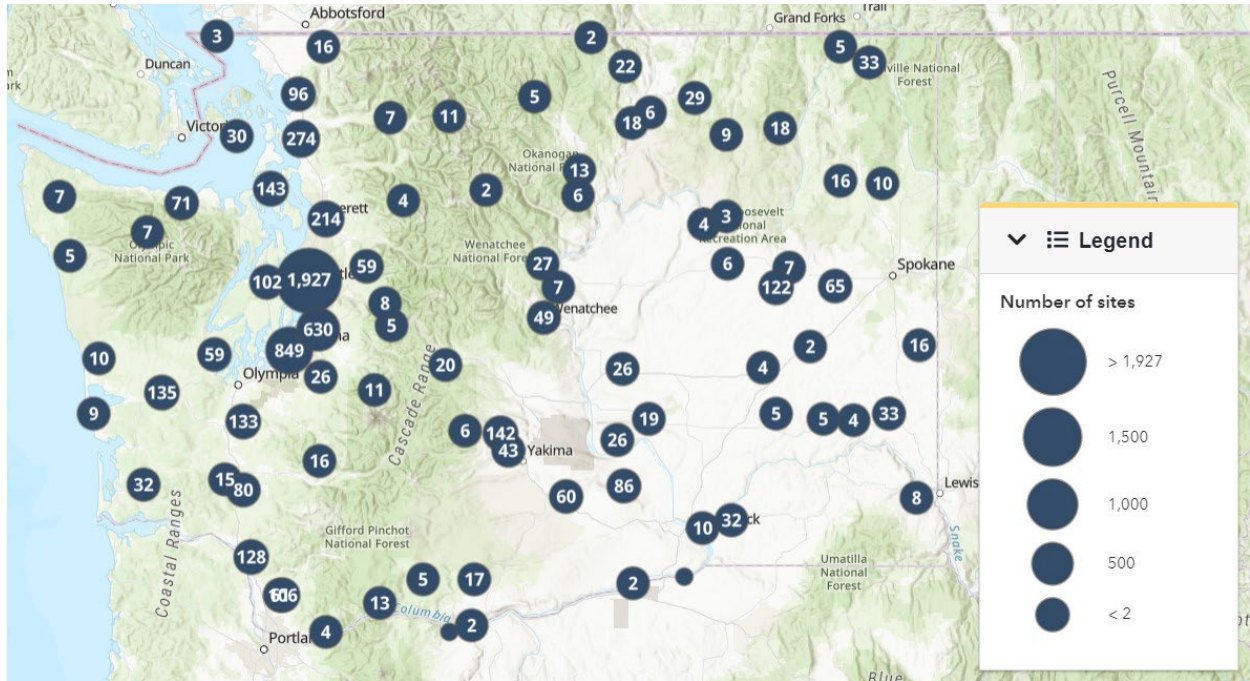
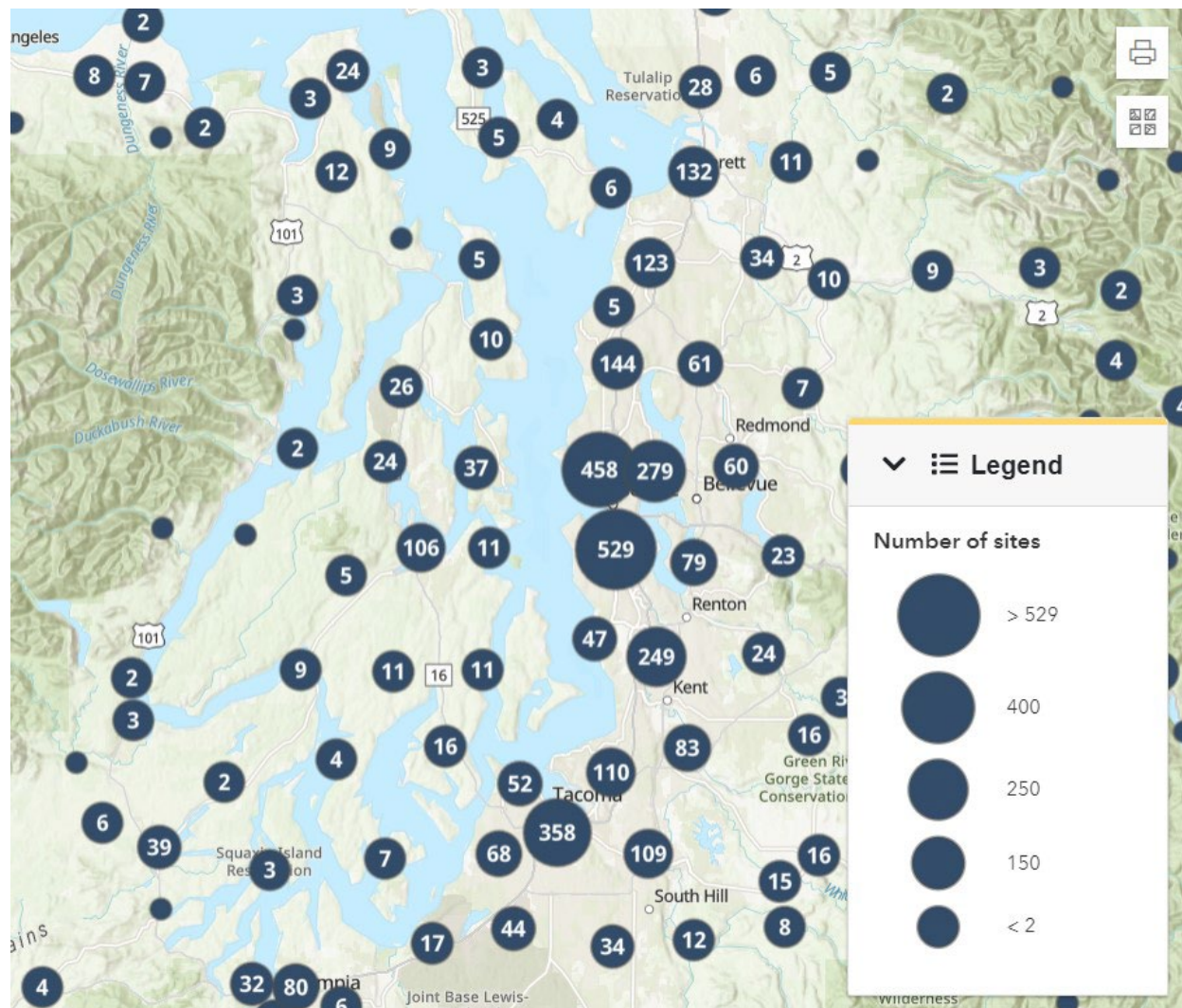


Figure 6. MTCA sites, Puget Sound region, excluding No Further Action.



We note that, particularly in urban areas, there is significant overlap between populations with high EHD rankings (indicating a higher level of environmental health burden and vulnerability), toxic releases, and MTCA sites. This illustrates one aspect of the factors contributing to health inequities across the state, that could be improved under the rule amendments’ emphasis on consideration of environmental justice impacts.

4.2.7 Adding documentation of appropriate management of waste generated during investigation to the Remedial Investigation Report

We do not expect this rule amendment to result in significant new benefits arising from additional documentation because this information is routinely required in practice by Ecology site managers, as part of additional Remedial Investigation information requested, which is allowed under the current rule.

4.2.8 Emphasizing consideration of climate change impacts

We expect this rule amendment to result in additional benefits of documenting and assuring consideration of climate change resilience during the development and selection of cleanup action alternatives in a feasibility study, to the extent that is not already done. Under the baseline, however, we expect that likely climate change impacts are already a consideration in determining the protectiveness and long-run effectiveness of cleanup actions, so we do not expect that this amendment will result in significant change to compliance behavior, but rather an emphasis and focus to comprehensively verify this work is being done. This assurance could reduce costs of Ecology site manager time to request this information under the baseline, and any time costs resulting from this additional baseline interaction, to the extent this implicit baseline consideration is not already clearly documented.

4.2.9 Establishing a stepwise procedure for Disproportionate Cost Analysis (DCA) and clarifying how public concerns and tribal interests are considered in DCA

We expect these rule amendments to result in benefits of clarity and potential reductions in the time-cost of performing the Disproportionate Cost Analysis and/or needing technical support and additional revisions.

We estimated a weighted wage of consultants that would be performing this work of \$210 per hour. This reflects weighting of junior, senior, and administrative staff wages (including overhead and profit) as summarized below, plus a 20% markup for direct expenses. (See Table 2 for calculation.)

Under the baseline and amended rule, a DCA is required for all sites except those where a permanent cleanup action or a model remedy is selected. We assumed the following ranges of hours and numbers of sites that would be impacted by the rule amendments and calculated corresponding ranges of annual benefits.⁵⁶ We assumed that at least 10% of sites awarded no further action status would require a DCA and therefore would be affected by these amendments: on average, 16 sites per year.⁵⁷ We assumed 40 to 80 hours of cumulative time would be saved due to the streamlined process and reduced need for technical support or rework, reflecting Ecology experience implementing Disproportionate Cost Analysis. Total annual benefits would be between \$0.1 million and \$0.3 million.

⁵⁶ We note that the adopted rule amendments include the baseline requirement to calculate the present value of future costs, and specify the relevant discount rates to use. (The proposed rule also specified these rates, but made them optional rather than required.) We expect this rule amendment to result in potential reductions in the time spent performing present value calculations (called “present worth analysis” in the adopted rule). We do not expect this additional specification to significantly affect our assumed ranges of hours saved, however, as we expect that our assumed ranges of hours are sufficiently broad to capture small variances in effort, and small changes would not affect our overall conclusions in this analysis.

⁵⁷ Ecology, 2022. MTCA Integrated Site Information System. Accessed October 19, 2022.

Table 22. Benefits of adding an explicit, stepwise procedure for Disproportionate Cost Analysis.

Hours (low)	Hours (high)	Annual Benefit per Site (low)	Annual Benefit per Site (high)	Sites per Year	Annual Benefit (low)	Annual Benefit (high)
40	80	\$8,400	\$16,800	16	\$134,400	\$268,800

Ecology considers costs and benefits of rulemakings on a 20-year timescale, using present value calculations. Present values discount future values using a discount rate based on the long-run average risk-free rate of return, which is currently 0.89%⁵⁸, and add them into a single value for comparison.

The total 20-year present value of benefits under this amendment would be between \$2.5 million and \$4.9 million.

4.2.10 Adding documentation requirements in the Feasibility Study report

We expect these rule amendments to result in benefits of:

- Identifying nonconformance and determining whether it is appropriate for the site in question. The inability to adequately explain any non-conformance could result in increased benefits and costs of an alternative that does meet the expectations.

We expect the rule amendments to result in benefits of identifying nonconformance of the preferred remedial action with expectations, and better determining whether it is appropriate for the site in question. This amendment is intended to restore and reinforce existing remedy expectations, including understanding of nonconformance to expectations.

- Consistent and accessible documentation of Remedial Investigation results in the Feasibility Study report.

4.2.11 Updating UST site characterization requirements

We expect these rule amendments to result in benefits of ten additional days to perform site characterization (30 days rather than 20 under the baseline), as well as benefits associated with characterizing the potential for vapor intrusion. The latter would include benefits of reduction or prevention of vapor intrusion into structures.

Extending the timeframe for site characterization will allow for more complete investigations. Ecology received input from stakeholders that the availability of drilling companies and

⁵⁸ US Treasury Department, 2022. I bond interest rates. Historic average September 1998 through November 2022. <https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.>

turnaround times for laboratories necessitate more time for site characterization. This will also aid in achieving compliance and avoiding potential noncompliance due to factors outside of an UST system's owner.

Adding characterization of potential for vapor intrusion to site characterization could reduce risks to potentially affected structures (e.g., basements, utility vaults, and parking garages) and people that use them. These risks include potential threats to safety related to explosive concentrations of petroleum vapors, and adverse health effects from inhalation of toxic chemicals.⁵⁹

The magnitude of this benefit is inherently uncertain, as documentation is not required under the baseline, and as the benefits of reductions in vapor intrusion would be:

- Site- and remedy-specific.
- Impacted by the degree and types of nonconformance.

It is difficult to separate the public health (or environmental) benefits of multiple actions at UST sites, so for this analysis we combined them for the following illustrative example of comparable benefits:

- A 2004 study found that long-term exposure to low-level benzene vapors from leaking USTs in Pennsylvania found higher incidence of leukemia nearer higher concentrations of benzene.⁶⁰
- The CDC summarizes that:⁶¹
 - The primary target organs for acute exposure are the hematopoietic system, nervous system, and immune system.
 - The primary target for adverse systemic effects of benzene following low-level chronic exposure is the hematological system.
 - Benzene is a known human carcinogen and is associated with leukemia, especially acute myelogenous leukemia.
 - Benzene exposure may also be associated with reproductive and developmental effects based on animal studies.
 - Benzene is rapidly absorbed through the lungs; approximately 50% of the benzene in air is absorbed.
 - Absorbed benzene is rapidly distributed throughout the body and tends to accumulate in fatty tissues.

⁵⁹ <https://www.epa.gov/ust/benefits-impacts-and-studies-preventing-and-cleaning-ust-releases>

⁶⁰ Patel, A, E Talbott, J Zborowski, J Rycheck, D Dell, and J Schwerha, 2004. Chronic low-level exposure to gasoline vapors and risk of cancer: a community-based study. *Epidemiology* 15:4, July 2004.

⁶¹ Agency for Toxic Substances and Disease Registry, 2007. ToxGuide for Benzene, C₆H₆, CAS#71-43-2. US Department of Health and Human Services, Public Health Service.

- A 2020 study found that annualized average medical care and drug costs across all cancer sites and stages, per person, were:⁶²
 - \$43,600 per year for initial care.
 - \$6,400 per year for continuing care.
 - \$109,700 per year for end-of-life care.
- The same study found that leukemia-related annualized medical care and drug costs depended on the type of leukemia:⁶³
 - \$56,000 per year for chronic lymphocytic leukemia (CLL).
 - \$192,000 per year for acute myeloid leukemia (AML).

Combining the above information, and incorporating quantifiable total annual costs associated with UST-related rule amendments, estimated in Chapter 3 as between \$0.3 million and \$0.9 million, we can illustrate the number of years of cumulative statewide medical and drug costs associated with CLL and AML that would need to be avoided to offset our estimated costs of these amendments.

Table 23. Cost-equivalent avoided leukemia treatment, years.

Total Annual Costs	Equivalent Years of CLL Treatment	Equivalent Years of AML Treatment
Low	5	1
High	16	5

4.2.12 Updating UST free product removal deadline, monitoring, and reporting

We expect these rule amendments to result in benefits associated with earlier removal of free product, at sites that currently take longer than 30 days. They will also result in benefits of comprehensive knowledge of the current status of free product removal and monitoring that would also facilitate ongoing assistance in effective free product removal that is protective of human health and the environment. Based on Ecology experience implementing MTCA, leaking UST sites need to continue tracking free-product removal operations, as many of these sites do not receive immediate cleanup.

It is difficult to separate the public health (or environmental) benefits of multiple actions at UST sites, so for this analysis we combined them in an illustrative example of cost-comparable benefits, as discussed in Section 4.2.11.

⁶² Mariotto, AB, L Enewold, J Zhao, CA Zeruto, and KR Yabroff, 2020. Medical care costs associated with cancer survivorship in the United States. *Cancer Epidemiology, Biomarkers, and Prevention* 29:1304-12. doi: 10.1158/1055-9965.EPI-19-1534

⁶³ Ibid.

4.2.13 Adding groundwater threat and vapor intrusion to UST interim action reports

We expect these rule amendments to result in benefits of comprehensive knowledge of initial site characterization regarding groundwater and vapor intrusion, which will also facilitate ongoing assistance in effective cleanup that is protective of human health and the environment.

It is difficult to separate the public health (or environmental) benefits of multiple actions at UST sites, so for this analysis we combined them in an illustrative example of cost-comparable benefits, as discussed in Section 4.2.11.

4.2.14 Requiring periodic updates for UST reporting

We expect this rule amendment to result in benefits associated with up-to-date knowledge of UST site and cleanup attributes, which will also facilitate ongoing assistance in effective cleanup. Earlier reporting of remedial actions will enable Ecology to better assess and rank the hazards posed by a site to the public and the environment, and to make more informed site prioritization and management decisions. It will also enable the public to better understand the hazards posed by the site to them. Further, Ecology has determined that this amendment is necessary to maintain federal approval of its state UST program, which is required by Chapter 70A.355 RCW.

As with other rule amendments related to documentation, this amendment could improve baseline compliance depending on what information is reported in periodic updates, and how that information informs any potential improvements or efficiencies in site management and cleanup. The magnitude of this benefit is inherently uncertain, as documentation with this frequency is not required under the baseline, and as the benefits of improved knowledge of site attributes over time would:

- Be site- and remedy-specific.
- Variably influence ongoing site management.

It is difficult to separate the public health (or environmental) benefits of multiple actions at UST sites, so for this analysis we combined them in an illustrative example of cost-comparable benefits, as discussed in Section 4.2.11.

4.2.15 Expanding cultural resource protection requirements

We expect these rule amendments to result in benefits of more comprehensive engagement, planning, and documentation that would reduce likelihood of impacts to cultural resources.

The value of protecting cultural resources is inherently not quantifiable or monetizable. We can instead look to descriptions of these values, history, and extensive current preservation efforts. In discussion of Hoh Tribe cultural resources, author Jay Powell states:

“The Hoh River itself can be characterized in aboriginal times as a busy waterway with seven settlements along its course and a resident population of 110 or more. Many of those settlements had fishtrap weirs spanning the river. There was constant movement as the people poled their canoes upriver to seasonal hunting grounds and foraging camps, or travelled to ritual sites, or attended hayokkwa (ceremonial feasts and potlatches), or simply visited relatives and friends. The entire watershed was utilized in traditional times. The Old Peoples’ cognitive maps of the river were dotted with place names, the boundaries of hunting grounds, and the sites associated with mythic narratives, spiritual beliefs, ritual sites, burial locales, tribal historic events, and favorite foraging spots. Much of that cultural knowledge was oral history and has been lost.

...

Possible archaeological sites are high-concern resources. The watershed has had little systematic archaeological reconnaissance, although two sites have been named and registered with the State of Washington. Because of the irretrievable loss of information and understandings that results from degradation of an archaeological deposit, any potential archaeological sites need to be reported to the tribe and the appropriate state or federal agency before work can continue. The causal mechanism resulting in degradation of these high-concern resources, then, is either (a) exploitation or development of a possible site by disarrangement of surface or subsurface stratigraphic matter or (b) disregarding evidence of previous habitation revealed while developing a site or as a result of natural accident (landslides, washouts, the root wells of blowdowns). Actually, experience has shown that circumspect development and some mass wasting events actually result in unexpected archaeological finds, making it clear that the emphasis is not on discouraging activities in the watershed, but on observant, responsible recognition of these resources. The indicated response to these concerns is that any development of the watershed should be attentive to evidence of archaeological deposits and responsible in reporting such findings.”⁶⁴

The Spokane Tribe Preservation Program (STIPP) describes its history and activities protecting cultural resources:

“Following the construction of the Grand Coulee Dam in the 1930s and the inundation of the Spokane and Columbia Rivers in 1941, the annual migration of salmon, a food resource that local people had relied on for at least 5,000 years, was blocked. The Grand Coulee Dam increased water levels in the river valleys resulting in the flooding of people’s homes and farmland as well as causing the loss of cultural heritage sites including both ancient fisheries and village sites. This flooding brought an abrupt end to a lifeway that had sustained the Spokane Tribe since time immemorial.

⁶⁴ <https://hohtribe-nsn.org/culture/cultural-resources/>

...

As a result of this loss, the Spokane Tribe Preservation Program (STIPP) was formed in 1995 in order to preserve the cultural sites, material, and knowledge of this inundated and eroding Spokane ancestral territory. The Program focuses most of its efforts on assisting the Federal Columbia River Power System (FCRPS) Cultural Resource Program and its federal agencies (Bonneville Power Administration, Bureau of Reclamation, U.S. Army Corps of Engineers, and National Park Service) with compliance of federal cultural resource laws and the mitigation of impacts to cultural resources that are caused by the reservoir operations at Grand Coulee Dam. STIPP's work area under this contract encompasses both federal and tribal lands along the Columbia and Spokane Rivers. STIPP conducts cultural resource management tasks including: inventory survey, site condition monitoring, Archaeological Resource Protection Act (ARPA) patrols, data recoveries, burial site inspections and more. Beginning in 2002, STIPP expanded their services and began to provide cultural resource compliance surveys at the local, state, and private levels."⁶⁵

The Wanapum Heritage Center describes the Wanapum River Patrol:

"Similar to one of the major aspects of the Wanapum Heritage Center – the protection and preservation of both physical artifacts and Wanapum culture – the Wanapum River Patrol is focused on these same efforts on the landscape within the Wanapum's traditional areas. The Wanapum River Patrol utilizes boats and four-wheel drive vehicles to patrol these areas year-round.

SPECIALIZED TRAINING

The Wanapum River Patrol leverages specialized training, such as the Archaeological Resources Protection Act (ARPA) and Crime Scene Investigation Training, to assist law enforcement agencies and regulatory entities in the protection of archaeological resources. The training teaches the Patrol how to spot looters and looting activity. The Wanapum River Patrol learns how to study and document an ARPA crime in progress, and how to properly investigate the scene to achieve the best possible outcomes. The Wanapum River Patrol is also trained on the various laws that apply to the situations they encounter and how they can utilize them in the interest of protecting the resources.

PUBLIC EDUCATION

As part of the protection and preservation goals of the Wanapum River Patrol, education of the public plays a large role in the Patrol's success. They strive to inform those they encounter regarding the applicable laws and agency policies that protect artifacts and locations of cultural importance. The Wanapum River Patrol also shares the Wanapum perspective on the value of preserving these

⁶⁵ <https://spokanetribe.com/resources/dnr/preservation/about/>

areas for the perpetuation of their culture and the education of all concerning the history of this region.

The prehistoric and historic archaeological sites, isolated artifacts, archaeological districts, structures, engineering features, landscapes and traditional cultural properties are all protected by state and federal laws. The Wanapum take the protection of these sites and artifacts very seriously. [SEP] In Washington, archaeological sites and Native American graves are protected from known disturbance by a variety of state and federal laws. Federal law applies to all federal and Native American lands and Washington State law applies to all other lands.”⁶⁶

4.2.16 Adding a requirement to report separate independent investigations of a site

For sites at which remedial action does not occur within 90 days of completion of independent investigations, these rule amendments will result in benefits associated with earlier reporting of up-to-date site and remedial action characteristics, and of having comprehensive information about all sites as necessary to rank all sites under rule amendments for internal operations.

Earlier reporting of site investigations will enable Ecology to better assess and rank the hazards posed by a site to the public and the environment, and to make more informed site prioritization and management decisions. It will also enable the public to better understand the hazards posed by the site to them.

4.2.17 Aligning the rule with current guidance and practice

Where current practice is the only reasonable interpretation of existing baseline, we do not expect amendments that align with current practice to result in benefits beyond clarity.

Where current practice is unclear or undocumented, or multiple possible interpretations or implementations of the baseline are plausible, we discuss the baseline, rule amendments, and expected impacts in relevant sections, above:

- 4.2.6 Emphasizing consideration of populations, overburdened communities, and Tribes explicit, including documentation requirements.
- 4.2.7 Adding documentation of appropriate management of waste generated during investigation to the Remedial Investigation Report.
- 4.2.8 Emphasizing consideration of climate change impacts.
- 4.2.9 Establishing stepwise procedure for Disproportionate Cost Analysis (DCA) and clarifying how public concerns and Tribal interests are considered in DCA.

⁶⁶ <https://wanapum.org/about/river-patrol/>

Chapter 5: Cost-Benefit Comparison and Conclusions

5.1 Summary of costs and benefits of the rule amendments

5.1.1 Costs

We identified the following likely costs resulting from the rule amendments. See Chapter 3 for details.

- Updating release reporting timelines for all sites and UST free product removal deadlines:
 - At sites that complete a remedial action within 90 days of release, the release will need to be reported separately within 90 days of the release, rather than later once the remedial action has been completed. We could not confidently assess how frequently this will occur at future sites, or the degree to which report timing would differ. We note, however, these would not be significant additional costs, as compared to the baseline, but rather opportunity costs of expenditures at different times. The table below illustrates the opportunity costs associated with spending a dollar at various times.
 - We expect these rule amendments to result in costs associated with earlier removal of free product,⁶⁷ at UST sites that currently take longer than 30 days. We could not confidently assess how frequently it takes sites longer than 30 days to begin removal of free product, or how much longer they take. We note, however, these would not be additional costs, as compared to the baseline, but rather opportunity costs of expenditures at different times. The table below illustrates the opportunity costs associated with spending a dollar at various times.

Table 24. Relative real cost of a dollar spent at different times.

Delay (years)	Present Value	Difference
0	\$1.00	\$0.00
1	\$0.99	\$0.01
2	\$0.98	\$0.02
3	\$0.97	\$0.03
4	\$0.96	\$0.04

- Emphasizing consideration of vulnerable populations, overburdened communities, and Tribes, including documentation requirements:⁶⁸

⁶⁷ Ecology estimates that there are approximately five such sites each year.

⁶⁸ This includes documentation in Feasibility Studies, summary in cleanup action plans, and equitable participation in Public Participation Plans.

- Annual costs: \$0.3 million – \$1.4 million.
- 20-year present value costs: \$5.7 million – \$26.6 million.
- Adding documentation requirements in the Feasibility Study report:⁶⁹
 - Annual costs: \$42,000 – \$84,000.
 - 20-year present value costs: \$0.8 million – \$1.5 million.
- Amending UST free product removal monitoring and reporting requirements:
 - Annual costs: \$56,000 – \$306,000.
 - 20-year present value costs: \$1.0 million – \$5.6 million.
- Modifying demonstrations and documentation of groundwater and vapor intrusion threats in UST interim actions:
 - Annual costs: \$0.2 million – \$0.6 million.
 - 20-year present value costs: \$4.2 million – \$10.6 million.
- Requiring periodic updates for UST reporting:
 - Annual costs: \$1.2 million – \$6.0 million.
 - 20-year present value costs: \$22.3 million – \$111.3 million.
- Expanding cultural resource protection requirements:
 - Annual costs: \$0.1 million – \$0.3 million.
 - 20-year present value costs: \$2.1 million - \$4.7 million.
- Adding a requirement to report separate independent investigations of a site:
 - Annual costs: \$57,000 – \$113,000.
 - 20-year present value costs: \$1.0 million – \$2.1 million.

We estimated total quantifiable annual costs of \$2.0 million – \$8.8 million, and corresponding 20-year present value costs of \$37.1 million – \$162.4 million. We note that the likelihood of costs is not distributed uniformly across this range:

- The majority of sites are relatively simple (e.g., involving a single known contaminant, at a known location or contained within a single property, without likely impacts to groundwater, surface water, or sediments), and will therefore fall at the lower end of the estimated range of compliance costs.

⁶⁹ This includes documentation of nonconformance with expectations and summary of Remedial Investigation results.

- Under the baseline a large part of these requirements is likely to already be met despite lack of explicit wording in the rule, as part of protection of public health and the environment, site management, and assessment of remedial actions.

We therefore expect true costs to fall toward the low end of this range: **\$2.0 million in annual costs and \$37.1 million over 20 years** (in present value).

5.1.2 Benefits

We identified the following likely benefits resulting from the rule amendments. See Chapter 4 for details.

- Expanding reporting exemptions:
 - Annual benefits: \$19,000 – \$37,000.
 - 20-year present value benefits: \$0.3 million – \$0.7 million.
- Updating release reporting timelines for all sites:
 - Comprehensive and timely knowledge of releases, regardless of whether remedial action has been taken, and supporting uniformity of site assessment and ranking under the newly adopted process.
- Emphasizing consideration of vulnerable populations, overburdened communities, and Tribes, including documentation requirements:⁷⁰
 - Assurance that consideration of vulnerable populations, overburdened communities, and Tribes is being consistently and successfully applied in MTCA compliance and site cleanup. Consideration of these groups could result in improved understanding of the impacts of contamination and cleanup. Improved understanding could, in turn, result in earlier or different cleanup of sites affecting these communities.
 - The table below provides examples of the present value of each dollar’s worth of benefits occurring earlier.

Table 25. Increases in present value due to earlier versus later occurrence of benefits.

Delay (years)	Present Value	Difference
0	\$1.00	\$0.00
1	\$0.99	\$0.01
2	\$0.98	\$0.02
3	\$0.97	\$0.03
4	\$0.96	\$0.04
5	\$0.95	\$0.05

⁷⁰ This includes documentation in Feasibility Studies, summary in cleanup action plans, and equitable participation in Public Participation Plans.

- Comparing the quantifiable total annual costs of these rule amendments, estimated in Chapter 3 as between \$0.3 million and \$1.4 million, the table below summarizes the populations annually avoiding a drop in life expectancy due to earlier site cleanup near vulnerable populations, overburdened communities, or Tribal interests, that would balance estimated costs of these rule amendments. (Recall that since most sites are relatively simple, and because many of the activities underlying quantitative costs are likely already performed under the baseline to some degree, true total costs are likely to be closer to the low \$0.3 million end of this range.)

Table 26. Total-cost-equivalent populations avoiding life expectancy reduction due to sites with improved protection due to documented community involvement, by degree of earlier benefit achievement.

Delay (years)	Low	High
1	1,962	9,123
2	976	4,536
3	649	3,018
4	484	2,249
5	386	1,792

- Vulnerable populations and overburdened communities are more likely to live near MTCA sites than the rest of the public. One reflection of this is a comparison of where these populations live and the locations of MTCA sites. See Figures 1-4 for mapped rankings of Environmental Health Disparities and toxic releases, and Figures 5-6 for maps of MTCA sites.
- Making consideration of climate change impacts explicit:
 - We do not expect that this amendment will result in significant change to compliance behavior, but rather an emphasis and focus to comprehensively verify this work is being done. This assurance could reduce costs of Ecology site manager time to request this information under the baseline, and any time costs resulting from this additional baseline interaction, to the extent this implicit baseline consideration is not already clearly documented.
- Adding an explicit, stepwise procedure for Disproportionate Cost Analysis:
 - Annual benefits: \$0.1 million – \$0.3 million.
 - 20-year present value benefits: \$2.5 million – \$4.9 million.
- Adding documentation requirements in the Feasibility Study report:
 - Identifying nonconformance and determining whether it is appropriate for the site in question.
 - Consistent and accessible documentation of Remedial Investigation results in the Feasibility Study report.

- Amending UST site characterization requirements, free product removal monitoring and reporting requirements, demonstrations and documentation of groundwater and vapor intrusion threats in interim actions, and periodic update requirements:
 - Extending the timeframe for site characterization will allow for more complete investigations. Ecology received input from stakeholders that the availability of drilling companies and turnaround times for laboratories necessitate more time for site characterization. This will also aid in achieving compliance and avoiding potential noncompliance due to factors outside of an UST system’s owner.
 - Free product removal timing, monitoring, and reporting requirements will result in benefits associated with earlier removal of free product (at sites that currently take longer than 30 days), and comprehensive knowledge of the current status of free product removal and monitoring that would also facilitate ongoing assistance in effective free product removal that is protective of human health and the environment. Based on Ecology experience implementing MTCA, leaking UST sites need to continue tracking free-product removal operations, as many of these sites do not receive immediate cleanup.
 - Adding characterization of potential for vapor intrusion to site characterization could reduce risks to potentially affected structures (e.g., basements, utility vaults, and parking garages) and people that use them. These risks include potential threats to safety related to explosive concentrations of petroleum vapors, and adverse health effects from inhalation of toxic chemicals.
 - It is difficult to separate the public health (or environmental) benefits of multiple actions at UST sites, so for this analysis we combined them in an illustrative example of cost-comparable benefits, as discussed in Section 4.2.11.
 - The table below illustrates the number of years of cumulative statewide medical and drug costs associated with chronic lymphocytic leukemia (CLL) and acute myeloid leukemia (AML) that would need to be avoided to offset our estimated \$0.3 million to \$0.9 million in annual costs of these amendments.

Table 27. Cost-equivalent avoided leukemia treatment, years.

Total Annual Costs	Equivalent Years of CLL Treatment	Equivalent Years of AML Treatment
Low	5	1
High	16	5

- Expanding cultural resource protection requirements:
 - The value of protecting cultural resources is inherently not quantifiable or monetizable. We can instead look to descriptions of these values, history, and extensive current preservation efforts.
 - See Section 4.2.15 for discussion of the value of cultural resources and the actions taken to protect them, from the Hoh Tribe, Spokane Tribe Preservation

Program, and Wanapum Heritage Center. Resources include archeological artifacts, natural resources and ecosystems, and culturally or historically important geographies.

- Adding a requirement to report separate independent investigations of a site:
 - For sites at which remedial action does not occur within 90 days of completion of independent investigations, these rule amendments will result in benefits associated with earlier reporting of up-to-date site and remedial action characteristics, and of having comprehensive information about all sites as necessary to rank all sites under rule amendments for internal operations. Earlier reporting of site investigations will enable Ecology to better assess and rank the hazards posed by a site to the public and the environment, and to make more informed site prioritization and management decisions. It will also enable the public to better understand the hazards posed by the site to them.

5.2 Conclusion

The APA requires Ecology 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 statute being implemented.” We conclude, based on a reasonable understanding of the quantified and qualitative costs and benefits likely to arise from the rule amendments (summarized in the previous section), as compared to the baseline, that the benefits of the rule amendments are likely greater than the costs.

Many benefits of the rule amendments were not fully quantifiable, due to compounding uncertainty in future site attributes and how the amendments would subsequently affect:

- Assessment, prioritization, timing, and attributes of different cleanup sites and their remediation.
- Changes to exposure and risk over time.
- Site-specific health and environmental impacts of different toxic substances and exposure pathways.
- Frequency and scope of impacts to vulnerable populations, overburdened communities, and the rights and interests of Tribes.
- Contribution of additional, consistent, and comprehensive information on Ecology strategic planning and public interests.

To attempt to illustrate the scope of benefits when uncertainty constrained our ability to quantify or monetize these impacts, we estimated the avoided costs of potential public health impacts that would counterbalance our estimated costs. Under the APA requirement quoted above, qualitative benefits and costs should be considered in conjunction with those that we were able to quantifiably estimate.

Chapter 6: Least-Burdensome Alternative Analysis

6.1 Introduction

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

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

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

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

6.2 Goals and objectives of the authorizing statute

The authorizing statute for this rule is Chapter 70A.305 RCW, Hazardous Waste Cleanup – Model Toxics Control Act. Its goals and objectives include:

- Protection of the public and environment: “The beneficial stewardship of the land, air, and waters of the state is a solemn obligation of the present generation for the benefit of future generations.”⁷¹
- Funding:
 - “The costs of eliminating these threats in many cases are beyond the financial means of our local governments and ratepayers. The main purpose of chapter 2, Laws of 1989 is to raise sufficient funds to clean up all hazardous waste sites and to prevent the creation of future hazards due to improper disposal of toxic wastes into the state's land and waters.”⁷²
 - “With a source of funds, the state may assist... farmers and business owners, as well as those persons who sustain damages, such as the loss of their drinking water supplies, as a result of the contamination.”⁷³
- Efficient land use: “It is in the public's interest to efficiently use our finite land base, to integrate our land use planning policies with our clean-up policies, and to clean up and reuse contaminated industrial properties in order to minimize industrial development pressures on undeveloped land and to make clean land available for future social use.”⁷⁴
- Expeditious cleanup: “Because it is often difficult or impossible to allocate responsibility among persons liable for hazardous waste sites and because it is essential that sites be cleaned up well and expeditiously, each responsible person should be liable jointly and severally.”⁷⁵
- Public notification: “Because releases of hazardous substances can adversely affect the health and welfare of the public, the environment, and property values, it is in the public interest that affected communities be notified of where releases of hazardous substances have occurred and what is being done to clean them up.”⁷⁶

Establishing specific objectives in furtherance of its goals, MTCA requires Ecology to “adopt, and thereafter enforce, rules under chapter 34.05 RCW” (RCW 70A.305.030(2)). These rules must:

- Provide for public participation, including at least:
 - Public notice of the development of investigative plans or remedial plans for releases or threatened releases, and
 - Concurrent public notice of all compliance orders, agreed orders, enforcement orders, or notices of violation.
- Establish a hazard ranking system for hazardous waste sites.

⁷¹ RCW 70A.305.010(1).

⁷² RCW 70A.305.010(2).

⁷³ RCW 70A.305.010(3).

⁷⁴ RCW 70A.305.010(4).

⁷⁵ RCW 70A.305.010(5).

⁷⁶ RCW 70A.305.010(6).

- Provide for requiring the reporting by an owner or operator of releases of hazardous substances to the environment that may be a threat to human health or the environment within ninety days of discovery, including such exemptions from reporting as the department deems appropriate, however this requirement may not modify any existing requirements provided for under other laws.
- Establish reasonable deadlines not to exceed ninety days for initiating an investigation of a hazardous waste site after the department receives notice or otherwise receives information that the site may pose a threat to human health or the environment and other reasonable deadlines for remedying releases or threatened releases at the site.
- Publish and periodically update minimum clean-up standards for remedial actions at least as stringent as the clean-up standards under section 121 of the federal cleanup law, 42 U.S.C. Sec. 9621, and at least as stringent as all applicable state and federal laws, including health-based standards under state and federal law.
- Apply industrial clean-up standards at industrial properties.

MTCA further authorizes Ecology to take a variety of actions to achieve its statutory goals, thereby implying several additional programmatic objectives for the agency. As set forth in RCW 70A.305.030(1), Ecology may also:

- Investigate, provide for investigating, or require potentially liable persons to investigate any releases of hazardous substances, including but not limited to inspecting, sampling, or testing to determine the nature or extent of any release or threatened release.
- Conduct, provide for conducting, or require potentially liable persons to conduct remedial actions ... to remedy releases or threatened releases of hazardous substances... In conducting, providing for, or requiring remedial action, the department shall give preference to permanent solutions to the maximum extent practicable and shall provide for or require adequate monitoring to ensure the effectiveness of the remedial action.
- Carry out all state programs authorized under the federal cleanup law and the federal resource, conservation, and recovery act, 42 U.S.C. Sec. 6901 et seq., as amended.
- Classify substances as hazardous substances.
- Issue orders or enter into consent decrees or agreed orders that include ... environmental covenants where necessary to protect human health and the environment from a release or threatened release of a hazardous substance from a facility.
- Enforce the application of permanent and effective institutional controls that are necessary for a remedial action to be protective of human health and the environment.
- Establish model remedies for common categories of facilities, types of hazardous substances, types of media, or geographic areas to streamline and accelerate the selection of remedies for routine types of cleanups at facilities.

- Provide a comprehensive biennial ten-year financing report (in even years) and a biennial report to the legislature and the public on progress made in cleaning up contaminated sites (in odd years).⁷⁷
- Take any other actions as necessary to carry out the provisions of this chapter, including the power to adopt rules under chapter 34.05 RCW.

6.3 Alternatives considered and why they were excluded

We considered the following alternative rule content for each significant rule amendment, and did not include it in the adopted amendments for the reasons discussed in each subsection below.

- Contaminated sites list:
 - Recovering petition review costs for listings made in error.
 - Continuing to require public notice and opportunity to comment before removing independent cleanup sites from the contaminated sites list.
- Remedial investigation:
 - Requiring periodic updates of independent remedial actions regardless of whether change or progress has occurred.
 - Not requiring reporting of independent site investigations until independent interim actions or cleanup have been completed.
 - Not requiring (though recommending) Inadvertent Discovery Plans for remedial actions.
- Feasibility Study:
 - Requiring site-specific environmental justice analysis for all Ecology-conducted and Ecology-supervised cleanups, including cumulative environmental health impacts, community engagement, and evaluation of the distribution of cleanup benefits and burden.
 - Not requiring documentation of consideration of vulnerable populations and overburdened communities.
- Not requiring documentation of appropriate waste management and disposal in the Remedial Investigation Report or Feasibility Study.
- Cleanup action expectations:

⁷⁷ These reports are required by RCW 70A.305.030(4) and (5), which are, in part, the statutory basis for the program planning and evaluation provisions in amended WAC 173-340-340. In particular, RCW 70A.305.030(5) is relevant, as it requires the biennial progress report to include the "hazardous waste ranking" of each site on the "hazardous waste sites list," i.e., to include the hazard ranking (amended WAC 173-340-320) of each site on the contaminated sites list (amended WAC 173-340-330).

- Not requiring the Feasibility Study Report to document nonconformance with expectations.
- Cleanup Action Plan:
 - Not requiring a summary of how the selected action reflects considerations of public concerns and the rights and interests of Tribes.
- Tribal engagement and cultural resource protection:
 - Requiring site-specific Tribal engagement efforts only upon request from Tribes or based on Ecology anticipation of concerns.
- Releases from underground storage tanks (USTs):
 - Requiring completion of site investigation within 20 days.
 - Not requiring vapor intrusion as part of the initial site characterization.
 - Requiring free product removal to begin within 60 days of release confirmation.
 - Not requiring regular monitoring or reporting to track ongoing free-product removal.
 - Not requiring demonstration of why groundwater impacts are not expected despite lack of testing.
 - Not requiring demonstration of why vapor intrusion is not expected although there is no identified pathway.
 - Requiring updates to Interim Action Reports every 5 years.

During the public comment period for this rulemaking, we received feedback suggesting additional alternatives. We included the following in the adopted rule amendments:

- Adding flexibility to the frequency of UST monitoring for free product. The proposed rule included quarterly monitoring, while the adopted rule includes flexibility for Ecology to evaluate necessary monitoring frequency on a site-specific basis.

We did not include the following additional alternatives received during the public comment period, in the adopted rule amendments:

- Reiterating other regulatory requirements.
- Including more baseline guidance material in the rule.
- Specifying additional procedures for environmental justice analyses.
- Specifying requirements for community and tribal engagement at formal sites.

6.3.1 Recovering petition review costs for listings made in error

We considered recovering costs associated with reviewing petitions for listings made in error, or for delistings that have been delayed through no fault of the petitioner. This would not have met the goals and objectives of the authorizing statute, as well as imposing more burden on

covered parties. We chose to include a continuation of past practice in the rule, and not allow for recovery of these costs.

6.3.2 Public notice and opportunity to comment on delisted sites

We considered requiring an opportunity to comment when removing independent cleanup sites from the contaminated sites list. This would have imposed more burden on covered parties. The baseline rule requires an opportunity to comment before removing just ranked sites from the hazardous sites list (HSL). Most independent cleanup sites are not on the HSL. Ecology adopted this practice when only the sites intended for Ecology-conducted and Ecology-supervised cleanups were ranked and included on this list. The authorizing statute does not require an opportunity to comment when Ecology adds or removes a site from the list.

The adopted rule amendments revise the site ranking and listing procedures (internal operations), resulting in prompt ranking and listing of all sites. This reflects the current situation in which the majority of cleanups are independent and mostly occur through the voluntary cleanup program. Given these new ranking and listing procedures, this alternative would have resulted in a need for hundreds of comment periods every year.

6.3.3 Periodic updates of independent remedial actions

We considered requiring persons conducting independent remedial actions to provide periodic updates of those actions, regardless of whether a change has occurred or progress has been made at the site. This would have imposed additional burden on covered parties. Under the baseline, a regular reporting requirement would be unenforceable, and the additional reports would be costly to track and review, with no substantial benefits to Ecology or the public. It is more efficient to wait until there is activity to report, such as an additional investigation or interim action.

6.3.4 Not requiring reporting of independent investigations before interim or cleanup actions are complete

We considered not requiring reporting of investigations until independent interim actions or cleanup actions have been completed. This would not have met the goals and objectives of the authorizing statute. There can be long lag times between investigations and interim actions or cleanup actions. For sites at which this is the case, Ecology needs timely information to keep the public and Tribes informed of known conditions at the site, and to plan and prioritize program resources.

6.3.5 Not requiring Inadvertent Discovery Plans

We considered maintaining the baseline by not requiring Inadvertent Discovery Plans for any sites. This would not have met the goals and objectives of the authorizing statute. Ecology's experience with MTCA cleanups and other construction and site investigation activities has

shown that lack of an Inadvertent Discovery Plan can contribute to adverse effects of remedial actions on cultural resources that must be protected under the rule.

6.3.6 Site-specific environmental justice analysis

We considered requiring site-specific analysis of environmental justice impacts for all sites, or at least Ecology-conducted and Ecology-supervised cleanups. This would have included identifying cumulative environmental health impacts, engaging with impacted communities, and evaluating the equity of the distribution of cleanup benefits and burdens at the site. This would have imposed additional burdens on covered parties.

This alternative would have extended environmental justice assessments, like those required for significant agency actions under the HEAL Act (RCW 70A.02.060), to all Ecology-conducted and Ecology-supervised sites. Based on discussion with stakeholders and Ecology cleanup site managers, we concluded that:

- Procedures for EJ assessment under the HEAL Act are not yet well defined and are still evolving during initial implementation of the Act.
- EJ assessment procedures appropriate for significant agency actions may not be necessary for the majority of MTCA site cleanups.
- Such procedures could complicate and delay cleanups without significantly affecting the choice of cleanup action alternatives, which is largely determined by site conditions and the stringent cleanup standards established in Parts 7 and 9 of the MTCA Cleanup Regulation.

6.3.7 Not requiring documentation of consideration of vulnerable populations and overburdened communities

We considered not requiring that Feasibility Studies document how vulnerable populations and overburdened communities were considered in the evaluation of cleanup action alternatives. This would not have met the goals and objectives of the authorizing statute. An objective for this rulemaking is to emphasize and make environmental justice considerations explicit in the site-level cleanup process. To assure that feasibility studies take sufficient account of vulnerable populations and overburdened communities affected by specific sites, Ecology needs to evaluate documentation of environmental justice considerations for all sites.

6.3.8 Not requiring documentation of appropriate waste management and disposal

We considered not requiring documentation of appropriate waste management and disposal in the Remedial Investigation Report or Feasibility Study Report. This would not have met the goals and objectives of the authorizing statute. In implementing the baseline, Ecology site managers often need to request this documentation to confirm compliance with baseline requirements.

6.3.9 Not requiring the Feasibility Study Report to document nonconformance with expectations

We considered not requiring that Feasibility Study Reports document nonconformance of the preferred cleanup action alternative with the cleanup action expectations specified in the current rule. This would not have met the goals and objectives of the authorizing statute. Requiring documentation of nonconformance will restore and strengthen the intended function of the cleanup action expectations.

6.3.10 Not requiring a summary of how the selected cleanup action reflects public and Tribal concerns

We considered not requiring a summary of how a selected action reflects public concerns and Tribal rights and interests. This would not have met the goals and objectives of the authorizing statute. While the intent under the baseline is to ensure this consideration is implemented as part of cleanup action evaluation, it may be inconsistently applied and is not always documented in the cleanup action plan. Including the documentation requirement provides greater visibility and creates accountability for considerations of public concerns and Tribal rights and interests.

6.3.11 Requiring site-specific Tribal engagement efforts upon request

We considered requiring site-specific tribal engagement efforts only upon request from Tribes or based on Ecology's anticipation of Tribal concerns. This would not have met the goals and objectives of the authorizing statute. The adopted rule amendments respond to concerns expressed by Stakeholder and Tribal Advisory Group (STAG) members – including Tribal representatives – and in consultation with Ecology's Tribal Affairs Advisor, to establish a framework consistent with evolving agency policy for tribal engagement.

An objective of the rule amendments is to systematically assure the equity, consistency, and efficiency of Tribal engagement practices for MTCA cleanups.

6.3.12 UST Site investigation within 20 days

We considered keeping the baseline requirement for UST release site investigation to be completed within 20 days of release confirmation. This would have imposed additional burden on covered parties. The adopted reporting extension is based on consultation with stakeholders during STAG discussions. The additional time allows for more complete investigations and considers the availability of drilling companies and turnaround times for laboratories.

6.3.13 Not requiring vapor intrusion as part of the initial UST site characterization

We considered maintaining the baseline by not requiring vapor intrusion pathways as part of initial UST release site characterization. This would not have met the goals and objectives of the

authorizing statute. In STAG discussions and in written responses to questions, stakeholders agreed that vapor intrusion pathways should be evaluated early in the cleanup process. Information about vapor intrusion would improve the initial Site Hazard and Ranking Process (SHARP) evaluation, with benefits of public information and program planning.

6.3.14 Free product removal within 60 days

We considered requiring free product removal from UST release sites no later than 60 days after confirmation of a release. This would not have met the goals and objectives of the authorizing statute. Based on STAG discussion, the rule amendments include a more protective timeframe of 30 days, which is also consistent with the deadline for completing initial site characterization.

6.3.15 Not requiring regular reporting for free product removal

We considered maintaining the baseline absence of a requirement for regular reporting to track ongoing free product removal from UST release sites. This would not have met the goals and objectives of the authorizing statute. Free product removal is typically an ongoing obligation until source and all free product is removed consistent with MTCA requirements. Program experience with leaking underground storage tank (LUST) sites has demonstrated a need to continue tracking free product removal operations at these sites, as many of them do not receive immediate cleanup.

6.3.16 Not requiring groundwater demonstration

We considered not requiring demonstration that an UST release does not pose a threat to groundwater, if groundwater has not been tested, as part of the initial site characterization. This would not have met the goals and objectives of the authorizing statute. Without groundwater testing or a clear demonstration that groundwater cannot be impacted, Ecology does not have sufficient evidence that the site meets MTCA goals for the protection of human health and the environment.

6.3.17 Not requiring vapor intrusion demonstration

We considered maintaining the baseline of not addressing vapor intrusion as part of UST release site characterization. This would not have met the goals and objectives of the authorizing statute. Based on STAG input, and consistent with Ecology's latest vapor intrusion guidance⁷⁸, Ecology chose to adopt amendments that require a demonstration that there is no potential for vapor intrusion into a structure at sites where no potential pathway has been identified as part of the site characterization. Omitting the demonstration would not provide sufficient evidence that human health is being protected.

⁷⁸ <https://apps.ecology.wa.gov/publications/SummaryPages/0909047.html>

6.3.18 Requiring updates to Interim Action Reports every 5 years

We considered setting a 5-year cycle for updated Interim Action Reports for UST release sites. This would not have met the goals and objectives of the authorizing statute. Based on STAG input, this alternative would not have provided enough assurance that a site is not further harming human health or the environment. The adopted minimum 3-year cycle for sites where cleanup has not been completed better assures this protection and, while it would be more burdensome to covered parties, it simplifies compliance because it coincides with the 3-year cycle for UST tank inspections under Chapter 173-360A WAC.

6.3.19 Reiterating other regulatory requirements

We received public comments requesting that we include the requirements of other regulations that apply to cleanup sites in the rule. This would have potentially imposed additional burden on covered parties, in the case of other regulations independently changing and parties facing misaligned, duplicative, or redundant requirements.

6.3.20 Including more baseline guidance material in the rule

We received public comments requesting that we include additional information and procedures currently specified in guidance, in the rule. The intent of Ecology guidelines and policies is to interpret the rule, and to maintain flexibility to use up-to-date procedures without the delays that would be associated with additional rulemakings when those procedures needed to be revised. This alternative would not have met the goals and objectives of the rule if such delays would have resulted in risks to public or environmental health, or in inefficiencies that could be addressed through faster adaptation of guidance.

6.3.21 Specifying additional procedures for environmental justice analyses

We received public comments requesting that the rule include various additional requirements for analyses of environmental justice impacts of cleanup sites. As with the alternative discussed in section 6.3.6, this alternative would have imposed additional burden on covered parties:

- Procedures for EJ assessment under the HEAL Act are not yet well defined and are still evolving during initial implementation of the Act.
- EJ assessment procedures appropriate for significant agency actions may not be necessary for the majority of MTCA site cleanups.
- Such procedures could complicate and delay cleanups without significantly affecting the choice of cleanup action alternatives, which is largely determined by site conditions and the stringent cleanup standards established in Parts 7 and 9 of the MTCA Cleanup Regulation.

As procedures for EJ assessment (generally and under the HEAL Act) are more defined over time, this could also have resulted in misaligned requirements that do not collectively serve the environmental justice goals of the statute.

6.3.22 Specifying requirements for community and tribal engagement at formal sites

We received public comments requesting that the rule specify additional requirements for engagement with communities and/or tribes at formal (Ecology-led or Ecology-supervised) cleanup sites. This set of alternatives would have potentially imposed additional burden on covered parties, and could also fail to meet the engagement goals and objectives of the statute. The amended rule requires development of a Public Participation Plan and a tribal engagement plan, which establish the appropriate activities necessary for meaningful engagement at a given site. These needs will be specific to the site and communities involved, and including specific requirements in the rule would have pre-determined what those needs are. Ecology may, however, develop a template to support a starting point for planning.

6.4 Conclusion

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

Chapter 7: Regulatory Fairness Act Compliance

7.1 Introduction

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. This chapter presents the:

- Analysis of relative compliance cost burden.
- Consideration of lost sales or revenue.
- Cost-mitigating elements of the rule, if required.
- Small business and local government consultation.
- Industries likely impacted by the rule amendments.
- Expected impact on jobs.

A small business is defined by the RFA as having 50 or fewer employees, at the highest ownership and operator level. Estimated compliance costs are determined as compared to the baseline (the regulatory environment in the absence of the rule amendments, limited to existing federal and state requirements). Analyses under the RFA only apply to costs to “businesses in an industry” in Washington State. This means the impacts, for this part of our analyses, are not evaluated for government agencies.

7.2 Analysis of relative compliance cost burden

We calculated the estimated per-business costs to comply with the rule amendments, based on the costs estimated in Chapter 3 of this document. In this section, we estimate compliance costs per employee.

The average affected small business likely to be covered by the rule amendments employs approximately 10 people. The largest ten percent of affected businesses employ an average of 107,743 people.⁷⁹ We note that due to the nature of site contamination, there is not likely to be a universal correlation between the magnitude of costs and the size of businesses – although initial contamination may be more likely at sites occupied by industrial businesses, sites may ultimately be discovered and remediated by other parties. For the comparison in this section, we made the simplifying assumption that low estimated costs would be incurred by small businesses, while high estimated costs would be incurred by the largest businesses.⁸⁰

Identifying the total cost per business for this rulemaking is complicated by the fact that a site might incur only a subset of the costs identified in Chapter 3, depending on the site’s characteristics and need for additional effort in compliance. Rather than assuming the subset of

⁷⁹ Dun & Bradstreet, 2023. D&B Market Insight Database.

⁸⁰ Any disproportion identified would also exist, and be higher, if we made the opposite assumption that low costs would be incurred by the largest businesses while high costs would be incurred by small businesses.

costs incurred by a site, we calculated the estimated costs per employee for each type of cost (and underlying number of sites). The table below summarizes these costs and the cost per employee to the largest businesses as a percentage of the costs per employee for small businesses.⁸¹

Table 28. Compliance costs per employee.

Cost Category	Small Businesses	Largest 10%	Ratio of Costs Largest to Small
Reporting exemptions	(\$2.59)	(\$0.00)	0.019%
Consideration of populations – Feasibility study	\$1,680.00	\$0.06	0.003%
Consideration of populations – Cleanup action plan	\$840.00	\$0.04	0.005%
Consideration of populations – Equitable participation	\$4,200.00	\$0.02	0.000%
Stepwise DCA Feasibility study	(\$840.00)	(\$0.16)	0.019%
UST – Free product	\$1,336.00	\$0.34	0.026%
UST – Groundwater	\$420.00	\$0.08	0.019%
UST – Vapor intrusion	\$105.00	\$0.04	0.037%
UST – Periodic updated	\$168.00	\$0.08	0.046%
Cultural resource protection – Engagement plan	\$63.00	\$0.02	0.031%
Cultural resource protection – Work plan	\$210.00	\$0.07	0.032%
Cultural resource protection – Inadvertent discovery plan	\$420.00	\$0.08	0.019%
Separate remedial investigation report	\$210.00	\$0.04	0.019%

We conclude that the rule amendments are likely to have disproportionate impacts on small businesses, and therefore Ecology must include elements in the rule amendments to mitigate this disproportion, as far as is legal and feasible.

7.3 Loss of sales or revenue

Businesses that would incur costs could experience reduced sales or revenues if the rule amendments significantly affect the prices of the goods they sell. The degree to which this could happen is strongly related to each business’s production and pricing model (whether additional lump-sum costs would significantly affect marginal costs), as well as the specific attributes of the markets in which they sell goods, including the degree of influence each firm has on market prices, as well as the relative responsiveness of market demand to price changes.

We used the REMI E3+ model for Washington State to estimate the impact of the rule amendments on directly affected markets, accounting for dynamic adjustments throughout the

⁸¹ Note that benefits of cost-savings are reflected as negative costs.

economy. The model accounts for: inter-industry impacts; price, wage, and population changes; and dynamic adjustment of all economic variables over time.

As inputs into the model and based on how costs were estimated in Chapter 3, we allocated costs across industries by the proportion of all identified industries (see Section 7.6) represented by each industry at the aggregated 4-digit NAICS code level, or at the lowest aggregation level in the model.

We found that the rule amendments would not significantly affect price levels and would negatively impact output in the state by the amounts below. For context, we note that baseline state output is forecast to be over \$1.2 trillion by 2027, of which the highest modeled impacts would be less than one-five-hundredth of one percent.

Table 29. Modeled impacts to output (billions of \$).

Cost Impact	2023	2030	2040
Low	-\$0.004	-\$0.007	-\$0.007
High	-\$0.017	-\$0.030	-\$0.033

Following parallel trajectories, modeled results indicate the highest impacts in the following industries, with total output losses across each industry of between \$1 million and \$3 million:

- Construction.
- Real estate.
- Retail trade.

7.4 Action taken to reduce small business impacts

The RFA (19.85.030(2) RCW) states that:

“Based upon the extent of disproportionate impact on small business identified in the statement prepared under RCW 19.85.040, the agency shall, where legal and feasible in meeting the stated objectives of the statutes upon which the rule is based, reduce the costs imposed by the rule on small businesses. The agency must consider, without limitation, each of the following methods of reducing the impact of the proposed rule on small businesses:

- a) Reducing, modifying, or eliminating substantive regulatory requirements;
- b) Simplifying, reducing, or eliminating recordkeeping and reporting requirements;
- c) Reducing the frequency of inspections;
- d) Delaying compliance timetables;
- e) Reducing or modifying fine schedules for noncompliance; or
- f) Any other mitigation techniques including those suggested by small businesses or small business advocates.”

We considered all of the above options, the goals and objectives of the authorizing statutes (see Chapter 6), and the scope of this rulemaking. We limited compliance cost-reduction methods to those that:

- Are legal and feasible.
- Meet the goals and objectives of the authorizing statute.
- Are within the scope of this rulemaking.

The rule amendments:

- Include reductions in substantive regulatory requirements, in terms of restructuring public involvement requirements (such as eliminating public comment processes for independent cleanups of less complex sites) and streamlining processes to reduce delays and rework. Other requirements are necessary to meet the goals and objectives of the authorizing statute (see Chapter 6), such as explicit requirements for engagement and consideration of the public, Tribal interests, vulnerable populations, and overburdened communities. Other significant MTCA regulatory requirements, such as cleanup levels, are outside the scope of this rulemaking.
- Include reductions in reporting requirements, in terms of expanding reporting exemptions. Other reporting requirements are necessary for Ecology to implement the rule and meet the objectives of the statute for protection of human health and the environment.
- Do not address inspections, which are outside the scope of this rulemaking.
- Include flexibility for Ecology to direct an alternative free product monitoring and reporting frequency as appropriate for a site.
- Do not address fines, which are outside the scope of this rulemaking.

Finally, multiple rule amendments will serve to reduce errors, need for additional interactions, and rework that may result from lack of clarity in baseline requirements.

7.5 Small business and government involvement

We involved small businesses and local governments in its development of the rule amendments, using:

- The MTCA Email distribution list: Emails sent to over 400 subscribers regarding the rulemaking, between December 2018 and November 2022.
- Stakeholder and Tribal Advisory Group (STAG) meetings: A total of 11 meetings including representation from:
 - Eight consulting engineers and attorneys whose practices represent a variety businesses involved in MTCA cleanups, including both large and small businesses.
 - 9 county, municipal, Tribal, and local governments.

- 5 nonprofit organizations representing community and environmental concerns.
 - Yakama Nation and Colville Tribes.
- Two STAG webinars.
- Five external presentations for representatives and members of:
 - Local Ports.
 - Attorneys working for small businesses.
 - Seattle Sierra Club.
 - Suquamish Tribe Cleanup team.
- Preproposal Statement of Inquiry (also known as the CR-101 form) notice sent to:
 - MTCA email list subscribers.
 - STAG members.
 - MTCA attorneys.

7.6 North American Industry Classification System (NAICS) codes of impacted industries

The rule amendments likely impact the following industries, with associated NAICS codes. NAICS definitions and industry hierarchies are discussed at <https://www.census.gov/naics/>.

Table 30. NAICS codes of likely impacted industries.

NAICS	Description	NAICS	Description	NAICS	Description
1111	Oilseed and Grain Farming	3313	Alumina and Aluminum Production and Processing	4842	Specialized Freight Trucking
1113	Fruit and Tree Nut Farming	3314	Nonferrous Metal (except Aluminum) Production and Processing	4851	Urban Transit Systems
1114	Greenhouse, Nursery, and Floriculture Production	3315	Foundries	4854	School and Employee Bus Transportation
1119	Other Crop Farming	3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	4881	Support Activities for Air Transportation
1121	Cattle Ranching and Farming	3328	Coating, Engraving, Heat Treating, and Allied Activities	4884	Support Activities for Road Transportation
2121	Coal Mining	3331	Agriculture, Construction, and Mining Machinery Manufacturing	4931	Warehousing and Storage
2123	Nonmetallic Mineral Mining and Quarrying	3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	5133	Newspaper, Periodical, Book, and Directory Publishers
2211	Electric Power Generation, Transmission and Distribution	3359	Other Electrical Equipment and Component Manufacturing	5311	Lessors of Real Estate
2213	Water, Sewage and Other Systems	3361	Motor Vehicle Manufacturing	5312	Offices of Real Estate Agents and Brokers
23XX	Construction	3363	Motor Vehicle Parts Manufacturing	5321	Automotive Equipment Rental and Leasing
311X	Food Manufacturing	3364	Aerospace Product and Parts Manufacturing	5617	Services to Buildings and Dwellings
3114	Fruit and Vegetable Preserving and Specialty Food Manufacturing	3366	Ship and Boat Building	5621	Waste Collection
3117	Seafood Product Preparation and Packaging	3369	Other Transportation Equipment Manufacturing	5622	Waste Treatment and Disposal

NAICS	Description	NAICS	Description	NAICS	Description
3118	Bakeries and Tortilla Manufacturing	4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	5629	Remediation and Other Waste Management Services
3119	Other Food Manufacturing	42XX	Wholesale Trade	6211	Offices of Physicians
3121	Beverage Manufacturing	44XX	Retail Trade	6221	General Medical and Surgical Hospitals
3141	Textile Furnishings Mills	4411	Automobile Dealers	7121	Museums, Historical Sites, and Similar Institutions
321X	Wood Product Manufacturing	4413	Automotive Parts, Accessories, and Tire Retailers	7139	Other Amusement and Recreation Industries
3211	Sawmills and Wood Preservation	4441	Building Material and Supplies Dealers	7211	Traveler Accommodation
3212	Veneer, Plywood, and Engineered Wood Product Manufacturing	4442	Lawn and Garden Equipment and Supplies Retailers	7223	Special Food Services
3219	Other Wood Product Manufacturing	4451	Grocery and Convenience Retailers	8111	Automotive Repair and Maintenance
3241	Petroleum and Coal Products Manufacturing	455X	General Merchandise Retailers	8114	Personal and Household Goods Repair and Maintenance
3251	Basic Chemical Manufacturing	4811	Scheduled Air Transportation	8123	Drycleaning and Laundry Services
3253	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	4821	Rail Transportation	n/a	n/a
3273	Cement and Concrete Product Manufacturing	4841	General Freight Trucking	n/a	n/a

7.7 Impact on jobs

We used the REMI E3+ model for Washington State to estimate the impact of the rule amendments on jobs in the state, accounting for dynamic adjustments throughout the economy. See Section 7.3 for discussion of model inputs.

The rule amendments would result in transfers of money within and between industries, as compared to the baseline. The modeled impacts on employment are the result of multiple small increases and decreases in employment, prices, and other economic variables across all industries in the state. Overall, the highest modeled impacts to jobs were for 2027, with a total statewide loss of 38 to 166 full-time employee (FTE) equivalents across all sectors of the state economy. Note that the likelihood of jobs impacts is not uniform over this range – most MTCA sites are relatively simple, indicating that costs are likely to be at the lower end of estimated ranges, and thus jobs impacts are also likely to be toward the lower end of this range. The high end of the range would reflect the highest estimated costs being incurred at all affected sites.

Table 31. Impacts on jobs (low-cost estimate).

Industry	2023	2030	2040
Whole state (all industries)	-25	-36	-31
Construction	-4	-4	-2
Personal care services	-3	-3	-2
Retail trade	-2	-3	-3
State and Local Government	-1	-4	-3
Real estate	-1	-2	-1
Food services and drinking places	-1	-2	-2
Farm	-1	-1	-1
Other personal services	-1	-1	-1
Automotive repair and maintenance	-1	-1	-1
Offices of health practitioners	-1	-1	-1
Wholesale trade	-1	-1	-1
Drycleaning and laundry services	-1	-1	-1
Individual and family services; Community and vocational rehabilitation services	0	-1	-1

Table 32. Impacts on jobs (high-cost estimate).

Industry	2023	2030	2040
Whole state (all industries)	-110	-157	-141
Construction	-18	-19	-9
Personal care services	-13	-12	-10
Retail trade	-9	-13	-12
State and Local Government	-5	-16	-15
Real estate	-5	-7	-6
Food services and drinking places	-4	-8	-8
Farm	-4	-4	-3
Other personal services	-3	-3	-3
Automotive repair and maintenance	-3	-4	-3
Offices of health practitioners	-3	-3	-3

Industry	2023	2030	2040
Wholesale trade	-3	-4	-3
Drycleaning and laundry services	-2	-5	-5
Individual and family services; Community and vocational rehabilitation services	-2	-3	-3
Services to buildings and dwellings	-2	-2	-2

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Appendix A: Administrative Procedure Act (RCW 34.05.328) Determinations

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

See Chapter 6.

B. RCW 34.05.328(1)(b) – Need for and alternatives to rulemaking

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

See chapters 1 and 2.

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

The citizens of Washington adopted MTCA, the state’s contaminated site cleanup law, as Initiative 97 in November 1988 (Chapter 2, Laws of 1989). It has been amended many times since then, not including budget-related amendments. The MTCA Cleanup Regulation authorized by the statute was last fully revised in 2001. Over the last 21 years, MTCA administrative methods and procedures have evolved significantly in practice, and now need to be reflected in an updated MTCA Cleanup Regulation. Ecology is adopting rule amendments in order to:

- Strengthen environmental justice principles when prioritizing and cleaning up contaminated sites.
- Improve the site hazard assessment and ranking process.
- Require comprehensive program plans and performance assessments.
- Improve initial response to releases from regulated underground storage tanks.
- Update and clarify remedial investigation and remedy selection requirements.
- Clarify which requirements apply to independent remedial actions.
- Strengthen public participation and tribal engagement requirements for Ecology-conducted or supervised cleanups.

Ecology believes the adopted amendments are necessary to achieve the statutory goals and objectives of MTCA more effectively.

The no-action alternative to this update would be a MTCA Cleanup Regulation that:

- Retains detailed methods for site hazard assessment and ranking that have proven inadequate and fallen into disuse contrary to statutory mandate, and cannot be amended without rulemaking.
- Includes descriptions of site cleanup and public involvement processes that have proven difficult for the regulated community and Ecology staff to interpret and apply.
- Does not clearly distinguish requirements for independent cleanups from requirements for Ecology-conducted and Ecology-supervised cleanups.
- Includes procedures for cleanups of leaking underground storage tanks that need to be streamlined, clarified, and better integrated with Chapter 173-360A WAC (Underground Storage Tank Regulations.)
- By current standards, no longer adequately puts into operation Ecology’s long-standing commitments to environmental justice, especially as these are evolving in response to passage of SB 5141 (the HEAL Act) in 2021 (codified as Chapter 70A.02 WAC, Environmental Justice).
- Has otherwise become inaccurate with respect to two decades of legislative change since the last update.
- Does not meet current rule writing standards for clarity and accessibility.

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.

WAC [173-340-710](#) (Applicable local, state, and federal laws) requires that cleanup actions under MTCA must comply with applicable state and federal laws.

Section 173-340-200 defines "Applicable state and federal laws" to mean all legally applicable requirements and those requirements that the department determines, based on the criteria in WAC [173-340-710\(4\)](#), are relevant and appropriate requirements.

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 amended rule does not impose more stringent cleanup process requirements, including conducting investigations and selecting cleanup actions, reporting remedial actions, and engaging the public and Tribes. The rule amendments update and clarify many of these requirements. The amendments also clarify the applicability of substantive requirements to independent remedial actions (e.g., conducting a feasibility study) and identify the differences in administrative requirements between independent remedial actions and Ecology-conducted or Ecology-supervised remedial actions (e.g., how report results and whether need to engage the public and Tribes). While the administrative requirements for Ecology-conducted and Ecology-supervised remedial actions are more stringent, both public and private entities conduct such actions.

The amended rule does not alter or impose more stringent cleanup standards on private entities than on public entities. Cleanup standards include cleanup levels of hazardous substances, points of compliance, and compliance with other applicable or relevant and appropriate regulations.

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.

Yes.

If **yes**, the difference is justified because of the following:

(i) A state statute explicitly allows Ecology to differ from federal standards. [If checked, provide the citation included quote of the language.]

(ii) Substantial evidence that the difference is necessary to achieve the general goals and specific objectives stated in Chapter 6.

RCW 70A.305.030(2)(e):

... (2) The department must immediately implement all provisions of this chapter to the maximum extent practicable, including investigative and remedial actions where appropriate. The department must adopt, and thereafter enforce, rules under chapter 34.05 RCW to:

... (e) Publish and periodically update minimum clean-up standards for remedial actions at least as stringent as the clean-up standards under section 121 of the federal cleanup law, 42 U.S.C. Sec. 9621, and at least as stringent as all applicable state and federal laws, including health-based standards under state and federal law

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.

The amended rule explicitly coordinates the MTCA Cleanup Regulations, Chapter 173-340 WAC, with the following related federal and state laws and regulations:

- Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ([42 U.S.C. 9601 et seq.](#)).
- Chapter 173-204 WAC, Sediment Management Standards.
- Chapter 173-360A WAC, Underground Storage Tank Regulations.
- Chapter 374-45 WAC, Reporting and Initial Investigations.
- Chapter 374-80 WAC, Advice and Technical Assistance Program.
<https://app.leg.wa.gov/rcw/default.aspx?cite=70A.330.040>
- RCW [90.56.280](#), Duty to notify coast guard and division of emergency management of discharge.
- Applicable state and federal laws regarding cultural resource protection specified in amended WAC 173-340-815.

During the announcement phase of this rulemaking, Ecology has provided informational briefings and opportunities to review and comment on two previous drafts of the rule to representatives of the following federal, state, and local agencies, and other Ecology programs:

- Federal Agencies:

- US Army Corps of Engineers
 - US Environmental Protection Agency
- Washington State Pollution Liability Insurance Agency, and the Departments of:
 - Archeology and Historic Preservation
 - Fish and Wildlife
 - Health
 - Natural Resources
 - Transportation
- Ecology programs:
 - Hazardous Waste and Toxics Reduction
 - Nuclear Waste Program
 - Solid Waste Management