DEPARTMENT OF ECOLOGY
State of Washington

Final Regulatory Analyses

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

Chapter 173-186 WAC
Oil Spill Contingency Plan – Railroad

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Chapter 173-186 WAC

Oil Spill Contingency Plan – Railroad

by

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Table of Contents

Tables

Figures

Acronyms

AFFF	Aqueous Film Forming Foam
CBA	Cost-Benefit Analysis
DEQ	Oregon Department of Environmental Quality
DWH	Deep Water Horizon
EDRC	Effective Daily Recovery Capacity
EPA	U.S. Environmental Protection Agency
ESHB	Engrossed Substitute House Bill
E2SSB	Engrossed Second Substitute Senate Bill
FTE	Full-time employee
GRP	Geographic Response Plan
GPVRFO	Group V Residual Fuel Oils
ICS	Incident Command System
LAPIO	Low American Petroleum Institute Oil
LBA	Least-Burdensome Alternative Analysis
MRU	Mobile Wildlife Rehabilitation Unit
NAICS	North American Industry Classification System
NFO	Non-floating Oils
NPREP	National Preparedness for Response Exercise Program
NWACP	Northwest Area Contingency Plan
PRC	Primary Response Contractors
RCW	Revised Code of Washington
REMI PI+	Regional Economic Models Incorporated Policy Insight plus
RFA	Regulatory Fairness Act
SDS	Safety Data Sheet
SMT	Spill Management Team
U.S.C.	United States Code
VOO	Vessels of Opportunity
WAC	Washington Administrative Code
WCSV	Worst-case Spill Volume
WRRL	Worldwide Response Resource List

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Executive Summary

This report presents the determinations made by the Washington State Department of Ecology (Ecology) as required under chapters 34.05 RCW and 19.85 RCW, for adopted amendments to the Oil Spill Contingency Plan – Railroad rule (chapter 173-186 WAC; the "rule"). This includes the:

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

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

The APA also requires Ecology to "determine, after considering alternative versions of the rule…that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives" of the governing and authorizing statutes (RCW 34.05.328(1)(d)). Chapter 6 of this document describes that determination.

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

All determinations are based on the best available information at the time of publication, and input received during the public comment period.

Motivation for rulemaking

Ecology was in the initial stages of implementing the rule in 2017, when the legislature passed Engrossed Substitute House Bill (ESHB) 1136 (RCW 90.56.210) changing oil spill contingency planning requirements for smaller railroads. The purpose of this rulemaking is to streamline plan requirements for smaller railroads that move refined oil products and not crude oil. In addition, the adopted amendments are intended to comply with the passage of Engrossed Second Substitute Senate Bill (E2SSB) 6269 in 2018 (RCW 90.56.210) directing Ecology to update rules to account for non-floating oils and to require spill management teams to apply and be approved by Ecology in order to be cited in contingency plans.

Summary of the adopted rule amendments

The adopted rule amendments make the following changes:

- Expanding applicability.
- Adding definitions.

- Changing plan submittal requirements.
- Phasing in requirements.
- Establishing specific requirements for Type A (crude, any volume) railroads.
- Establishing specific requirements for Type B (non-crude, more than 49 tank cars per year) railroads.
- Establishing specific requirements for Type C (non-crude, less than 49 tank cars per year) railroads.

Likely costs

The following 20-year present value costs are likely as a result of the adopted amendments.

- Type A and Type B railroads:
  - $900 in plan submittal costs for submitting one additional paper copy.
- Type A railroads:
  - $120 thousand to $165 thousand in plan update costs.
  - $545 thousand to $5.5 million in Spill Management Team (SMT) retainer costs.
  - $1.1 million to $1.9 million in wildlife response retainer costs.
- Type B railroads:
  - $7 thousand in plan update costs.
- (The adopted amendments are not likely to result in costs to Type C railroads.)

We estimate that the adopted amendments are likely to result in $1.8 million to $7.6 million in 20-year present value costs. Where requirements for railroads decrease, these decreases are a result of statutory requirements (baseline), and impacts are not a result of this rulemaking.

Likely benefits

The following benefits are likely to result from the adopted amendments. Because we could not quantify how much the amendments will improve spill response timing or qualities (resulting in reduced damage to wildlife, property, public health, and environmental wellbeing), we have included these benefits qualitatively, with illustrative total or incremental values as available. Where requirements for railroads decrease, these decreases are a result of statutory requirements (baseline), and impacts are not a result of this rulemaking.

- Bringing plan submittal requirements into line with current plan submittal practice that supports statewide electronic plan availability, with paper backup.
- Avoided present-value costs of phased-in requirements, of between 0.5 cents and 1.5 cents per dollar of cost.
- Additional planning and retained available personnel to manage and participate in improved spill response for Type A and Type B railroads, resulting in more comprehensive spill response. This particularly relates to:
  - Potentially sinking oils.
  - Wildlife rescue and rehabilitation.

    - Guaranteed (contracted) SMT and wildlife response contractors for Type A (crude) railroads.

- Potential reduced or avoided impacts to the following, based on comprehensive and contracted response management.
    - Public health and safety:
        - Fire.
        - Explosions.
        - Air quality.
        - Toxic chemical exposure.
        - Drinking water contamination.
        - Subsistence or traditional food source contamination.
        - Evacuation.
        - Property damage and contamination.
        - Property value impacts of risk.
    - Surface water quality.
    - Groundwater quality.
    - Fisheries.
    - Areas prone to wildfire.
    - Shellfisheries.
    - Bird populations.
    - Sea mammals.
    - Endangered species.
    - Animals consuming contaminated fish or shellfish.
    - Recreational quality.
    - Passive or non-use values for nature.
- Potential reduction in impacts to the following, based on improved planning for non-floating oils and wildlife response.
    - Water column and sediment wildlife, including shellfish.
    - Bird populations.
    - Animals including sea mammals.
    - Fish.
    - Endangered species such as some salmon and orcas.
    - Recreational use of shorelines.
    - Wildlife habitat surrounding the spill that may be impacted by long-term response size and duration.
- See pages 26 – 31 for unit values and illustrative total values for:
    - Immediate spill cleanup.
    - Spills of non-floating oils.

    - Worst case freshwater spills.
    - Values for animals and nature, including salmon recovery and wildlife watching.
    - Values for commercial fishing industries.
    - Post spill response remediation.
    - Non-crude oil spills.
- Ability to list SMT members in up to two positions.
- Ability to include wildlife drills as part of the multi-objective drill.

Comparison

While we were not able to quantify how the adopted amendments will reduce the amount or severity of damages to wildlife, property, public health, and environmental wellbeing, we have illustrated the myriad benefits categories and values that will potentially be gained. These will be reductions in short-term, and long-term damages, and also affect risk that underlies property values. These benefits will come at a 20-year present value cost of between $1.8 million to $7.6 million.

Conclusion

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

Least-burdensome alternative

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

Regulatory Fairness Act compliance

We conclude that the adopted rule amendments *may* have disproportionate impacts on small businesses. Ecology is therefore required to include elements in the rule amendments to mitigate disproportionate compliance costs, to the extent that is legal and feasible.

The adopted amendments are likely to result in insignificant impacts to prices, and between insignificant and $1 thousand impacts to total state output.

Under low cost assumptions, the REMI model forecasts the adopted amendments will result in the sustained loss of one aggregate job statewide. Under high cost assumptions, this impact increases to one aggregate job lost in 2019, increasing to six jobs by 2025 – 2027, then decreasing and stabilizing at five jobs lost. Under low cost assumptions, the model forecasts the adopted amendments will not result in significant job losses in the rail transportation industry. Under high cost assumptions, this impact increases to the sustained loss of one job beginning in 2021.

Chapter 1: Background and Introduction

1.1 Introduction

This report presents the determinations made by the Washington State Department of Ecology (Ecology) as required under chapters 34.05 RCW and 19.85 RCW, for adopted amendments to the Oil Spill Contingency Plan – Railroad rule (chapter 173-186 WAC; the "rule"). This includes the:

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All determinations are based on the best available information at the time of publication, and input received during the public comment period.

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

1.1.1 Oil transportation

Washington State requires state-approved oil spill contingency plans for:

- Larger oil-handling facilities.
- Pipelines.
- Commercial vessels.
- Railroads.

These plans describe the plan holder's ability to respond to oil spills. Plans include information on:

- Spill response procedures
- Equipment
- Safety
- Communications
- Training

Every year, 20 billion gallons of oil moves through Washington by vessel, rail, and pipeline, posing significant risk of environmental damage. The risks associated with all modes of oil transportation and handling require a robust state program of prevention, preparedness, and response to protect our communities, environment, and economy.

Oil transportation in Washington State

Data on the quantities of oil transported by vessel, pipeline, and rail in Washington show an increasing percentage of oil is transported by rail.

Table 1: Gallons of oil transported in Washington, by movement type.

Total Oil Movement Washington State by vessel, rail and pipeline - *All oil moved as cargo*							
	Volume (Billions of gallons)			**Total All Types**	**Percentages**		
Year	**vessel**	**pipeline**	**rail**		**vessel**	**pipeline**	**rail**
2014	10.5	6.7	1.3	18.6	56%	36%	8%
2015	9.6	7.4	2.1	19.2	50%	39%	11%
2016	10.7	7.8	2.1	20.7	52%	38%	10%
2017	9.8	7.4	2.2	19.5	50%	38%	12%
2018	10.0	7.4	2.4	19.9	50%	38%	12%

All oil of any kind including crude oil, petroleum, gasoline, diesel, aviation fuel, fuel oils, biological oils, and blends. Cargo only. Does not include fuel oil being transported for fueling.

Oil trains carrying crude oil travel through the areas depicted in Figure 1. The number of cars per train can vary between 90 and 120.

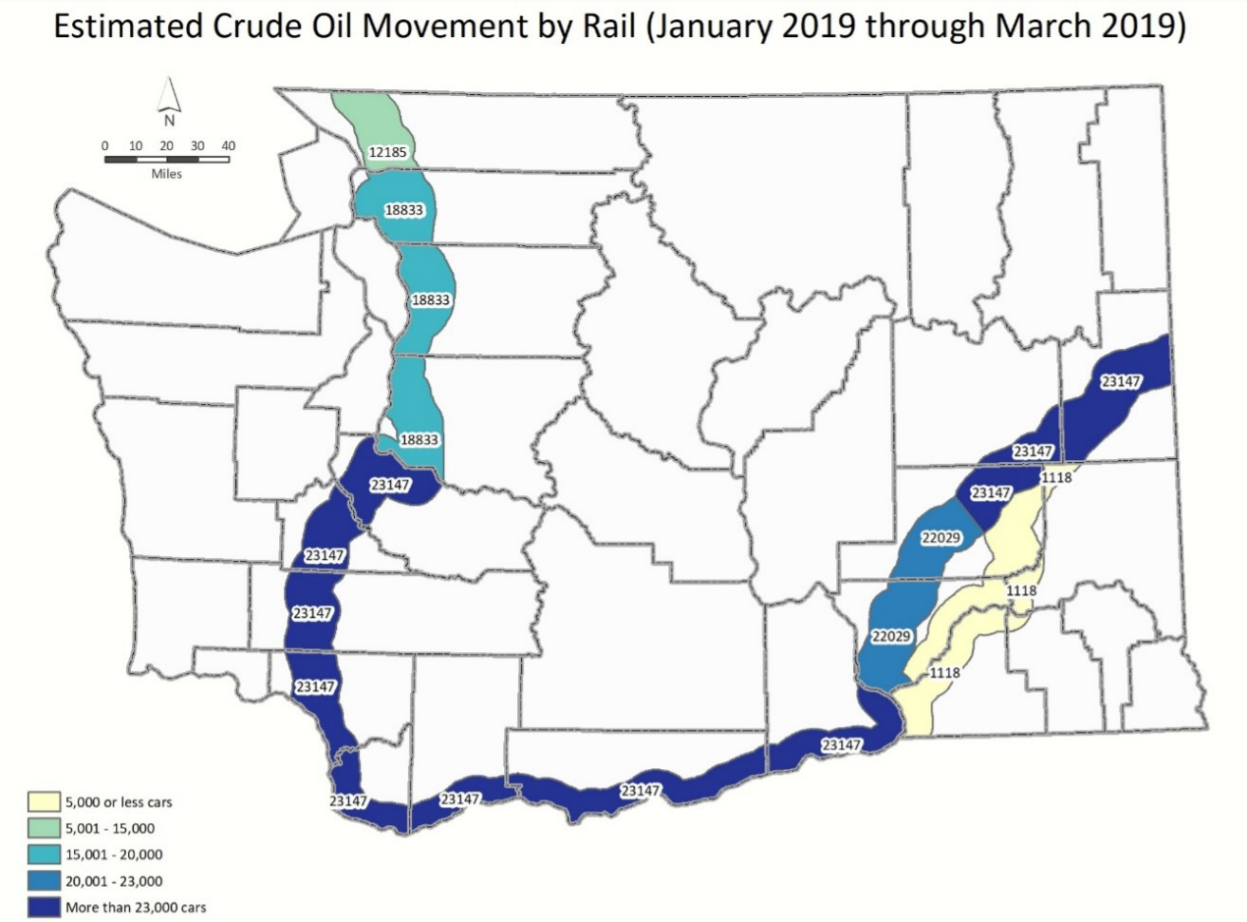

Figure 1: Number of cars carrying crude oil movement by rail.

Some trains transfer oil within the state, while others pass through to Oregon and California. Railroads are not currently required to report volumes of non-crude oil transported.

Washington's waters support some of the most productive and valuable ecosystems in the world, and spills on land or water can threaten:

- Public health.
- Safety.
- The environment.
- Tribal cultural values.
- The economy.

Equipment failure, human error, poor training, and lack of thorough planning to minimize the impacts of spills can lead to unintended and potentially enormous consequences. Even small oil leaks, drips, and spills lead to cumulative impacts that can significantly degrade our ecosystems.

Risk of spills from rail

Transporting oil by rail carries risks typically associated with spills, as well as risks that may be more specific to transporting oil by rail. Risks include:

- Public safety risk of fires and explosions
- Public and environmental risk of wildfire
- Public health risk of drinking water contamination
- Health and cultural risks of contamination of subsistence and tribal fishing resources
- Environmental risks of spills to surface waters (marine and freshwater)
- More and larger inland spills than in the past
- Social and economic disruptions
- Property damage from fires or spills
- Property value impacts from increased risk of spills

During 2003 – 2012, throughout the United States, an average of 96,600 gallons of oil spilled from trains each year. This is equal to about 0.000086 gallons spilled for every gallon transported, or 0.0086 percent of volume. This is also equal to one gallon of oil spilled for every 11,628 gallons transported by rail. This number has varied each year, with the lowest ratio of one gallon spilled of every 62,500 gallons transported (2012). This is significantly lower than less recent ratio statistics, including one gallon spilled of every 333 gallons transported (1990).

Overall, nationally, the rate of gallons spilled per gallons transported by rail has decreased significantly, from 0.000996 in 1980 – 1982, to 0.000086 in 2003 – 2012. However, the number of spills from rail started to decrease during 1980 – 2002, but increased again starting in 2003. We expect this trend to continue as the volume and number of trains carrying oil increase.[1]

Table 2: Examples of oil spills from rail.

Location Year Incident Type	Fire	Spill (Gallons)	Details of Incident
LaSalle, CO 2014 Derailment	No	6,500	6 cars of a 100-car crude oil train derailed, causing leakage from one car. Leakage was at rate of 20-50 gallons/minute. Spill contained in ditch. No injuries.
Lynchburg, VA 2014 Derailment	Yes	Less than 50,000	15 cars in crude oil train derailed in downtown area of city. 3 cars caught fire, and some cars derailed into river along tracks. Immediate area surrounding derailment evacuated. No injuries were reported.

[1] Ecology (2015). Washington State 2014 Marine and Rail Oil Transportation Study. March 1, 2015. Ecology publication no. 15-08-010.

Location Year Incident Type	Fire	Spill (Gallons)	Details of Incident
Vandergrift, PA 2014 Derailment	No	4,550	21 tank cars of 120-car train derailed outside Pittsburgh. 19 derailed cars carrying crude oil from western Canada; 4 released product. No fire or injuries.
Philadelphia, PA 2014 Derailment	No	None	7 cars of 101-car CSX train, including 6 carrying crude oil, derailed on bridge over Schuylkill River. No injuries and no leakage were reported, but 2 cars, one tanker, leaning over river.
Wisconsin/ Minnesota 2014 Leak	No	12,000	Valve or cap mishap caused spill of 12,000 gallons from one tank car while in route between Winona and Red Wing. Train traveling at low speed.
Plaster Rock, New Brunswick, Canada 2014 Derailment	Yes	Unknown	Train delivering crude from Manitoba and Alberta to Irving Oil refinery in St. John, New Brunswick. 45 homes evacuated; no injuries reported. 17 cars of mixed train hauling crude oil, propane, and other goods derailed likely due to sudden wheel/axle failure. 5 tank cars carrying crude oil caught fire and exploded.
Casselton, ND 2013 Derailment	Yes	More than 400,000	Eastbound train hauling 106 tank cars of crude oil struck westbound train carrying grain that shortly before had derailed onto eastbound track. Some 34 cars from both trains derailed, including 20 cars carrying crude oil that exploded and burned for over 24 hours. About 1,400 residents of Casselton were evacuated, but no injuries were reported. Cause of derailments and subsequent fire under investigation.
Aliceville, AL 2013 Derailment	Yes	Less than 748,400	Train hauling 90 cars of crude oil from North Dakota to refinery near Mobile, AL, derailed on section of track through wetland near Aliceville, AL. 30 tank cars derailed and some dozen burned. No one was injured or killed. The derailment occurred on a short line railroad's track that had been inspected a few days earlier. Cause of derailment under investigation. 30 cars derailed, 12 breached.
Gainford, Alberta, Canada 2013 Derailment	Yes	Unknown	9 tank cars of propane and four tank cars of crude oil from Canada derailed. About 100 residents evacuated. 3 propane cars burned, but tank cars carrying oil were pushed away and did not burn. No one injured or killed. Derailment cause under investigation. 9 propane, 4 crude; 3 propane cars burned.

Location Year Incident Type	Fire	Spill (Gallons)	Details of Incident
Lac-Mégantic, Quebec, Canada 2013 Derailment	Yes	More than 26,500	Train with 72 loaded tank cars of crude oil from North Dakota moving from Montreal, Quebec, to St. John, New Brunswick, stopped at Nantes, Quebec, at 11:00 pm. Operator and sole railroad employee aboard train secured it and departed, leaving train on short line track with descending grade of 1.2 percent. At about 1:00 am, train began rolling down descending grade toward town of Lac-Mégantic, about 30 miles from U.S. border. Near center of town, 63 tank cars derailed, resulting in multiple explosions and subsequent fires. 47 fatalities and extensive damage to town. 2,000 people evacuated.
White River, Calgary, Alberta 2013 Derailment	Yes	26,866	A broken wheel and emergency brake application caused a derailment. Two of seven cars carrying crude oil spilled. There was a fire that was put out by local firefighters.
Parkers Prairie, MN 2013 Derailment	No	30,000	14 cars on 94-car crude oil train derailed; up to 3 cars ruptured.
Lynchburg, VA 2014 Derailment	Yes	Unknown	17 car derailment and fire.
Ontario, Canada 2015 Derailment	Yes	Unknown	35 cars derailed and 7 caught fire.
Southwestern Alberta 2015 Derailment	No	None	12 crude oil cars derailed.
West Virginia 2015 Derailment	Yes	Under investigation	Train derailment involving 27 cars spilled oil into the Kanawha River, a source of drinking water in Kanawha and Fayette counties. 19 cars were involved in the fire.
Mosier, Oregon 2016 Derailment	Yes	42,000	96-car oil train derailed 20 feet from the city's sewage treatment facility and next to the Columbia River. 16 cars derailed and 4 were involved in the fire. Drinking water use was restricted and the town's treatment plant was closed (with wastewater shipped to nearby Hood River). Groundwater contamination and an oil sheen on the river were later observed.

Non-floating oils

Increased oil-by-rail traffic is associated with increased bitumen (tar sands) oil and other crude oils transported through Washington. Because of the properties of non-floating oils (potentially sinking or being suspended in the water column), even if diluted, they are uniquely difficult to remove after a spill. Additionally, some portion may sink or submerge after weathering, which renders conventional techniques ineffective in containing and removing oil from the water's

surface. Potentially sinking oil poses a risk of contamination to sediments and their ecosystems, which include economically and culturally valuable shellfish and fisheries.
Costs associated with sinking oils can be significantly higher than other crude oils. In 2010, a large quantity of diluted bitumen spilled from the Enbridge pipeline running through Marshall, Michigan, into the Kalamazoo River. The spill of 20,000 barrels (a barrel contains 42 gallons) ultimately closed an about 35-mile stretch of the river for over a year, and required cleanup from floodplains and marshes. Enbridge reported that the total cost of the spill as of December 31, 2015 totaled $1.2 billion.[2] That is about $60 thousand per barrel spilled. Before this incident, the average crude oil spill in the past decade is reported to be $2 thousand per barrel or more to clean up.

1.1.2 Motivation for rulemaking

Ecology was in the initial stages of implementing the rule in 2017, when the legislature passed Engrossed Substitute House Bill (ESHB) 1136 (RCW 90.56.210) changing oil spill contingency planning requirements for smaller railroads. The purpose of this rulemaking is to streamline plan requirements for smaller railroads that move refined oil products and not crude oil. In addition, the adopted amendments are intended to comply with the passage of Engrossed Second Substitute Senate Bill (E2SSB) 6269 in 2018 (RCW 90.56.210) directing Ecology to update rules to account for non-floating oils and to require spill management teams to apply and be approved by Ecology in order to be cited in contingency plans.

1.2 Summary of the adopted rule amendments

The adopted rule amendments make the following changes:

- Expanding applicability.
- Adding definitions.
- Changing plan submittal requirements.
- Phasing in requirements.
- Establishing specific requirements for Type A (crude, any volume) railroads.
- Establishing specific requirements for Type B (non-crude, more than 49 tank cars per year) railroads.
- Establishing specific requirements for Type C (non-crude, less than 49 tank cars per year) railroads.

1.3 Document organization

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

- 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 changes to rule requirements.
- Likely costs of the adopted rule amendments (Chapter 3): Analysis of the types and sizes of costs we expect impacted entities to incur as a result of the adopted rule amendments.

[2] Enbridge, Inc. (2015). 2015 Annual Report. p. 78.

- Likely benefits of the adopted rule amendments (Chapter 4): Analysis of the types and size of benefits we expect to result from the adopted 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 adopted rule amendments.
- Regulatory Fairness Act Compliance (Chapter 7, when applicable): Comparison of compliance costs to small and large businesses; mitigation; impact on jobs.
- RCW 34.05.328 determinations not discussed in chapter 5 or 6 (Appendix A).

Chapter 2: Baseline and the Adopted Rule Amendments

2.1 Introduction

We analyzed the impacts of the adopted rule amendments relative to the baseline of the existing rule, within the context of all existing requirements (federal and state laws and rules). This context for comparison is called the baseline, and reflects the most likely regulatory circumstances that entities would face if the amended rule were 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 adopted rule amendments.

For this rulemaking, the baseline includes the:

- Existing rule: chapter 173-186 WAC, Oil Spill Contingency Plan – Railroad.
- Authorizing statute: RCW 88.46.160, Refueling, bunkering, or lightering operations – Availability of containment and recovery equipment – Rules.
- Authorizing statute: RCW 90.48.080, Discharge of polluting matter in waters prohibited.
- Authorizing statute: chapter 90.56 RCW, Oil and Hazardous Substance Spill Prevention and Response.
- Any other applicable law or rule.

2.3 Adopted rule amendments

The adopted rule amendments make the following changes:

- Expanding applicability.
- Adding definitions.
- Changing plan submittal requirements.
- Phasing in requirements.
- Establishing specific requirements for Type A railroads.
- Establishing specific requirements for Type B railroads.
- Establishing specific requirements for Type C railroads.

2.3.1 Expanding applicability

Baseline

The baseline rule applies to railroad facilities (excluding those owned and operated by the state), any person submitting a plan on their behalf, and Primary Response Contractors (PRCs).

Adopted
The adopted amendments add Spill Management Teams (SMTs) to the baseline list of applicability.

Expected impact
In and of itself, this change does not create impacts. Impacts to SMTs stem from requirements set for them, and are discussed in the relevant sections below.

2.3.2 Adding definitions

Baseline
The baseline rule sets definitions appropriate for the rule contents, including:

- Bulk
- Cargo
- Facility
- Oil or oils
- Owner or operator
- Planning standards
- Rail plan holder
- Tank car
- Worst case spill

Adopted
The adopted amendments do not change any existing definitions. They add definitions for:

- Spill Management Team (SMT): Representatives and assigned personnel who are qualified and capable of integrating into an incident command system or unified command system and managing a spill. A company internal SMT is approved through the contingency plan and a contracted SMT is approved by Ecology through the SMT application process and is directly responsible to a contingency plan holder, either by a contract or other approved written agreement.
- Type A railroad: Any railroad classification transporting oil in bulk that is crude oil regardless of volume.
- Type B railroad: Any railroad classification transporting oil in bulk that is not crude oil in an amount of forty-nine or more tank car loads per year.
- Type C railroad: Any railroad classification transporting oil in bulk that is not crude oil in an amount less than forty-nine tank car loads per year.
- Worldwide Response Resource List (WRRL): An equipment list established and maintained by spill response equipment owners.

Expected impact
Most of the new definitions do not have costs and benefits in and of themselves, but the definition of an SMT sets the requirement that SMTs must be approved by Ecology. We expect this to have costs and benefits, as part of overall plan update impacts discussed as relevant for each railroad type. *(See sections 2.3.6 through 2.3.8, and corresponding estimates and discussion in chapters 3 and 4).*

2.3.3 Changing plan submittal requirements

Baseline
Under the baseline, plan holders must submit two paper copies or one electronic copy of the contingency plan. In practice, this was previously two paper copies (one located at Ecology headquarters, and one at Ecology's Northwest Regional Office). We have since shifted to having all files available electronically, with one paper copy in case access to electronic copies is not available. Plan holders also print copies for their personnel to access.

Adopted
The adopted amendments replace the explicit requirement for two paper copies, with a requirement to submit one electronic and one paper copy.

Expected impact
The adopted amendments will bring the rule into line with current practice. Under the APA – considering only what is written in rules and laws – this is a change that will result in:

- Compared to two paper copies:
    - The cost of electronic submissions.
    - A cost-savings for printing and submitting one less paper copy.
- Compared to one electronic copy:
    - The cost of printing and submitting a paper copy.

2.3.4 Phasing in requirements

Baseline
Under the baseline, rule requirements are immediately applicable on the rule's applicability date.

Adopted
The adopted rule includes language on which plan updates are due in 18 months (instead of immediately when the amended rule is applicable).

- Type A railroads have 18 months to submit updates for:
    - Binding agreement.
    - Reference to incident management handbook or description of planning process.
    - List of resources at risk considering water column and benthic species and habitat, identification of waterways depth and response options based on those factors.

    - Adding large scale equipment deployment to frequency of drills.
    - Notification information relating to SMTs, contracts or other approved means.
    - Personnel listed in Incident Command System (ICS) roles in an organizational table.
    - Description of type and frequency of training dependent on ICS position.
- Type B railroads have 18 months to submit updates for:
    - Binding agreement.
    - Reference to incident management handbook or description of planning process.
    - List of resources at risk considering water column and benthic species and habitat, identification of waterways depth and response options based on those factors.
    - Notification information relating to SMTs, contracts or other approved means.
    - Personnel listed in ICS roles in an organizational table.
    - Description of type and frequency of training dependent on ICS position.
- Type C railroads have 18 months to:
    - Submit letter that plan is complete and meets requirements
    - Update plan with missing required info.

Expected impact
We expect these adopted amendments to mitigate the costs created by required plan updates and contracts, as applicable, by railroad type. Costs are mitigated in the sense that plan holders have 18 additional months before they incur some of these costs.

2.3.5 Requirements for Type A railroads

Baseline
Under the baseline rule, all railroads have the same requirements. The baseline rule includes the following (some of which are included in sections above).

Establishes:

- Contingency plan requirements.
- Drill and equipment verification requirements.
- Provisions for inspection of records.
- Provisions for effects of noncompliance.
- Provisions for enforcement.

Applies to:

- Railroad facilities.
- Railroad owners and operators that lease state owned rail.

- Persons submitting contingency plan on behalf of the above.
- Primary response contractors (PRCs) (by reference to chapter 173-182 WAC).

Authority to submit contingency plan:

- The owner or operator of the railroad or a person who has contracted with the railroad to provide containment and cleanup services and who has been approved by Ecology.
- A person may submit a single integrated plan for more than one railroad provided that all requirements of the rule are met.
- A contingency plan prepared for an agency of the federal government or another state that satisfies the requirements of this chapter may be accepted by ecology.

Submittal:

- Two paper copies of plan and appendices.
- Only one copy if electronic.
- Five-year cycles of review and approval.

Annual plan maintenance:

- Annual review and update.
- Submit updates for review and approval.

Significant changes:

- Defines significant changes.
- Submit revised plan for review and approval.

Post spill:

- After a spill, review and evaluate effectiveness.
- Update and approve plan as needed.

General content:

- Northwest Area Contingency Plan (NWACP) serves as the statewide master oil and hazardous substance contingency plan. Write plans that refer to and are consistent with the NWACP.
- Name, location, type, and address.
- Federal or state requirements intended to be met.
- Size of the worst case spill volume(s).
- Log sheet to record revisions and updates to the plan.
- Table of contents and a cross-reference table.
- Provide a list and map of expected rail routes.

- Description of the operations covered by the plan, including locations where fueling occurs and an inventory of above ground storage tanks and the tank capacities. **(Exemption:** total above ground inventory in more than 55 gal containers is less than 1320 gal.)
- List all oil cargo transported, including region of origin, oil types, physical properties, and health and safety hazards of the oil cargo. May be safety data sheet (SDS).
- PRC name, address, phone number or other means of contact.
- PRC contract or letter summarizing the terms of the contract signed by the PRC.
- Mutual aid agreement(s).
- Personnel (including contract personnel) who will be available to manage an oil spill response.
    - Organizational diagram depicting the chain of command for the spill management team for a worst case spill.
    - Organization list of one primary and one alternate person to lead each incident command system (ICS) spill management position down to the section chief and command staff level as depicted in the NWACP standard ICS organizational chart.
    - Detailed description of the planning process and job description for each spill management position (may reference NWACP).
    - Description of the type and frequency of training that the spill management team receives. Minimum:
        - ICS
        - NWACP policies
        - Use and location of geographic response plans (GRPs)
        - Contents of the plan
        - Worker health and safety.
    - New employees shall complete the training program before being assigned job responsibilities that require participation in emergency response situations.
    - Identify a primary and alternate incident commander's representative.
    - Notification procedures.
    - A list of the names and phone numbers of required notifications.
    - Central reporting office or individuals responsible for implementing the notification process.
    - Form to document notifications.
- Procedures to track and account for the entire volume of oil recovered, and oily wastes generated and disposed of during spills.
- State how an oil spill will be assessed for determining product type, potential spill volume, and environmental conditions including tides, currents, weather, river speed and initial trajectory as well as a safety assessment including air monitoring.

- Procedures that will be used to confirm the occurrence, and estimate the quantity and nature of the spill. An updated notification report is required if the initially reported estimated quantity or the area extent of the contamination changes significantly. Rail plan holders and responsible parties are required to document their initial spill actions and the plan shall include the forms that will be used for such documentation.
- Checklist that identifies significant steps used to respond to a spill, listed in a logical progression of response activities.
- Description of the methods to be used to promptly assess spills with the potential to impact groundwater, including contact information in the plan for resources typically used to investigate, contain, and remediate and/or recover spills to groundwater.
- Concise procedures to manage oil spill liability claims of damages to persons or property, public or private, for which a responsible party may be liable.
- Description of the sensitive areas and a description of how environmental protection will be achieved, including containment, enhanced collection, and diversion tactics.
- Information on natural, cultural and economic resources, coastal and aquatic habitat types and sensitivity by season, breeding sites, presence of state or federally listed endangered or threatened species, and presence of commercial and recreational species, physical geographic features. This includes relative isolation of coastal regions, beach types, and other geological characteristics; public beaches, water intakes including both drinking and agricultural water supplies, private and public wells that supply drinking water, and marinas; shellfish resources, significant economic resources and vulnerable populations to be protected in the geographic area covered by the plan.
- May refer to NWACP for sensitive areas if one exists.
- Potential initial command post locations.
- Description of how the rail plan holder meets each applicable planning standard.

<u>Field document:</u>

- Plan contains a field document that lists time critical information for the initial emergency phase of a spill or a substantial threat of a spill. The owner or operator of the railroad makes the field document available to personnel who participate in oil handling operations and keeps the field document in key locations for use during an initial response. The plan lists all locations where field documents are kept.
- Procedures to detect, assess, and document the presence and size of a spill.
- Spill notification procedures.
- The checklist that identifies significant steps used to respond to a spill, listed in a logical progression of response activities.

<u>Equipment planning standards:</u>

- The equipment necessary to address the worst case spill volume (WCSV) is brought to an incident over a period of time.

- Planning points for calculating equipment access and timelines (or new developed during plan review):
    - Bellingham
    - Mukilteo/Everett
    - Seattle
    - Tacoma
    - Centralia/Chehalis
    - Longview/Kelso
    - Aberdeen
    - Vancouver
    - Coulee City
    - Tri-Cities (Kennewick)
    - Colfax
    - Clarkston
    - Spokane
    - Colville
    - Pend Oreille/Colville National Forest
    - Okanogan
    - Wenatchee
    - Yakima/Union Gap
    - Moses Lake
    - Bingen
- Demonstrate access to equipment within timeframes:
    - Six hour:
        - Safety assessment of spill
        - Appropriate air monitoring arrives
        - 5,000 feet of boom arrived
        - Alternative site-specific strategy resources
        - Capacity to recover 10 percent or WCSV or 4,100 barrels in 24 hours
        - One effective daily recovery capacity (EDRC)
    - 12 hour:
        - Additional 20,000 feet of boom arrived
        - Capacity to recover 15 percent WCSV or 12,000 barrels in 24 hours
        - One and one half EDRC
    - 24 hour:
        - More boom as necessary
        - Capacity to recover 20 percent WCSV or 16,000 barrels in 24 hours
        - Two EDRC

    - 48 hour:
        - More boom as necessary
        - Capacity to recover 25 percent WCSV or 20,000 barrels in 24 hours
        - More storage as necessary
- Equipment maintenance schedules, methods for owned equipment

Crude standards:

- For carrying, handling, storing, and transporting.
- Letter of intent with PRC capable of oil that may weather, sink, or submerge
    - Sonar, sampling to locate sunk/suspended oil
    - Boom to contain floating and prevent sinking
    - Dredges and pumps to recover from bottom and shore
    - Assessment equipment
- 12-hour planning standard.

In situ burning standard:

- Identify equipment
- Locations of:
    - Fire booms
    - Air monitoring equipment
    - Aqueous film forming foam (AFFF)
    - Igniters
    - Aircraft or vessels deploying igniters
- 12-hour planning standard.

Shore cleanup standard:

- Identify and ensure resources for shore cleanup.
- 24-hour planning standard.

Air monitoring standard:

- Narrative description of applicable requirements.
- Description of initial site characterization.
- Air monitoring instruments and detection limits.
- Action levels for oil constituents.
- Description of data management and reporting.
- Description of communication to at-risk populations.

- Description of evacuation zone and shelter-in place criteria process.

Wildlife rescue and rehabilitation:

- Identify applicable requirements.
- Description of equipment, personnel, resource, and strategies for compliance.
- 24-hour planning standard.

Documenting compliance:

- Describe how planning standards are met.
- Include planning standard spreadsheets (provided by Ecology) accounting for boom, recovery systems, storage, personnel by type, and home base provider.

Drills:

- Drill and equipment verification program.
- Modified triennial cycle for drills (per NPREP).
- Ecology has opportunity to help design and evaluate table-top and deployment drills.
- Schedule drills on NWACP calendar.
- Ecology provides written drill evaluation report.

Drill frequency during triennial cycle:

- Table-top:
    - One per year (three total).
    - One of three for WCSV.
- Deployment:
    - Two per year (six total).
    - Include notification, safety assessment, geographic response plan deployment, and equipment deployment.
- Ecology unannounced:
    - As necessary.
- Wildlife deployment:
    - One total (additional unless part of large multi objective deployment).
    - Wildlife equipment and handlers.

The baseline also includes existing laws. As they apply explicitly and specifically to planning standards, RCW 90.56.275, which sets specific requirements for multi-objective drills.

Adopted
The adopted amendments make the following changes to requirements for Type A (crude-carrying) railroads:

- Expanding the binding agreement to all parties authorized to implement the contingency plan.
- Adding a listing of names, addresses, phones, and emails of those implementing the contingency plan.
- Expanding the listing of ICS contact information to include contracted PRC and SMT resources.
- Expanding ICS contract and/or description of terms to include PRCs and SMTs.
- Adding a structured list of SMT positions. Under contracted circumstances, the name of the whole PRC or SMT can be listed instead of an individual's name.
- Expanding the description of the planning process to include references to the incident management handbook.
- Adding a notification documentation form. (Note that this is part of current practice).
- Expanding description of sensitive areas to include:
    - Water column and benthic species at risk from sunken, submerged, or non-floating oil spills.
    - Identification of waterway depths, water density, sediment load, sea floor or river bottom types, and response options based on those factors and risks from non-floating oil spills.
- Replacing the planning standard for crude oil with a standard for potentially sinking oils:
    - Include examples: crude oil, Diluted Bitumen ("dilbit"), Group V Residual Fuel Oils (GPVRFO) Low American Petroleum Institute Oil (LAPIO), decant oil, asphalt, and asphalt products.
    - Replaces 12 hour standard for crude with:
        - 6 hour capability to initiate assessment of potentially sinking oils.
        - 6 – 12 hour resources and equipment to detect and delineate oils, and boom to prevent sinking arrive.
        - 12 – 24 hour resources and equipment to evaluate environmental impact, and equipment to recover from bottom and shoreline arrive.
    - Description of the process to detect, delineate, and recover non-floating oils.
- Adding to the wildlife planning standard:
    - Plan for impacts to wildlife (with examples on surface and below).
    - Commit to conduct response per NWACP.
    - Contact information for PRC, SMT, and contractors available to be on Wildlife Branch of ICS in 24 hours.
    - Wildlife plan including information on: equipment, personnel, resources, and strategies for wildlife response.
    - Contract with PRC with Mobile Wildlife Rehabilitation Unit (MRU) that has (note this is a part of existing contracts):

        - 1,100 square feet of space to treat and house, intake, stabilize, wash/rinse, and dry impacted wildlife.
        - Two wash/rinse stations.
        - Additional 1,000 square feet to support rehabilitation, with food preparation, medical lab, dry storage, morgue, and necropsy space.
        - 600 square feet of pools.
        - Supporting equipment, supplies, and personal spaces for hot and cold work zones.
        - 24-hour planning standard.
    - Identify personnel, source, and training.
- Drills:
    - Removes requirement that wildlife drill be additional unless part of multi-objective drill.
    - Adds multi plan holder deployment drill (per RCW 90.56.275):
        - One total (per three-year cycle).
        - May involve dedicated and non-dedicated equipment, Vessels of Opportunity (VOO), multiple simultaneous tactics, response to potentially non-floating oils, and verification of operational readiness over multiple operational periods.
        - May be incorporated into other drill requirements.

Expected impact
We expect the adopted amendments for Type A railroads to result in three types of cost:

- **Plan update costs:** These costs are for staff to add personnel, contact, contracts, and narrative descriptions to the plan. For Type A railroads, we assume this cost will be payments to a planning contractor, based on current practice by three existing railroads that classified as Type A.
- **SMT retainer contract costs:** These costs are paid to SMTs to retain their guaranteed services in the event of a spill.
- **Wildlife response retainer contract costs:** These costs are paid to wildlife response providers to retain their services in the event of a spill.

The additional planning and retained available personnel to manage and participate in improved spill response are likely to result in benefits of better and more comprehensive spill response, particularly as it relates to potentially sinking oils and wildlife response.

Based on conversations with Ecology's Spill Prevention, Preparedness, and Response Program staff, as well as conversations with primary response contractors, we do not expect impacts to the types or locations of spill response equipment in the state. Adopted amendments to the planning standards are designed to correspond to current equipment availability.[3]

[3] Ecology spoke with several state-approved primary response contractors in April 2019.

2.3.6 Requirements for Type B railroads

Baseline

Under the baseline rule, all railroads have the same requirements. (*See section 2.3.5 – Baseline for a summary list of these requirements).*

The baseline also includes the authorizing statute, RCW 90.56.210(3)(b):

> (b) For class III railroads transporting oil in bulk that is not crude oil in an amount of forty-nine or more tank car loads per year, the rules adopted under this subsection may not require contingency plans to include:
>
> > (i) Contracted access to oil spill response equipment; or
> >
> > (ii) The completion of more than a total of one basic table-top drill every three years to test the contingency plans.

Adopted

The adopted amendments make the following changes to requirements for Type B (non-crude-carrying, more than 49 tank cars per year) railroads. (Note that most of the adopted amendments match changes adopted for Type A railroads. *We have italicized adopted changes that differ for Type B railroads.)*

- Expanding the binding agreement to all parties authorized to implement the contingency plan.
- Adding a listing of names, addresses, phones, emails of those implementing the contingency plan.
- *Expanding the listing of ICS contact information to include PRC and SMT resources.*
- Adding a structured list of ICS positions. Under contracted circumstances, the name of the whole PRC or SMT can be listed instead of an individual's name.
- Expanding the description of the planning process to include references to the incident management handbook.
- Adding a notification documentation form. (Note that this is part of current practice).
- Expanding description of sensitive areas to include:
    - Water column and benthic species at risk from sunken, submerged, or non-floating oil spills.
    - Identification of waterway depths, water density, sediment load, sea floor or river bottom types, and response options based on those factors and risks from non-floating oil spills.
- Replacing the planning standard for crude oil with a standard for potentially sinking oils:
    - Include examples: crude oil, Diluted Bitumen ("dilbit"), Group V Residual Fuel Oils (GPVRFO) Low American Petroleum Institute Oil (LAPIO), decant oil, asphalt, and asphalt products.
    - Replaces 12 hour standard for crude with:
        - 6 hour capability to initiate assessment of potentially sinking oils.

        - 6 – 12 hour resources and equipment to detect and delineate oils, and boom to prevent sinking arrive.
        - 12 – 24 hour resources and equipment to evaluate environmental impact, and equipment to recover from bottom and shoreline arrive.
    - Description of the process to detect, delineate, and recover non-floating oils.
- *Adding to the wildlife planning standard:*
    - *Plan for impacts to wildlife (with examples on surface and below).*
    - *Commit to conduct response per NWACP.*
    - *Contact information for PRC, SMT, contractors available to be on Wildlife Branch of ICS in 24 hours.*
- *Drills:*
    - *One basic table-top drill every three years.*

Expected impact
We expect the adopted amendments for Type B railroads to result in plan update costs. These costs are for staff to add personnel, contact, and narrative descriptions to the plan. For Type B railroads, we assume this cost will be wages for internal employee time, based on current practice by three existing railroads classified as Type B.

The additional planning and retained available personnel to manage and participate in improved spill response are likely to result in benefits of better and more comprehensive spill response, particularly as relates to potentially sinking oils and wildlife response.

While the number of drills will also be reduced for these railroads, this reduction is required by the baseline authorizing statute.

2.3.7 Requirements for Type C railroads

Baseline
Under the baseline rule, all railroads have the same requirements. *(See section 2.3.5 – Baseline for a summary list of these requirements).*

The baseline as relevant specifically to Type C railroads also includes RCW 90.56.210(3), which as of 2017, explicitly restricts requirements for small, non-crude-carrying railroads:

> (b) For class III railroads transporting oil in bulk that is not crude oil in an amount of forty-nine or more tank car loads per year, the rules adopted under this subsection may not require contingency plans to include:
>
> i. Contracted access to oil spill response equipment; or
>
> ii. The completion of more than a total of one basic table-top drill every three years to test the contingency plans.
>
> (c) For class III railroads transporting oil in bulk that is not crude oil in an amount less than forty-nine tank car loads per year, rules adopted under this subsection may only require railroads to submit a basic contingency plan to the department.

A basic contingency plan filed under this subsection (3)(c) must be limited to requiring the class III railroads to:

i. Keep documentation of the basic contingency plan on file with the department at the plan holder's principal place of business and at dispatcher field offices of the railroad;

ii. Identify and include contact information for the chain of command and other personnel, including employees or spill response contractors, who will be involved in the railroad's response in the event of a spill;

iii. Include information related to the relevant accident insurance carried by the railroad and provide a certificate of insurance upon request;

iv. Develop a field document for use by personnel involved in oil handling operations that includes time-critical information regarding basic contingency plan procedures to be used in the initial response to a spill or a threatened spill; and

v. Annually review the plan for accuracy.

(d) Federal oil spill response plans created pursuant to 33 United States Code (U.S.C.) Sec. 1321 may be submitted in lieu of contingency plans by a class III railroad transporting oil in bulk that is not crude oil.

(e) For the purposes of this section, "class III railroad" has the same meaning as defined by the United States surface transportation board as of January 1, 2017.

Adopted
The adopted amendments replace requirements in the baseline rule, for Type C railroads, with requirements verbatim from the law (RCW 90.56.210).

Expected impact
Since the adopted amendments for the three existing railroads classified as Type C railroads are verbatim from the statute – and therefore make no change from baseline – we do not expect these amendments to result in costs or benefits.

However, Type C railroads are required to submit a letter to Ecology stating that their plan meets the new requirements. We expect this to result in costs of submission, and benefits of having confirmation that Type C railroads meet the new requirements.

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Chapter 3: Likely Costs of the Adopted Rule Amendments

3.1 Introduction

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

3.2 Cost analysis

The adopted rule amendments make the following changes:

- Expanding applicability.
- Adding definitions.
- Changing plan submittal requirements.
- Phasing in requirements.
- Adding update comment and approval timeframes.
- Establishing specific requirements for Type A railroads.
- Establishing specific requirements for Type B railroads.
- Establishing specific requirements for Type C railroads.

3.2.1 Expanding applicability

In and of itself, the expansion of applicability does not create impacts. Impacts to SMTs stem from requirements set for them, and are discussed in the relevant sections below.

3.2.2 Adding definitions

Most of the new definitions do not have costs and benefits in and of themselves, but the definition of an SMT sets the requirement that Ecology must approve. We expect this to have costs and benefits, as part of overall plan update impacts discussed as relevant for each railroad type. *(See sections 2.3.6 through 2.3.8, and corresponding estimates and discussion in chapters 3 and 4).*

3.2.3 Changing plan submittal requirements

The adopted amendment to plan submittal requirements will bring the rule into line with current practice. Under the APA – considering only what is written in rules and laws – this change will result in:

- Compared to two paper copies:
    - The cost of electronic submissions.
    - A cost-savings for printing and submitting one less paper copy.
- Compared to one electronic copy:
    - The cost of printing and submitting a paper copy.

Since current practice has become the lower-cost option of electronic submittal with one paper submittal, we assume plan holders would have chosen the low-cost plan submittal option of one electronic copy. Under this assumption, and comparing only rule language, plan holders will incur the cost of submitting one paper copy. Based on conversations with planning contractors, we estimate printing a copy of the plan and submitting it by certified mail costs $180, resulting in an estimated $900 in total costs for five Type A and Type B plan holders.[4]

3.2.4 Phasing in requirements

We expect these adopted amendments to generate a potential benefit by mitigating the costs created by required plan updates and contracts, as applicable, by railroad type. (*See chapter 4).*

3.2.5 Requirements for Type A railroads

We expect the adopted amendments for Type A railroads to result in three types of cost:

- **Plan update costs:** These costs are for staff to add personnel, contact, contracts, and narrative descriptions to the plan. For Type A railroads, we assume this cost will be payments to a planning contractor, based on current practice by three existing railroads classified as Type A.
- **SMT retainer contract costs:** These costs are paid to SMTs to retain their guaranteed services in the event of a spill.
- **Wildlife response retainer contract costs:** These costs are paid to wildlife response providers to retain their services in the event of a spill.

We do not expect costs or benefits for portions of the updates that are part of the baseline (multi plan holder deployment drill) or part of existing contracts offered by PRCs (MRU).

Plan update costs

Based on conversations with planning contractors, we assumed contracted plan updates will cost $40 thousand to $55 thousand each. This cost range reflects two senior-level planners and two-three months of work, and will likely include contract for additional modeling, depending on the railroad. Costs will be highly variable for railroads, because they cut through many different ecosystems. In general, however, smaller railroads (geographically) that operate within a single ecosystem will have smaller costs and require a less complex analysis. Longer railroads and those that cut through many different kinds of ecosystems will experience significant costs for updating their plans, as they will need to account for potential spills in each habitat type they cross, as well as each of the species/types of animals that are likely to be found in these habitats during different seasons.

For the three plan holders classified as Type A railroads, this will result in an immediate one-time cost (with components delayed for up to 18 months as needed; *see section 4.2.4*) of $120 thousand to $165 thousand. Future regular plan reviews and updates will be covered by the baseline rule, and are not considered costs of this rulemaking.

[4] Ecology spoke with several SMTs state-approved primary response contractors in April 2019. US Postal Service, 2019. Price Calculator. http://www.usps.com

SMT retainer contract costs
Retainer contract costs and types of contract vary across SMTs, and by railroad size and type. Based on conversations with SMTs, we identified that $10 thousand to $100 thousand annually typically covers drills, training, and equipment costs.[5]

One company that provides both SMT and PRC services to railroads does not have retainer costs for their contracts with larger railroads – these contracts are billed directly. The most significant cost for large railroads are drills. These often range between $30 thousand and $50 thousand and occur several times annually. Drills occurring in or near aquatic ecosystems are more expensive than those occurring solely on land.

Assuming all Type A railroads will retain SMT services by ongoing contract, these plan holders will incur annual costs of $10 thousand to $100 thousand annually. Across the three Type A plan holders, this will be a total annual cost of $30 thousand to $300 thousand. The equivalent 20-year present value (future stream of costs converted to current values, based on a risk-free discount rate) will be between $545 thousand and $5.5 million.[6]

Wildlife response retainer contract costs
No railroads currently have retainer contracts with wildlife response providers in Washington State. Based on conversations with wildlife response providers, we estimate that this cost will be between $20 thousand and $35 thousand annually. It includes costs of planning, training plan holder staff, drills, and maintaining equipment. Variation in costs will be influenced by the size of plan holder, affecting the level of service and the number of facilities involved.

Across the three Type A plan holders, this will be a total annual cost of $60 thousand to $105 thousand. The equivalent 20-year present value will be between $1.1 million and $1.9 million.[7]

Total costs for Type A railroads
We estimate total 20-year present value costs (of one time and annual expenditures) across the three Type A railroads, of between $1.7 million and $7.5 million.

3.2.6 Requirements for Type B railroads

We expect the adopted amendments for Type B railroads to result in plan update costs. These costs are for staff to add personnel, contact, contracts, and narrative descriptions to the plan. For Type B railroads, we assume this cost will be wages for internal employee time, based on current practice by three existing railroads classified as Type B.

Based on Spill Prevention, Preparedness, and Response Program experience and observation, we assumed this work will take one week of a full-time employee (FTE) to complete, and the work will be done internally. This smaller estimate is based on the significant difference in adopted

[5] Ecology spoke with several SMTs state-approved primary response contractors in April 2019.
[6] US Treasury Department, 2019. Series I Savings Bonds Rates & Terms. https://www.treasurydirect.gov/indiv/research/indepth/ibonds/res_ibonds_iratesandterms.htm Historic rates 1998 to present.
[7] Ibid.

wildlife response requirements, and allowance of narrative descriptions. We assumed an hourly average wage of $60.63 for General and Operations Managers.[8]

For the two plan holders classified as Type B railroads, this will result in an immediate one-time cost (with components delayed for up to 18 months as needed; *see section 3.2.4*) of $7,276.

Future regular plan reviews and updates will be covered by the baseline rule, and are not considered costs of this rulemaking.

Total costs for Type B railroads
We estimate total 20-year present value costs (of only one-time expenditures, in the case of Type B railroads) across the two Type B railroads, of $7,276.

3.2.7 Requirements for Type C railroads

Since the adopted amendments for the three existing railroads classified as Type C railroads are verbatim from the law – and therefore make no change from baseline – we do not expect these amendments to result in costs.

However, Type C railroads are required to submit a letter to Ecology stating that their plan meets the new requirements. We expect this to result in minimal submission costs, as Ecology will accept a letter sent by email as meeting this requirement.

[8] US Bureau of Labor Statistics, 2018. May 2018 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm. Job classification 11-1021 General and Operations Managers: "Plan, direct, or coordinate the operations of public or private sector organizations. Duties and responsibilities include formulating policies, managing daily operations, and planning the use of materials and human resources, but are too diverse and general in nature to be classified in any one functional area of management or administration, such as personnel, purchasing, or administrative services." May 2018 mean hourly wage updated to 2019 dollar values using the Consumer Price Index for all urban consumers. US Bureau of Labor Statistics, 2019. Consumer Price Index. https://www.bls.gov/cpi/.

Chapter 4: Likely Benefits of the Adopted Rule Amendments

4.1 Introduction

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

4.2 Benefit analysis

The adopted rule amendments make the following changes:

- Expanding applicability.
- Adding definitions.
- Changing plan submittal requirements.
- Phasing in requirements.
- Adding update comment and approval timeframes.
- Establishing specific requirements for Type A railroads.
- Establishing specific requirements for Type B railroads.
- Establishing specific requirements for Type C railroads.

4.2.1 Expanding applicability

In and of itself, this change does not create impacts. Impacts to SMTs stem from requirements set for them, and are discussed in the relevant sections below.

4.2.2 Adding definitions

Most of the new definitions do not have costs and benefits in and of themselves, but the definition of and SMT sets the requirement that SMTs must be approved by Ecology. We expect this to have costs and benefits, as part of overall plan update impacts discussed as relevant for each railroad type. (*See sections 2.3.6 through 2.3.8, and corresponding estimates and discussion in chapters 3 and 4*).

4.2.3 Changing plan submittal requirements

The adopted amendments will bring the rule into line with current practice. Under the APA – considering only what is written in rules and laws – this change will result in:

- Compared to two paper copies:
    - An additional electronic submission.
    - Printing and submitting one less paper copy.
- Compared to one electronic copy:
    - Printing and submitting a paper copy.

The benefit of this amendment is in bringing rule language into line with how plan holders currently submit their plans, allowing them to continue operating consistent with rule requirements. While rule requirements generally precede associated behaviors, current practice has been allowed to incur the least cost without hindering spill preparedness. Since they are stored on an Ecology server, electronic copies are available at all Ecology locations at all times. One physical copy is printed and kept at Ecology headquarters, in case of server failure.

4.2.4 Phasing in requirements

We expect these amendments to mitigate the costs created by required plan updates and contracts, as applicable, by railroad type. Costs are mitigated in the sense that plan holders have 18 additional months before they incur some of these costs.

Ecology compares costs incurred at different times using a risk-free annual discount rate of 1.03 percent.[9] Under phased-in requirements, a dollar of immediate cost saves 1.5 cents by delaying 18 months.

4.2.5 Requirements for Type A and Type B railroads

The additional planning and retained available personnel to manage and participate in improved spill response for Type A and Type B railroads are likely to result in benefits of better and more comprehensive spill response, particularly as it relates to potentially sinking oils and wildlife response. Type A requirements for Ecology-approved SMTs, and retention of SMT and wildlife response providers increase certainty of appropriate and comprehensive expertise and management being available to respond to spills of crude oil. Significant differences between adopted amendments for Type A versus Type B railroads include requirements to retain SMTs and wildlife response personnel through contracts, and specific equipment requirements for wildlife response. These areas of preparedness are addressed for Type B large-volume, non-crude oil transporters through narrative descriptions and listings of contact information.

Types of reduced or avoided impact

While the adopted amendments are intended to improve the effectiveness, efficiency, and speed of spill response for Type A and Type B railroads, we could not quantify this benefit in terms of reduced impact to:

- Public health and safety:
  - Fire.
  - Explosions.
  - Air quality.
  - Toxic chemical exposure.
  - Drinking water contamination.
  - Subsistence or traditional food source contamination.
  - Evacuation.

[9] US Treasury Department, 2019. Series I Savings Bonds Rates & Terms. https://www.treasurydirect.gov/indiv/research/indepth/ibonds/res_ibonds_iratesandterms.htm Historic rates 1998 to present.

    - Property damage and contamination.
    - Property value impacts of risk.
- Surface water quality.
- Groundwater quality.
- Fisheries.
- Areas prone to wildfire.
- Shellfisheries.
- Bird populations.
- Sea mammals.
- Endangered species.
- Animals consuming contaminated fish or shellfish.
- Recreational quality.
- Passive or non-use values for nature.

Adopted amendments that improve overall effectiveness of spill response are likely to reduce impacts to all of the above types of value, by improving on existing planning requirements.

Benefits related to non-floating oils and wildlife response
Adopted amendments specific to non-floating oils and wildlife response are likely to reduce impacts to:

- Water column and sediment wildlife, including shellfish.
- Bird populations.
- Animals including sea mammals.
- Fish.
- Endangered species such as some salmon and orcas.
- Recreational use of shorelines.
- Wildlife habitat surrounding the spill that may be impacted by long-term response size and duration.

Values of avoiding or reducing the severity of spill impacts
The adopted amendments will not prevent spills entirely. They will serve, however, to reduce the degree to which spills could affect the environment and their severity and the degree of response and ongoing cleanup necessary.

Value of immediate spill cleanup

A 1995 case study of willingness to pay to prevent spills on the California coast indicates the value placed on prevention at $76.45 per household.[10] The spills described in the study oiled 10 miles of coast and killed 12,000 birds. By comparison, the scenarios studied for these rules involve only the central coastline of California whereas the adopted rule affects Puget Sound and the Columbia River, as well as many freshwater bodies near coasts as well as inland. The California scenario involved prevention and immediate response using a tug escort. Thus, the case study assumed 100 percent of spills will be immediately addressed for a ten-year period. Therefore, the losses for the California study may be more appropriate for the smaller, more frequent spills than for the worst case spills that Ecology is required to prepare for in Washington law.[11] For the 2.8 million households in Washington, the collective willingness to pay would be $211 million for ten-year protection, or $401 million in 20-year present value for two payments ten years apart.[12]

Spills of non-floating oils

Additional coordination and preparedness for dealing with spills of potentially non-floating oils reduce the likelihood that oils will weather and sink before they are addressed. Improved preparedness for potentially sinking oils could have helped reduce damages and ultimate cleanup costs from the Enbridge Kalamazoo spill that cost $1.2 billion to clean up.[13]

Worst-case freshwater spills

In May 2016, the Washington Attorney General's Office commissioned a report on the potential impacts of a worst-case spill on the lower Columbia River.[14] As one of its modeled spills, the report used a derailment of a train carrying 840 thousand gallons (20 thousand barrels) of Bakken crude oil near and upstream of the Bonneville Dam. Estimated restoration-based damages were $84.9 million, including $54.5 million for injured habitats in the river channel, and $30.4 million for damages to floodplain wetlands.

Spills along or into waterways simultaneously affect multiple values. The Columbia River can serve as an example of multiple values vulnerable to oil spills, in areas frequented by oil trains. The Columbia is the largest river in the Pacific Northwest, and is over a thousand miles long. It is a large regional source of water, hydropower,

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[10] Carson, RT, et al. (2004). Valuing Oil Spill Prevention: A case study of California's Central Coast. Richard T Carson, Michael B. Conaway, W. Michael Hanemann, Jon A. Krosnick, Robert C. Michael, Stanley Presser, Kluwer Academic Publishers, 2004. Notes: This value must be indexed for inflation. There were a variety of exclusions. E.g. if the 15 percent of the respondents who objected that the oil companies should pay for the tug and not the citizens were excluded the results would have be $8.74 higher.

[11] RCW 90.56.010 Definitions. RCW 90.56.210 Contingency plans. RCW 88.46.010 Definitions. RCW 88.46.060 Contingency plans. RCW 90.56.060 Statewide master oil and hazardous substance spill prevention and contingency plan--Evaluation and revision or elimination of advisory committees.

[12] US Census Bureau, 2019. QuickFacts for Washington State. https://www.census.gov/quickfacts/wa.

[13] Enbridge, Inc. (2015). 2015 Annual Report. p. 78.

[14] Abt Associates, Inc. (2016). Potential Fishing Impacts and Natural Resource Damages from Worst-Case Discharges of Oil on the Columbia River. Report in the Matter of Application No. 2013-01, Vancouver Energy Distribution Terminal, EFSEC Case Number 15-001. May 26, 2016.

transportation, recreation, and habitat. In particular, it is home to or a place of transit for multiple fish species, and specifically salmon species (some of which are listed as protected under the Endangered Species Act on sections of the Columbia or its tributaries) and the white sturgeon (the population of which is divided into landlocked populations between the river's dams, except below Bonneville Dam). Recreational areas thrive on and near the river throughout its course, including near freight rail crossings such as the Rock Island Railroad Bridge near Wenatchee, Washington. Downriver, the Columbia River Gorge is a National Scenic Area that attracts $50 million dollars in annual spending in local communities on the Oregon side of the river.[15] The river (including its fisheries) is also of significant historical and cultural value to multiple regional tribes. The adopted rule's requirements for rapid and comprehensive response to spills from rail are likely to reduce impacts to these multiple values.

Values for animals and nature

Even after spills are cleaned up, and surviving wildlife has been cleaned, there may be long-run impacts to wildlife wellbeing. These may manifest as wildlife mortality during cleanup, or as long-run morbidity and mortality from exposure to toxins in the oil (external or through ingestion).[16] While this may typically be understood for marine and shoreline environments, it is also true for inland and freshwater environments, particularly for potentially suspended or sinking oils.[17] Improving the efficiency and potential response time of wildlife response (through documentation and practice of notification procedures, or through contracted access to wildlife response contractors and equipment) may result in reduced wildlife mortality or duration of exposure to oils. Improved survival or reduced toxicity of plants and animals that are important food sources for other animals (e.g., shellfish for otters, or salmon for orcas) will result in additional benefits for animals higher on the food chain.

Again, we could not quantify the reduction in risk or damage to habitat and animals resulting from the adopted amendments, so we include total values as illustrations of the types and size of value the public holds for animals.

In 2012, a survey of households found a willingness to pay an average of $40.49 per household per year for ten years for the recovery of Puget Sound Chinook salmon from threatened species status. For the 2.8 million households in Washington, this translates to an annual willingness to pay of $112 million, or over $1 billion in present value over ten years.[18] While values for salmon are typically thought of in the context of marine oil

[15] White, EM and D Goodding (2013). Spending and Economic Activity from Recreation at Oregon State Park Properties – Columbia River Gorge Management Unit. Oregon State University. June 2013. https://www.oregon.gov/oprd/PLANS/docs/scorp/2013-2018_SCORP/Gorge_Economic_Impact%20Report.pdf

[16] Shigenaka, G (2015). Biological Effects of Crude Oil Spills. Presentation to the National Academy of Sciences. March 10, 2015.

[17] Hodson, P (2015). Dilbit Spills in Freshwater – Why should we be concerned? Presentation to the National Academy of Sciences. March 10.

[18] US Treasury Department, 2019. Series I Savings Bonds Rates & Terms. https://www.treasurydirect.gov/indiv/research/indepth/ibonds/res_ibonds_iratesandterms.htm Historic rates 1998 to present.

spills, inland oil spills can affect spawning areas and habitat for salmon fry and parr, as well as adults traveling inland to spawn, and smolt traveling to sea.

The Southern Resident Killer Whale Chinook Salmon Initiative reports that:[19]

- Wildlife watchers spend nearly $1 billion annually in Washington, primarily in rural areas.
- In 2001, 47 percent of Washington's residents participated in wildlife watching, compared to 16 percent in fishing and 5 percent in hunting.
- Wildlife watching activities support more than 21,000 jobs in Washington State, yield $426.9 million in job income, and generate $56.9 million in state and $67.4 million in federal tax revenues each year, based on 2001 data.
- The value of the overall whale watching industry in Washington State is worth at least $65-$70 million annually, with an average annual growth rate of 3 percent.
- An estimated 42 whale watch companies operate in Washington State, 22 of which are listed in Dun & Bradstreet's Million Dollar Data base. The 22 listed companies generated $64 million in sales, by themselves.
- On San Juan Island, there are 17 whale-watching and kayak-touring businesses. Countywide, tourism is a $127 million industry. "This is an orca-based economy," says Jason Gunter, manager of Discovery Sea Kayak. He estimates that 75 percent of his clients sign up to see killer whales.

Values for commercial fishing industries

Washington's commercial fisheries have historical, cultural, and economic significance to the state. Pollution from an oil spill and resulting impacts to wildlife would have lasting negative effects on the state's fisheries, but we are unable to quantify these at this time. As provided above, we discuss total values of Washington's commercial fisheries in lieu of a detailed analysis of avoided risk resulting from the adopted amendments.

In 2015, Washington's commercial fishing and seafood processing industries supported nearly 16,000 jobs with combined wages of over $1 billion and revenue of $9.4 billion.[20] Between 2009 and 2015, Washington exported over $8 billion in seafood, with the majority going to Canada, China, and Japan. Over half of Washington's counties support fisheries-related jobs with locations along the coastal, Puget Sound, and inland regions of the state.

A significant portion of the state's fishing industry shares Puget Sound with petroleum-related industries. Washington is the largest farmed and hatchery shellfish producer in the nation, with annual sales exceeding $100 million.[21] Although revenue from Washington's commercial salmon fisheries ($7.7 million in 2017) is not as significant as that from

[19] Southern Resident Killer Whale Chinook Salmon Initiative (2015). Economic Value. https://srkwcsi.org/the-economic-value-of-southern-resident-killer-whales/
[20] CAI, 2017
[21] Pacific Shellfish Institute, 2019

shellfish, the health of Washington's salmon population have economic implications fisheries both in and outside the state, given that Canadian and Alaskan fisheries harvest 97 percent of the landed chinook salmon that spawn along Washington's coast.[22]

A large oil spill in Washington's marine or fresh waters could have significant and lasting impacts on fisheries in Washington and beyond. In the case of the Exon-Valdez Spill of 1989, traces of oil persisted in the environment for more than 10 years, with chronic direct and indirect ecosystem effects even after the significant cleanup effort.[23] Many of Washington's key fisheries species are highly sensitive to pollution from oil spills. Studies have shown that both shellfish and finfish may experience rapid population declines and lasting effects from exposure.[24]

In the years following the *Deep Water Horizon* (DWH) spill in 2010, shrimp landings in the Gulf of Mexico decreased by 27 percent. Louisiana's shrimp harvest decreased by nearly 60 percent and some estimates suggest that up to half of the state's annual oyster crop was lost, due in part to both the spill and remediation.[25] One estimate places the DWH spill's total economic impacts to the Gulf of Mexico commercial and mariculture fishing industries at nearly $5 billion between 2012 and 2020 (2012 dollars).[26] Exposure to even low levels of crude oil has been shown to negatively impact salmon and herring embryos, affecting reduced growth, reduced cardiorespiratory function, and altered cardiac structure. These physiological changes reduce the fitness and survivability of individuals as well as their ability to spawn.[27]

Impacts to fisheries from oil spills go beyond those related to direct ecosystem services, especially in the case of catastrophic and highly publicized oil-related disasters. Consumers, worried about the quality or health effects of eating seafood from areas near spills, may change their consumption patterns. In a public opinion poll following the DWH spill, Louisiana Seafood and Promotion Board found that 70 percent of consumers expressed some concern about the health implications of consuming Gulf seafood and over 20 percent reduced their consumption of seafood.[28]

Post spill response remediation

We note also that oil spills may extend beyond the scope of spill response and immediate cleanup, if they result in toxic contamination that must be remediated as required under cleanup regulations such as the Model Toxics Control Act (chapter 70.105D RCW; chapter 173-340 WAC). Spills resulting in long-term contamination of groundwater could affect nearby groundwater and surface water users, such as homes and agriculture using irrigation water, as well as wildlife. Spills allowed to weather and sink could contaminate sediments, resulting in long-term impacts to the viability of sediment

[22] PFMC, 2018; EcoNorthwest, 1999
[23] Peterson et al, 2003
[24] Ibid
[25] Upton, 2011
[26] Sumalia, et al, 2012
[27] Incardona et al, 2015
[28] CBS, 2011

habitats and ecosystems. Improvements in spill response structure and communication could reduce the likelihood or degree of creating cleanup sites.

After the 2016 derailment of an oil train in Mosier, Oregon that leaked a small unknown quantity of oil, Oregon's Department of Environmental Quality (DEQ) identified high concentrations of benzene in the groundwater. Drinking water wells in that area were uphill from the benzene contamination, but a hydrologically connected wetland was not, generating concern about exposure for amphibians and insects living in the wetland.[29] 2960 tons of oil-contaminated soil were excavated from site and transported off-site to Wasco County landfill.[30] Monitoring wells and biosparge cleanup technology was installed at the contaminated site, resulting in reduced methylnaphthalene, toluene, and xylene contamination that was still marginally above cleanup screening levels in 2017.[31] The cost of groundwater remediation was not reported for this cleanup, but in 2003 EPA reported that sparging (without additional soil vapor extraction or pump-and-treat technology) cost a median of $154 thousand across eight projects.[32]

Non-crude oil spills

The benefits of these adopted amendments for Type B railroad requirements are similar to the benefits of amendments to requirements for Type A railroads, but adjusted in scope and degree for the different types of oil they carry. Non-crude oils may include (but are not limited to):

- Vegetable oils
- Animal fats
- Gasoline
- Diesel
- Petroleum

While all oils have different physical and toxicity attributes, they all pose dangers to the environment and are costly to clean up. In 2015, 175 gallons of restaurant vegetable oil spilled into a storm drain near Seattle. It contaminated a nearby wetland, and was not immediately reported. Ecology spent over $300 thousand cleaning up the oil, and cleaning over 80 oiled birds. $250 thousand of that cost was spent on wildlife response.[33] For context, this spill contained 0.6 percent of the volume of a rail tank car.

[29] Davidson, K (2016). Mosier Groundwater Contaminated After Oil Train Derailment. Oregon Public Broadcasting.
[30] Franklin, R (undated). Mosier Oil Train Derailment. Presentation. On-scene coordinator, US EPA Region 10.
[31] Mulvihill, P (2017). Mosier Derailment: No pollution in Columbia, groundwater tests continue. Hood River News. https://www.hoodrivernews.com/archive/mosier-derailment-no-pollution-in-columbia-groundwater-tests-continue/article_0a39ce23-887c-50db-8998-cdfad374a4b5.html
[32] Fiedler, L and M Berman (undated). Cost of In Situ Treatment of Fuel Oxygenates. EPA, Office of Solid Waste and Emergency Response.
[33] Schaefer, S (2016). White Center company to repay state for 2015 cooking oil spill response. White Center Blog. http://whitecenterblog.com/2016/10/24/white-center-company-to-repay-state-for-2015-cooking-oil-spill-response/

Other benefits
In addition, there are some requirements that are reduced for Type A and Type B railroads, that may reduce compliance costs without incurring environmental or public health losses:

- Plan holders may list SMT members in up to two positions (rather than only one). If SMT members are able to act in more than one capacity, this potentially reduces costs associated with retaining additional members. As SMT retainer contract costs are bundled, we could not identify the cost associated with a single member. Internal SMT members will avoid incurring additional costs at their hourly wage for time spent participating in drills or during spill response.
- Wildlife drills for Type A railroads may be part of the multi-objective drill, allowing plan holders to avoid the costs of a separate wildlife drill. Drills are requirements for plan holders, but are costs are typically incurred through contract with PRCs. With a potential combination of wildlife deployment drills into multi-objective drills, prices for PRC contracts and services may be reduced.[34]

We do not expect costs or benefits for portions of the updates that are part of the baseline (multi plan holder deployment drill; maximum one table-top drill for Type B railroads) or part of existing contracts offered by PRCs (MRU).

4.2.6 Requirements for Type C railroads

Since the rule amendments for the three existing railroads classified as Type C railroads are verbatim from the law – and therefore make no change from baseline – we do not expect these amendments to result in costs or benefits.

However, Type C railroads are required to submit a letter to Ecology stating that their plan meets the new requirements. We expect this to result in costs of submission, and benefits of having confirmation that Type C railroads meet the new requirements.

[34] We note there is also a possibility that PRCs may develop different sets of costs for railroad contingency plan holders, better reflecting requirements and potential spill attributes specific to rail.

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Chapter 5: Cost-Benefit Comparison and Conclusions

5.1 Summary of the costs and benefits of the adopted rule amendments

In chapters 3 and 4, we discussed likely costs and benefits created by the adopted amendments. These are summarized below.

5.1.1 Costs

The following 20-year present value costs are likely as a result of the adopted amendments.

- Type A and Type B railroads:
  - $900 in plan submittal costs for submitting one additional paper copy.
- Type A railroads:
  - $120 thousand to $165 thousand in plan update costs.
  - $545 thousand to $5.5 million in SMT retainer costs.
  - $1.1 million to $1.9 million in wildlife response retainer costs.
- Type B railroads:
  - $7 thousand in plan update costs.
- (The adopted amendments are not likely to result in costs to Type C railroads).

We estimate that the adopted amendments are likely to result in $1.8 million to $7.6 million in 20-year present value costs. Where requirements for railroads are adopted to decrease, these decreases are a result of statutory requirements (baseline), and impacts are not a result of this rulemaking.

5.1.2 Benefits

The following benefits are likely to result from the adopted amendments. Because we could not quantify how much the amendments will improve spill response timing or qualities (resulting in reduced damage to wildlife, property, public health, and environmental wellbeing), we have included these benefits qualitatively, with illustrative total or incremental values as available. Where requirements for railroads decrease, these decreases are a result of statutory requirements (baseline), and impacts are not a result of this rulemaking.

- Bringing plan submittal requirements into line with current plan submittal practice that supports statewide electronic plan availability, with paper backup.
- Avoided present-value costs of phased-in requirements, of between 0.5 cents and 1.5 cents per dollar of cost.
- Additional planning and retained available personnel to manage and participate in improved spill response for Type A and Type B railroads, resulting in more comprehensive spill response. This particularly relates to:
  - Potentially sinking oils.
  - Wildlife rescue and rehabilitation.

    - Guaranteed (contracted) SMT and wildlife response contractors for Type A (crude) railroads.

- Potential reduced or avoided impacts to the following, based on comprehensive and contracted response management.
    - Public health and safety:
        - Fire.
        - Explosions.
        - Air quality.
        - Toxic chemical exposure.
        - Drinking water contamination.
        - Subsistence or traditional food source contamination.
        - Evacuation.
        - Property damage and contamination.
        - Property value impacts of risk.
    - Surface water quality.
    - Groundwater quality.
    - Fisheries.
    - Areas prone to wildfire.
    - Shellfisheries.
    - Bird populations.
    - Sea mammals.
    - Endangered species.
    - Animals consuming contaminated fish or shellfish.
    - Recreational quality.
    - Passive or non-use values for nature.

- Potential reduction in impacts to the following, based on improved planning for non-floating oils and wildlife response.
    - Water column and sediment wildlife, including shellfish.
    - Bird populations.
    - Animals including sea mammals.
    - Fish.
    - Endangered species such as some salmon and orcas.
    - Recreational use of shorelines.
    - Wildlife habitat surrounding the spill that may be impacted by long-term response size and duration.

- *See section 4.2.5* for unit values and illustrative total values for:
    - Immediate spill cleanup.
    - Spills of non-floating oils.

    - Worst case freshwater spills.
    - Values for animals and nature, including salmon recovery and wildlife watching.
    - Values for commercial fishing industries.
    - Post spill response remediation.
    - Non-crude oil spills.
- Ability to list SMT members in up to two positions.
- Ability to include wildlife drills as part of the multi-objective drill.

5.1.3 Comparison

While we were not able to quantify how the adopted amendments will reduce the amount or severity of damages to wildlife, property, public health, and environmental wellbeing, we have illustrated the myriad benefits categories and values that will potentially be gained. These will be reductions in short-term, and long-term damages, and also affect risk that underlies property values. These benefits will come at a 20-year present value cost of between $1.8 million to $7.6 million.

5.2 Conclusion

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

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Chapter 6: Least-Burdensome Alternative Analysis

6.1 Introduction

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

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

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

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

6.2 Goals and objectives of the authorizing statutes

The rule is authorized by various laws. The goals and objectives of the authorizing laws include:

- RCW 88.46.160, Refueling, bunkering, or lightering operations – Availability of containment and recovery equipment – Rules:
  - "Any person or facility conducting ship refueling and bunkering operations, or the lightering of petroleum products, and any person or facility transferring oil between an onshore or offshore facility and a tank vessel shall have containment and recovery equipment readily available for deployment in the event of the discharge of oil into the waters of the state and shall deploy the containment and recovery equipment in accordance with standards adopted by the department."

- "An onshore or offshore facility shall include the procedures used to contain and recover discharges in the facility's contingency plan."

- RCW 90.48.080, Discharge of polluting matter in waters prohibited:
  - "It shall be unlawful for any person to throw, drain, run, or otherwise discharge into any of the waters of this state, or to cause, permit or suffer to be thrown, run, drained, allowed to seep or otherwise discharged into such waters any organic or inorganic matter that shall cause or tend to cause pollution of such waters according to the determination of the department, as provided for in this chapter."

- Chapter 90.56 RCW, Oil and Hazardous Substance Spill Prevention and Response:
  - "The legislature declares that waterborne transportation as a source of supply for oil and hazardous substances poses special concern for the state of Washington."
  - "Recent accidents in Washington, Alaska, southern California, Texas, Pennsylvania, and other parts of the nation have shown that the transportation, transfer, and storage of oil have caused significant damage to the marine environment."
  - "Washington's navigable waters are treasured environmental and economic resources that the state cannot afford to place at undue risk from an oil spill."
  - "To establish state agency expertise in marine safety and to centralize state activities in spill prevention and response activities."
  - "To prevent spills of oil and to promote programs that reduce the risk of both catastrophic and small chronic spills."
  - "To ensure that responsible parties are liable, and have the resources and ability, to respond to spills and provide compensation for all costs and damages."
  - "To provide for state spill response and wildlife rescue planning and implementation."
  - "To support and complement the federal oil pollution act of 1990 and other federal law, especially those provisions relating to the national contingency plan for cleanup of oil spills and discharges, including provisions relating to the responsibilities of state agencies designated as natural resource trustees."
  - "The legislature intends this chapter to be interpreted and implemented in a manner consistent with federal law."
  - "To provide broad powers of regulation to the department of ecology relating to spill prevention and response."
  - "To provide for independent review on an ongoing basis the adequacy of oil spill prevention, preparedness, and response activities in this state."
  - "To provide an adequate funding source for state response and prevention programs."
  - "To maintain the best achievable protection that can be obtained through the use of the best achievable technology and those staffing levels, training procedures, and operational methods that provide the greatest degree of protection achievable."

6.3 Alternatives considered and why they were not included

Ecology considered the following alternatives during this rulemaking, but did not include them in the adopted amendments.

6.3.1 No internal employees on SMT

Ecology considered allowing only external professional groups to be members of SMTs. This would have imposed more burden on railroads, while potentially not achieving the goals and objectives of the authorizing statutes. Under the adopted amendments, each plan holder will make a decision enabling a rapid, aggressive, and well-coordinated response to a spill. This will need to include internal trained staff as well as contracted professional groups, to best achieve the necessary response.

6.3.2 List only individuals as Spill Management Team members

Ecology considered requiring specific individuals to be listed in the ICS table. This would have imposed more burden on railroads, without necessarily achieving the goals and objectives of the authorizing statutes. Under the adopted rule, plan holders may list the name of the SMT under particular conditions (must have an approved application on file with the state, and must agree in writing) that guarantee qualified participation in spill response regardless of named individuals.

6.3.3 Six-hour Spill Management Team arrival in state

Ecology considered keeping language requiring team members to arrive in the state within six hours. This would not meet the goals and objectives of the authorizing statutes, unless arrival in-state meant arrival at the incident command post. This was the intent of the rule, and the change under the adopted amendments is intended to clarify the requirement.

6.3.4 Longer time to assess non-floating oil cargo

Ecology considered allowing one hour to assess non-floating oils (NFOs). This would have imposed more burden on railroads without necessarily achieving the goals and objectives of the authorizing statutes. Multiple tasks must be accomplished during the first hour (e.g., safety), and Ecology believes the six-hour planning standard allows for completion of those tasks, as well as accurate assessment of NFOs.

6.3.5 Alternative presentation of planning standards

Ecology considered listing the baseline planning standard and requiring three times what is listed under the baseline. This would have made compliance potentially confusing and imposed more burden on railroads.

6.3.6 Volunteer planning

Ecology considered requiring plans describe how wildlife volunteer resources may be used to supplement the plan, what roles volunteers may fill, and how volunteers will be identified, activated, managed, and compensated. This would have imposed more burden on railroads, without necessarily achieving the goals and objectives of the authorizing statutes. Rather than individual plans describing volunteer context and procedures, a separate or centralized approach to volunteers may be less burdensome and more effective.

6.3.7 Drill credit for out-of-state table-top drills

Ecology considered allowing drill credit for table-top drills performed outside of the state. The adopted amendments explicitly require credit to be achieved in-state, but in some cases, Ecology has given out of state credit on a case-by-case basis, depending on whether the goals of the drill are met. Allowing credit for all out-of-state table-top drills would not ensure that they have all met the state-specific goals of the drill, and not meet the goals and objectives of the authorizing statutes.

6.3.8 Worst-case spill volume the same as onshore facilities

Ecology considered defining worst-case spill volume identically to the definition for onshore facilities (the entire volume of the largest above ground storage tank). While this idea is outside of the scope of this rulemaking, the baseline rule allows plan holders to request a different calculation of worst-case spill volume. Moreover, this alternative would have potentially been less successful in meeting the goals and objectives of the authorizing statutes, due to the different nature of rail (multiple, connected cars of the same volume; potential derailment of multiple cars; engine) and onshore facilities (multiple tanks but unlikely to spill multiple tanks simultaneously).

6.4 Conclusion

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

Chapter 7: Regulatory Fairness Act Compliance

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:

- Results of the analysis of relative compliance cost burden.
- Consideration of lost sales or revenue.
- Cost-mitigating action taken by Ecology, if required.
- Small business and local government consultation.
- Industries likely impacted by the adopted rule.
- Expected net impact on jobs statewide.

A small business is defined by the RFA as having 50 or fewer employees. Estimated costs are determined as compared to the existing regulatory environment—the regulations in the absence of the adopted rule amendments. The RFA only applies to costs to "businesses in an industry" in Washington State. This means that impacts, for this document, are not evaluated for non-profit or government agencies.

The existing regulatory environment is called the "baseline" in this document. It includes only existing laws and rules at federal and state levels.

7.2 Quantification of Cost Ratios

Ecology calculated the estimated per-entity costs to comply with the adopted rule amendments, based on the costs estimated in Chapter 3. In this section, Ecology summarizes compliance cost per employee at affected businesses of different sizes.

There are eight railroads covered by the rule. Of these:

- One is owned by a public entity.
- Two are owned by one small business.

The small business likely to be covered by the adopted rule amendments employs 20-49 people.[35] For calculations, we use the low estimate of 20 employees. The largest ten percent of affected businesses (rounded from 0.5 businesses to one business) employ an average of ten thousand or more people. Based on cost estimates from chapter 3, we estimated the following compliance costs per employee, using the average employment listed.

[35] Ecology database of employment.

Table 3: Estimated compliance costs per employee.

Business Size	Average Employment	Average Cost per Employee
Small	20	$182
Largest ten percent (low costs)	10,000	$59
Largest ten percent (high costs)	10,000	$251

We conclude that the adopted rule amendments *may* have disproportionate impacts on small businesses. Ecology is therefore required to include elements in the rule amendments to mitigate disproportionate compliance costs, to the extent that is legal and feasible.

7.3 Loss of sales or revenue

Businesses that will incur costs could experience reduced sales or revenues if the adopted 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 significantly affect marginal costs), as well as the specific attributes of the markets in which they sell goods. This includes the degree of influence of each firm on market prices, and the relative responsiveness of market demand to price changes.

Ecology used the REMI PI+ model for Washington State to estimate the impact during 2019 – 2038 of the adopted rule on directly affected markets, accounting for dynamic adjustments throughout the economy. The model accounts for:

- Inter-industry impacts.
- Price, wage, and population changes.
- Dynamic adjustment of all economic variables over time.

As inputs for the REMI model, we assumed costs estimated in Chapter 3 were incurred by the rail industry (North American Industry Classification System code 4821; NAICS 4821), as either one-time costs or ongoing annual costs. We assumed compliance costs were transferred as:

- Internal wages
- Payments to wildlife response contractors (a subcategory of NAICS 5416)
- Payments to SMTs (a subcategory of NAICS 5416)

The model returns results for aggregate impacts to the state economy, as well as impacts to specific industry groups, by NAICS code. Model results indicated the following impacts to be likely results of the spending necessary to comply with the adopted amendments.

Prices

Under low or high cost assumptions, the REMI model forecasts no significant change (in some years it may be positive but less than 0.001 of an indexed dollar) in the aggregate price index for Washington, or for the final delivered price of rail transportation services. Without a significant change in prices, we do not expect the adopted amendments to impact revenues or sales for covered businesses.

Sales and revenue
Under low cost assumptions, the model forecasts no significant change (in some years it may be negative but less than $1 thousand state-economy-wide; it is not significantly different than zero for the rail transportation industry) in output or demand, as measured in dollar values.

Under high cost assumptions, the model forecasts a $1 thousand reduction in state-economy-wide output. Demand for rail transportation services remains not significantly affected. We examined impacts across all industries, and the impact to the statewide economy is the sum of many very small adjustments across multiple other industries.

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.

Ecology considered all of the above options, and included the following legal and feasible elements in the adopted rule amendments that reduce costs. In addition, Ecology considered the alternative rule contents discussed in chapter 6, and excluded those elements that would have imposed excess compliance burden on businesses.

- Setting requirements based on oil type (crude vs. non-crude) will result in fewer requirements for Type B railroads than Type A railroads. One Type B railroad is owned by the single small business covered by this rule.
- Updating plan submission requirements to be consistent with current practice of electronic submittal reduces costs for all plan holders. This inherently reduces costs per employee by more for small businesses.
- Allowing an SMT member to be listed in two positions in the ICS table reduces the likelihood that a plan holder will need to contract with an external approved SMT.
- While motivated verbatim by statute, the significant reduction in requirements for Type C railroads will decrease costs for one railroad owned by the single small business covered by this rule.

7.5 Small business and government involvement

Ecology involved small businesses and local government in the development of the rule amendments, by:

- Sending letters to tribes.
- Communicating via listservs:
    - Spills Program listserv
    - WAC Track listserv
    - Interested Parties listserv
- Holding a workshop with Type C railroads (Vancouver-Portland Junction, Great Northwest, and Central Washington). One of these railroads is owned by the only impacted small business.
- Holding two workshops with Type B railroads (Puget Sound & Pacific and Columbia Basin). One of these railroads is owned by the only impacted small business.
- Holding two workshops with Type A railroads (BNSF, Tacoma Rail, and Union Pacific).
- Meeting with the Washington State Department of Fish and Wildlife Oil Spill Team unit.
- Including the Washington Utilities and Transportation Commission, and Washington Emergency Management Division, in all meetings with railroads.

7.6 NAICS codes of impacted industries

The adopted rule is likely to impact only covered railroads. All are classified as North American Industry Classification (NAICS) code 4821, Rail Transportation.

7.7 Impact on jobs

Ecology used the REMI PI+ model for Washington State to estimate the impact of the adopted rule on jobs in the state during 2019 – 2038, accounting for dynamic adjustments throughout the economy. The model accounts for:

- Inter-industry impacts.
- Price, wage, and population changes.
- Dynamic adjustment of all economic variables over time.

As inputs for the REMI model, we assumed costs estimated in Chapter 3 were incurred by the rail industry (NAICS 4821), as either one-time costs or ongoing annual costs. We assumed compliance costs were transferred as:

- Internal wages
- Payments to wildlife response contractors (a subcategory of NAICS 5416)
- Payments to SMTs (a subcategory of NAICS 5416)

The model returns results for aggregate employment impacts to the state economy, as well as

impacts to specific industry groups, by NAICS code. Model results indicated the following impacts to be likely results of the spending necessary to comply with the adopted amendments.

Aggregate employment
Under low cost assumptions, the REMI model forecasts the adopted amendments will result in the sustained loss of one aggregate job statewide. Under high cost assumptions, this impact increases to one aggregate job lost in 2019, increasing to six jobs by 2025 – 2027, then decreasing and stabilizing at five jobs lost. We examined the origin of these total job losses, and found that they are based on multiple small (one job or less) forecast losses across multiple industries, resulting from very small adjustments in prices and wages statewide.

Rail industry employment
Under low cost assumptions, the model forecasts the adopted amendments will not result in significant job losses in the rail transportation industry. Under high cost assumptions, this impact increases to the sustained loss of one job beginning in 2021.

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Appendix A
Administrative Procedure Act (RCW 34.05.328)

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

See chapter 6.

B. RCW 34.05.328(1)(b) –

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

See chapters 1 and 2.

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

Ecology was directed by the legislature to update our rule to address legislative direction outlined in ESHB 1136 and E2SSB 6269 and did not consider an alternative.
Please see the Least Burdensome Alternative Analysis, chapter 6 of this document, for discussion of alternative rule content considered.

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

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

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

See chapters 1 – 5.

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

Please see chapter 6.

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

The adopted rule does not conflict with other federal or state laws. During the 2015 legislative session, RCW 88.46.010 and RCW 90.56.010 were amended to include railroads (not owned by the state) that transport bulk oil as cargo in the definition of "facility", and RCW 90.56.210 was amended to expand Ecology's authority to require state contingency plans for rail. The Legislature directed Ecology to develop rules establishing contingency planning requirements for railroads transporting oil in bulk.

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

The rule will not impose more stringent performance requirements on private entities than on public entities. One of the eight plan holders is a public entity (Tacoma Rail) and will be required to meet the same standards as the two largest public railroads operating within the state's jurisdiction (BNSF and Union Pacific).

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.

The rule does not differ from any federal regulation or statute applicable to the same activity or subject matter.

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.

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.

Ecology is also conducting rulemaking for facilities, vessels and pipelines (Chapter 173-182 WAC) in accordance with E2SSB 6269. The two teams responsible for the separate rulemakings meet frequently to maintain alignment between the requirements to the maximum extent practicable.